

**CREATING KNOWLEDGE-BASED CLUSTERS THROUGH URBAN  
DEVELOPMENT:  
A STUDY OF CYBERJAYA, MSC MALAYSIA**

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## Glossary of Terms

<i>Adat</i>	Malay custom; way of life
<i>Bumiputera</i>	Sons of the soil; term refers to the native Malays and other ethnic groups in Sabah and Sarawak
<i>Berhad (Bhd)</i>	Public limited company
<i>Kampung</i>	Village
<i>Kelang Valley</i>	Geographical terms which refers to Kuala Lumpur and its suburbs, and adjoining cities and towns in the State of Selangor.
<i>Ketuanan Melayu</i>	Malay Supremacy
<i>Malaysia Boleh</i>	Malaysia Can do it; widely use slogan to encourage Malaysian to strive to be the best
<i>Petaling Jaya</i>	Satellite city located adjacent to Kuala Lumpur, considered the first ‘new city’ in Malaysia
<i>Putrajaya</i>	Malaysia’s new administrative capital built in 1996; always referred to as Cyberjaya twin city
<i>Ringgit Malaysia (RM)</i>	Malaysia’s currency – approximately RM3.9 = €1 (May, 2012)
<i>Sendirian Berhad (Sdn Bhd)</i>	Private Limited company
<i>Selangor</i>	The most developed state in Malaysia; Cyberjaya is located in the state Sepang Administrative district in which Cyberjaya is located
<i>Shah Alam</i>	State capital of Selangor
<i>Wawasan 2020</i>	Vision 2020; Malaysia’s long term goal to become a developed country by the year 2020

## List of Abbreviations

CIDB	Construction Industry Development Board
ECER	East Coast Economic Region
EPU	Economic Planning Unit
FELDA	Federal Land Development Authority
FTZ	Free Trade Zones
GDP	Gross Domestic Product
GIS	Geographic Information System
GLC	Government Linked Companies
IBB	Internet Based Business
ICT	Information & Communication Technology
IT	Information Technology
IMR	Institute of Medical Research
JPBD	<i>Jabatan Perancangan Bandar dan Desa</i> (Department of Town and Country Planning)
KBE	Knowledge-Based Economy
KLCC	Kuala Lumpur City Centre
KLIA	Kuala Lumpur International Airport
KLN	<i>Kementerian Luar Negeri</i> (Ministry of Foreign Affairs)
LUCT	LimKokWing University of Creative Technology
MARA	<i>Majlis Amanah Rakyat</i> (The Council of Trust for the Indigenous People)
MASTIC	Malaysian Science and Technology Information Centre
MCA	Malaysian Chinese Association
MCMC	Malaysian Communications and Multimedia Commission
MDEC	Multimedia Development Corporation
MIC	Malaysian Indian Congress
MITI	Ministry of International Trade and Industry
MMU	Multimedia University
MOE	Ministry of Education
MOHE	Ministry of Higher Education
MOSTI	Ministry of Science, Technology and Innovation
MPSP	<i>Majlis Perbandaran Sepang</i> (Sepang Municipal Council)
MQA	Malaysian Qualifications Agency
MSC Malaysia	Multimedia Super Corridor Malaysia
MyIPO	Intellectual Property Corporation of Malaysia
NCER	Northern Corridor Economic Region
NEAC	National Economic Advisory Council
NEM	New Economic Model
NEP	New Economic Policy
PAS	<i>Parti Islam Se-Malaysia</i> (Pan-Malaysian Islamic Party)
PMO	Prime Minister Office
R&D	Research & Development
SME	Small and Medium Enterprise
SNA	Social Network Analysis
SSO	Shared Services Outsourcing
TM R&D	Telekom Malaysia Research & Development
UIAM	<i>Universiti Islam Antarabangsa</i> (International Islamic University)

UiTM	Universiti Teknologi MARA
UKM	<i>Universiti Kebangsaan Malaysia</i> (National University of Malaysia)
UM	University of Malaya
UMNO	United Malays National Organisation
UNITEN	Universiti Tenaga Nasional
UPM	Universiti Putra Malaysia
UPSI	<i>Universiti Pendidikan Sultan Idris</i> (Sultan Idris University of Education)
UTM	<i>Universiti Teknologi Malaysia</i> (University of Technology Malaysia)
UUM	<i>Universiti Utara Malaysia</i> (Malaysia Northern University)
USM	<i>Universiti Sains Malaysia</i> (University of Science Malaysia)
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WHO	World Health Organisation

## Abstract

In 1997 Malaysia started the construction of the largest knowledge-based cluster in the form of a new township known as Cyberjaya<sup>1</sup>. The cluster was designed to be the Information and Communication Technology (ICT) hub following other Science Park models in developed countries<sup>2</sup>. The planning and development of the cluster is highly centralised and focuses on hard rather than soft infrastructure. If interconnection (Porter, 2000) and the transfer of tacit knowledge (Evers, 2008) are central to a successful cluster, then they should be the main indicators of a dynamic cluster. This is in addition from having a well-developed infrastructure as argued by Saxenian (2004). Therefore, the main question addressed in this research is; *how does urban development contribute to knowledge flow and knowledge sharing in Cyberjaya, Malaysia?*

This research has three main objectives; the first objective is to contribute towards the understanding on how physical development impacts the formation of knowledge-based clusters in Peninsular Malaysia. The next objective is to analyse the influence of spatial planning and urban development on Cyberjaya as a knowledge-based cluster. Finally, the last objective is to thoroughly examine knowledge sharing, knowledge network, and the importance of spatial proximity among people working in ICT companies in the city.

In an attempt to answer the question and fulfil the three aforesaid objectives, this research applies a case study (Yin, 2008) approach as well as a combination of qualitative and quantitative methods (Cresswell, 2009). It uses the bottom up technique in which the research begins by understanding the situation through individuals living and working in the city before proceeding to analysing the development at the macro level. From the standpoint of *Verstehende soziologie* (understanding sociology), I attempt to understand the symbolic meaning connected with the city and its inhabitants<sup>3</sup>.

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<sup>1</sup> Knowledge-based clusters are agglomeration of organisation that actively uses knowledge both as input and output for instance universities and colleges, research institutions, think-tanks, government research agencies and knowledge-intensive firms (Evers, 2010).

<sup>2</sup> The term ICT is used loosely and covers all related industries including multimedia as well as software development and hardware design.

<sup>3</sup> This method is utilised in chapter three in which the symbolic meaning of the city is analysed following an earlier study by Evers (1997).

I argue that politically motivated cluster development has influenced the epistemic landscape, knowledge-based cluster and knowledge workers in Cyberjaya. Furthermore, physical infrastructure alone would not produce the innovative and knowledge outcome. Malaysia's centralised administrative system, the race based policy, elites and crony based capital distribution have also impacted the growth of knowledge-based clusters. It creates an opportunity for the political elites to benefit from the massive infrastructure projects such as Cyberjaya.

## Deutsche Zusammenfassung

Die Gründung der Stadt Cyberjaya.<sup>4</sup> im Jahre 1997 war für Malaysia gleichbedeutend mit der Schaffung des größten wissensbasierten Clusters des Landes. Der Cluster sollte das Zentrum für Informations- und Kommunikationstechnologie (ICT) werden und dabei den Modellen von Forschungsparks in Industrieländern folgen<sup>5</sup>. Planung und Entwicklung des Clusters erfolgten sehr zentralisiert und das Hauptaugenmerk wurde eher auf harte als auf weiche Infrastruktur gesetzt. Falls die Verknüpfung (Porter, 2000) und der Transfer von implizitem Wissen (Evers, 2000) der Schlüssel zu einem erfolgreichen Cluster sind, dann sollte dies, neben einer hochentwickelten Infrastruktur, einer der Hauptindikatoren eines dynamischen Clusters sein, wie Saxenian erörtert (2004). Daher ist die Hauptfrage, der sich diese Arbeit widmet: *Wie tragen Wissensfluss, Wissensaustausch und urbane Planung zur Entwicklung von Cyberjaya als Wissensstadt bei?*

Diese Arbeit verfolgt drei Hauptziele. Das erste Ziel ist, zum Verständnis des Einflusses physischer Entwicklung auf die Schaffung wissensbasierter Cluster auf der malaysischen Halbinsel beizutragen. Des weiteren wird der Einfluss von Raumplanung und Stadtentwicklung auf Cyberjaya als wissensbasiertem Cluster analysiert. Das letzte Ziel wird sein, Wissensaustausch, Wissensnetzwerke und die Bedeutung räumlicher Nähe zwischen den Mitarbeitern von ICT-Firmen in der Stadt sorgfältig zu untersuchen.

In dem Bemühen, die Kernfrage zu beantworten und den drei Ziele gerecht zu werden, arbeitet diese Untersuchung mit Fallstudien (Yin, 2008) sowie mit verschiedenen Methoden, dabei sowohl quantitativen als auch qualitativen Ansätzen folgend (Cresswell, 2009). Es werden bottom-up Techniken verwendet, bei denen die Untersuchung mit dem Verständnis der Situation der Individuen, die in der Stadt leben und arbeiten, beginnt, bevor mit der Analyse der Entwicklung auf dem

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4 Wissensbasierte Cluster sind Agglomerationen von Organisationen, die Wissen aktiv sowohl als Input, als auch als Output verwenden, beispielsweise Universitäten und Colleges, Forschungseinrichtungen, Denkfabriken, staatliche Forschungsbehörden und wissensintensive Firmen (Evers, 2010).

5 Der Begriff ICT wird in seinem erweiterten Sinne verwendet und bezieht sich auf alle verwandten Industrien, mitsamt der Multimedia- und Softwareentwicklung, sowie Hardwaredesign.



Makrolevel fortgefahren wird. Zusätzlich dazu wird „Verstehen“ angewandt, um die symbolische Bedeutung zu erfassen, die mit der Stadt und ihren Bewohnern verbunden ist<sup>6</sup>.

Meine These lautet, dass politischer Einfluss und Politik, die auf ethnischen Kategorien basiert, die epistemische Landschaft beeinflussen. Des Weiteren wird allein durch physische Infrastruktur weder Innovation noch Wissen produziert. Malaysias zentralisiertes Verwaltungssystem, sowie ethnische Zugehörigkeit, Eliten und die vernetzte wirtschaftliche Kapitalverteilung beeinflussen ebenfalls das Wachstum wissensbasierter Cluster. Dies ermöglicht den politischen Eliten, von den massiven Infrastrukturprojekten, wie beispielsweise Cyberjaya, zu profitieren.

Die Arbeit ist in sieben Abschnitte unterteilt, bestehend aus einer Einleitung, fünf empirischen Kapiteln und einer zusammenfassenden Darstellung. Für den Zweck dieser Zusammenfassung liegt der Fokus auf den empirischen Kapiteln. Im Folgenden werden zusammenfassend die empirischen Kapitel dargestellt.

### Die Bildung von Wissensclustern auf der malaysischen Halbinsel

Das Ziel dieses Kapitels ist es, die Entstehung wissensbasierter Cluster auf der malaysischen Halbinsel aufzuzeigen. Die Fragestellungen lauten: Welche Ergebnisse zeitigte es, wenn die Bildung eines Wissensclusters (insbesondere in der ICT-Branche) auf der Agenda der Regierung stand? Hat Malaysia eine epistemische Landschaft von Wissensclustern entwickelt? Hat sich der Hauptwissenscluster wirklich in und um Cyberjaya materialisiert?

Um die oben genannten Fragen zu beantworten, soll zuerst ein Blick auf Malaysia und seinen Weg zu einer wissensbasierten Wirtschaft geworfen werden. Dazu wird zunächst die Entwicklungsstrategie der malaysischen Regierung beschrieben, die die Bildung von Clustern als eines ihrer Hauptziele nennt. Danach folgt eine Übersicht über den aktuellen Stand der Bildung von Wissensclustern auf der malaysischen Halbinsel.

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<sup>6</sup> Diese Methode wird im dritten Kapitel verwendet, in dem die symbolische Bedeutung der Stadt auf der Basis einer früheren Studie von Evers (1997) analysiert wurde.

Als Resultat jahrzehntelanger institutionalisierter Planung von Entwicklung wurden an verschiedenen Orten auf der malaysischen Halbinsel wissensbasierte Cluster mit unterschiedlichen Graden der „Wissensdichte“ gebildet. Eine vom Autor erstellte Dichtekarte, basierend auf der Anzahl der Institutionen, sowie der Anzahl der Wissensarbeiter, findet sich in der Arbeit. Die Ergebnisse zeigen, dass sich die wissensbasierten Cluster auf der malaysischen Halbinsel immer noch größtenteils an der Westküste befinden. Drei Hauptstandorte mit der höchsten Konzentration wissensproduzierender Institutionen und Wissensarbeitern sind das Kelang Tal, Joho Bahru und Penang.

Im Gegensatz dazu finden sich an der Ostküste der malaysischen Halbinsel weniger entwickelte Wissenscluster, die sich auch weiterhin in den wichtigen regionalen Städten, wie Kota Bahru, Kuala Terengganu, Dungun und Kuantan konzentrieren. Im Vergleich zu den anderen drei Städten hat Kuantan die höchste Dichte von Wissensarbeitern. Eine interessante Erkenntnis der Dichtekarte ist, dass sich Wissenscluster an der Ostküste nicht entlang wichtiger Autobahnen verbreiten, wie es an der Westküste der Fall ist, sondern in den urbanen Zentren konzentriert sind.

Zusätzlich zur Wissensdichtekarte wurde eine ICT-Wissensclusterkarte erstellt, die auf Daten basiert, die während der Feldforschung gesammelt wurden. Sie zeigt, dass ICT-Cluster auf der malaysischen Halbinsel mit den oben genannten Clustern korrelieren, so befindet sich im Gebiet des Kelang Tals, das auch Cyberjaya einschließt, eine signifikante Anzahl von Institutionen des ICT-Bereichs. Offensichtlich hat der MSC Malaysia zur Schaffung von ICT Clustern innerhalb des Kelang Tals beigetragen.

Nach der Unabhängigkeit Malaysias hatten sich R&D Aktivitäten auf Hauptsektoren der Wirtschaft konzentriert, wie beispielsweise den Agrarsektor und den Fischfang. Während der Amtszeit von Premierminister Mahathir, die 1980 begann, setzte eine Diversifizierung der R&D Aktivitäten ein, weg von den traditionellen Bereichen, hin zur Hochtechnologie in den Bereichen ICT, Automobilindustrie und Luft- und Raumfahrttechnik. Daraus resultierend wuchs die Zahl der R&D Institute von 14 (vor der Unabhängigkeit) auf 101 (Stand 2009). Zur

gleichen Zeit begann der Aufstieg neuer Gruppen wie etwa Aufsichtsräten und Beratergremien, die von solchen Institutionen profitierten. Sie setzten sich überwiegend aus hochrangigen Mitgliedern der herrschenden Partei und pensionierten Beamten zusammen.

Zusätzlich zu staatlichen wissensproduzierenden Institutionen existieren auch private Institutionen, zu denen auch das Goon Institute in Kuala Lumpur zählt, das 1936 gegründet wurde. Wegen der steigenden Nachfrage nach Hochschulbildung, die in den 1970ern einsetzte, stieg die Anzahl privater akademischer Bildungsinstitute signifikant an. Dies wurde durch die Liberalisierung und Restrukturierung der Hochschulbildung in den 1990ern weiter verstärkt. Dieser Prozess trägt zu dem beachtenswerten Anstieg der Anzahl öffentlicher und privater wissensproduzierender Institutionen bei. Daraus resultierend verdreifachte sich die Zahl staatlicher Universitäten von lediglich acht vor 1990 auf 20 im Jahr 2009. Während es in den 1990ern keine einzige private Universität gab, waren im Jahr 2007 37 private Universitäten in Malaysia zugelassen. Gleichzeitig vermehrten sich andere Formen privater akademischer Institutionen von 156 (1992) auf 460 (2009).

Anschließend folgt eine Diskussion der wichtigsten Frage, nämlich ob dieser Clustering-Prozess auch höhere Wissensproduktion zur Folge hat, so wie es die Clustering-Theorie vorhersagt. Dazu wurde die Produktion von Wissen, d.h. wissenschaftliche Publikationen, Patente und Markenzeichen, als Indikator für Innovation und Wissensproduktion verwendet. Die Datenbasis für Produktion wissenschaftlicher Publikationen stammt vom ISI Web of Science. Die Ergebnisse zeigen, dass öffentliche Universitäten mehr Publikationen produzieren als private, nämlich im Durchschnitt das Zehnfache an Publikationen pro Jahr, verglichen mit ihren privaten Gegenübern.

Neben der Anzahl der Publikationen wurden auch Daten zu Patenten und Markenzeichen gesammelt, um die Dynamik von Wissensclustern zu bewerten. Die Daten zeigen, dass Selangor und Kuala Lumpur, gefolgt von Penang und Johor zwischen 2005 und 2009 die höchsten Zahlen in diesen Kategorien vorweisen. Gleichzeitig weisen auch Perak, Malacca und Negeri Sembilan, die sich in den konzentriertesten Wissensclustern auf der malaysischen Halbinsel befinden,

signifikante Zuwächse in Bezug auf die Anmeldung von Patenten und Markenzeichen auf. Also dominiert das Kelang Tal immer noch die Produktion von Wissen auf der malaysischen Halbinsel, und es zeigt sich, dass die Produktion von Patenten und Markenzeichen stark mit wirtschaftlichem Wachstum korreliert.

Zusammenfassend lässt sich sagen, dass die Daten von Websites, Direktorien, staatlichen Veröffentlichungen und Experteninterviews es ermöglichten, die epistemische Landschaft der malaysischen Halbinsel aufzuzeigen. Mehrere Wissenscluster mit einer hohen Dichte an Institutionen zur Wissensproduktion sowie ihre Wissensarbeiter wurden identifiziert und beschrieben. Die Analyse des Wissensoutputs, gemessen an wissenschaftlichen Publikationen, Patenten und Markenzeichen, zeigt, dass die existierenden Wissenscluster in der Tat produktiv waren und sind, wie es die Cluster-Theorie vorhergesagt. Allerdings sind die Ergebnisse nicht mehr so eindeutig, sobald der Output relativ zu den Institutionen betrachtet wird. Politisch motivierte Entwicklungsplanung, sowie soziale Netzwerke haben sowohl die epistemische Landschaft, als auch die Ergebnisse von Wissensclustering beeinflusst. Dies wird beim Vergleich zwischen der Verteilung von Wissensarbeitern und den von der Regierung geplanten Entwicklungskorridoren deutlich. Mehrere Korridore weisen eine zu geringe Konzentration an Wissensarbeitern auf, um die gewünschte Entwicklung herbeizuführen, während andere Gebiete mit einer guten Wissensbasis nicht als Korridore ausgewiesen werden.

### Die malayische Vormachtstellung in der urbanen Entwicklung

Das Kapitel analysiert, wie verschiedene Akteure urbane Symbole benutzen, um ihre Vision einer modernen malaysischen Nation und Gesellschaft bei der Konstruktion der neu gegründeten und wissensbasierten Stadt Cyberjaya umzusetzen. Ziel ist es, den Gebrauch von Symbolen und Zeichen im sozialen Raum von Cyberjaya zu beobachten. Dies wird durch den *Verstehen*-Ansatz umgesetzt, wobei versucht wird, die symbolische Bedeutung physischer Entwicklung, bei der Zeichen und Symbole benutzt werden um urbanen Raum zu definieren, zu interpretieren und zu verstehen. Politische Eliten machen Gebrauch von Symbolen, um ihren Anspruch auf eine Vormachtstellung anzumelden. Auf die

gleiche Art wurden auch Websites, Nachrichtenarchive und während der Feldforschung aufgenommene Fotografien interpretiert. Da die herrschende Regierungselite das Land und den urbanen Planungsprozess kontrolliert, ist sie in der Lage, dem urbanen Raum und urbanen Konstruktionen ihre Vision von einer malaysischen Gesellschaft aufzuzwingen, wie die Analyse von Logos staatlicher Firmen, von Architektur und des Gebrauch des urbanen Raums zeigte. Es zeigt sich, dass sowohl der Rückgriff auf traditionelle Modelle malaysischen Lebens als auch Visionen eines modernisierten Malaysias um räumlichen und symbolischen Ausdruck konkurrieren.

In der multi-ethnischen Gesellschaft Malaysias ist der Raum für Symbole hart umkämpft. Während der Zeit als chinesische Symbole, beispielsweise Schilder mit chinesischen Zeichen und chinesische Tempel, den urbanen Raum dominiert haben, war der malaiische Symbolismus auf nationale Moscheen, Sultanspaläste und in ländliche Gebiete verbannt. Mit der NEP, von der malaiisch dominierten Regierung nach der Unabhängigkeit in Gang gesetzt, haben die Malaien einen größeren Anteil der wirtschaftlichen Möglichkeiten beansprucht. Dies konnte nur durch die Inanspruchnahme von mehr urbanem Raum, in dem sich wirtschaftliche Aktivitäten konzentrieren, erreicht werden. Dies erwies sich jedoch als schwierig und schließlich öffnete die Gründung neuer urbaner Zentren die Möglichkeit, symbolisch einen Platz für malaiische Dominanz in der Regierung und der Wirtschaft einzufordern. Die Schaffung von Cyberjaya war das Resultat des Kampfes um symbolische Vorherrschaft.

Der neue urbane Raum Cyberjaya ist, wie alle urbanen Räume, einem ständigen Wettbewerbs- und Verhandlungsprozess unterworfen. Gedacht, geplant und gebaut als das Herzstück des ambitionierten MSC Projekts, wird Cyberjaya als die Hauptantriebskraft gesehen, die es Malaysia ermöglichen wird, sein seit langem angestrebtes Ziel, die Erlangung des Status einer Industrienation, bis 2020 zu erreichen. Der Transformationsprozess ist in jeder Hinsicht spektakulär gewesen. Um es mit den Worten Ross King's (2008: xxii) auszudrücken, der den Aufstieg des nahegelegenen Putrajaya schildert, -eine Beschreibung die ebenso gut auf Cyberjaya zutrifft-, haben wir folgendes gesehen: „the landscape of oil palm plantations succumb to bulldozers and excavators to yield the red-earth scars of

construction sites, then roads, formal avenues, monuments and domes, engineering extravaganzas, high-rise offices and housing estates“. So ist Cyberjaya tief, sogar ikonengleich, in das *nationale* Entwicklungsprojekt einbezogen, das der Staat seit mehr als fünf Jahrzehnten verfolgt.

Im malaysischen Kontext aber werfen die materielle Realität und die symbolische Bedeutung Cyberjayas wesentliche Fragen in Bezug darauf auf, wessen Entwicklung vorangetrieben wird und zu welchen unmittelbaren wie auch langfristigen Zielen. Obwohl Malaysia traditionell eine Gesellschaft vieler Gemeinschaft ist, wurde Cyberjaya von ihren Planern, nicht zuletzt von Mahathir selbst, *gleichzeitig* als Manifestation des Multikulturalismus und als Monument für die Leistung der partikularistischen Malai-Muslime präsentiert. Durch diese Teilung spiegelt Cyberjaya die breitere Ambivalenz der Identitätspolitik wider, da sie jeden Aspekt des Lebens durchdringt: politische Kontrolle, Besitzverhältnisse, räumliche Trennung, die Zugehörigkeitszeichen, die Bedeutungen von Kultur und mehr. Hinzu kommt der Einfluss globaler Dynamiken, die Teil des Versprechens sind, die Wirtschaft zu liberalisieren und zu öffnen, um als Technopolis in der informatorischen Netzwerkgesellschaft wettbewerbsfähiger zu sein.

Kann Cyberjaya alle drei Identitäten gleichzeitig miteinander vereinbaren? Kann sie malaiisch und multikulturell, malai-muslimisch und kommunal, global und grenzenlos sein? Die meisten Belege erwecken den Eindruck, dass die *Primäridentität* Cyberjayas die eines Teils der malai-muslimischen Welt ist. Dies ist sicherlich Ross' Sicht (2008: xxiv), der bei der Diskussion der Ursprünge des MSC Projekts als Ganzes sagt, dass „the underlying agenda is the advancement of Malaysia as a Malay-Muslim polity, a new kind of high-modernist Muslim nation, one pole is an emerging pan-Islamic world and noble counter to more venal globalist ideas“. Der Großteil der für dieses Kapitel gesammelten Belege scheint diese Behauptung zu bestätigen, sowohl materiell als auch symbolisch. Die Logos und Wappen, die in Cyberjaya verwendet werden, um die Schlüsselakteure bei der Entwicklung zu definieren und zu projizieren, haben einen sehr klaren Bezug zu einem sowohl „traditionellen“, als auch „modernen“ malai-muslimischem Hintergrund. Durch die Untersuchung der architektonischen Motive und die Raumnutzung wird ebenso klar, dass malaiische Identifikatoren vorherrschen,

allerdings nicht exklusiv. Es gibt eine Mischung von verwendeten Stilen: der Stadtrat von Sepang, Cyberview und die MMU verwenden jeweils einen relativ konventionellen, international modernistischen Architekturstil. Dadurch, dass man die modernistische Tradition beibehält, folgt Cyberjaya „a zonal pattern that is corresponding to each function of the city“, mit charakteristischen Flagship-, Einwohner-, Geschäfts- und Freizeitzonen. Brooker deutet an, dass „Zoning was designed to produce specific psychological effects on the citizens who inhabit the “intelligent city” (Brooker, 2012: 9).

Die symbolische und ästhetische Ambivalenz und Inkonsistenz in Cyberjaya ist jedoch viel größer, als es anfangs erscheint. In diesem Licht es ist nicht möglich zu behaupten, einzig die malai-muslimische kulturelle Identität sei bedeutungstiftend in Cyberjaya, auch wenn sie vorerst die dominierende sein mag. Bis 2020 wird die malaiische politische Elite eine Gratwanderung meistern müssen in Bezug auf die konkurrierenden Ansprüchen was Cyberjaya heute ist und wie es sein sollte: zwischen einem genuin malaysischen Projekt, das die gesamte Bevölkerung mit einschließt, und einer exklusiv malai-muslimischen urbanen Landschaft, die ironischerweise auf der Suche nach Inspiration den Blick immer mehr weg von der traditionellen *kampung* Welt und hin zu einer breiteren islamischen Welt wendet. Zu dieser Mischung kommt die Art hinzu, mit der globale Kräfte während der Schaffung einer Wissensgesellschaft die Dynamik sozialen Wandels beeinflussen. Vorerst scheint Cyberjaya nichts zu reflektieren, das „real“ in Malaysia, außerhalb des MSC, existiert. Es ist eine postmoderne Fantasie, die symbolische kulturelle Bezüge in allen möglichen verworrenen Varianten vermischt, vermutlich ohne zu wissen, was sie wirklich bedeuten. Wohin diese Entwicklung führt, hängt in großen Teilen von der Balance zwischen den politischen Kräften ab, die möglicherweise in den kommenden Jahren hervortreten werden. Sie wird aber auch von globalen Strukturen und Einflüssen abhängen, deren Effekte sich weit schwieriger voraussagen lassen.

## Vetternwirtschaft und die Entwicklung Cyberjayas

Dieses Kapitel untersucht die Entstehung der Wissensstadt und ihrer Gestaltung unter der Einwirkung der diversen Vernetzungen und informellen Verbindungen der Akteure. Der Fokus liegt auf physischen Infrastrukturprojekten als entscheidendem Faktor, sowohl für den Aufbau der Stadt, als auch für die Zuteilung von Ressourcen. Daher ist die Hauptfrage dieses Abschnitts: „Wer profitiert von der Entwicklung Cyberjayas und spüren die Einwohner den Effekt einer wissensbasierten Stadt?“

Das Netzwerk von Kapital und Politik ist ein offenes Geheimnis und wurde offensichtlich, als Malaysia während der Amtszeit Mahathirs mit großangelegten Privatisierungen und massiven Infrastrukturprojekten begann. (Gomez, 2012; Wain 2010; Jomo & Gomez, 2000). Bei Baubeginn lagen die Kosten für die städtische Infrastruktur zwischen 2 und 5 Milliarden RM<sup>7</sup> (iProperty.com , 2010a; Wain, 2010). Die Aufwendung solch großer Kapitalmenge eröffneten Möglichkeiten für die kapitalistische und politische Elite. Daher konnten die, die es schafften, sich Zugang zu den Konstruktionsaktivitäten in Cyberjaya zu verschaffen, von den massiven Arbeiten an der Infrastruktur profitieren, durch die vor allem unerschlossene Grundstücke zugänglich gemacht wurden.

Momentan gibt es 17 aktive Bauträger in der Stadt. An der Spitze steht die Emkay Group (6 Milliarden RM), gefolgt von SP Setia (3 Milliarden RM), OSK (1,5 Milliarden RM), Mah Sing (1,5 Milliarden RM) und UEM Land (1 Milliarde RM). Das momentane Volumen des GDV (Gross Development Value) zeigt eindeutig, dass die Emkay Group durch ihre Position als Hauptentwickler den Zugang zu Landbesitz in Cyberjaya leitet und kontrolliert. Obwohl das Land innerhalb der Stadt dem Staat gehört, wurde einem einzigen der freie Zugang als Hauptentwickler gegeben, d. h. der Emkay Group. Der Mann, der die Firma besitzt, ist Mustapha Kamal, ein bekannter malaiischer Bauträger. Er hat enge Verbindungen zu Mahathir, dem Mann hinter der Schaffung von Cyberjaya.

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7 RM, oder Ringit Malaysia, ist die Währung Malaysias. Ein Euro entspricht in etwa vier RM.



Gleichzeitig haben die meisten Firmen entweder zur herrschenden Partei oder zu Mustapha Kamal enge Verbindungen. Beispielsweise sind Emkay, Laketown, Mah Sing und UEM Land alle dadurch verbunden, dass Mitglieder ihrer Vorstände entweder persönlich mit ihm gearbeitet haben, oder engste Familienangehörige sind, hingegen sind einige Aufsichtsratsmitglieder von Glomac, SP Setia, Subang Alam, OSK Property, Nadayu Properties und Andaman Property auch aktive Mitglieder der herrschenden Partei. Neben den politischen und sozialen Netzwerken existieren auch bürokratische Netzwerke, was durch die Wahl ehemaliger hochrangiger Beamter in Vorstände ersichtlich wird. Dies ist gängige Praxis in der malaysischen Unternehmenswelt (Mariarti & Kamarulzaman, 2005; Nor Azizah & Halimah, 2007). So wurden durch die Arbeiten an der Infrastruktur drei Netzwerkarten unter den Hauptakteuren in Cyberjaya geschaffen, nämlich soziale, politische und bürokratische. Alle drei stehen in einer Wechselbeziehung und beeinflussen sich gegenseitig. Dies zeigt, wie Infrastrukturprojekte nicht nur als Werkzeug zur Schaffung wirtschaftlicher Möglichkeiten für malaiische Kapitalisten verwendet werden, sondern durch die Wahl von Parteimitgliedern in Vorstände auch zur Sicherung von Vorteilen für die herrschende Partei beitragen.

Nichtsdestotrotz muss die Frage gestellt werden, ob vor diesem Hintergrund die Gesamtentwicklung der Stadt beeinflusst wird und was die Menschen, die dort leben und arbeiten, über die Stadt denken. Dazu werden die Standpunkte von Fachkräften, Einwohnern und Wissensarbeitern zur Entwicklung Cyberjayas analysiert; dabei wird zwischen ihren Erfahrungen mit und ihren Ansichten über die Stadt unterschieden.

Die Interviews zeigten, dass Fachkräfte, die mit der Entwicklung der wissensbasierten Cluster befasst waren, sich in dem Dilemma befanden entweder ihren professionellen Grundsätzen zu entsprechen oder sich ihren politischen Vorgesetzten zu unterwerfen. Währenddessen haben interne Führungs- und Managementprobleme innerhalb von Organisation wie EPU zur Demotivierung von Fachkräften beigetragen, und sie dazu gebracht, die Organisation zu verlassen. Obwohl Cyberjaya als wissensbasierte Stadt entwickelt und hervorgehoben wurde, scheint sie nicht einmal die grundlegenden Einrichtung für ihre Einwohner bereitzustellen. Der größte Bedarf, der nicht adäquat gedeckt wird, besteht in

bezahlbarem Wohnraum. Religiöse und medizinische Bedürfnisse werden ebenfalls vernachlässigt. Zusätzlich nehmen die Einwohner die ICT-Komponente, die das Rückgrat in der Entwicklung Cyberjayas sein sollte, nicht wahr. Dies hat Frustration unter den Menschen in Cyberjaya geschaffen. Sie scheinen keinen Unterschied zum Leben in anderen Städten zu spüren.

Abschließend werden Rückschlüsse auf der Basis statistischer Analysen gemacht, um die Frustration, die Wissensarbeiter in Cyberjaya verspüren, zu erfassen. Von der Clusterentwicklung profitiert a priori eine bestimmte ethnische Gruppe, nämlich die Malai. Aufgrund begrenzten Zugangs zu wirtschaftlichen Möglichkeiten in Cyberjaya sind die Chinesen unzufrieden. Dies hat die Situation erschwert und Missfallen zwischen den verschiedenen Ethnien hervorgerufen. Diese Auswertung basiert auf der Zusammenfassung der individuellen Ansichten von Fachleuten, Einwohnern und Wissensarbeitern.

Die Entwicklung der Infrastruktur in Cyberjaya zeigt, dass die Kapitalisten dazu auserkoren wurden, das Projekt zu leiten. Sie nutzen die Gelegenheit um ihren Profit zu realisieren. Infrastrukturen wie Häuser und soziale Einrichtungen werden gebaut, sobald der Marktwert und die Nachfrage steigen, um höchstmöglichen Profit zu erwirtschaften. Dies zeugt von purem kapitalistischem Verhalten. Im Gegenzug hat dieses Verhalten Frustration und Demotivation unter Fachleuten, Einwohnern und Wissensarbeitern, die in Cyberjaya leben und arbeiten, hervorgerufen.

### Wissensaustausch in ICT-Firmen in Cyberjaya

Dieses Kapitel befasst sich mit folgenden Fragen: Ist Cyberjaya eine Wissensstadt? Beeinflusst ICT-Technologie den Prozess des Wissenserwerbs? Auf den ersten Blick werden Besucher Cyberjayas von der Größe der Stadt, der Anzahl der Gebäude, der Landschaft und den zur Verfügung gestellten Einrichtungen beeindruckt sein. Die Planer nahmen an, durch die Bereitstellung von ICT-Infrastruktur ein wissensbasiertes Umfeld schaffen zu können. Verwirklicht sich diese Annahme in der neuerbauten Stadt? Trägt Technologie wirklich zur Schaffung eines wissensbasierten Umfelds bei?

Obwohl es Studien gab, die implizierten, dass ICT die Notwendigkeit physischer Nähe reduzieren würde, zeigen die Ergebnisse der Arbeit etwas anderes. Daher ist die These dieses Kapitels, dass physische Nähe selbst für ICT-Firmen wichtig ist, die sich in einem Gebiet voller ICT-Firmen wie es Cyberjaya ist befinden.

Die Umfrageergebnisse zeigen, dass die Stadt es geschafft hat, ob beabsichtigt oder nicht, einen einzigartigen Charakter zu schaffen mit einer großen Vielfalt von Menschen, die im Cluster arbeiten. Dadurch wurde die Anforderung erfüllt, ein erfolgreicher Cluster zu sein, wie es andere ICT-Cluster weltweit sind. Wie frühere Studien gezeigt haben trägt Vielfalt allein nicht notwendigerweise zu Innovation bei, wenn es nicht genügend Interaktion gibt.

Cyberjaya fehlen soziale Einrichtung wie Wohn-, Geschäfts- und Freizeiteinrichtungen. Auch die verstreute Entwicklung hilft dabei nicht. Durch den Versuch, modernes und hochtechnisiertes Leben darzustellen, ist die Stadt auf Kosten der lokalen Kultur zu „formell“ und „künstlich“ (Norhafezah, 2010). Norrezati et al (2009) bewiesen in einer früheren Studie die Bedeutung informeller Kommunikation für den Wissensaustausch, die während Aktivitäten außerhalb der Büroumgebung stattfindet. Die begrenzte Anzahl von Orten, die aktive Interaktion zwischen den in der Stadt lebenden Menschen gewährleisten, schafft eine Leere beim Wissensfluss innerhalb des Clusters.

Während der Feldforschung gesammelte Daten weisen darauf hin, dass konventionelle Methoden der Wissensakquise für ICT-Ingenieure, die in Cyberjaya arbeiten, immer noch wichtig sind. Neueste ICT-Einrichtungen und -Fähigkeiten verringern nicht die Bedeutung von persönlicher Kommunikation beim Wissenserwerb in diesem Bereich. In ICT-Städten wie Cyberjaya ausgebildete und lebende Menschen leben nicht zwangsläufig in einer virtuellen Welt. Sie betrachten menschlichen Kontakt und physische Nähe als entscheidend bei der Erweiterung ihres persönlichen Wissens. Die virtuelle Welt erweitert lediglich ihre Möglichkeiten der Wissensakquise, ersetzt jedoch nicht die Bedeutung zwischenmenschlicher Kontakte.

Um das Umfeld, in dem Wissensaustausch stattfindet, zu analysieren, wurde eine statistische Analyse, bekannt als PCA (Principal Component Analysis/Hauptkomponentenanalyse) angewandt. Es war möglich, die einzelnen Variablen entsprechend ihrer Wichtigkeit vier Hauptfaktoren zuzuordnen und eine Rangliste zu erstellen. Die identifizierten Faktoren decken den physischen und sozialen Input der Umwelt der Wissensarbeiter ab. Die Ergebnisse zeigen, dass die individuelle Arbeitserfahrung der wichtigste Faktor ist, der sie ermutigt, ihr Wissen zu teilen. Allerdings zeigt das Ergebnis der Analyse auch die Bedeutung firmeninterner Arbeitsabläufe. Sie beweist, dass Wissensaustausch stark von den innerhalb der Firma angewandten Prozessen abhängt. Darüber hinaus wird deutlich, dass physische Nähe von Bedeutung ist, um sicherzustellen, dass Mitarbeiter sich an interne Abläufe halten. Die Analyse zeigt auch, dass physische Nähe als Instrument benutzt wird, um den Wissensaustausch innerhalb der Organisation zu er- und außerhalb der Organisation zu entmutigen.

Das Kapitel diskutiert auch Wissensaustauschaktivitäten innerhalb kleinerer Gruppen. Das Ergebnis beweist, dass strategischer Wissensaustausch in auf R&D-basierenden Firmen auf kleinere Gruppen begrenzt ist. Es wird ersichtlich, dass der Prozess eher in einer informellen als einer formellen Art geschieht, insbesondere unter Teammitgliedern. Zudem sind gewisse Industriezweige, insbesondere R&D und Multimedia Firmen, sehr auf die tägliche persönliche Interaktion angewiesen, um bessere Qualität und Ergebnisse zu gewährleisten. Ein weiterer, oft bei der Diskussion physischer Nähe und Wissensaustausch vernachlässigter Faktor ist die innere Gestaltung des Gebäudes. Physische Gestaltung und die innere Ausstattung von Gebäuden können eine aktivierende Umwelt für den Wissensaustausch innerhalb der Firma schaffen. Die angefertigte Studie hat bewiesen, wie barrierefreie Gestaltung und Möblierung, die Interaktion ermutigt, signifikant zum Wissensaustausch, insbesondere unter Mitgliedern kleiner Gruppen, beitragen. Physische Nähe allein reicht nicht aus, sie muss mit einer aktivierenden Umwelt einhergehen, um zwischenmenschliche Bindungen zu ermöglichen, die dann zur Schaffung von Vertrauen unter den Teammitgliedern und schließlich zur Verbesserung des Wissensaustauschs beitragen.

Zusammenfassend lässt sich sagen, dass das Kapitel die Wichtigkeit physischer Nähe zwischen Ingenieuren in ICT-Firmen diskutiert hat. Es war in der Lage zu zeigen, dass ICT-Einrichtungen die Bedeutung physischer Nähe nicht verringern können. Persönliche Interaktion bleibt die wichtigste Methode bei der Akquise neuen Wissens und trägt zur dynamischen Wissensproduktion und zum Wissensaustausch bei. Physische Nähe gewährleistet zwischenmenschliche Bindungen, auch zwischen den Angestellten ICT-basierter Unternehmen.

Die Verbesserung physischer Nähe durch die Gewährleistung einer passenden inneren Gestaltung und barrierefreier Architektur kann das Niveau zwischenmenschlicher Beziehungen zwischen Teammitgliedern verbessern und ferner zum Wissensaustausch beitragen.

### Soziale Netzwerke und die Dynamik Cyberjayas

Das letzte empirische Kapitel beabsichtigt zu analysieren, wie soziale Netzwerke zwischen Wissensarbeitern zur Dynamik des Clusters beitragen. Dabei bezieht sich die Dynamik auf den Fluss impliziten Wissens zwischen ICT-Ingenieuren in Cyberjaya. Dazu werden soziale Netzwerke genutzt um den Wissensfluss zwischen Wissensarbeitern zu visualisieren und besser zu verstehen. Kurz gesagt wird das Kapitel die Frage beantworten, wie das Wissen im sozialen Netzwerk der Wissensarbeiter fließt und wie dies zur Dynamik wissensbasierter Cluster wie Cyberjaya beiträgt? Die These dieses Kapitels basiert auf dem Zentrum und Peripherie Raummodell, das von Friedmann (1966) entwickelt wurde. Das Modell wurde erweitert, um nicht nur den räumlichen, sondern auch den organisatorischen und individuellen Kontext unter Verwendung der gleichen Dichotomie zu analysieren. Auch das GIS (Geographic Information System) wurde angewandt, um das soziale Netzwerk der ICT-Ingenieure zu visualisieren.

Das Kapitel beginnt mit einem Blick darauf, wie Cyberjaya durch das soziale Netzwerk sozialer Eliten entwickelt wurde. Die Idee entstammt einer informellen Diskussion zwischen Tengku Mohd Azzman Shariffadeen, Gründungsdirektor des Malaysischen Instituts für Mikroelektronische Systeme (MIMOS) und einem hochrangigen Kabinettsmitglieds zum Ende der 1980er Jahre

(Shariffadeen, 2011). Hieraus erwuchs der Anfang der aktiven Beteiligung Malaysias an R&D-Aktivitäten, was schließlich zur Schaffung des Multimedia Super Corridors (MSC) und Cyberjayas in den späten 1990er Jahren führte. Dies ist wiederum ein Beispiel für die Bedeutung und den Einfluss sozialer Netzwerke, insbesondere zwischen sozialen Eliten. Eine Idee, ursprünglich von einer Gruppe von Menschen gefördert, hat es geschafft das Entwicklungsmodell des gesamten Landes zu verändern. Dies markierte auch die Entfaltung des Zentrums sowie der Peripherie der Macht, die Technologie als Katalysator verwenden.

Cyberjaya ist ein Beispiel dafür, dass räumlicher Grenzen von Clustern oft nach politischen Vorgaben definiert werden, so wie es Reid, Smitund Carroll (2008) und Sternberg (2008) beobachtet haben. Der Planungs- und Entwicklungsprozess wird häufiger durch die von Behörden vorgenommene Demarkation als durch die Dynamik der Branchen definiert. Der Cluster ist bei der Erschließung und Entwicklung un bebauter Flächen stark von den organisatorischen und institutionellen Rahmenbedingungen abhängig. Deswegen sind die meisten lokalen Firmen, vor allem Start-Ups und SMEs, nicht in der Lage zu florieren. Die starke Abhängigkeit von institutioneller Unterstützung schafft es nicht, nachhaltiges Wachstum, insbesondere in wissensbasierten Clustern, zu gewährleisten. Dies zeigt auch, dass Firmen, die durch zentralisierte Planung in Clustern etabliert wurden, mehr als finanzielle Unterstützung und Hilfe bei der Ausbildung ihrer Mitarbeiter benötigen, um zu wachsen. Dies ist besonders in wissensbasierten Clustern zu beobachten.

Die Lage in Cyberjaya wird auch in Folge des Wandels der politischen Landschaft nach der Wahl von 2008 komplizierter. Zum ersten Mal in Malaysias Geschichte gewann die Opposition fünf Einzelstaaten sowie die Mehrheit der Sitze im Bundesdistrikt. Das leitete einen Paradigmenwechsel in der Beziehung zwischen Bund und Einzelstaaten ein, insbesondere in Selangor, dem am weitesten entwickelte Einzelstaat Malaysias, in dem auch Cyberjaya liegt. In Folge dessen hat das stark zentralisierte Regierungsmodell, das sich seit Malaysias Unabhängigkeit etabliert hatte, eine neue Richtung eingeschlagen. Dies wiederum beeinflusst das Wachstum Cyberjayas. Im Rahmen der Forschung für diese Arbeit wurde die Existenz von Gruppen deutlich, die von dieser Entwicklung profitieren und der

herrschenden Partei zugeneigt sind. Sie agieren als „ICT-Zaren“, die sich bedroht fühlen, wenn der politische Wandel ein Ungleichgewicht in der Machtstruktur zwischen der Bundesregierung und der Regierung des Einzelstaates zur Folge hat. Auf diese Weise hat eine politisch konstruierte Grenze eine symbiotische Beziehung zwischen den politischen Eliten und den „ICT-Zaren“, oder sogenannten Technokraten, geschaffen.

Am Fall von Cyberjaya wurde gezeigt, wie soziale Netzwerke für die Eliten Möglichkeiten schaffen, ihre Macht im Zentrum beizubehalten, indem sie Ressourcen an ausgewählte Kapitalisten übertragen.

Im Rahmen der Arbeit wurden verschiedenen Faktoren diskutiert, die den Wissensfluss in Cyberjaya beeinflussen. Die Faktoren können grundsätzlich zweigeteilt werden, was zum einen in Bezug auf die Firma zum anderen relativ zu den sozialen Profilen.

*Erstens* haben Firmengröße, Branche und Ursprung einen signifikanten Einfluss auf die Anzahl sozialer Netzwerke. Es wurde deutlich, dass entweder die Firmen eine strukturierte und organisierte Methode haben, um sicherzustellen, dass die Angestellten „miteinander verbunden“ sind, oder die Angestellten selbst Möglichkeiten schaffen, um untereinander vertrauter zu werden. Soziale Vernetzung wird für Firmen als notwendig betrachtet, um die Produktivität zu gewährleisten und gleichzeitig ist es den einzelnen Mitarbeitern ein soziales Bedürfnis, Teil der Gruppe zu sein. Nichtsdestotrotz können die sozialen Netzwerke ein Ungleichgewicht im Wissensfluss verursachen und so ein Zentrum und eine Peripherie innerhalb der Firma schaffen. Es hat den Anschein, dass manche Gruppen aufgrund ihres Geschlechts, ihrer Ethnie, Erfahrung oder Bildung besseren Zugang zur Vernetzung haben, was in Folge besseren Zugang zum Wissensfluss ermöglicht.

*Zweitens* wurde beobachtet, dass Bildungshintergrund, Persönlichkeit und Erfahrung der Angestellten möglicherweise Barrieren für den Wissensaustausch schaffen können. Manche Angestellte werden versuchen, dem Zentrum der Firma nah zu sein, oder sich dort zusammenzuschließen, wo sich Wissen vereint. Die

Übrigen, insbesondere neue, unerfahrene Angestellte, denen das notwendige Netzwerk fehlt, werden an die Peripherie gedrängt. Sie werden sich beweisen müssen, bevor sie ein Mitglied des Zentrums werden können. Das kann entweder in derselben Firma geschehen, oder sie müssen zu einer anderen Firma gehen. Eine Möglichkeit, denen näherzukommen, die erfahrener sind, ist die Teilnahme an informellen Aktivitäten, die helfen, Barrieren zu beseitigen und die Chancen zu verbessern. Beispielsweise helfen Sport und andere soziale Aktivitäten, die Lücke zwischen denen im Zentrum und denen an der Peripherie zu verringern. Es ist die beste Alternative für die Angestellten von der Peripherie, dem Zentrum näher zu kommen. Soziale Vernetzung zwischen den Menschen, die in Cyberjaya arbeiten, ist nicht auf diejenigen begrenzt, die in derselben Firma arbeiten. In der vorliegenden Untersuchung stellte sich heraus, dass sich soziale Netzwerke auf den Arbeits- und Freizeitbereich erstrecken. Die Umfrage zeigte, dass beinahe 90 Prozent der Befragten ihr soziales Netzwerk in Cyberjaya durch die Universität, die Arbeit und Freunde etabliert haben. Diese Zahl beweist auch, dass Freundschaft und Arbeit eine wesentliche Rolle in sozialen Netzwerken von ICT-Ingenieuren in Cyberjaya spielen. Daher hängt die Dynamik des Zentrum und der Peripherie vom Individuum, der Firma und dem Umfeld ab.

*Drittens* wurde die These aufgestellt, dass das Zentrum auch die Peripherie ist. Im Fall von Supportdiensten, internetbasierten Unternehmen und SSO Firmen in Cyberjaya sind die Mutterkonzerne noch immer in anderen, entwickelteren Ländern, wie den USA, in Europa oder in Singapur ansässig. Lediglich kleine und unbedeutendere R&D-Arbeiten werden in den Zweigstellen in Cyberjaya ausgeführt und häufig sogar überhaupt keine. In diesen Fällen fungieren sie als Peripherie für die Zentrale, während innerhalb der lokalen Zweigstellen eine kleine Gruppe die Funktion des Zentrums für die lokale Einheit übernimmt.

*Abschließend* wurde durch die Anwendung von GIS Instrumenten illustriert, wie physische Entwicklung zur Ungleichheit innerhalb des Wissensflusses in Cyberjaya beiträgt. Die Gesamtentwicklung der physischen Infrastruktur ist polyzentrisch verteilt. Räumlich dargestellt zeigt das soziale Netzwerk im Gegensatz dazu nur ein Zentrum und eine Peripherie auf. Obwohl Cyberjaya physisch eher verstreut und nicht konzentrisch entwickelt wurde, weisen die



Ergebnisse dieser Arbeit darauf hin, dass sich die soziale Interaktion immer noch sehr in den zentralsten Gebieten ballt. Dies zeigt, dass der Cyberjaya Cluster in seiner physische Entwicklung nicht in der Lage war, der Bedeutung sozialer Netzwerke Rechnung zu tragen. Verstreute Bebauung und isolierte Gebäude tragen nicht zur Schaffung eines dynamischen, wissensbasierten Clusters bei. Physische Nähe ist wesentlich bei der Ermutigung zu Aktivitäten im Rahmen sozialer Netzwerke, die zum Wissensfluss beitragen, dies gilt auch in ICT-Clustern wie Cyberjaya.

Schlussendlich lässt sich sagen, dass diese Studie gezeigt hat, dass geografische Nähe bei der Schaffung einer Wissensstadt immer noch wichtig ist. Sie animiert den Wissensaustausch und verbessert die soziale Vernetzung. Gleichzeitig spielen im malaysischen Kontext der Gebrauch von Symbolen im sozialen Raum in Verbindung mit Vetterwirtschaft eine entscheidende Rolle bei der Errichtung der Stadt. Dies greift auf die Hauptthese zurück. Die Wissensstadt Cyberjaya reifiziert die Dominanz der Malaien. Die Stadt Cyberjaya wurde von Eliten geschaffen und sie profitieren von ihr. Dies trägt zu einer ungleichen Entwicklung im Cluster Cyberjaya und in ganz Malaysia bei.

## Chapter 1

### Knowledge City as the Epitome of a Knowledge Cluster: Introducing Cyberjaya

*“Welcome to Cyberjaya - Malaysia's First Intelligent City”*  
(Setia Haruman, 2012)

#### 1.1 Introduction

Yes, welcome to Cyberjaya! I have chosen the promotional statement downloaded from the Cyberjaya main developer website as the starting point for this dissertation. It will be my journey into Malaysia’s first Information and Communication Technology (ICT) based city. I am venturing to understand the city from an urban planning and sociological perspective in what will be my contribution to the *Malaysia Boleh* (‘Malaysia Can Do It’)<sup>8</sup> call. The inspiration came from seeing billboards promoting the city on the North-South highway that I always take to go back to my hometown in Malacca during numerous weekend trips to spend time with my family<sup>9</sup>. On the way back to Kuala Lumpur, I pass a by-pass that says ‘Putrajaya-Cyberjaya’. I have never once taken the detour to Cyberjaya, and I always wonder if Cyberjaya is just a city that people simply pass through.

In fact, Cyberjaya is not just any other city; it was intended to be ‘*The City*’. Cyberjaya was the brainchild of former Prime Minister Mahathir as part of the aim to create a knowledge society. Malaysia’s fourth and longest-serving prime minister (1981-2003), he is known for his ‘revolutionary’ ideas that involve massive infrastructure projects such as Kuala Lumpur City Centre (KLCC), Kuala Lumpur International Airport (KLIA) and Multimedia Super Corridor (MSC) Malaysia, which eventually created Cyberjaya (see section 1.5). Nevertheless, in one of his latest interviews on Cyberjaya, when Mahathir was asked what he thinks of the city, he

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<sup>8</sup> Slogan popularise during the 1998 Commonwealth Game in Kuala Lumpur. It encourages Malaysian to try to do their best, originally in sports but subsequently it became a motivation in all other aspects of life i.e. education, economy etc.

<sup>9</sup> The billboard is strategically located along the North-South Highway. I will pass by a few billboards for my two hours journey south of Kuala Lumpur.

replied: '[...] if you ask me, am I satisfied? The answer is no. I like things faster. Faster, better and sometimes more expensive' (Bernama, 2009).

Mahathir's frustration is comprehensible because Cyberjaya was created as a symbol of Malaysia's ambition of becoming a knowledge-based economy and society (Evers, 2003; Evers, 2011; Evers and Nordin, 2012). In Mahathir's words, 'it is also symbolic of discarding old legacies and old mindsets' (Mahathir, 1998:10). In addition, Lepawsky (2009) argued that the whole idea was to attain political gain through geographical means.

Then again, building a city is not simply about the size, the symbols, the physical infrastructure, or solely the location. The key component of a city is its people, and they decide the growth and decline of cities (Sjoberg, 1960; Khaldun, 1967; Mumford, 1968). Cities also need to connect with other cities to ensure their relevancy and survival, especially in the age of globalisation and advancement in ICT (Castells, 1996, 2010; Sassen, 2003, 2004).

In an earlier study, Sarimin and Yigitcanclar (2011) concluded that knowledge-based urban development and ICT have significant roles in contributing towards Malaysia's aim of becoming a knowledge society. Realising this, policy makers began to comprehend that the current approach to urban planning and urban development must be changed. Cities need to be developed in a compact manner which will utilise their vibrancy and capacity (EPU, 2010; Najib, 2010).

At the same time, one of the crucial elements of a knowledge city or cluster is the existence of knowledge-based organisation and the knowledge flow in the city (Ergazakis, Metaxiotis et al., 2004; Menkhoff, Evers et al., 2010; Evers, Gerke et al., 2011). However, although knowledge flow is fundamental to the growth of knowledge cities, they must avoid the 'knowledge trap' in which they merely become users or copiers rather than creators (Menkhoff, Evers et al., 2011). Worst, the long-term consequence will be the country becoming a victim of the middle-income trap (Radhi and Zeufack, 2009; Woo, 2009; Hall, 2011).

This study examines knowledge city planning and creation against the backdrop of state-led modernisation. Thus, I ask; *how do knowledge flow, knowledge-sharing and urban planning contribute to the development of Cyberjaya as a knowledge city?*

## **1.2 Research Area**

The research was conducted in Cyberjaya, which is the first and the biggest ICT based city in Malaysia and is part of the MSC Malaysia. It was conceptualised as a model intelligent city and designed to attract world class multimedia and ICT companies (Neo, Nasir et al., 2008). In addition to attracting the best and the biggest ICT companies in the world, the city was expected to create an atmosphere conducive to the promotion of creativity and innovation, similar to Silicon Valley in the USA (Mahathir, 1998). Administratively, the city is located in the State of Selangor; the most populated and developed state in Malaysia (see Map 1.1).

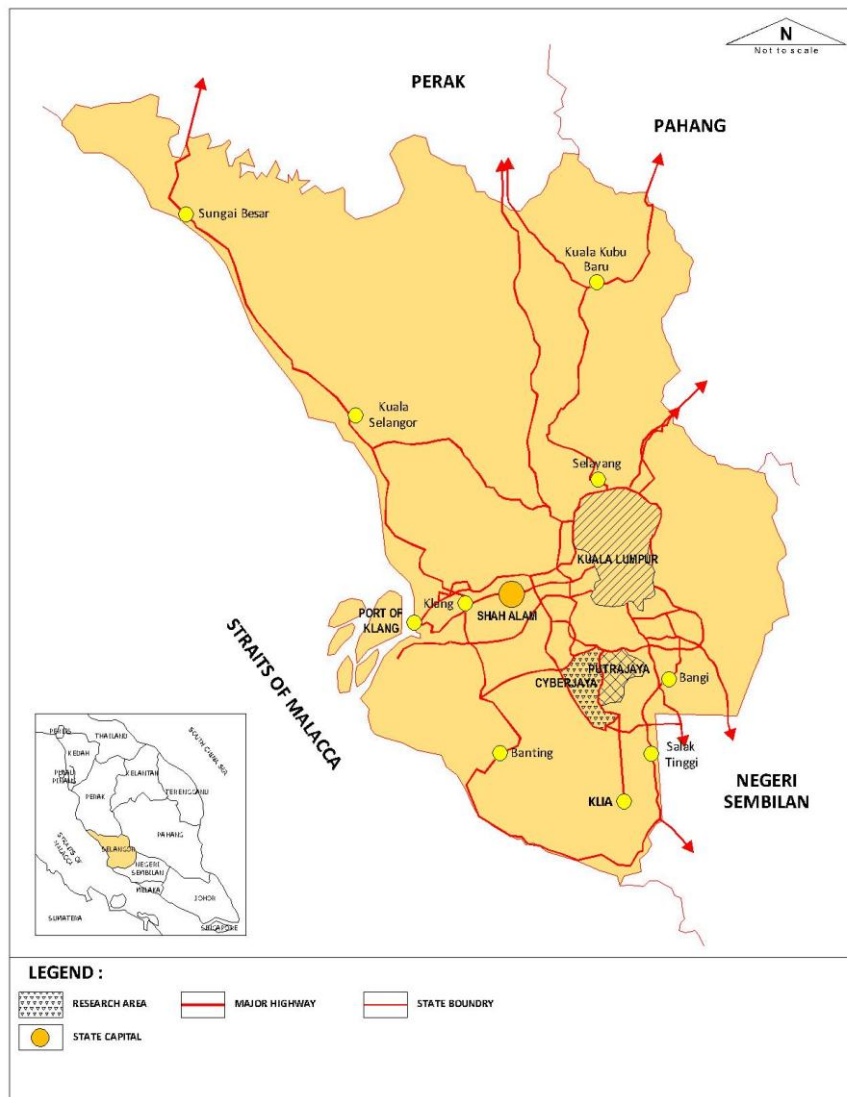
Cyberjaya is located next to Putrajaya and linked to Kuala Lumpur International Airport (KLIA) and Shah Alam, the State capital. The city is also connected to major highways which allow accessibility to key economic centres in the Kelang Valley. It covers an area of 7,000 acres and is expected to cater to 210,000 people once it is fully developed (SetiaHaruman, 2011).

Currently, there are three higher learning institutions located in the city, the largest being the Multimedia University (MMU), followed by Limkokwing University of Creative Technology (LUCT) and Cyberjaya University College of Medical Sciences (CUCMS). Aside from Multimedia Development Corporation (MDeC), the main actors in Cyberjaya include, the main landowner, Cyberview Sdn Bhd, a subsidiary company controlled by the Ministry of Finance (MOF); the local authority, *Majlis Perbandaran Sepang* (Sepang Municipal Council); and the master developer, Setia Haruman Sdn Bhd.

Nearly all the main organisational actors in Cyberjaya development are members of or are owned by the Malay elite, from the landowner, the local authority, and two of the higher

learning institutions to the residents' association and the master developer<sup>10</sup>. The city is an attempt to reconstruct the meaning of 'developed' based on the interpretation of the Malay political elite. This is done in the form of the planning guidelines, which clearly prescribe the architectural forms and the land use that should be applied in the city (JPBD, 2006) and therefore regulate the usage of space.

**Map 1.1: Research Area**



Source: JPBD Selangor, 2003(modified by the author).

<sup>10</sup> The chairman of Setia Haruman Sdn Bhd has strong links with the political elites while, out of the total 23 senior positions in MPSP, only one has a non-Malay background (referred to the website on the 26 August 2010).

A total of 457 companies operate in Cyberjaya, providing jobs for 35,000 employees. The day population in the city is 36,000, while during the night the population reduces to 14,000 (MSCMalaysia, 2011). This fact shows that more than half of the population commute on a daily basis. They mostly stay in other cities located nearby, such as Bangi, Shah Alam, and Salak Tinggi (refer Map 1.1). Additionally, the 2,500 houses available in the city come with an 'expensive price tag' that makes it uninviting for people to stay in the city.

At present, almost all the multinational companies in the ICT business are present in Cyberjaya, such as Dell, IBM, AT&T, NTT, Ericsson, Fujitsu and Satyam as well as local brand names, for example Telekom Malaysia and MEASAT. Yet, almost all the foreign-owned companies are involved only in support services or call centres that serve the Asia-Pacific region. Their participation in R&D activities is very minimal where it exists at all. Most of the R&D activities take place in their parent companies' home countries, such as the USA, Japan, India or European countries.

The city had been in development for more than 10 years when I did the fieldwork. Meanwhile, the MSC Malaysia has entered its second phase and has encouraged the creation of smaller clusters in different locations in the country. This research aims to build a basis for other studies related to ICT based or knowledge-based cluster development in Malaysia. Furthermore, the planning and architecture of the city symbolise a vision that envisaged a developed society. It is designed by translating Malay conceptions of space into urban planning (Evers and Korff, 2000). It will be interesting to see how the city impacts other similar cities or clusters as well as urban development in future Malaysia.

### **1.3 Aims of the Study**

In an attempt to answer the research question, the main objectives of this study are as follows:

- 1) To contribute towards the understanding of how physical development impacts the formation of knowledge-based clusters in Peninsular Malaysia;
- 2) To analyse the influence of spatial planning and urban development on Cyberjaya as a knowledge city; and

- 3) To thoroughly examine knowledge-sharing, the knowledge network and the importance of spatial proximity among people working in ICT companies in the city.

I argue that the formation and growth of the epistemic landscape in Peninsular Malaysia is very much influenced by ethnically based politics. At the same time, Malaysia's centralised administrative system as well as elites and crony-based capital distribution have also impacted the growth of knowledge-based clusters and cities.

Accordingly, I have applied a case study approach (Yin, 2009) and combined quantitative and qualitative methods (Creswell, 2009). My study uses a bottom-up technique in which the research begins by understanding the situation on the ground through individuals living and working in the city. Then I move on to comprehend the policy making process through officials from main organisations involved in creating the city. Likewise, besides triangulation and statistical inference, I have also utilised the GIS method to visualise the knowledge cluster formation as well as the social network activity in Cyberjaya. It helps to combine the spatial and social aspect to strengthen the argument in this dissertation (for a detailed discussion on the research method, refer to Appendix I).

#### **1.4 Defining Knowledge**

In order to comprehend the discussion on knowledge cities, I will first define what I mean by knowledge in this dissertation. Nevertheless, I do not claim to have developed a definitive or exhaustive definition of the term. What I present is rather a working definition for the purpose of my discussion in the whole dissertation. In this context, knowledge simply means the state of knowing something either through education or experience.

Polanyi (1966), the often cited writer on knowledge, coined the term 'tacit knowledge' by which he argued that 'we can know more that we can tell'. By 'tacit knowledge', he referred to 'all the hidden structures, experiences and minor skills which underlie a person's present competence' (Hodgkin, 1992:255).

Studying product development in Japanese companies, Nonaka (1994) criticised but nevertheless expanded on Polanyi's work, by dividing knowledge into 'tacit' and 'explicit' knowledge. The former refers to 'knowledge that is articulated and tied to the senses, movement skills, physical experiences, intuition, or implicit rules of thumb' whereas the latter refers to 'knowledge that is uttered and captured in drawings and writing' (Nonaka and Von Krogh, 2009:635).

Based on both definitions, I refer to knowledge<sup>11</sup> as '*knowing what to do*'. In the case of the knowledge workers<sup>12</sup> in Cyberjaya, I refer to their *day-to-day problem solving*. I subscribe to Nonaka's differentiation of 'tacit' and 'explicit' knowledge, but I also believe the *knowledge workers know more than what they can tell*. I denote *human capital*, namely knowledge workers in Cyberjaya, when I discuss knowledge. This entails the movement or mobility of human capital from one company to another. I restate this as job-hopping activity.

Subscribing to the concept of *day-to-day problem solving* somehow limits the study in that I do not explore the different types of knowledge for product development in Cyberjaya, for instance, developing new software or improving current hardware. Not to say this is not my concern, but I would argue that it is vital for us to first establish whether people in Cyberjaya do share their knowledge among themselves, and if they do, how knowledge flows among these individuals.

## 1.5 Knowledge Cluster

In this section, I will first briefly chart the study of location theory, which plays a vital role in cluster studies. Next, I will focus my discussion on the knowledge cluster and finally on its relation with my study. To begin, industrial revolution<sup>13</sup> in Europe, especially in Germany during the 18<sup>th</sup> and 19<sup>th</sup> centuries, led to the development of interest in the study of spatial

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<sup>11</sup> I confine my definition of knowledge to ICT based knowledge since the study focuses on this particular field. Furthermore, my respondents are mostly those with ICT education background in line with the main activities of companies located in Cyberjaya.

<sup>12</sup> I use the term *knowledge workers* to refer to those with post-secondary qualification in ICT.

<sup>13</sup> The term was coined by Arnold Toynbee, a British Historian in his lecture series in Oxford from 1881-1882. The lecture was later published as a book and available at: <http://archive.org/stream/lecturesonindust00toynuoft#page/n37/mode/2up>



economics. In 1826, Johan Heinrich von Thünen wrote ‘The Isolated State’ in which he discussed locational impact on economics (Fujita, 2010). The study was considered the pioneer in location theory, and von Thünen was accorded the title of the ‘founding God’ (Samuelson, 1983: 1468). In essence, von Thünen argued that distance from the city centre (market place) would determine the type and intensity of land use activities (Fujita and Thisse, 2002). Hence, proximity has an impact on activities in and around a major economic centre.

More than sixty years after von Thünen’s ground-breaking work and at the peak of the industrial revolution, Alfred Marshall published his book, *Principles of Economics* (1890). His study highlighted the benefits of economies of scale, such as enhancing workers’ skills, creating a talent pool, helping the growth of and supporting specialised industries. He also pointed out that co-location will create new ideas or improve upon existing ones. Hence, clustering will support innovation due to knowledge spillovers between people with different sets of skills as well as experience. Another German economist, Alfred Weber (1909), working separately from Marshall, pointed out the benefits of spatial concentration of firms. He highlighted the importance of proximity to reduce the transport cost and the sharing of knowledge (Fujita, 2010).

After Marshall and Weber, there was a substantial number of researcher focusing on spatial economics, but it was not until the 1990s that this interest become more profound and mainstream (Fujita, 2010). In the economic field, the interest in clustering studies has encouraged a ‘new’ area of studies known as the ‘New Economic Geography’ (Krugman, 1998; Fujita and Krugman, 2004). Clustering is not only understood as an academic field but has become an important tool for policy makers as well. While in the advanced economies, large-scale cluster development initiatives started as early as the mid-1990s, interest among developing countries began around the year 2000 (Ketels, Lindqvist et al., 2006:5).

Malaysia, on the other hand, has introduced a cluster-based policy as early as 1996 through the Second Industrial Master Plan (MITI, 1996). However, Rasiyah (2003) argued that the master plan is weak in terms of cross industry links. I believe both Rasiyah and the policy makers have failed to highlight the social aspect of the cluster development. They look at a cluster as a purely economic entity rather than as a social subject. As defined by Porter (2000a:254), ‘A

cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field linked by commonalities and complementarities’.

Porter’s definition again restricts the understanding of clusters to an economic point of view. It fails to explain the intricacy of other elements either at the macro or the micro level and their impact on the cluster, especially in a knowledge cluster. Nevertheless, Evers, Gerke et al. (2011: 35), expanding on Porter’s work, have given a concise definition for a knowledge cluster. According to them:

*Knowledge clusters are agglomerations of organisations that are production oriented. Their production is primarily directed to knowledge as output or input. Knowledge clusters have the organisational capability to drive innovations and create new industries. They are central places within an epistemic landscape, i.e. in a wider structure of knowledge production and dissemination. Examples of organisations in knowledge clusters are universities and colleges, research institutions, think-tanks, government research agencies, and knowledge-intensive firms.*

Apart from concentrating in one geographical area, knowledge clusters must also be able to encourage knowledge flow between the different actors that exist in the cluster. In this regard, Maskells (2001) reminded us that there are two forms of knowledge flow i.e. vertical and horizontal. The former refers to knowledge flow within the production chain through which companies at the lower end of the chain learn from their parent companies. The latter refers to companies at the same level of the production chain. They essentially learn from companies with similar capacities. Nevertheless, the weakness in this argument is that it assumes companies learn only from those within the same production chain.

Wennberg and Lindquist (2010), on the other hand, highlighted the importance of differentiating between knowledge intensive with capital intensive clusters. Based on data collected from 4,397 companies in different clusters in Sweden, they have concluded that new knowledge-based companies located in a dynamic knowledge-based cluster have higher chances of survival compared to those located in capital-based clusters. This shows how a

company's survival not only depends on their capacity as a unit but also depends on their location at the regional level. Hence, clustering helps new companies to survive better due to the pool of talent, especially in a stronger cluster.

In addition to the geographical contributions, the social network of people in the cluster also contributes significantly towards knowledge spillover (Breschi and Lissoni, 2001; Dahl and Pedersen, 2005; Grabher and Ibert, 2006). In some cases, it is the social network that helps form the cluster. For example, Huggins (2008) highlighted that 'it is largely informal channels and personal relationships that have shaped the formation of the Cambridge cluster' (p: 281). In addition, although ICT helps to enhance knowledge flow, it does not reduce the importance of face-to-face communication (Morgan, 2004; Storper and Venables, 2005). Thus, knowledge flow in a cluster does not depend only on formal and structured relationships but also comprises informal and face-to-face communication between the knowledge workers.

In the latest study by Purwaningrum (2012) on the Jababeka Industrial Cluster in Indonesia, the analysis showed that geographical proximity plays a vital role in influencing the flow of 'tacit' knowledge between industries within the cluster. The study also highlighted the importance of social proximity especially among people sharing similarities such as language and alma mater. By studying the Mekong Delta in Vietnam, Bauer (2010) concluded that in order to benefit from clustering, it must first overcome the challenges of knowledge-sharing among organisations and individuals in the cluster. She pointed out that access to social relationships limits knowledge-sharing activity.

Therefore, I suggest that geographical proximity contributes significantly towards creating a dynamic cluster. For example, it helps to encourage face-to-face communication and facilitate knowledge flow either formally or informally through the social networks of the knowledge workers. Nevertheless, the social or cultural factor has an impact on either enhancing or limiting the knowledge flow.

## 1.6 Knowledge City

Leif Edvinson explained that the term *knowledge city* has been used to refer to ‘a city that was purposefully designed to encourage the nurturing of knowledge’ (Dvir and Pasher, 2004:17). A more detailed definition was given by Ergazakis, Metaxiotis et al., (2004:7) who described a knowledge city as:

*[...] a city that aims at a knowledge-based development, by encouraging the continuous creation, sharing, evaluation, renewal and update of knowledge. This can be achieved through the continuous interaction between its citizens themselves and at the same time between them and other cities’ citizens. The citizens’ knowledge-sharing culture as well as the city’s appropriate design, IT networks and infrastructures support these interactions.’*

We are also reminded that cities grow due to the fact that some of its residents are able to create new ideas (Jacobs, 1969; Florida, 2002; Saxenian, 2002; Glaeser and Resseger, 2010). New ideas allow for new businesses to develop and contribute towards enhancing the dynamic of the cities. Hence, human capital is an important element in ensuring the development and vitality of cities.

Furthermore, Nonaka’s (1994) argument regarding the transfer of tacit knowledge due to geographical proximity can also be applied in a bigger spatial context such as a city. A previous study on the characteristics of knowledge-based urban development in cities in Europe, USA, Australia and Asia suggested that proper urban design can contribute towards creating a knowledge city (Yigitcanlar, O’Connor et al., 2008; Yigitcanlar, 2009; Hornidge and Kurfürst, 2011). Hence, proper urban design and building architecture can definitely enhance knowledge flow in urban areas.

Therefore, a knowledge city is a city properly designed to enhance the knowledge flow process among the people living and working in the city. It must also be filled with knowledge workers who will contribute significantly towards creating new ideas which, in return, will allow the city to grow and maintain its vibrancy.

## 1.7 Issues of Knowledge Cluster Development in Malaysia

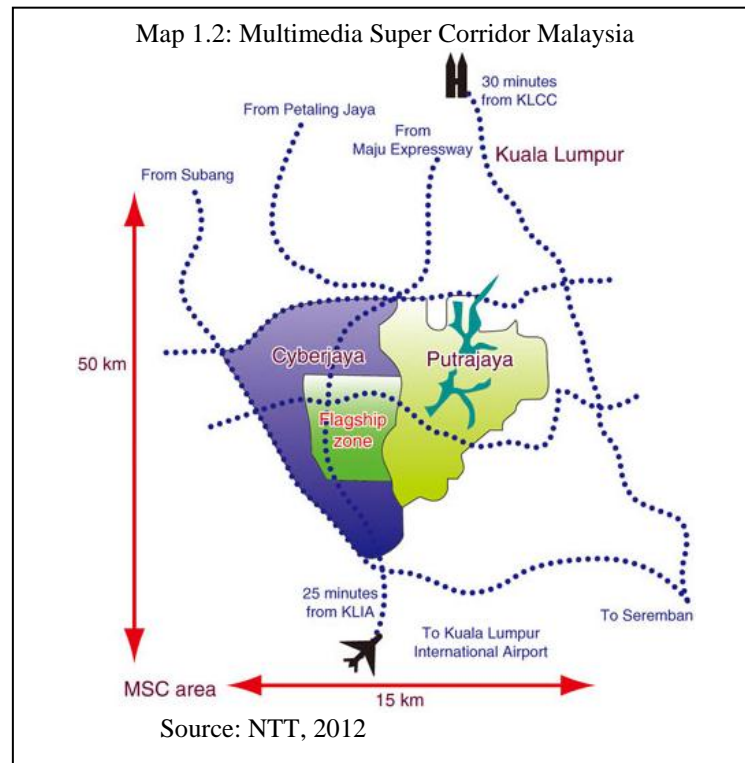
In 1991, the then-Prime Minister of Malaysia, Mahathir Mohamad, unveiled the ambitious and long-term planning of Malaysia becoming a developed country by the year 2020. The plan is known as *Wawasan 2020* (Vision 2020) and has become the epitome of development planning in Malaysia. The term *Wawasan 2020* has grown into a popular slogan and turned out to be a daily mantra among Malaysians<sup>14</sup>. A strong believer in industrialisation, modernisation and urbanisation and the benefits that comes with them (Mahathir, 1970), Mahathir wants his idea become part of the mindset of the people especially the Malays. The idea was propagated through public relation campaigns that run in all state media. For the first time, Malaysia was made to look into the future as a nation.

The *Wawasan* also marks the start of Malaysia's involvement in 'grandeur' as well as 'iconic' projects stressing the size and height that are associated with prestige and achievement (Goh, 2002: 60). Examples of such projects are the Kuala Lumpur City Centre (KLCC), Kuala Lumpur International Airport (KLIA), Putrajaya (the new administrative capital of Malaysia) and Multimedia Super Corridor (MSC Malaysia).

MSC Malaysia is part of the plan to create a knowledge society and knowledge-based economy in line with the *Wawasan 2020*. The idea was conceptualised five years after the launching of the *Wawasan* and aimed to increase the knowledge content especially in the major economic sector (ISIS, 2002). As shown in Map 1.2, it was originally a 15 kilometres by 50 kilometres physical development zone, stretching from the KLCC to KLIA which includes Putrajaya, Cyberjaya (the ICT based city) and Technology Park Malaysia (Ramasamy, Chakrabarty et al., 2004; King, 2008). The zone was also designated to create an integrated environment that would encourage innovation for both local and foreign investors (Omar and Mohan, 2010).

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<sup>14</sup> A special song and logo were created to further promote the slogan to the people. The song was played frequently on the national media and the term *Wawasan* was used as the National Day Parade theme from 1991-1995. It permeates all aspect of the society such as education with the introduction of *Wawasan* School.



Nevertheless, in the year 2004, a decision was made by the government to expand the MSC Malaysia zone from the original area to cover the whole country. The plan was divided into three phases with a 20-year timeframe. The first phase, which covers the period from 1996 to 2004, was marked with the formation of the zone. From the year 2004 to 2010, the plan was to expand the designated zone to different parts of the country. Finally, from 2010 to 2020, the aim is for Malaysia to become a fully knowledge-based society and economy.

An organisation named Multimedia Development Corporation (MDeC) was specifically set-up to manage the project together with various incentives to encourage ICT development. Companies that are located within the physical zone and have fulfilled the requirements set by MDeC will be accorded with a special status (known as MSC Malaysia status). They will then benefit from various financial and non-financial incentives<sup>15</sup>. Basically, these companies fall into the categories of creative multimedia, software development, support services, hardware design, shared services and outsourcing (SSO) and internet based businesses (IBB)

<sup>15</sup> The incentives are known as the MSC Malaysia Bill of Guarantees. Some of the incentives are unrestricted hiring of foreign knowledge workers, non-censorship of the internet, tax exemption (for pioneer status companies) and government procurement. For further details, visit <http://www.msomalaysia.my/topic/Why+MSC+Malaysia+Status>

(MSCMalaysia, 2009). The number of companies with the MSC Malaysia status has shown a steady increase since it was launched, from 94 in 1997 to 2,173 in 2008. In addition, revenues created by the companies rose from RM12.99 billion in 2006 to RM17.06 billion in 2007 while creating job opportunities for 63,883 people (MDeC, 2008).

However, the statistics provided by the MDeC reflect only the companies' numbers rather than their activities. Furthermore, the company categorisation based on their main business activity is vague and tends to overlap. For instance, during the fieldwork, I noticed that some of the companies which are categorised as software development companies are also involved in internet based businesses (see Chapter 2).

The companies are given the MSC Malaysia status based on the usage of multimedia technologies (MSCMalaysia, 2012). There is no emphasis placed on research and development activities (R&D) or knowledge content. There is no requirement for the companies to be involved in a certain per centage of R&D to qualify for the status. This explains the high number of companies in the SSO, IBB and support services categories compared to software development, hardware design or creative multimedia, which requires a higher level of creativity compared to the former.

Furthermore, MSC Malaysia is perceived to involve big land deals (Huff, 2002) which benefit a few capitalists close to the political elites. In a study of incubators in different clusters in Peninsular Malaysia, Jusoh (2006: 28) concluded that several of them started out as technology-based but ended up being 'real estate-based development'. Hence, the large-scale development proposed to create the MSC Malaysia provides an avenue for the 'selected' capitalists to benefit from the major infrastructure work.

Other than MSC Malaysia and *Wawasan 2020*, another factor which needs to be taken into consideration while discussing development is the concept of ethnicity and elites<sup>16</sup>. As pointed out by Evers (1975), conflict among classes (i.e. I use the term *elites*) should be taken into consideration while analysing cities in the Southeast Asia region. Furthermore, the same author

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<sup>16</sup> I subscribe to the notion of elites as a 'massive concentration of power in the hands of small group of people' (Bottomore, 1964: 128)

suggested that ethnicity plays a major role in creating a symbolic universe as well as defining physical space in major cities in the region (Evers, 1977; Evers, 1984; Evers, 1993; Evers, 1997; Evers, 2011).

In order to understand its importance, one needs to go back to the New Economic Policy (NEP) which brought a new perspective on ethnicity and elites in post-independence Malaysia. In brief, the NEP (1971-1990) was an affirmative action program proposed as a response to the racial riot in 1969. The two main aims of the policy were to eradicate poverty and restructure the society (Leete, 2007; Zin, 2012). Among others, it allowed for the implementation of a quota system for entrance to universities, property ownership, employment and corporate shares. As a result, it created a new group of middle class and business elites especially among the Malays (Gomez and Jomo, 1999; Embong, 2002; Aziz, 2012). This 'preferred Malay' group enjoyed 'both special state largesse and a corporate citizenship' (Ong, 2000:61) during the economic boom.

The NEP also created the practice of patronage and crony capitalism in major economic activities (Gomez and Jomo, 1999; Jomo and Gomez, 2000; Norhashim and Aziz, 2005; Gomez, 2012). This has made Nicholas Tarling (2001:457), a well-known Southeast Asian historian, state that the NEP has benefited the Malay bureaucrats and politicians which perceive UMNO, the biggest Malay-based political party, as 'an avenue for wealth expansion'. In exchange, these business elites help 'reaffirm loyalty' to the political leaders (Case, 2005:286). The intricate relationship between politics and business has created the phenomenon of the 'party state' in post-independence Malaysia, especially during Mahathir's premiership (Mohamad, 2011). A party state denotes a situation in which the political party 'owns outright or directly controls huge portions of the nation's economic assets' (Fields, 1998).

Thus, although the NEP was originally implemented to ensure the distribution of economic wealth benefits to the majority, it has become a tool that is used by the political elites to create a patronage system that benefits a selected few.



## **1.8 Conceptual Framework of Knowledge City Development in the Malaysian Context**

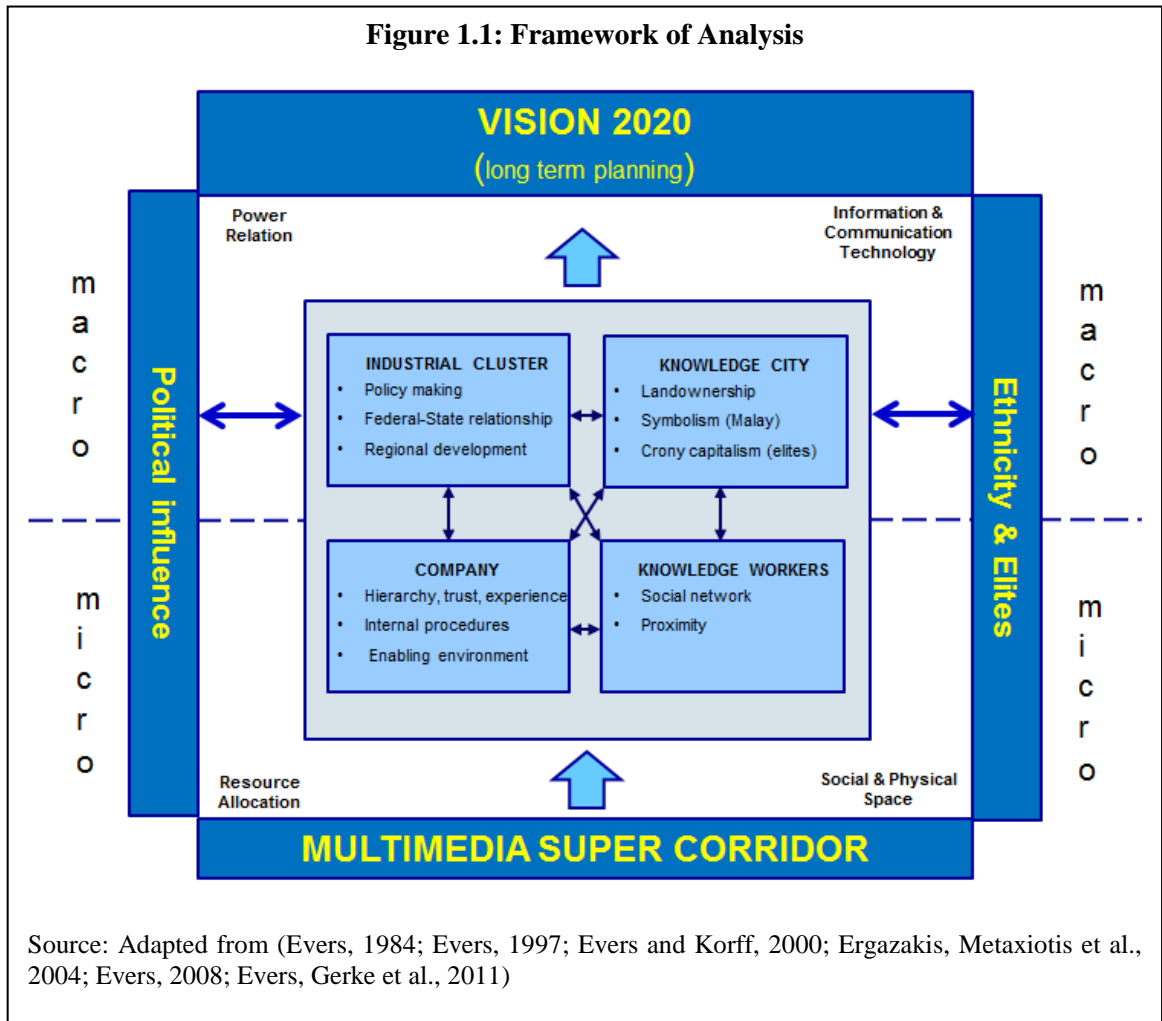
Based on the discussion in section 1.7, I have come up with a framework for analysing knowledge city development in Malaysia as shown in Figure 1.1.

To begin, the development of a knowledge city in Malaysia is very much related to the long-term planning of becoming a developed country by 2020. In order to achieve this aim, one of the physical developments proposed was the MSC Malaysia corridor. It basically prepares a scheme for resource allocation for the ‘selected few’ Malay capitalists. They are given special treatment and priority in the allocation of major infrastructure work and landownership in the pretext of the NEP.

The corridor formed a platform for the different actors to compete so as to claim dominance over the other. For example, it was observed that the development is an ‘expression and even extension of central state power’ (Bunnell, 2002:290). Additionally, the corridor symbolises a ‘special’ space in which the ‘Muslim Malays with capabilities and know-how are marked off from the many without’ (Ong, 2008:122). As suggested by Brooker (2012:11), the Cyberjaya city planning ‘is embedded with specific notions of inclusion and exclusion as citizens are divided according to class and their ability to pay’. For instance, the Cyberjaya zoning plan shows that high-end bungalows are built fronting the lake while low-cost housing is plotted beside a sewerage treatment plant (Rekarancang, 2009). As stated by Kong (2008: 16), ‘planning laws and other legal and fiscal devices are the most common ways in which the state shapes the city’s built and natural environments’.

Taking into account the MSC Cluster development and knowledge city in Malaysia, the framework of analysis is basically divided into two main levels i.e. macro and micro. The macro level comprises the industrial cluster and the knowledge city, whereas the companies and knowledge workers are analysed as a micro unit.

**Figure 1.1: Framework of Analysis**



Although Malaysia achieved independence more than half a century ago, the colonial legacy in urban development lives on. During British rule, segregation of urban residents based on their ethnicity and race was a common practice (Evers, 1975; Evers and Korff, 2000; Goh, 2002; King, 2008; Kong, 2008; McGee, 2011). In post-independence Malaysia, segregation in urban areas is evidently done according to economic ability of its residents by those in power, as shown in the case of the Cyberjaya development. Hence, I concur with Kong (2008: 26), who concluded her study on power relation in urban areas by saying that ‘cities are the medium by which the powerful express their influence’.

The corridor has created an exclusive zone for the minority who have the necessary ICT skills while the majority are pushed outside of it. In an earlier study on MSC Malaysia, it was

revealed that the Indian estate workers and the *orang asli* (natives) were relocated in order for the city to be built (Bunnell, 2004).

A proper understanding of the political influence, ethnicity and elites is important in sociological research in Southeast Asian countries (King, 2008). In my study, these elements play an important role in the development of Cyberjaya. It is difficult to set boundaries because they are intertwined and influence each other. For example, politics influences policy making, the federal-state relationship and allocation for the regional development fund. At the same time, it also influences landownership and plays a major role in selecting and funding companies allowed within the corridor.

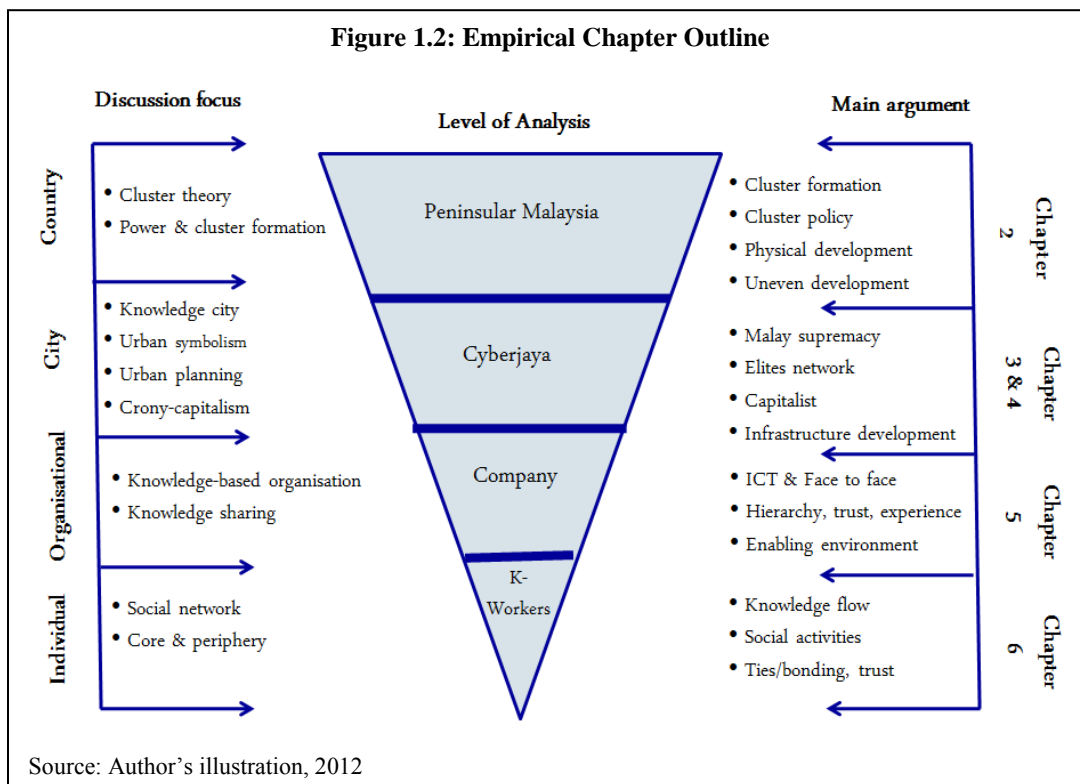
Moreover, even within the companies and among the knowledge workers, the ethnicity and elite factors influence decision-making and knowledge-sharing activity. Despite the fact that ICT plays an essential role in enhancing knowledge-sharing activity, it does not reduce the importance of face-to-face communication. In addition, the elements of power relation, ICT, resource allocation and space function as the connectors within the cluster.

Therefore, knowledge cluster development in Malaysia is very much framed within the four components shown in Figure 1.1. They are intertwined and impact each other, although at different levels of influence.

## **1.9 Thesis Outline and Line of Argument**

My study in this dissertation is outlined along the knowledge city development approach (Edvinsson, 2006; Ergazakis, Metaxiotis et al., 2006; Yigitcanlar and Sarimin, 2010; Carrillo and Batra, 2012). I positioned my discussion based on my main argument in which I reason that physical development does not necessarily produce the expected results from a knowledge cluster. To deal in detail with the main argument and to fulfil the research objectives, the dissertation is divided into seven parts' one preamble which includes the conceptual framework, five empirical chapters and a conclusion. Figure 1.2 simplifies the discussion focus, level of analysis and main argument of the empirical chapters.

In Chapter 2, a critical evaluation of cluster formation in Peninsular Malaysia is made. The chapter offers a macro-historical analysis of the cluster formation, with particular reference to knowledge-based institutions development from colonial rule to the present day. It examines the development of knowledge-based institutions in three phases: (i) the colonial or pre-independence period (prior to 1957); (ii) the immediate post-independence years especially from the NEP period until the 1980s, when Mahathir came into power; (iii) the period beginning in the 1990s, when Malaysia started to be involved in heavy industrialisation programmes, to the present day. The chapter engages in a detailed discussion on the state policy and its impact on cluster formation in different part of the Peninsular Malaysia. The macro-historical analysis in this chapter provides the framework for subsequent chapters.



Chapters 3 and 4 examine several interrelated questions concerning the knowledge city development. They examine the planning and development of the city focusing on issues related to urban symbolism and crony capitalism. Both the chapters constitute the bulk of the discussion on knowledge city development. Chapter 3 concludes by suggesting that Cyberjaya is a symbolic city which highlights Malay supremacy in state-led city development. In Chapter

4, the conclusion suggests that the city was developed through an elitist network which benefitted a group of selected Malay capitalists.

Chapter 5 builds on earlier chapters by examining one of the main components of the city, i.e. the ICT companies. The chapter focuses on the knowledge-sharing activities in the different ICT companies in Cyberjaya. Experience from people working in the different types and sizes of companies are analysed using statistical inference. In addition to statistical valuation, I have also strengthened my argument by analysing the physical layout, rules and procedures as well as social facilities provided within the companies. Leisure activities and the respondents' evaluations of their own companies allow me to see if their subjective evaluations match the definition of a knowledge city. This chapter aims to show that the companies located in Cyberjaya are not homogenous and that while some companies have developed a distinctive knowledge-producing and knowledge-sharing environment, most are still trying to come to terms with the whole idea of becoming a knowledge-producing company.

Chapter 6 goes one step further than the companies by analysing the social networking activities of the knowledge workers in Cyberjaya. This chapter traces the social networks of knowledge workers with their friends working in different companies in Cyberjaya. The aim of this chapter is to show the knowledge flow from one company to another by analysing the socio-spatial element. The visualisation method through the GIS is applied in order to grasp a better understanding of the whole process. It appears that there exists a core and periphery of knowledge concentration in the city. Moreover, social activities done outside of the office environment are pivotal in building relationships among the knowledge workers in Cyberjaya. The activities help to build trust which then contributes to the knowledge-sharing process. Thus, the result demonstrates that physical proximity has a direct correlation on knowledge flow in Cyberjaya.

The dissertation ends with Chapter 7, which draws together some of the major arguments regarding the social and political elements of the knowledge city and explores the implications of these arguments for Malaysia's knowledge city development.

## Chapter 2

### Knowledge Cluster Formation in Peninsular Malaysia:

#### The Emergence of an Epistemic Landscape

*“The corridor development is one catalyst to solve many other problems. If we compare the West Coast with the East Coast, the whole of the peninsular to Sabah and Sarawak, there is lopsided development that must be corrected”*  
(Abdullah Ahmad Badawi, 10 December 2007).

### 2.1 Introduction

International agencies, governments and experts have identified industrial cluster formation as a prime strategy to induce innovations, increase the GDP and develop a nation (OECD, 1996). The beneficial effects of the formation of industrial clusters have already been investigated by Alfred Marshall (Marshall, 1920) and Alfred Weber (Weber, 1909). As Michael E. Porter has argued in his well-known book, the competitive advantage of nations is greatly enhanced by the formation of industrial clusters: ‘The phenomenon of industry clustering is so pervasive that it appears to be a central feature of advanced national economies’ (Porter, 1990:149). Clusters are defined as follows: ‘A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities’ (Porter, 2000:16).

Whereas the reduction of transaction costs because of proximity has been formerly emphasised, the ease of distributing information and of sharing knowledge has been identified as essential for emerging knowledge-based economies (KBEs). Porter stated, ‘Clusters are concentrations of highly specialised skills and knowledge, institutions, rivals, related businesses, and sophisticated customers in a particular nation or region. Proximity in geographic, cultural, and institutional terms allows special access, special relationships, better information<sup>17</sup>, powerful incentives, and other advantages in productivity and productivity growth that are difficult to tap from a distance. As a result, in a cluster, the whole is greater

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<sup>17</sup> Whether or not knowledge and information are, indeed, transferred more easily in clusters is assumed by Porter and others, but needs to be verified empirically. Some studies have produced contrary evidence (see Evers, 2009, Menkhoff, Evers, Chay 2010).

than the sum of the parts' (Porter 2000:32). If indeed, as Porter has argued, the formation of industrial clusters is the outcome of successful economic development and a signifier of the competitive advantage of a nation, then the formation of knowledge clusters should be a measure of the degree a nation has advanced towards a knowledge-based economy (KBE).

The following chapter will look at Malaysia and its path towards becoming a KBE. I will first describe the development strategy of the Malaysian government which has used cluster formation as one of its prime targets. It will provide evidence of the current state of knowledge cluster formation in Peninsular Malaysia<sup>18</sup>. This will then be checked against the current measures to form 'corridors' of development and answer the question of whether or not these planned 'corridors' have already developed into knowledge clusters or, in other words, how far 'natural' clustering conforms to regional cluster planning. As an explanation of correspondences and differences in cluster creation, the chapter shall look both at economic rationality and political power. By forming innovative knowledge clusters, resources become available on a local level either through channelling of government funds and corporate investments into the 'epistemic landscape' or through the benefits produced by effective cluster policies. After painting the overall picture of a Malaysian 'epistemic landscape', I will then discuss the formation of the knowledge cluster of Cyberjaya.

I shall try to answer the following questions. *If the formation of a knowledge cluster (especially in the ICT and multimedia industry)<sup>19</sup> has been the government policy, what has been the result? Has Malaysia developed an epistemic landscape of knowledge clusters? Has the main knowledge cluster really materialised in and around Cyberjaya in the Multimedia Super Corridor (MSC)?*

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<sup>18</sup> Malaysia is geographically divided into two areas i.e. West or Peninsular Malaysia and East Malaysia. Throughout this thesis, the term *Peninsular Malaysia* is used rather than *West Malaysia* to avoid confusion because the Peninsula is further separated into East Coast and West Coast.

<sup>19</sup> ICT refers to all industry related to Information and Communication Technology.

## 2.2 Malaysia's Cluster Formation from the Development Planning Perspective

### 2.2.1 Industrial Clusters<sup>20</sup>

In Malaysia, the systematic approach to development planning emerged in the form of the First Five Year (Federation of Malaya) Plan 1956-1960 (Leete, 2007: 43). The First Five Year Plan laid the foundation for an organised development planning process in the Federation of Malaya and later Malaysia. In the beginning, policy makers mainly focused on rural development and providing basic amenities to the people. This was also the period when they started to realise the commercial value of the oil palm and timber besides rubber which was the focus of British colonial. The plan also generated interest and awareness on the importance of agricultural education and research among policy makers (Leete, 2007).

During this period, the Federal Land Development Authority (FELDA) was founded. They manage the largest land development scheme in which people from poor and underdeveloped areas are relocated as well as provided with arable land and basic infrastructures. The main focus of these land development schemes is the plantation of commercial crops such as rubber and oil palm and their related industries. This became the basis of the cluster formation and can be considered as the first large-scale economic-based cluster in Malaysia.

In the 1960s, through the first industrial cluster developed in Petaling Jaya<sup>21</sup>, the policy makers realised the economic benefits of agglomeration. Its success has encouraged the creation of other industrial clusters in other states such as Johore, Perak, Penang and Negeri Sembilan. The focus now shifted from low level agricultural-based to light and heavy industries.

The growth-oriented economic development of Malaysia was taken aback in 1969 due to a bloody racial riot. The riot was considered to be a result of a serious structural problem of the country due to its past history (Faaland et al., 2003). This contributed to the creation of the New Economic Policy (NEP) in 1970. The NEP had two main objectives i.e. to reduce and eventually eradicate poverty and to restructure the society to correct economic imbalance (Leete, 2007). In addition, the NEP, which became the central pillar of Malaysia's

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<sup>20</sup> Industrial clusters in Malaysia are administratively called Free Trade Zones, Industrial Estates and High-Technology Zone. The terms refer to the different administrative statuses of the industrial clusters.

<sup>21</sup> Petaling Jaya is the first new township developed during colonial British rule. Refer to Chapter 3 for a detailed discussion.



development planning, put the racial component into practical use by those in power. The political elites started to strengthen their position to maximise material and immaterial gains and profit (Evers & Gerke, 2009). Hence, in all aspects of development, race became the main defining factor.

The Second Malaysia Plan (2MP) covering the period of 1971-1975 was the first Malaysia plan that incorporated the objectives of the NEP. The establishment of manufacturing activities in the less developed areas represented an important dimension of the industrialisation programme. The strategy was to modernise the less developed areas by modernising the rural areas where the majority of the population is ethnic Malay. The government provided incentives for the labour-intensive industries to locate their plants outside of the main urban areas. Research institutions related to industrial development, such as the Standards Institution of Malaysia (SIRIM), was established to complement the manufacturing industries.

The potential of new forms of industries related to tourism and exports was also introduced. Traditional handicraft related to the tourism industries was utilised with the establishment of *Lembaga Kraftangan* (Handicraft Board) Malaysia in 1974. The tourism industry indirectly created a new form of smaller cluster in the rural and less developed areas; whereas, in the developed areas, the Free Trade Zones (FTZs) were developed to encourage the development of export-oriented industries. The FTZs were built in Penang, Selangor, Malacca, Johor, Kedah, Kelantan and Pahang. The concentration, however, was still in the developed states, i.e. Penang, Selangor, Malacca and Johor. In addition, to support the tourism and export-oriented industries, small and medium enterprises (SMEs) were formed, mainly among the ethnic Malay. Tourism and FTZs are examples of how the political elites exploit new resources through the creation of special organisations to ensure their power base is retained.

The period from 1986 to 1995 marked a different orientation in the industrial development in Malaysia. The first Industrial Master Plan (IMP) was launched to supplement the Malaysia Plan starting from the Fifth (1986-1990). In addition to types of industries, locations and workforces, the IMP also stressed the private sector's involvement in the development of industrial clusters. The private sector's role in the development process was also encouraged through privatisation of government entities. Two of the biggest were Telekom Malaysia and

Tenaga Nasional Berhad in 1985 and 1990<sup>22</sup>. The period marked the strong formation of government-linked companies (GLCs), which are defined as:

*[...] companies that have a primary commercial objective and in which the Malaysian Government has a direct controlling stake. Controlling stake refers to the Government's ability (not just per centage ownership) to appoint BOD members, senior management, make major decisions (e.g. contract awards, strategy, restructuring and financing, acquisitions and divestments etc.) for GLCs either directly or through GLICs (Khazanah Nasional Berhad, 2010).*

The GLCs and their managers form another group created by the political elites to utilise new resources covering all major economic, transportation, infrastructure and technology fields in Malaysia<sup>23</sup>. The GLCs also created a new group of Malay capitalists that benefited from the NEP in executing the agenda of the political elites as I will discuss in the subsequent chapters.

If, during the first IMP period, the orientation was to encourage privatisation, the second IMP (1996-2005) focused on the industrial network in which it stressed linkages between industries, i.e. interdependence. Furthermore, it vigorously encouraged the development of industrial clusters and emphasised a 'broad-based, resilient and internationally competitive industrial sector' (IMP2, 1996: 21). This has encouraged the development of industrial clusters with specialisations such as ICT. MSC Malaysia and Cyberjaya were developed within the framework of the policy. The two policies were followed by the third IMP (2006-2020) which not only covers aspects related to physical development but also emphasises producing knowledge workers. It creates the opportunity to establish not only government-owned but also private-run training centres. Thus, the political elites use their power to determine which resources and institutions to create and exploit while maintaining control. Industrial cluster development is an example of how the political elites utilise newfound resources such as ICT and create a new power base through different groups.

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<sup>22</sup> Telekom Malaysia is the telecommunication service provider while Tenaga Nasional Berhad is the national electricity utility supplier.

<sup>23</sup> Currently, there are 95 GLCs, and the top 20 GLCs' aggregate earnings are forecasted at RM17.7billion for the 2010 financial year (Khazanah Nasional Berhad, 2010).

### 2.2.2 Economic Development Corridors

A long-term development goal known as *Wawasan* (Vision) 2020 was formulated in 1991 by Prime Minister Mahathir during his premiership. The goal was to make Malaysia an industrialised and developed country by the year 2020 in its ‘own mould’ (Mahathir, 1991: 21). The year 2020, according to Mahathir, was the logical, convenient and appropriate timeframe; furthermore, Malaysians needed to have a perfect vision<sup>24</sup> of their future and had 30 years to achieve the status (Mahathir, 2009). The aim and challenges highlighted by Mahathir were implemented in the Sixth Malaysia Plan (6MP) to the Tenth Malaysia Plan (10MP), covering the period from 1991 to 2015. The vision is still tailored towards achieving the objectives of the NEP, which was formulated in the 1970s. Even though, technically it was supposed to have ended in 1990, the spirit and fundamentals are carried out in the subsequent development policy of Malaysia. The preference towards the *bumiputera*<sup>25</sup> has a long-term impact on the development process in Malaysia and the cluster development.

In the Seventh (7MP) and Eighth Malaysia Plan (8MP), covering the period from 1996 to 2005, two main developments emerged in Malaysia. The Government moved the Federal Administrative machinery from Kuala Lumpur to Putrajaya, and development focus shifted to knowledge-based. The first action has decreased the escalating pressure on Kuala Lumpur and extended the urban growth to a wider geographical area, whereas knowledge-based development started with the utilisation of ICT in all sectors of the economy to increase productivity. The MSC Malaysia and Cyberjaya were created to set into practice the vision of making Malaysia a knowledge-based economy by utilising ICT. The government also encourages the growth of companies related to biotechnology, advanced electronics and software development. Technology-based incubator centres were set up by the Malaysian Technology Development Corporation (MTDC) and Technology Park Malaysia (TPM)<sup>26</sup> to facilitate high technology-based industries. MSC Malaysia, MTD and TPM are examples of the formation of different institutions to utilise the new resources (i.e. technology) and strengthen the power of the political elite.

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<sup>24</sup> In the same interview, Mahathir was asked, “Why 2020?” He answered that, for an optometrist, 2020 is perfect vision.

<sup>25</sup> Constitutionally, the term refers to Malay Muslim or Indigenous Native of Sabah and Sarawak.

<sup>26</sup> TPM is one of the GLCs involved in technology-based industries. It is a much smaller and condensed cluster compared to Cyberjaya, located about 3 kilometres from Kuala Lumpur.

In the Ninth Malaysia Plan (9MP), which covers the period of 2006-2010, apart from the requirement of ‘knowledge’, strong emphasis was also given on innovation. The establishment of high technology and research and development (R&D) based clusters were suggested in order to shift from low technology and labour intensive industries. Regional development was revitalised and reorganised. GLCs were given the task to spearhead and execute the regional development plans. *Appendix III* provides details of the economic regions and the respective GLCs assigned to manage them. This was the first time profit-oriented bodies were given the task of regional development across different states. The economic regions are clustered based on the strength of the respective states as shown in Map 2.1; however, three states in Peninsular Malaysia, i.e. Selangor, Negeri Sembilan and Melaka, are not covered by the respective corridors. All three states are located within the Klang Valley Development Region and have benefitted through the development of Kuala Lumpur and Putrajaya.

The development regions and corridors indicate the government focus for different states based on two main clusters, i.e. industry and agriculture. The corridors in the developed states, i.e. NCER and Iskandar Malaysia, focus on high-end industries such as electric and electronic compared to the less developed states. In Kelantan, Terengganu and Pahang, even though there is a substantial number of industry corridors planned in the region, they mainly focus on agriculture and tourism. This shows that the policy makers still perceive these states as lacking and able to focus only on the traditional industries rather than other high-end and knowledge-based industries. Within the corridors, the concentration is still based on political needs rather than economic or social. Even though the ECER stretches from the north of Kelantan to part of Johor, the development and investment is still focused in Terengganu and Pahang. This can be seen with the creation of a Special Economic Zone within the corridor which covers only Terengganu and Pahang (The Star, 31 January 2011)<sup>27</sup>.

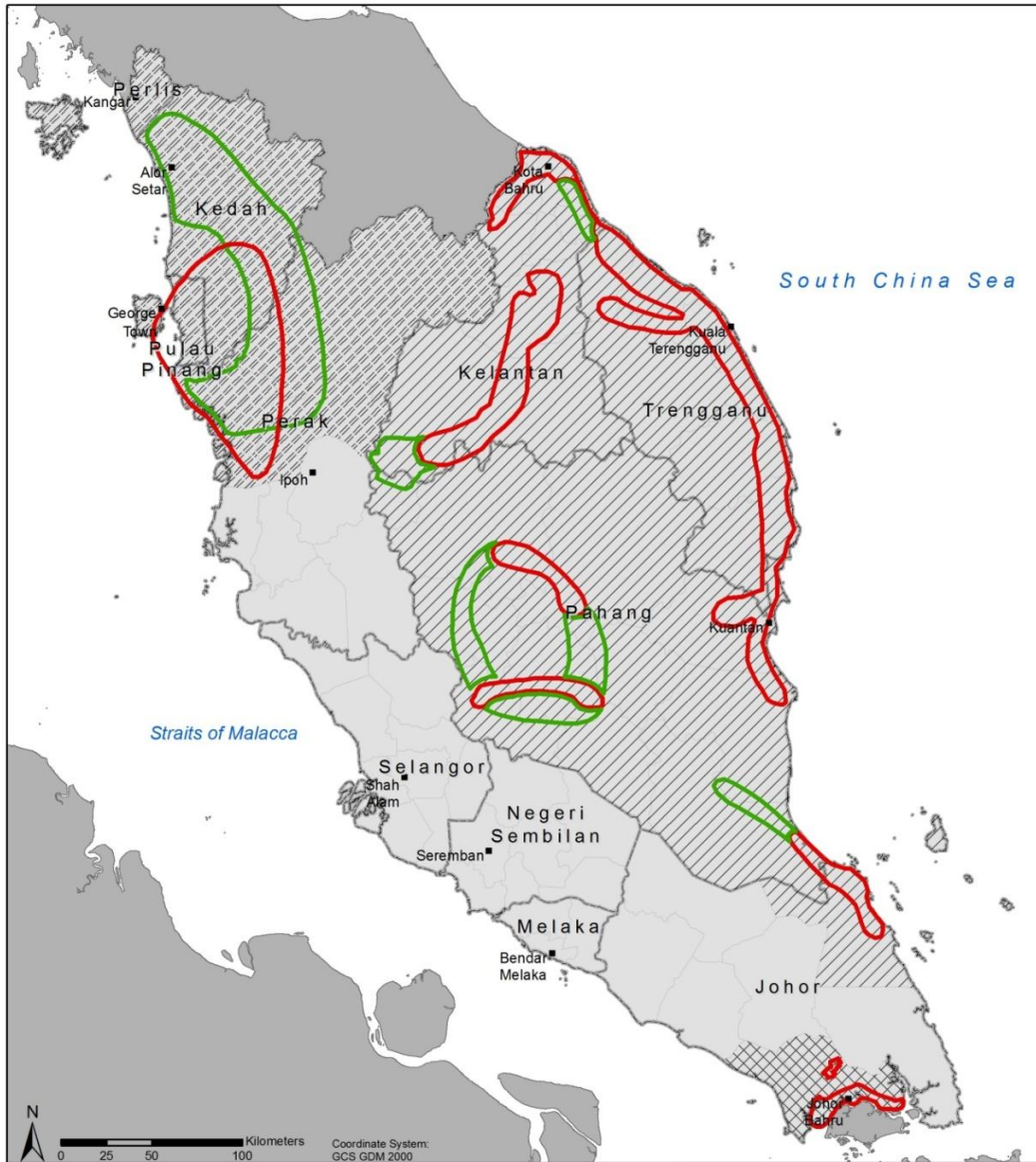
Nineteen years after Mahathir’s celebrated speech, on the 30th March 2010, the current Malaysian Prime Minister, Najib Razak, unveiled the New Economic Model (NEM). The NEM and Vision 2020 were intended to ensure that Malaysia would become a developed country as set by Mahathir. One of the suggestions in both of the policies was the formation of

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<sup>27</sup> Compared to the other two states which is managed by the same political party ruling the federal government, Kelantan is ruled by the PAS (*Parti Islam Se-Malaysia*) or Pan-Malaysian Islamic party an opposition at the federal level.

cluster- and corridor-based economic activities. The focus was on innovation and productivity growth, in addition to technological advancement and entrepreneurial development. Cluster development was the planning tool used to attract the attention of the people in the less developed states. They are attracted to the concept and the promise for better economic and social futures. The creation of a special body to manage the economic region and also the grand launching of the concept really attracted the attention of the people living in the backward economic region. The planning of economic corridors further strengthens the power of the political elite by re-emphasising their dominance. Regional development planning is being used as a tool to manipulate and control the resources in the respective states. The GLCs managing the corridors represent the political elites in the form of economic organisations.

**Map 2.1: Development Regions, Peninsular Malaysia**



**Legend**

<b>Corridors</b>	<b>NCER</b>	<b>ECER</b>	<b>Iskandar</b>	<b>Federal States</b>	<b>Bordering countries</b>
Agriculture Corridor	NCER	ECER	Iskandar	Federal States	Bordering countries
Industry Corridor					



Source: Northern Corridor Economic Region ([www.ncer.com.my](http://www.ncer.com.my)) dated 19th May 2010; Iskandar Malaysia ([www.iskandarmalaysia.com.my](http://www.iskandarmalaysia.com.my)) dated 19th May 2010; East Coast Economic Region ([www.ecerc.com](http://www.ecerc.com)) dated 19th May 2010.

### 2.2.3 Cyber Cities and Cyber Centres

The potential of creating new sources of growth using ICT as a catalyst has encouraged the establishment of designated areas in different parts of the country as Cyber Cities and Cyber Centres. These are areas created based on a development strategy that locates industrial companies of similar technology within the same geographical boundary (Mior Azhar, 2009). They are designed, created and developed to integrate three key elements – man, nature and technology – to promote the concept of industry clustering by being located with similar companies (Neo, et.al, 2008).

Out of the total six cyber cities and eleven cyber centres in Peninsular Malaysia, only one is located in the East Coast. Most of the cyber cities and cyber centres are located in the developed states, as shown in Appendix III. The qualifying criteria themselves exclude the opportunity for the less-developed states to achieve the status. These also contribute to regional imbalance and digital divide in terms of development planning.

One of the biggest and leading cyber cities in Malaysia is Cyberjaya. It is located adjacent to Putrajaya, between Kuala Lumpur International Airport (KLIA) and Kuala Lumpur City Centre. The city was opened in 1999 and functioned as the catalyst for MSC Malaysia. It covers an area of 7000 acres and was designed as a cutting edge multimedia centre to attract world class multimedia and ICT companies (Neo, et.al. 2008). There are 414<sup>28</sup> companies which provide employment to 35,000 people (MDeC, 2009). There are three universities located in Cyberjaya: the Multimedia University, Limkokwing University of Creative Technology and Cyberjaya University College of Medical Science, which caters to 15,000 students<sup>29</sup>.

The name given to the city is a reflection of the intention of the political elite. ‘Cyber’ is an English word related to computers and the internet, whereas ‘*Jaya*’ is a Malay word literally translated as ‘success’ (refer to Chapter 3 for discussion on the symbolic universe of the city). The city was established with the intention of creating a glorious environment for the development of ICT in Malaysia. This is different from the previous industrial clusters, which

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<sup>28</sup> This was the official figure given by MDeC, but the fieldwork done between April-December 2009 managed to locate only 348 companies in Cyberjaya.

<sup>29</sup> The unpublished figure of the total number of students was provided by the Ministry of Higher Education during the fieldwork, 2009.

are named after the place where they were built, such as Petaling Jaya, Batu Berendam and Bayan Lepas, among others. The planners of Cyberjaya visited other cities such as Silicon Valley, USA; Sophia Antipolis, France; Bangalore, India; and a few similar projects in Japan (Bunnell, 2006).

Cyberjaya is an example of how the political elites construct a physical location to create an imagined city with ICT as the backbone. However, the imagination is not necessarily well understood by the people involved with and affected by the project. One of the three planners who has been working in Majlis Perbandaran Sepang<sup>30</sup> for ten years said:

*There is no clear concept of Cyberjaya development. We follow what the markets require such as the term enterprise, which is not a common term in planning but it actually refers to commercial land (Personal communication, 23 December 2009).*

The opinion is shared by a member of the Cyberjaya Residents Association, who observed that there is nothing special about Cyberjaya compared to other new cities in Klang Valley (Personal communication, 24 December 2009). The city replicates other similar cities around the world but fails to ensure that it is well-understood by the people involved. The planner interviewed saw Cyberjaya as products that need to be sold and the residents who bought this idea and live in it do not see anything special. The imagined city failed to materialise.

The aim of this section was to show how the political elite utilise development planning to ensure their political survival at different levels of the process. They have manipulated economic disparities and used racial pressure to gain power and control over the country's resources through the New Economic Policy (NEP). Different themes of development strategies, such as race, regional development, technology and ICT, were used to strengthen their power position. The formation and demand of different groups within the elites has caused the planners of development in Malaysia to become trapped in a dilemma of pure economic benefit or the quest to strengthen the power of their political masters. In the next section, I will discuss further the formation of knowledge clusters in Peninsular Malaysia.

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<sup>30</sup> Majlis Perbandaran Sepang is the local authority managing Cyberjaya.



## **2.3 Knowledge Clusters in Malaysia**

### **2.3.1 Spatial Patterns of Knowledge Clusters**

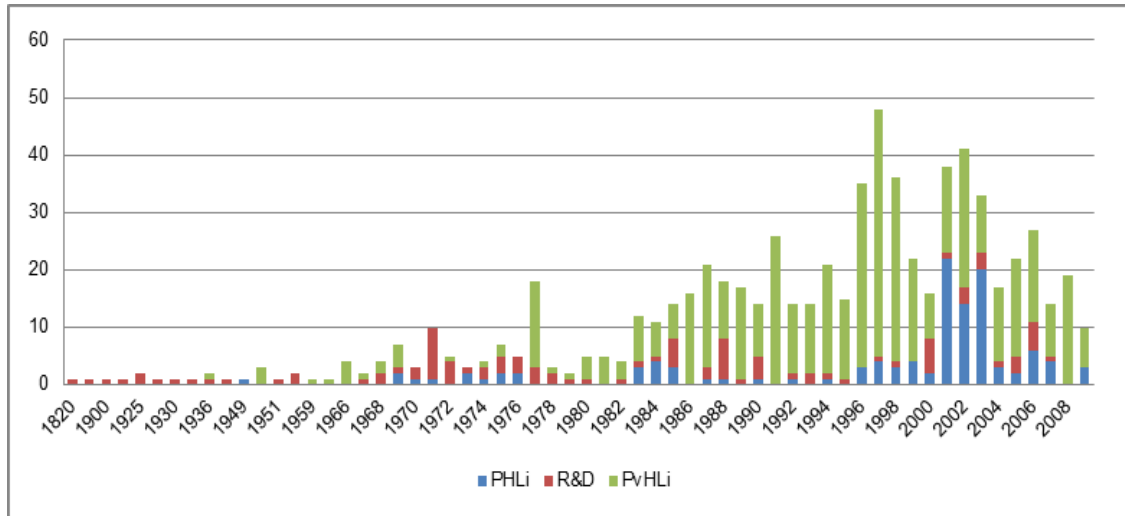
The establishment of an organised R&D institution in Malaysia was fundamentally related to colonial needs. The first recorded institution was the Meteorological Department, established in 1820. The department collects data on air pressure, temperatures and precipitation (Malaysia Meteorological Department, 2010). This was followed by nine additional R&D institutions, established between 1900 and 1957 (Field data, 2009). All the institutions were created to support colonial economic interests related to rubber, minerals, forestry, animal husbandry and wildlife. The only R&D institution directly related to local needs was the Institute of Medical Research, which was established in 1900. The Institute was established to ‘carry out scientific and sustained research into the causes, treatment and prevention of such scourges as beri-beri and all forms of malaria fevers’. The creation of the institute followed the resolution in Europe of the Conference of Berlin in 1885 to undertake such activities as ‘to promote the moral and material well-being of the native population and to explore the great and unknown field of tropical medicine’ (Institute of Medical Research Malaysia, 2010).

Main economic activities such as agriculture and fisheries were the focus of R&D activities in post-independence Malaysia. These correlate with the government policy to upgrade and modernise the traditional sector. Mahathir’s era brought a new dimension to R&D activities in Malaysia. The focus shifted from traditional sectors to commercial crops and high technology R&Ds including ICT, automobile, aeronautic and space related research. New businesses and groups aligned to the ruling party emerged in the form of board members and advisory panels. The R&D activities inherited from the colonial period are continued primarily either by government-owned or government-linked institutions. As can be seen in Figure 2.1, the R&D activities from the 1800s to the 1950s were dominated by the government-owned institutions. Pre-independence, the total number of R&D institutes was only 14, but the number rose to 101 in 2009. Furthermore, the number doubled between the 1970s and the 1980s due to government reliance on R&D to support the main economic activities.

On the other hand, privately-owned knowledge-producing institutions began with the establishment of Goon Institute in Kuala Lumpur in 1936. The Institute is the longest serving

privately-owned institute offering post-secondary education in Malaysia (Goon Institute, 2010). The number of private higher learning institutes increased significantly beginning from the late 1970s due to the demands and the limited capacity of the public institutions.

**Figure 2.1:**  
Number of Knowledge-producing Organisations by Year of Establishment, 1820 to 2009



Source: Malaysian Science and Technology Information Centre (MASTIC), 2009 (unpublished data), Ministry of Higher Education, 2008, Ani Asmah (eds.), 2009 and field data, 2009.

PHLi=Public Higher Learning Institutions, PvHLi=Private Higher Learning Institutions, R&D=Government Owned Research & Development Institutions

The 1990s saw a policy shift in line with the global higher education restructuring (Lee, 2004; Sivalingam, 2006). The numbers of public universities almost tripled from merely eight before 1990 to twenty in 2009. The government also increased the number of polytechnics and community colleges apart from universities to cater to the needs of the industries. Private universities saw their numbers grow from none in the 1990s to 37 in 2007<sup>31</sup>, and other forms of private higher learning institutions grew from 156 in 1992 to 460 in 2009. The expansion of these institutions has created different groups of ownership, i.e. individual proprietors, private companies, consortium of companies, public listed companies, government corporations, foundations, philanthropic organisations and community financing (Lee, 2004: 1). The formation of these different groups is derived from the lucrative business of higher education in Malaysia. Looking at the past 200 years of Malaysian history, it becomes clear that the establishment of research institutes, colleges and universities was not only motivated by the

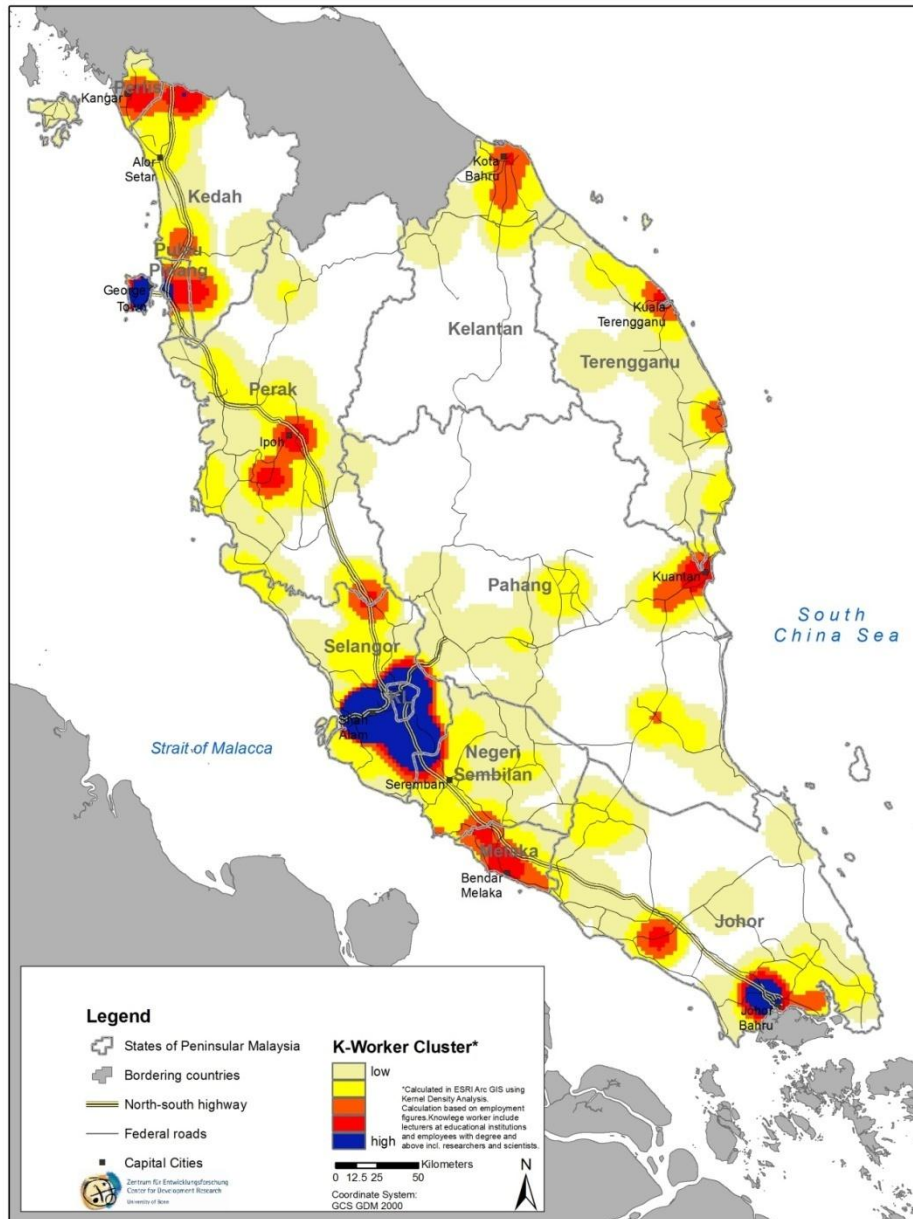
<sup>31</sup> The numbers comprise private universities (18), college universities (15) and foreign branch campuses (4).

quest for knowledge but has helped form different groups that strengthened the position of the political elites. All the higher learning institutions are monitored by the Ministry of Higher Education and controlled by the University and University College Act, 1971. The increasing demand and the aim to make Malaysia an education hub have contributed to the growth.

The outcome of decades of regional development planning is the formation of knowledge clusters with different degrees of 'knowledge density', which means that certain areas show a disproportionately high number of knowledge-producing institutions and knowledge workers. The knowledge cluster map (map 2.2, refer to Appendix I for explanation) shows that knowledge clusters in Peninsular Malaysia are still concentrated in the West Coast with three main locations having the highest concentration of knowledge-producing institutions and knowledge workers, namely Kelang Valley, Johor Bahru and Penang. The concentration correlates with the number of Higher Learning Institutes (HLIs) and some of the earliest public universities in Peninsular Malaysia, namely University Malaya, Universiti Kebangsaan Malaysia and Universiti Putra Malaysia in Kelang Valley, University Science Malaysia in Penang and University Technology Malaysia in Johor. The most dense and dynamic location of knowledge clusters in Peninsular Malaysia are the areas from Tanjung Malim where Universiti Pendidikan Idris is located in the North to Malacca in the South. Penang has the most dense knowledge clusters in the Northern Region of Peninsular Malaysia. Interestingly, the area in Northern Kedah and Perlis bordering Southern Thailand has a strong presence of knowledge clusters even though both areas are economically less developed compared to the other areas in the West Coast. The concentration of knowledge clusters in the West Coast also correlates with the major infrastructures and economic activities.

On the contrary, the East Coast of Peninsular Malaysia has less developed knowledge clusters which can only be found at the main cities in the region, i.e. Kota Bahru, Kuala Terengganu, Dungun and Kuantan. Based on my data set, Kuantan shows the highest density of knowledge workers in comparison to the other three cities. In comparison with the West Coast, the knowledge clusters did not spread along the major highways but rather within the main urban areas, where most economic and social activities are concentrated. However, kernel density tends to be much lower than in the West Coast.

**Map 2.2: Knowledge Clusters in Peninsular Malaysia<sup>32</sup>**



Sources: Ministry of Higher Education, 2008a, 2008b, 2009, 2010(unpublished data); Ani Asmah (ed.), 2009 and field data, 2009<sup>33</sup>.

<sup>32</sup> The map is based on number of employee as of 31 December 2008.

<sup>33</sup> Data of employee for some of the R&D Institutions were collected through telephone survey between April-December, 2009.

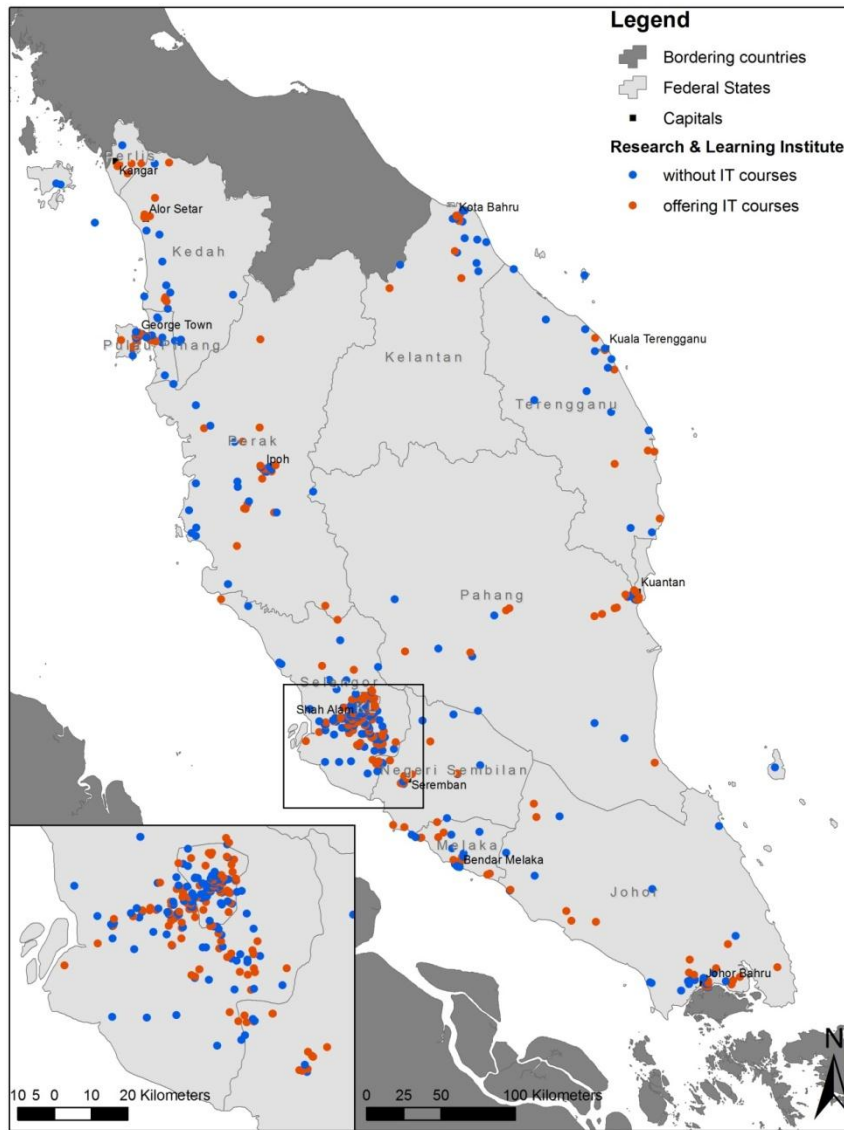
### **2.3.2 ICT Knowledge Cluster**

MSC Malaysia was formed with ICT as the prime industry. The industry was given a boost with the introduction of MSC Malaysia. ICT usage and education were given priority, and special policies were created to support the industry. The first government-funded institute established to perform R&D in microelectronics was the Malaysia Institute of Microelectronic Systems (MIMOS). The institute was established in 1984 to become a premier applied research institution and a pioneer in innovative ICT research (MIMOS, 2011). The interest in ICT has also contributed to the establishment of higher learning institutes offering courses related to the field. Based on the data gathered during the fieldwork, an ICT knowledge cluster map was produced. The map shows the concentration of institutions with ICT-related courses or R&D activity. It also shows that the ICT clusters in Peninsular Malaysia correlate with the knowledge clusters as shown in Map 2.3. Kelang Valley has the highest concentration of ICT based institutions, forming a distinct ICT cluster. Perlis, Northern Kedah, Penang and Johor Bahru are three main areas with significant numbers of ICT based institutions. HLIs offering ICT courses can also be found scattered in major cities in Peninsular Malaysia, without forming a significant cluster. This is in line with the government plan to encourage ICT based development throughout the country.

Areas within the Kelang Valley which also covers Cyberjaya show a significant number of institutions related to ICT. Obviously, the MSC Malaysia has contributed towards the creation of an ICT based cluster within the Kelang Valley. The government decision to expand the cyber cities and cyber centres beyond Cyberjaya correlates with the ICT cluster.

Recognising that knowledge clusters have emerged, the most important question remains whether this clustering process has also resulted in higher knowledge production, as predicted by clustering theory. Knowledge production is measured by using scientific publications, patents and trademarks as indicators of innovation and knowledge output. The outputs for scientific publications were derived from the ISI Web of Science, which provides quick and powerful access to the world's leading citation databases (ISI Web of Science, 2011).

**Map 2.3: Distribution of Research Institutes and Institutions of Higher Learning with or without ICT, Peninsular Malaysia 2009**



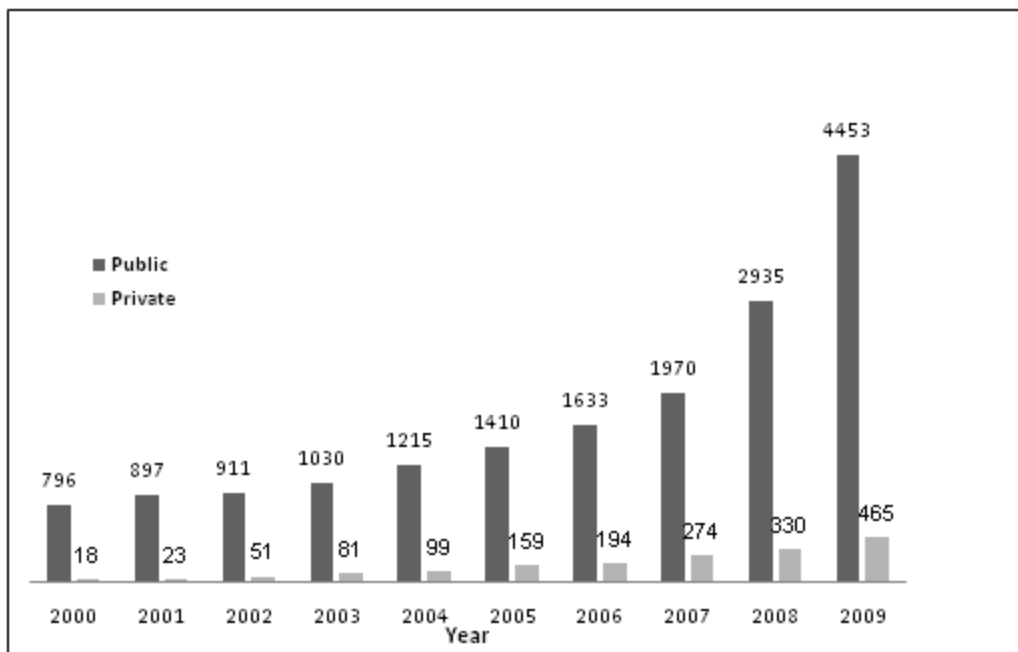
Sources: Ministry of Higher Education, 2008a, 2008b, 2009; Ani Asmah(eds.), 2009; Ministry of Higher Education, 2009 (unpublished data) and field data, 2009<sup>34</sup>.

Although the Ministry of Higher Education compiles publication data for all public higher learning institutions, they do not do the same for private institutions. For this reason, the Web of Science was used to ensure the unbiased comparison between public and private higher learning institutions. Based on data collected from the ISI Web of Science as shown in Figure

<sup>34</sup> Data of courses offered by private higher learning institutions were collected from individual web sites from April – December 2009.

2.2, from 2000 to 2009, public universities produced more publications than private. On average, the public universities produced almost ten times more publications yearly than the private institutions. Although there is an increase in the number of publications by private institutions based on the 2009 data, it is still low compared to the public. Government policy, funding, the number of faculty members and the year of establishment do contribute towards these figures. The government policy used to rank the universities starting from the year 2007 saw a drastic increase in the number of publications between the years 2008 and 2009 because the number of publications by university staff became one of the main ranking criteria (Malaysian Qualification Agency, 2010).

**Figure 2.2:**  
**Knowledge Output: Number of Publications of Malaysian University Staff, 2000 to 2009**



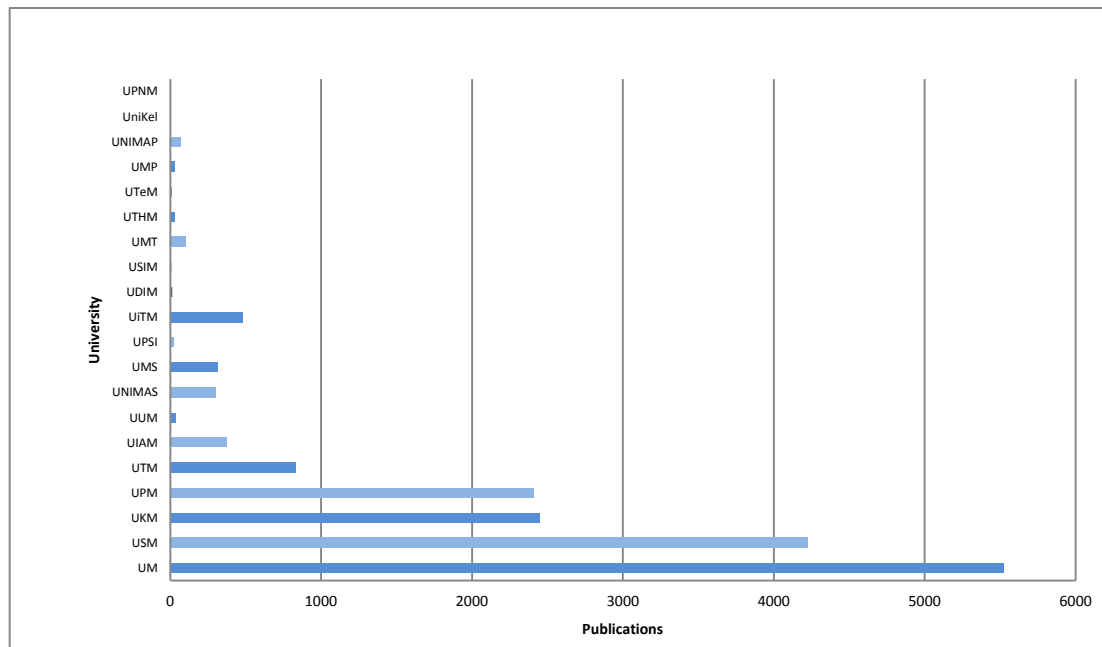
Source: Web of Science, 2010

As can be seen in Figure 2.3, at the individual institution level, UM, USM, UKM and UPM show the highest numbers of publications from 2000 to 2009. UM, the oldest university in Malaysia, produced the highest number of publications, followed by USM, which is also the only APEX<sup>35</sup> University in Malaysia. The five universities with the highest numbers of

<sup>35</sup> The Accelerated Programme for Excellence (APEX) university programme is proposed in the National Higher Education Strategic Plan. Under the programme, each APEX university was promised autonomy in finance, service scheme, management, student intake, study fees and determining the top leadership (Bernama, 2008).

publications are also the universities which the Ministry of Higher Education (MOHE) has granted the research university status (MOHE, 2010). Based on the knowledge cluster map discussed earlier, UM, UKM and UPM are located in the Kelang Valley knowledge cluster, USM in Penang and UTM in Johor Bahru. The East Coast knowledge clusters are represented by the UMT and UMP, which are located in Terengganu and Pahang respectively. Although areas in Northern Kedah and Perlis have formed knowledge clusters based on the density of knowledge workers, they fail to produce commendable outputs. UUM relatively has one of the lowest numbers of publications compared to a new university in the same cluster, i.e. UNIMAP, which is located in Perlis.

**Figure 2.3: Knowledge Output: Publications by Staff of Public Universities, 2000-2009**



Source: Web of Science, 2010

UUM is an example of an institution which has all the basic necessities to produce higher output but does not seem to produce the expected results. The university was incorporated on 16 February 1984 with the mission to become an excellent academic provider in the field of business management, education, information technology, and quality management (UUM, 2011). It is ironic that, although its focus is in the field of business and management, the university is located far from the major economic activities. The only way students and



lecturers can connect and relate to all the happenings in the business world are symbolically done through the name of their residential colleges<sup>36</sup>. The university was established by Mahathir and located in the parliamentary seat which he represented, Kubang Pasu (Utusan Malaysia, 2 February 2010). The university also has a strong connection with the political elites; two of the current board members hold important positions in UMNO<sup>37</sup>. In addition, out of the total 43 senate members listed on the university web site, only one is non-ethnic Malay (UUM, 2011). These numbers show how the political elite tries to ensure their power grip by using the management as a tool to control the university. Establishing knowledge-producing institutions under the control of the power elite does not produce the expected results, as can be seen in the case of UUM.

In the East Coast cluster, only UMT has a publication rate comparable to clusters in the West Coast of Peninsular Malaysia. Nevertheless, the number is one-third that of UIAM, which has the least number of publications for universities within the Kelang Valley cluster. On the other hand, although UIAM is located in the most dynamic knowledge cluster in Peninsular Malaysia, their output is one-quarter that of the rest of the universities within the same cluster. Most of the universities in the cluster produced more than 2000 publications compared to UIAM, which produced fewer than 500 within the same period. Hence, location in a knowledge cluster does not always influence the output. The power elements are crucial in determining the location and output of a knowledge-producing institution. The political elites determine the location, whereas different power relations within the institutions then would determine the output of those institutions.

Next, Figure 2.4 shows that most government-linked private universities, such as Multimedia University (MMU), University Teknologi PETRONAS (UTP) and Universiti Tenaga Nasional (UNITEN), produce higher numbers of publications compared to the others. Among them, MMU is the most productive private university. It was established in 1996 with campuses in Malacca and Cyberjaya. With the exception of IMU, the rest of the top four private universities with the highest number of publications have a strong connection with the political elites. The

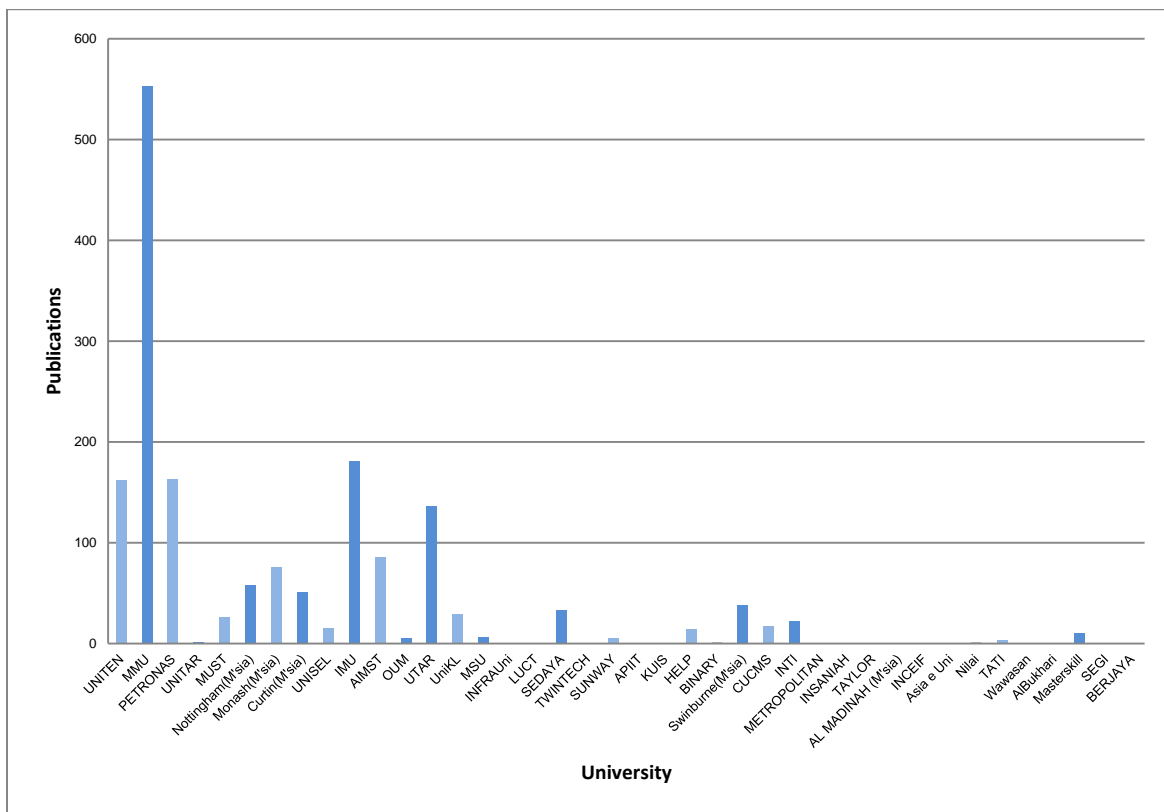
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<sup>36</sup> The residential colleges are named after some of the public listed companies in Malaysia namely, Sime Darby, MAS, Tenaga Nasional, TM, Proton, Petronas, Tradewinds, EON, MISC, Perwaja, Maybank, Bank Muamalat, Yayasan Al Bukhary, Bank Rakyat and SME Bank.

<sup>37</sup> One of the board members, Dato Dr Affifudin Haji Omar, is a member of the UMNO Supreme Council 1993/1996, while another member, Dato' Zuraidah Atan, holds a position on the UMNO Disciplinary Board.

universities were set up by three of the largest GLCs in Malaysia, namely, Telekom Malaysia, Petronas and Tenaga Nasional. The chancellor for Petronas University is Mahathir, whereas MMU is headed by his wife, Siti Hashmah. Both of them are members of the ruling party of UMNO. Universiti Tunku Abdul Rahman (UTAR) and the Asian Institute of Medicine, Science and Technology University (AIMST), which have high numbers of publications, are also strongly linked with two of the largest political parties in Malaysia next to UMNO i.e. MCA and MIC. All these universities have a significant number of faculties focusing in the field of science and technology. Connections with the political elites have contributed towards sustaining the universities' financial capability and 'softening' the bureaucratic interference. Having bigger faculties and focusing in the field of science and technology contribute to the higher number of publications by the universities discussed.

**Figure 2.4:**  
**Knowledge Output: Publications of Staff of Private Universities, 2000-2009**



Source: Web of Science, 2010.

Nevertheless, quite a significant number of universities fail to produce any significant publications despite being located in the most dynamic knowledge cluster. These universities

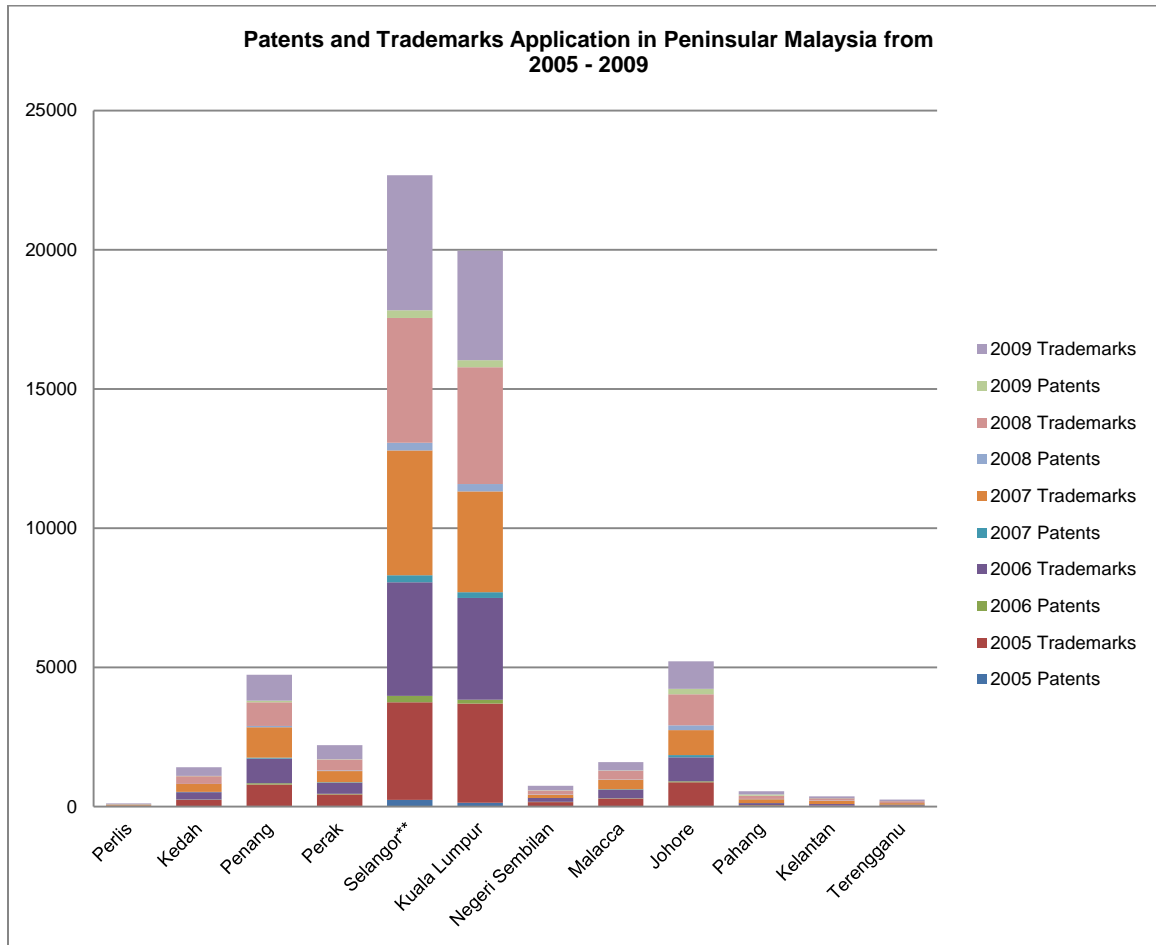
include Segi, Taylor, Metropolitan, Sunway, APIIT, UNITAR and LUCT, all of which have been operating more than ten years, although their university status was granted after the liberalisation of higher education in 1996. They are well-equipped and have all the latest facilities physically, but they do not seem to produce the expected results as academic institutions other than producing graduates. In short, location and physical facilities do not necessarily contribute to positive output as shown by the publication data. Other elements within the organisation, such as motivation and networking, do play a role in determining the output.

I also collected patents and trademarks data to evaluate the dynamics of the knowledge clusters. As shown in Figure 2.5, Selangor and Kuala Lumpur had the most numbers of applications for both from 2005 to 2009. Penang and Johor, located in the south and north knowledge cluster in Peninsular Malaysia, also have high numbers of patents and trademarks applications, followed by Perak, Malacca and Negeri Sembilan, which are located in the most concentrated knowledge clusters in Peninsular Malaysia. Data from all the states in the East Coast show a low number of applications for both patents and trademarks. Kelang Valley still dominates the knowledge output in Peninsular Malaysia. The patents and trademarks output strongly correlates with the economic growth.

States with high economic growth record a high number of patents and trademarks applications. The data also correlate with the knowledge clusters map discussed earlier. Nevertheless, the number of patents and trademarks applications for Penang is lower than Johor, although based on my calculations earlier the level of knowledge density is higher in Penang. The same incidence can be seen in Negeri Sembilan.

Another example of having a significant knowledge cluster with lower output can be seen in Kedah and Malacca. Although Malacca has a dense knowledge cluster compared to Kedah, its total output is almost insignificant. This again confirmed that a dense knowledge cluster does not necessarily contribute to higher output. There are other elements which determine the output of a knowledge cluster, such as the type of activities and awareness of the importance of patents and trademarks applications. Having discussed the knowledge output at the country level, I will now move to the knowledge output pattern in Cyberjaya.

Figure 2.5: Applications for Patents and Trademarks, Peninsular Malaysia 2005 to 2009



Source: MyIPO, 2010

## 2.4 ‘How Do I Look?’ The Story of Cyberjaya

Cyberjaya was conceptualised as a model intelligent city and designed to attract world class multimedia and ICT companies (MDeC, 2008). It was supposed to attract the best and the biggest ICT companies in the world and create an atmosphere conducive to promoting creativity and innovation, similar to Silicon Valley in the USA (Mahathir, 1998). The planning of the city follows a vision by former Prime Minister Mahathir, and the architecture of Cyberjaya is envisaged as a symbol for the developed Malaysian society. The city itself is designed as an image of a Malay or at least Malaysian city in which Malay conceptions of space are translated into urban planning (Evers & Korff, 2000). Almost all the main stakeholders in the development of Cyberjaya are members of the Malay elite, from the

landowner and local authorities to the master developer<sup>38</sup>. The most prominent building in Cyberjaya currently is the MDeC building with a sort of Neo-Malay architecture and roof. The city is an attempt to reconstruct the meaning of ‘developed’ based on the interpretation of the Malay political elite. This is done in the form of the planning guidelines (Jabatan Perancangan Bandar dan Desa, 2006), which clearly prescribe the architectural forms and the land use, and therefore regulate the meaning of space.

Cyberjaya was also intended to create a new breed of entrepreneurs with ICT or new technologies as the main business. This new group is known as ‘technopreneurs’ and benefits directly from the existence of Cyberjaya. The emergence of this group was due to special policies and programmes of the government and in a way also in connection to physical buildings constructed in Cyberjaya. ICT as a new form of resource has encouraged the political elite to translate it into spatial existence, which benefits them. This is an example of how the political establishment manages to maintain relevancy and use new resources available within the society to strengthen their power position.

After ten years of development, Cyberjaya hosts fewer than 400 companies, and the opening of other cyber cities and cyber centres will also have an impact on its future development. Most of the companies located in Cyberjaya currently focus on call centres and data processing activities. The activities do not create an environment in which creativity and creative thinking can develop (King, 2008). Patent data registration with the Malaysian Intellectual Property Organisation (MyIPO) database record less than 10 per cent of the companies have ever registered a patent up to December, 2008 (MyIPO, 2010), which shows the low level of creativity and innovativeness among the companies.

The limited ‘soft’ infrastructure has also impacted on the number of people staying in Cyberjaya. The total number of housing units in Cyberjaya currently is 2,500 (Jabatan Perancangan Bandar dan Desa, 2009), and with the assumption of 5 people living in a household, the total population residing in Cyberjaya is slightly close to 13,000. The total

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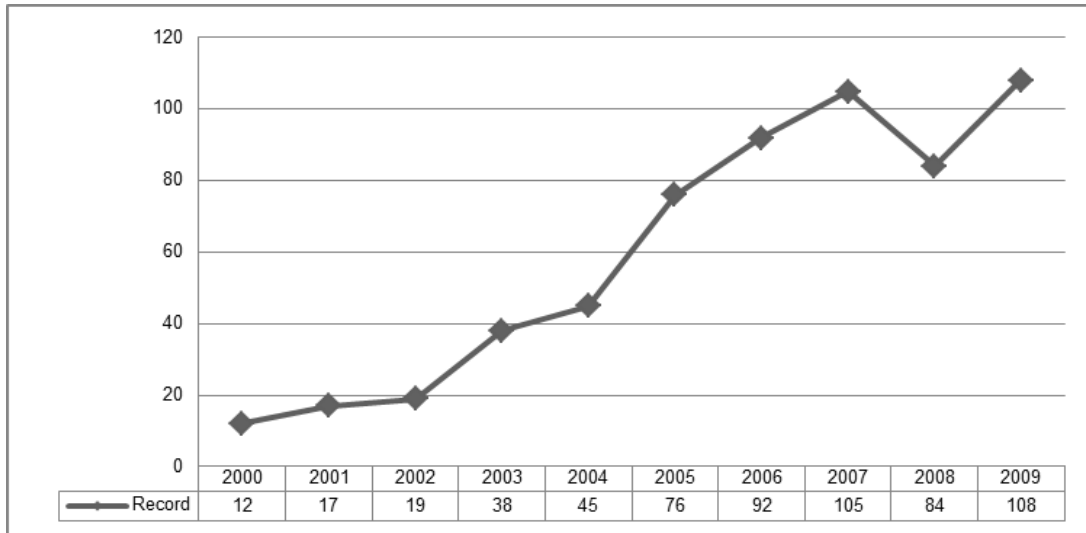
<sup>38</sup> The landowner is Cyberview Sdn Bhd (subsidiary of the Ministry of Finance), the master developer is Setia Haruman Sdn Bhd (the Chairman has strong links with the political elites) and the local authority is Majlis Perbandaran Sepang (as of 26 August 2010, out of the total 23 heads of department or unit listed on the web site, only one is from a non-Malay ethnic background).

number of people working in Cyberjaya is estimated at 35,000 (MDeC, 2009); based on this figure, about 60 per cent of the population commute to Cyberjaya on a daily basis. The original plan of the city was to accommodate 210,000 people by the year 2014 (Setia Haruman Sdn. Bhd., 2010). In an interview on 15 May 2009, Mahathir agreed that the plan for the creation of a community of foreigners working and living in Cyberjaya had not materialised. He blamed the slow progress of the development and suggested the development to move 'faster, better and sometimes more expensive' (The Star, 2009: B6).

Publication data based on the ISI Web of Science for Cyberjaya show a better output. The number of publications by institutions located in Cyberjaya shows a stable increase from 2000 to 2009 with a slight decrease in 2008, as shown in Figure 2.6. MMU records more than 80 per cent of the publications, followed by CMUCM. TM R&D is the only company with publications recorded in the ISI database. None of the other institutions in Cyberjaya has recorded any publications apart from those mentioned. It must be noted that MMU and TM R&D are subsidiaries of one of the biggest telecommunication company in Malaysia i.e Telekom Malaysia, which is a GLC. LUCT, which is also located in Cyberjaya, has no record of publications in the ISI database, even though it claims to be 'The Global University' (Limkokwing, 2010).

This section has provided data on the formation and development of Cyberjaya based on new resources, particularly education, ICT and city development. There remains, however, the possibility that Cyberjaya will evolve into a 'cybercolony' of transnational capital (King, 2008: 146).

**Figure 2.6:**  
**Publications by Staff of Universities and Companies in Cyberjaya, 2000-2009**



Source: Web of Science, 2010

## 2.5 Conclusion

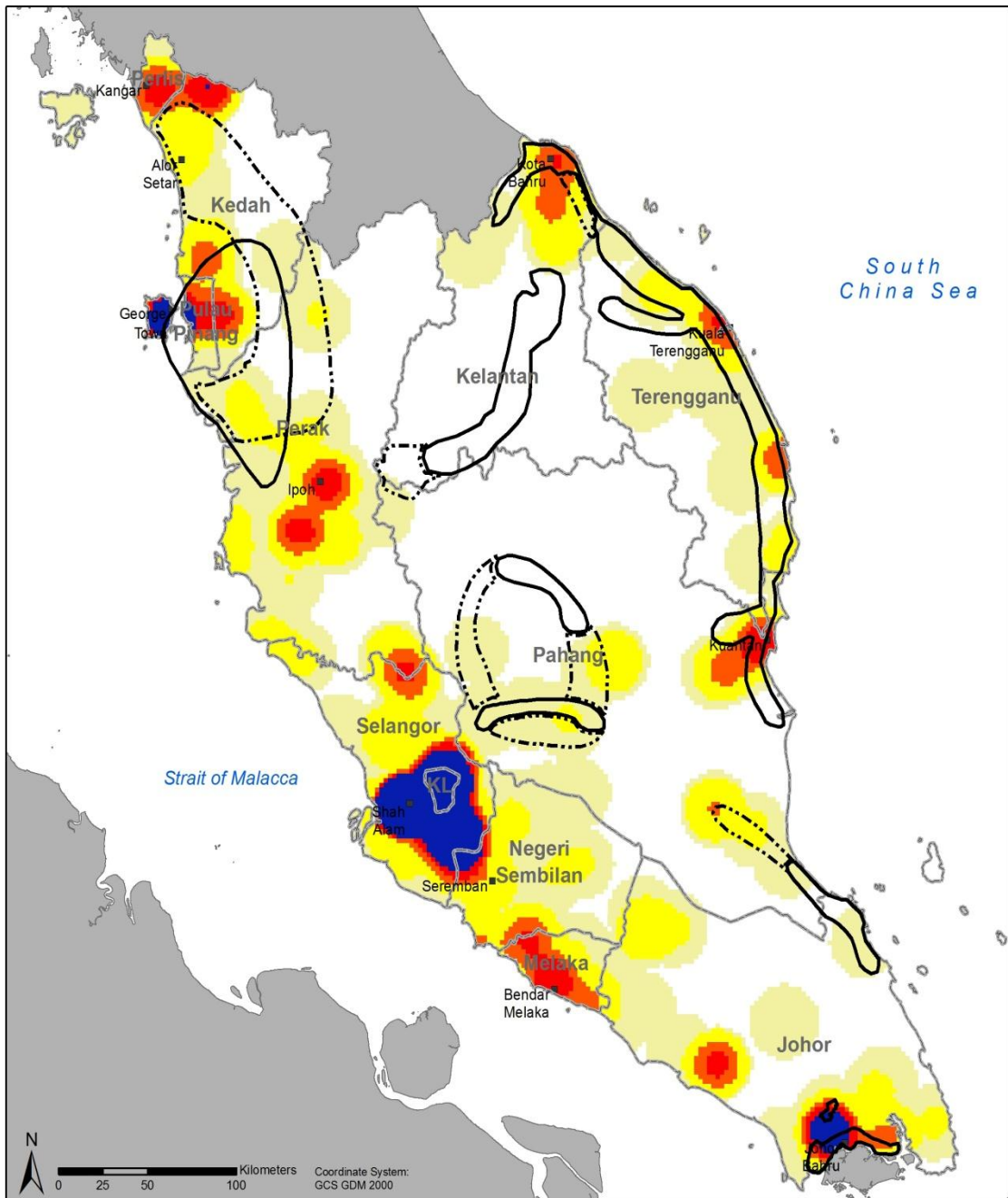
I began this chapter by analysing the cluster formation in Malaysia and proving that almost all the industrial clusters were created through policy set by the political elites. Several knowledge clusters of a high density of knowledge-producing institutions and their knowledge workers have been identified and described through GIS methods. A preliminary analysis of the knowledge output, measured in terms of scientific publications, patents and trademarks, show that knowledge clusters have, indeed, been productive as predicted by cluster theory. The results are, however, not as clear cut once the output is disaggregated by institutions. Politically motivated development planning and social networks have probably influenced both the epistemic landscape as well as the results of knowledge clustering. This is evident when the distribution of knowledge workers and the government planned development corridors are compared (see Map 2.4). Several corridors do not have the high level manpower to bring about development, whereas other areas with a good knowledge base have not been designated as corridors.

The corridors planned by the policy makers mostly centred on the natural resources available in the respective states. Agriculture and natural resources such as petroleum and tourist

attraction sites are the main catalysts for the corridors. The GLCs selected to spearhead the respective corridors is also a reflection of these, i.e. Sime Darby, PETRONAS and Khazanah Berhad. The GLCs are primarily involved in plantation, oil and gas and property development. None of the corridors cater to the ICT or knowledge-based industry apart from the electric and electronic cluster in the northern corridor. The corridors in ECER do not correlate with the government aim to become a knowledge economy. The industries planned there primarily involve tourism and agriculture. As observed by Fatimah (2009), progress in Malaysian agriculture and plantations in general has not lead to invention and innovation but rather high dependence on foreign labour. The creation of development corridors which neglect the human capital factor will definitely produce unintended results, as can be seen in the development of Cyberjaya. This chapter has shown that physical infrastructure alone will never produce the expected innovative and knowledge outcomes. I suggest that it depends on the knowledge workers and social networking among them. In the subsequent chapters, I will analyse this hypothesis by using Cyberjaya as a case study.

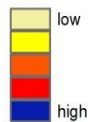


Map 2.4: Knowledge Clusters and Development Corridors



**Legend**

**K-Worker Cluster\***



**Corridors**

- Agriculture Corridor
- Industry Corridor

States of Peninsular Malaysia

Bordering countries

Capital Cities

\*Calculated in ESRI Arc GIS using Kernel Density Analysis. Calculation based on employment figures. Knowledge worker include lecturers at educational institutions and employees with degree and above incl. researchers and scientists.



## Chapter 3

### A Symbolic Universe of Cyberjaya: From Yap Ah Loy to Mustapha Kamal

*“It is almost impossible to imagine a Malaysia without the ubiquitous Chinese shopkeeper. They perform a function that has become so much a part of Malaysian life that it must seem to everyone that they have been there since the beginning of time”*  
(Mahathir Mohamad, *The Malay Dilemma*, 1970: 32)

#### 3.1 Introduction

In Malaysia’s multi-ethnic society, symbolic space is highly contested. Whereas Chinese symbols, such as signboards with Chinese characters and Chinese temples, previously dominated urban space, Malay symbolism was largely relegated to national mosques, the sultans’ palaces and rural areas. With the New Economic Policy (NEP), Malays made claims to a larger share of economic opportunities under the stated objectives of reducing socio-economic disparities and eradicating poverty. One way this could be achieved was by occupying more urban space where higher value economic activities are concentrated (Evers, 1984). The foundation of new urban centres such as Putrajaya and Cyberjaya opened avenues to material and symbolic claims for Malay hegemony.

Cyberjaya is a ‘powerful national symbol’ (Evers, 1997: 1) created by the political elites<sup>39</sup> ‘romanticizing the future’ (Evers & Gerke, 1997: 4). It reflects their intention to capitalise on technology and globalisation in order to attract capital and investment. Given the intimate relationship between economic and political power, the governing class in return benefits from contracts to construct the city, which is part of the ‘RM8 billion Multimedia Super Corridor (MSC) project’ (Wain, 2009: 189). Urban development is used by the political elites to define modernity with ICT as the backbone. Cyberjaya was planned and developed with the idea of creating a ‘new economy, embracing capitalism and modernity’ (Norhafezah Yusof, 2010: 29). This modernity was projected to have a Malay-Muslim face to reflect a relatively new Malay assertiveness at the centre of the ‘national development’ project in a global ‘informational age’.

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<sup>39</sup> I use this term with reference to members of the ruling party.

The very name ‘Cyberjaya’ itself is a combination of the English term ‘cyber’, relating to the culture of computers, information technology and virtual reality, and the Malay term ‘*jaya*’, meaning victory.

Apart from creating a new city, the idea behind the creation of Cyberjaya was to reduce the development pressure on Kuala Lumpur, the capital of Malaysia (Moser, 2010; King, 2008; Bunnell, 2004). Historically, Chinese merchants and tin mining interests, with the help of Malay rulers, were largely responsible for developing Kuala Lumpur. Its status was further enhanced when the British chose it as the administrative capital of the newly formed Federated Malay States in 1896 (Gullick, 2000). By creating a new city from a greenfield site on former rubber and oil palm plantations exactly a century later, the political elite consciously aimed to relocate core elements of the ‘new economy’ away from the Chinese-dominated economy of Kuala Lumpur, challenging and countering that supremacy through the spatial development of the new urbanscapes (King, 2008).

In this chapter, I will examine the relationship between culture and power as expressed in architecture and urban planning in the form of symbolism. *I ask how political authority takes shape in stone, glass, marble, steel and signs, and how, in turn, these architectural, urban and symbolic spaces help shape the discourse on the allocation of power and the politics of identity in contemporary Malaysia.* These processes can be demonstrated by examining the different actors and decision-making dynamics involved in the planning and construction of Cyberjaya.

### **3.2 Urban Planning<sup>40</sup> and Development in Peninsular Malaysia<sup>41</sup>**

In an attempt to gauge the impact of urban planning on knowledge-based city creation, one must ask whether state decision-making has an influence on the whole process and, if so, how? To answer this, I will discuss the structure of urban planning decision-making in Peninsular Malaysia.

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<sup>40</sup> In Malaysia, the widely used term is town *planning* instead of *urban planning*. See, for example, the Town and Country Planning Act 1976 (Act 172). Nevertheless, for the purpose of this thesis, I will use the terms interchangeably while referring to the same activity.

<sup>41</sup> References are made only to Peninsular Malaysia due to different planning laws applied in Sabah and Sarawak.

To begin, I will define what planning means and how it influences decision-making. According to the most cited definition, planning is:

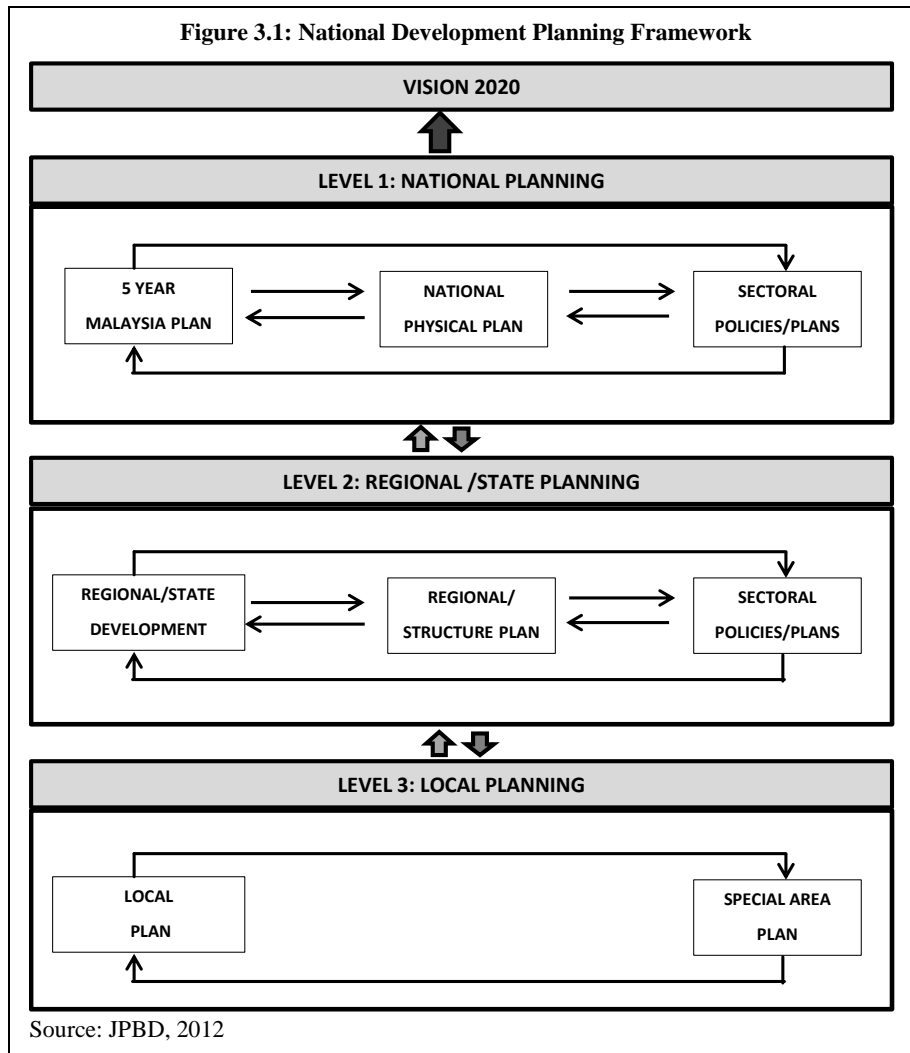
*The art and science of ordering the use of land and the character and siting of buildings and communication routes so as to secure the maximum practicable degree of economy, convenience and beauty* (Keeble, 1969 cited in JPBD encyclopaedia, 2007: 1005).

This definition clearly indicates that decision-making is an important element of urban planning activity which requires a multidisciplinary approach to produce the best possible results. Nevertheless, the definition appears to be silent on power elements that underline the whole process. Power created either formally or informally through State planning structure has an influence on decision-making.

In Peninsular Malaysia, urban planning is divided into three levels, federal, state and local, as shown in Figure 3.1. First, at the federal level, planning is based on Malaysia's five-year plan and long-term development plans such as Vision 2020 and the New Economic Model. These plans became an 'important platform for the economic bargaining over resources among ethnic groups' (Shamsul, 2001: 216). Second, they are incorporated into physical development through a structure or regional development plan at the state level. For example, the State of Selangor Structure Plan specifies development policy for the whole state from 2002 until 2020. The plan itself is not rigid and goes through changes according to the needs of both the federal or the state government and also input from the public. Finally, at the local level, more specific plans are prepared by the local planning authorities in the form of Local Plans and Special Area Plans (JPBD, 2012). Although the first town planning law was introduced in 1923 with the passing of Town Planning Enactment and later listed in the 1957 Constitution of Malaysia, it was not until 1976 that it became the forefront in spatial development in Peninsular Malaysia with the introduction of the Town and Country Planning Act (Bristow, 2000).

In the case of Cyberjaya, there are three main documents which control its physical development, namely, Physical Guidelines for the MSC, Urban Design Guidelines for Cyberjaya and *Garis Panduan Fizikal Senibina Cyberjaya* (Cyberjaya Architectural Guidelines). All the guidelines are supplementary control measures apart from the existing

laws related to construction<sup>42</sup>. Furthermore, any development of land and buildings requires planning approval from the Local Planning Authority as stated in the Town and Country Planning Act 1976 (Act 172).



While the Constitution provides both state and federal government authority on matters pertaining to town planning, it is the federal government that holds the upper hand. The National Physical Planning Council was established on 23 June 2003 as the main body responsible for town and country planning. The council is chaired by the Prime Minister, and among others the membership includes ministers responsible for town and country planning,

<sup>42</sup> See, for example; Street, Drainage and Building Act 1974 (Act 133), Housing Development (Control and Licensing) Act 1966 (Act 118) and Strata Titles Act 1985 (Act 318).

land, local government and the Chief Minister of each state (JPBD, 2012). This exhibits the centralist character of the planning process.

The planning system shows that actors involved are regulated and types of physical development are decided by the political elites at every level. In other words, this reveals how powerful planning is as a tool for the political elite to control resource allocation through urban development. Nevertheless, sometimes planning guidelines are neglected to suit their needs, as voiced by one of the three town planners working for the local authority that manages Cyberjaya:

*The guideline helps but we must consider the economic factor too. We cannot follow the guideline strictly. There were a lot of investors coming in, so we have to relax some of the requirement of the guideline (Personal communication, 23 December 2009).*

She further stressed that it is their duty to ensure investors interested in coming to Cyberjaya are assisted accordingly. Her view concurs with Lee (2002), who asserted that the flexible nature of planning guidelines and law allows property developers to manoeuvre to get their plans approved. This may indicate the capitalist nature of Cyberjaya development. It was developed to fulfil the ambition of a Malay leader who is also a proponent of a capitalist economy. In addition, Shamsul (2001) argued that Mahathir believes entrepreneurship is the key to Malay modernity and progress. One of the ways to create this is through active involvement in the urban economy, as rightly pointed out by Evers (1984: 494) who stated that landownership in urban areas controls ‘access to urban living space as well as to other economic activities’.

Nonetheless, the situation became complicated when the ruling party failed to retain their seats in the state during Malaysia’s 12th General Election. This has caused the state to be managed by an opposition party. The impact on Cyberjaya development is obvious, as shared by one committee member of the Cyberjaya Residents Association:

*Cyberjaya was doing well before the election but now no more. The wakil rakyat (elected representatives) must be involved. Currently, they are not* (Personal communication, 24 December 2009).

She further explained that the changes have contributed towards Cyberjaya's slow progress and the state government does not seem to be interested in its development. Likewise, she believes they are not actively involved in promoting it either. Hence, she views the whole phenomena as a state versus federal issue which has negative repercussions on the overall development.

In this section, I have briefly discussed the formal decision-making process in Malaysian urban planning. I have also shown that, in practice and in formal documentation, the decision-making process is centralised, so changes in the political structure influence the knowledge city development.

While in the 'old' cities, property developments are mostly based on supply and demand by a small group of people which control the landownership, in Cyberjaya, the scenario is different. The city was developed from greenfield sites with absolute control by the political elites. They hold landownership and determine who should benefit from its creation. This will be further discussed in Chapter 4. Meanwhile, I will first highlight the colonial influence on urban development, especially new townships, and then proceed to discuss the different symbolism in the city which tries to emulate the concept of space envisioned by the main ethnic group in Malaysia, as proposed by Evers (1977).

### **3.3 Colonial Legacy and the Imagined City**

Large-scale urbanisation started in Malaya in the late 19<sup>th</sup> century when the British introduced modern urban planning and municipal reform in Peninsular Malaysia (Goh, 1991; Lees, 2011). Major cities and smaller towns were settled, organised and managed along racial and ethnic lines (Evers, 1975, Cangi, 1993, Yuen, 2011). This contributed towards an imbalanced spatial distribution of ethnic groups, reinforced by a sharply differentiated division of labour. Historically, ethnic Chinese dominated most major urban settlements in the West Coast of the peninsula, where major economic and infrastructural development took place (Sidhu, 1976).

As a result, the combination of spatial segregation, economic imbalances and political competition contributed to increasing strains on the post-independence political settlement, leading to bloody inter-ethnic conflict in 1969. This crisis created an opportunity for the ruling elite to push for a new politics of ethnic preferment at the heart of urban planning and development, embedded within the provisions of the NEP.

Rapid urbanisation was seen as an important process to enable the Malays to overcome perceived socio-economic problems. In his well-known book, *The Malay Dilemma* (1970), which set out the terms for a new Malay ascendancy, the former Prime Minister Mahathir Mohamad, the man behind the creation of Putrajaya and Cyberjaya, noted:

*Properly regulated and planned, urbanization appears to afford the only method of keeping the Malays abreast of developments around them and in the rest of the world. [...] It is the old values and ways of life which have held the Malays back, cutting them off from the changes continually taking place in the rest of the country and the world (Mahathir, 1970: 112-113).*

Though he was absolutely clear about the economic prerequisites to achieve his developmental goals, and the broader project of social engineering this would entail, Mahathir was equally conscious of the importance of ideational constructs to change the ‘values and way of life’ he attributed to the majority of Malays.

Cyberjaya was envisioned as an ICT-themed city at the heart of the showcase MSC Malaysia, a business cluster self-consciously modelled on Silicon Valley, part of a region-wide ‘Siliconisation of Asia’ (Jessop and Sum, 2000: 2308). The immediate aim was to attract international ICT companies, drawn by a state-of-the-art integrated infrastructure, but also to promote research and development leading to the creation of *new* technology. But the emergence of Cyberjaya, and the MSC Malaysia more broadly, should also be understood as a core element of Mahathir’s long-term developmental strategy to attain self-sufficient industrialised nation status by 2020.



Beyond the pragmatic political and economic considerations, the MSC Malaysia, Putrajaya and Cyberjaya are expressive of current discourses that confront the Malaysian polity. First, as we have seen, the new departures of the 1990s (the end of the NEP) were conceived as a maturing of the long-term national development project, allowing the government to retain *national* political legitimacy. In this regard, Mahathir was able to present MSC Malaysia as bound up with a *multicultural* imagining of Malaysian national identity (Bunnell, 2002). Though long known as a champion of Malay interests, Mahathir was not insensitive to the needs of nation building. In promoting the attractiveness of the MSC Malaysia to potential international investors, Mahathir understood perfectly well the value of ‘multicultural marketing’:

*The Malaysians are made up of people of Malay, Indonesian, Indian and Chinese origin. We are only a few hours flight from the major Asian capitals. We have language skills and cultural knowledge that can be very helpful. Most people speak English as well as one or more languages such as different Chinese or Indian dialects, or Malay. [...] Malaysia will be a highly efficient and effective hub for the region* (Mahathir, 1997:96).

In this version of development, then, the regional high-tech hub of the MSC and its leading cities were to be expressions of national power projected through a multicultural version of the nation.

Second, both the MSC and Cyberjaya are explicitly situated as part of the re-scaling of global capital not only beyond the national level but also at the sub-national level of cities and urban regions (Swyngedouw, 2004; Brenner, 2004). From the outset, a range of incentives and benefits were designed to attract high-tech transnational investors to Cyberjaya, including largely unrestricted employment of local and foreign ‘knowledge workers’, exemption from local ownership requirements and the freedom to source investment capital globally (MDeC, 1996). Mahathir, once again, was able to imagine Cyberjaya as one of the world’s great hubs for an information age in which ‘borders are disappearing due to the ease of global communications, capital flows, the movements of goods and people and location of operational headquarters’ (Mahathir, 1996 cited in Bunnell, 2002: 112). This is emphatically not an

example of the power of global capital displacing or even hollowing out the nation-state. Rather what Cyberjaya – and the MSC more broadly – sought to do was to harness these new global imperatives to Malaysia’s national developmental project by embedding them in a new region-city scale of accumulation. Tensions invariably arise from this symbiosis of the national/sub-national and the global. A great deal of the political elite’s efforts has been precisely targeted at mediating and containing fears of the ‘negative consequences’ of ‘opening up’.

Third, the interaction between global, national and sub-national scales of economic development is, in the Malaysian context, inevitably conjoined by the politics of ethnicity and specifically Malay rights. As we have seen, the NEP actively promoted the interests of the Malay community – even though the results have been ambiguous at best. During the 1970s and 1980s, the policy was largely pursued through state-directed developmentalism via the creation of government-owned entities that became directly involved in the economic activities of the nation. Many analysts argue that the main beneficiaries of the NEP have not been the Malay community tout court but rather a small class of politically-connected, rent-seeking businessmen and a larger middle class group that has gained from educational opportunities and salaried employment in state agencies (Searle, 1999: 58–78; Gomez and Jomo, 1999,; Gomez, 2009, 2012). The Mahathir administration consciously attempted to break the dependency syndrome associated with the NEP by reconfiguring the role of Malay interests during the 1990s. This was done through a greater emphasis on privatization of state-owned assets and the promotion of Malay entrepreneurialism. As much as anything else, then, the MSC and Cyberjaya were presented as an opportunity for a new generation of Malay entrepreneurs to compete in the high-tech economy and for the urban Malay middle class to personify the future (Brooker, 2012: 14).

In this respect, both Cyberjaya and Putrajaya were consciously conceived and created as symbols of Malay modernity, a ‘unique Malay urban sphere’ (King, 2008). They represent a particular kind of emergent identity politics, a confident vision of political and economic power that imagined and then asserted a specifically Malay-Islamic character. Both cities consciously tried to break away from colonial or Chinese forms and symbols which had been the dominant features of the built environment since the introduction of modern city planning.

Most of the buildings in Putrajaya, for example, demonstrate (or rather claim to demonstrate) either Malay or Muslim architectural and design motifs, although the exact provenance of these stylistic and structural forms is the subject of considerable debate (see Bunnell, 2004; Mohamad Tajuddin, 2005; King, 2008; Moser, 2010). The attempt to shape a ‘modern’ Malay sense of identity and its political-economic mission from earlier ‘traditions’ actually had precursors. The new national university, Universiti Kebangsaan Malaysia, was founded in 1970 and is situated close to Cyberjaya. As we have shown in an earlier study, the physical plan, rather than the architectural form, of its buildings reflected the basic symbolic structure and spatial pattern of the traditional Malay state. In this regard, ‘UKM has been constructed in the image of the Malay civilization’ (Evers, 1997: 54). In Cyberjaya, the symbolism of a constructed Malay modernity has been further enhanced in novel ways.

### **3.4 ‘Key to the City’**

Who holds the key to Cyberjaya? Over the past fifteen years, five main actors have driven Cyberjaya’s development (see Table 3.1). Apart from the local authority, Sepang Municipal Council, the remainder were established together with MSC Malaysia in 1996: the Multimedia Development Corporation (MDeC) directs and oversees the National ICT Initiative; Cyberview is a government-owned corporation and the principal landowner; Setia Haruman is the so-called ‘master developer’ entrusted with the planning, design and preparation of the primary infrastructure for Cyberjaya; and the Multimedia University is the country’s first private university seen as central to the creation of a ‘knowledge society’.

**Table 3.1: Actors in Cyberjaya’s development**

Actor	Function	Interest	Instrument
Sepang Municipal Council	Local authority	<ul style="list-style-type: none"> <li>• Creating jobs</li> <li>• Expanding authority</li> </ul>	<ul style="list-style-type: none"> <li>• Planning guidelines and giving approval</li> <li>• Bylaws</li> <li>• Quit rent</li> <li>• Business license</li> <li>• Building approval</li> </ul>
MDeC	MSC Malaysia governing body	<ul style="list-style-type: none"> <li>• Creating business opportunities</li> <li>• Expanding authority</li> <li>• Acting as ‘gate keeper’</li> </ul>	<ul style="list-style-type: none"> <li>• MSC status approval</li> </ul>
Cyberview Sdn Bhd	Landowner	<ul style="list-style-type: none"> <li>• Expanding authority</li> <li>• Controlling development</li> </ul>	<ul style="list-style-type: none"> <li>• Capital shares</li> <li>• Building/land sale</li> </ul>
Setia Haruman Sdn Bhd	Master developer	<ul style="list-style-type: none"> <li>• Creating a business empire</li> <li>• Making profits</li> </ul>	<ul style="list-style-type: none"> <li>• Infrastructure</li> </ul>
Multimedia University	Higher learning institution	<ul style="list-style-type: none"> <li>• Offering education</li> <li>• Providing funding</li> <li>• Participating in R&amp;D</li> </ul>	<ul style="list-style-type: none"> <li>• Tuition fees</li> <li>• Research projects</li> </ul>

Source: Field data, 2009

Sepang Municipal Council, previously known as Sepang District Council, is the local planning authority for Cyberjaya. In March 2005, Cyberjaya Development Committee approved upgrading the status of Sepang Municipal Council with a total of about 60,000 sq km of developable land. Its responsibilities as the local authority for Sepang are set out under the Local Government Act 1976, which includes ‘planning, development and community services’ (MDeC, 2006). The function of the local planning authority is vital in dealing with planning applications and granting planning permission in Cyberjaya. The ceremony to commemorate the upgrading of the council’s status offers an interesting insight into the discursive and symbolic languages that help to project a very particular vision of Cyberjaya. The ceremony was described on the council’s website in the following terms:

*Upacara pengisytiharan gilang gemilang dengan mengekalkan adat istiadat Melayu dilangsungkan penuh kemeriahan di Stadium Perbandaran Sepang yang telah dirasmikan oleh Duli Yang Maha Mulia Sultan Selangor pada 13hb Disember 2005 [A splendid proclamation ceremony ensued, which was held at the Sepang Municipal*

Stadium in Bandar Baru Salak Tinggi in full Malay ceremonial regalia.  
This ceremony was attended by HRH Sultan Sharafuddin Idris Shah, the  
Sultan of Selangor on 13th December 2005] (MPSP, 2012a).

This highlights an explicitly Malay set of ceremonial motifs, not least the Sultan of Selangor's attendance. In Malaysia, the sultan functions as the titular head of Islam at the state level. Further, of the 24 consultative committees established in the Sepang municipality as platforms for residents to communicate with the local authority, only the Cyberjaya Community Consultative Committee is headed by a member of the state royal family. While Cyberjaya is portrayed as a modern, globally connected city, the local authority still maintains a strong connection with the sultan, Islam and the wider Malay society.

The MDeC is the government-owned corporation that acts as a 'one-stop agency' appointed to govern, promote, develop and manage the operation of the MSC with Cyberjaya at its core. It envisions a 20-year timeframe for the full implementation and execution of all the aims of the corridor. This schedule is divided into three inter-connected phases: the creation of the MSC itself (1996–2004); the growth of a global ICT hub with links to other cyber cities in Malaysia and around the world (2004–2010); and the transformation of Malaysia into a 'knowledge society', thus fulfilling one of the stated aims of Vision 2020 (2010–2020). Given a mission to realise Malaysia as a global hub and preferred location for ICT and multimedia innovations, services and operations, it is hardly surprising that the MDeC portrays itself in quite different ways from the Sepang Municipal Council: 'we combine the entrepreneurial efficiency and effectiveness of a private company with the decision-making authority of a high-powered government agency' (MDeC, 2012). The members of the Board of Directors comprise high-ranking civil servants from ministries and a special officer to the prime minister as well as corporate leaders. The MDeC presents itself as a new form of governance, harnessing a public–private partnership which privileges current organizational management orthodoxies in the field of urban development. Its purpose, in the Malaysian context, is nothing short of revolutionary. In the words of the MDeC's former chief executive officer, 'we are aiming to create a "multimedia utopia" for knowledge workers by developing the ideal environment to generate creativity' (cited in Brooker, 2012: 9; see also Wee, 2008).

Cyberview is also a government-owned company, with direct links to the Ministry of Finance, that owns the land of Cyberjaya. It has been mandated by the government to spearhead the development of Cyberjaya. Its core mission is to realise Cyberjaya as a nucleus of the MSC and as a global hub and preferred location for ICT, multimedia and services for innovation and operations, and to fulfil specific government initiatives in support of Vision 2020. In addition, Cyberview is also responsible for the physical development tasks of Cyberjaya, including attending to all land administration matters, building enterprise buildings, building supporting amenities and undertaking necessary maintenance work (Cyberview, 2012). In ways that are analogous to the MDeC, Cyberview offers a means for politically connected strategic groups to directly control all aspects of the physical development of Cyberjaya in accordance with the government's stated aspirations (Evers, 1980; Evers and Schiel, 1988).

As we have seen, Sepang Municipal Council, the MDeC and Cyberview are each directly controlled by the political elite through specific bureaucratic and legally-binding arrangements. By contrast, Setia Haruman, the 'master developer' of Cyberjaya, uses different instruments to benefit from the city's development. The company is chaired by Mustapha Kamal bin Abu Bakar, one of the best-known Malay property developers who have strong links with the ruling elite. Formerly a civil servant, he became head of a state property company and concurrently served as a special officer to the chief minister of Selangor. In 1983, he formed the EMKAY group of companies, which proved to be his point of entry into the lucrative property and land development sector that became the most common means of advancement for a rising class of Malay capitalists under Mahathir's administration. Due to his strong political connections:

*The Selangor State Government awarded EMKAY its first major breakthrough project in 1985, the development of a new township consisting of residential and commercial units in Sungai Buloh. Bandar Baru Sungai Buloh, a RM200 million project, was hailed as 'the first ever large-scale privatised property development scheme' in the state of Selangor Darul Ehsan (EMKAY Group, 2012).*

Setia Haruman was entrusted with the role of planning, designing and preparing the primary infrastructure for the Cyberjaya Flagship Zone. The area covers 7,000 acres of freehold land consisting of enterprise, commercial, institutional and residential zones. The company also

provides basic infrastructure and marketing, and sells parcels of land and other property developments to investors and sub-developers to design their own premises. In addition, Setia Haruman has also been approved to oversee Cyberjaya's residential development (Setia Haruman, 2012).

The final core actor in Cyberjaya's development is the Multimedia University (MMU). As the country's first private university, it became the flagship for the government's goal to liberalize higher education and aimed to 'enhance creative dynamics between research and industry'. The aspirational character of the university is set out in the clearest possible terms:

*As the university at the heart of the MSC, MMU also serves as a catalyst for the development of the high tech ICT industry of the nation, parallel to the Silicon Valley-Stanford model in the United States (MMU, 2012).*

As a private institution, MMU caters to a different set of students compared to state universities. Tuition fees are a significant source of income. A typical 4-year undergraduate degree costs RM50, 000, which is considerably higher than fees charged by state universities located in the Klang Valley<sup>43</sup>. Even though most universities around the world have faced strained financial circumstances over the past decade, MMU boasts of having achieved 'financial independence' within the first three years of its founding, because of what it calls 'prudent spending and careful budgeting', though the very considerable forms of support it receives are not mentioned (MMU, 2012).

Perhaps the most interesting aspect of the institutionalization of the entire Cyberjaya project is the extent to which it collapses the claims to being multicultural and transnational to a much more familiar pattern of control. Almost all the key decision-makers in the five key agencies – chairmen of boards, chief executives, chief operating officers – are drawn from a very specific social group: Malay elite that have close ties to the state through bureaucratic arrangements, business contracts and social networks. They represent that generation of Malays who emerged during the NEP era and greatly benefited from Mahathir's later support for the emergence of a 'modern' entrepreneurial class. Representative of a highly technocratic managerial style, they are, at the same time, rooted in deeply-embedded traditional ties of ethnicity, religion, party

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<sup>43</sup> Figure derived from similar courses offered at UM, UKM and UPM.

politics and personal ties. They are emblematic of what John Hutnyk (1999) calls, in a memorable phrase, ‘semi-feudal cyber-colonialism’.

### **3.5 Symbols and Signs in Cyberjaya**

While material interests and the institutionalisation of the Cyberjaya project are obviously central to any understanding of its place in the overall national developmental project, this is not its only significant aspect. The ideational significance of Cyberjaya also matters. As Evers (2011: 194) has recently suggested, ‘the strong interrelation between political and economic developments with urban symbolism should not be overlooked as an important dimension in the study of urban governance in Southeast Asia’. In this regard, Peter Nas (1993) pioneered the study of the importance of symbolic signifiers in understanding urban landscapes. He argued that a city’s identity and image depend on its ‘symbolic ecology’. Of course, symbols and signs do not exist in a vacuum. Symbolic ecology has to be regarded as ‘poly-form and often nested’, either historically or politically (Nas, 1993; Nas, et al., 2011). In a similar way, Evers (1997: 47) noted that symbols ‘often are made up of a chain of related signs and refer to complex sets of meaning and provoke feelings raise consciousness or influence behaviour if not immediately, possibly in the future’. They are, in the final analysis, a key component of the cultural capital that helps to mediate the forces of globalisation to create outcomes that are congruent with more local and national aspirations.

A study of the different symbols in Cyberjaya offers an interesting insight into how the ruling elite creates and defines space and projects high-tech utopian dreams in Malaysia (Wong, 2003). First, I look at the logos used by different actors to represent their organisations. Second, I discuss the different symbols created in the main buildings of organisational offices. Third, I analyse the physical location of the main buildings. Finally, I interpret the relationship between different actors based on their social ecology in terms of locational arrangements.


#### **i. Symbols and signs: Logos and crests**

The logos chosen to represent different actors have deeper meanings once they are analysed thoroughly. As shown in Table 3.2, they have different signs with meanings attached to various domains. MDeC, established by the political elites to manage MSC Malaysia, has tried to



create an inclusive image. For example, different ethnic groups are represented on equal ground to create the 'future' Malaysia. It seems the political elites hope ICT would finally allow different ethnic groups to compete and contribute equally. In other words, the logo symbolises the vision to establish a united *Bangsa Malaysia* (Malaysian Nation) with full and fair partnership (Mahathir, 1991). This is different from the NEP, which grants special privilege to the *bumiputera* compared to other ethnic groups. Furthermore, English language and ICT provide the best platform for the political elites to push forward the *Bangsa Malaysia* (Malaysian Nation) vision.

Table 3.2: Symbols Connecting Different Actors in Cyberjaya<sup>44</sup>

Symbol	Signs	Meaning	Domain
<p>MDeC</p> 	<ul style="list-style-type: none"> <li>• Black colour alphabet for 'M'</li> <li>• Red colour alphabet for 'DEC'</li> <li>• English motto 'Driving Transformation'</li> </ul>	<ul style="list-style-type: none"> <li>• 'M' stands for Malaysia.</li> <li>• Black colour means the 'rakyat'<sup>45</sup>.</li> <li>• Red symbolises bravery and the drive for success<sup>46</sup>.</li> <li>• The three letters represent the three main ethnic groups in Malaysia.</li> <li>• English represents the global language and the main lingua franca in ICT.</li> </ul>	<ul style="list-style-type: none"> <li>• State</li> <li>• Ethnicity</li> <li>• Globalisation</li> <li>• Modernity</li> </ul>
<p>Cyberview Sdn Bhd</p> 	<ul style="list-style-type: none"> <li>• Dome</li> <li>• Green colour font and 'circle'</li> <li>• Mechanical design</li> <li>• One full triangle and two half triangles pointing to the north, east and west.</li> <li>• English name 'Cyberview'</li> </ul>	<ul style="list-style-type: none"> <li>• Official religion of Malaysia</li> <li>• Modernity</li> <li>• Nature; sustainable</li> <li>• Malaysia's position in Southeast Asia</li> <li>• Global</li> <li>• Green technology</li> </ul>	<ul style="list-style-type: none"> <li>• Religion: Islam</li> <li>• State</li> <li>• Globalisation</li> <li>• Modernity</li> <li>• Sustainable future</li> </ul>
<p>Majlis Perbandaran Sepang</p> 	<ul style="list-style-type: none"> <li>• Yellow</li> <li>• Blue</li> <li>• Red</li> <li>• Highway connection</li> <li>• Malay name 'Majlis Perbandaran Sepang'</li> </ul>	<ul style="list-style-type: none"> <li>• Yellow represents the official colour for Malay royalty.</li> <li>• Blue symbolises unity.</li> <li>• Red symbolises bravery and the drive for success.</li> <li>• The highway represents the advanced technology and connection provided in Cyberjaya.</li> <li>• The language connects to Malay identity.</li> </ul>	<ul style="list-style-type: none"> <li>• Religion: Islam</li> <li>• Ethnicity</li> <li>• State</li> <li>• Modernity</li> </ul>
<p>Setia Haruman Sdn Bhd</p> 	<ul style="list-style-type: none"> <li>• Three triangles</li> <li>• Green</li> <li>• Blue</li> <li>• Thin line</li> <li>• Malay name 'Setia Haruman'</li> <li>• English motto 'The Master Developer of Cyberjaya'</li> </ul>	<ul style="list-style-type: none"> <li>• Represents the State of Selangor coat of arms: Royal</li> <li>• Land; rubber and palm oil estate</li> <li>• Lake</li> <li>• Land subdivision</li> <li>• Loyal &amp; fragrance</li> <li>• Global</li> </ul>	<ul style="list-style-type: none"> <li>• Tradition</li> <li>• State</li> <li>• Nature</li> <li>• Social network</li> <li>• Capital</li> <li>• Modernity</li> </ul>
<p>Multimedia University</p> 	<ul style="list-style-type: none"> <li>• Red circle</li> <li>• Blue pins</li> <li>• Blue band</li> <li>• English name 'Multimedia University'</li> </ul>	<ul style="list-style-type: none"> <li>• Nucleus of first private university in Malaysia; dynamic and grows with technology</li> <li>• Creative ways to acquire knowledge</li> <li>• Environment for R&amp;D</li> <li>• Located at the centre of the ICT capital</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge</li> <li>• Academic modernity</li> <li>• Global</li> </ul>

Source: Individual websites, 2012; field data, 2009.

<sup>44</sup> Analysis based on earlier work by Evers (1997).

<sup>45</sup> The meaning is taken from the flag colour in different states of Malaysia. Black means the 'rakyat' on the State of Terengganu flag.

Likewise, the MMU crest symbolises the same globalised and high-tech image. The university, which was formerly known as Universiti Telekom, changed its name to Multimedia University in 1997. The change of name from Malay to English indicates the university's intention to avoid making reference to any ethnic group and to create a global image. Furthermore, it symbolises the university's status as the first private university and the one chosen to be at the centre of Malaysia's first intelligent city (MMU, 2012).

The logo of Cyberview Sdn Bhd is commonly used to symbolise MSC Malaysia, and a smaller version of it is also used on the MDeC logo. Although the design has a mechanical appearance,



Source: Masjid Putra, 2006 and Cyberview, 2012

upon closer inspection, it does symbolise the dome of a mosque. As shown in Photo 3.1, the resemblance is not with any ordinary mosque but with the dome of *Masjid Putra* (Putra Mosque). The mosque is located adjacent to the Prime Minister's office in Putrajaya and was built in the

same year as Cyberjaya. The colour green and the star are also common symbols for Islam. Together, the logo symbolically indicates Malaysia's position as the leader of other Islamic countries. Malaysia was a founding member of the International Organisation of the Islamic Conference (OIC) in 1969 and Chairman of the OIC from 17 October 2003 to 13 March 2008 (Kementerian Luar Negeri, 2012). Why else, if not to emulate the model of Islam, would the logo use all the symbols which signify Islam? Whatever the people working in Cyberview or MDeC might think about Cyberjaya and MSC Malaysia, the symbolic representation of its logo is constructed in the image of Islam. Furthermore, it symbolises modern and progressive Islam through the usage of ICT. It seems this is what MSC Malaysia tries to symbolise.

Next is the logo of MPSP, the local authority in charge of Cyberjaya development. The most significant colour on the logo is yellow, which is the official colour of the Sultan. This symbolise the Sultan special position in the society. It also symbolises that they are the protectors of the *rakyat* (people). Loyalty to the Sultan is an important element in Malay *adat*. The ethnic groups should love each other, but at the same time, the greater love should be with the *Sultan*. The three circles symbolise the three main ethnic groups, and the connection shows

the symbiotic relationship among them. It also portrays the love they share, as denoted by the stylised heart. Hence, the logo of MPSP clearly symbolises the three elements of governance, i.e. the *Sultan*, *rakyat* and technology. In contrast with the other actors in Cyberjaya, MPSP upholds the Malay language as well. Thus, MPSP presents a traditionalist view of governance in which the *Sultan* is the protector of the *rakyat* and holds the highest strata in the society.

Finally, the logo of Setia Haruman Sdn Bhd clearly shows a link with the royalty and the Malay, as shown in Photo 3.2. A closer look at the upper part of the Setia Haruman logo exhibits a resemblance with the State of Selangor Coat of Arms.

**Photo 3.2:**  
State of Selangor Coat of Arms and Logo of Setia Haruman



Source: State of Selangor and Setia Haruman websites, 2012

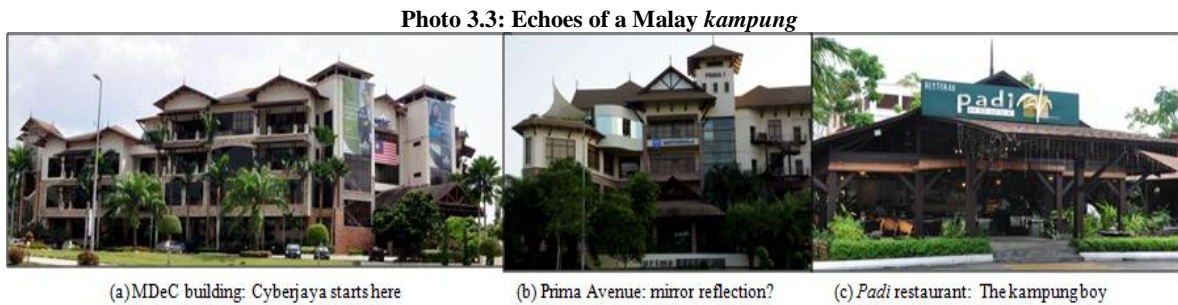
It symbolises the *keris* (small dagger) and *tombak* (spear), two of the state regalia (Selangor, 2012). The company name *Setia* literally translates as ‘loyal’, whereas *Haruman* means ‘fragrance’. The logo is meant to symbolise that loyalty is the most important trait of a businessman/woman or business organisation. Evidently, the owner of Setia

Haruman, Tan Sri Mustapha Kamal, used to work as a civil servant for the State of Selangor and became the special officer to one of the Chief Ministers of the State. He also managed to secure land for his first property development project in the State. His strong connection with the State is translated through the creation of a symbol of the State Coat of Arms for his company. This exhibits his loyalty to the State and the royalty, which concurs with Evers’ (1977) observation of the Malay *adat* (way of life).

In brief, the logos used by different actors in Cyberjaya symbolise meaning ranging from technology, modernity and ethnicity to bureaucracy and royalty. Nevertheless, I discovered the primary meanings of all the logos, which can be divided into two groups, one that perceives the overall development from a global Islamic perspective and the other that still retains the traditional Malay position. The interesting findings from the logos are that the Malay capitalist still views loyalty to the Sultan as his standpoint. I will now move to analyse the symbolic meaning of the main building which houses the different actors.

## ii. Symbols and signs: Buildings

In Cyberjaya, the buildings portray different meanings of their occupants, as shown in Table 3.3. I will begin the discussion with the MDeC building. During the fieldwork, I discovered that it is one of the two earliest buildings in Cyberjaya. Those who are familiar with Malay *kampung* (village) would notice the significant resemblance of the building to a Malay house. In addition, in their study of traditional Malay architecture, Mohd Sabrizaa and Suffian (2008) pointed out, among others, that the *tunjuk langit* (finial) signifies its owner's wealth and nobility status. One who visits Cyberjaya would notice the *tunjuk langit* from afar, as shown in Photo 3.3. Based on its size, the MDeC building would fit perfectly as a *penghulu* (village



Source: Field data, 2009

chief) house.

To enter the building, there are steps which are also a common feature in traditional Malay houses. In addition, it is surrounded with few species of palm trees, some of which resemble the betel nut, which is a common plant in the *kampung*.

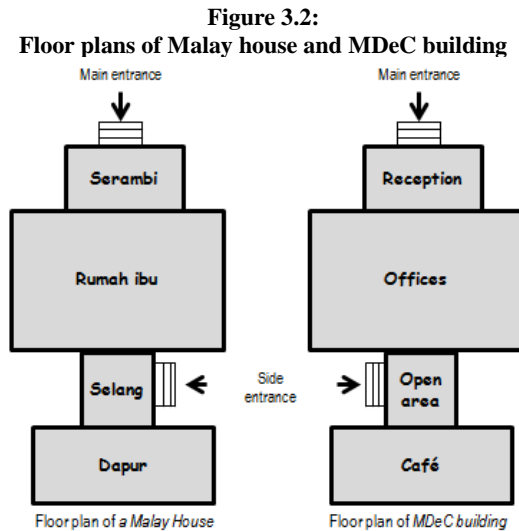
A Malay *kampung* is normally located by a river or coastline (Zulkifli, 1994; Evers, 1997). Although no natural water elements exist near the building, technology helps to recreate the *kampung* environment. I notice that there is a man-made miniature waterfall and fish pond attached to the building. Apart from creating a cooling atmosphere, it also recaptures the *kampung* lifestyle. In addition, the building is also located within a cluster of buildings with similar architectural features (refer to Photo 3.3). I found more features symbolising a *kampung* within the cluster.

**Table 3.3: Symbols and Signs of Main Buildings in Cyberjaya**

Building	Signs	Location	Meaning	Domain
MDeC	<ul style="list-style-type: none"> <li>Malay roof</li> <li>Steps to enter the building</li> <li>Floor plan, i.e. typical Malay house</li> <li>Palm trees</li> <li>Fish pond</li> <li>Flag of Malaysia and State of Selangor</li> <li>Three-tiered concrete slab</li> <li><i>Padi</i> restaurant</li> </ul>	<ul style="list-style-type: none"> <li>Main junction</li> <li>'Heart of Cyberjaya'</li> </ul>	<ul style="list-style-type: none"> <li>Malay cultural identity</li> <li>Pseudo-traditional Malay architecture</li> <li><i>Kampung</i></li> <li>Government</li> </ul>	<ul style="list-style-type: none"> <li>Ethnicity</li> <li>State</li> </ul>
Cyberview	<ul style="list-style-type: none"> <li>Modern architecture</li> <li>Glass and latest building materials</li> <li>Compact design</li> </ul>	<ul style="list-style-type: none"> <li>Cluster of small and medium companies</li> <li>Off the main boulevard</li> </ul>	<ul style="list-style-type: none"> <li>Modern technology</li> <li>Modernity</li> <li>Culture-free architecture</li> </ul>	<ul style="list-style-type: none"> <li>Architecture modernity</li> <li>Development</li> <li>Capital</li> </ul>
Majlis Perbandaran Sepang	<ul style="list-style-type: none"> <li>Modern architecture</li> <li>Glass and latest building materials</li> <li>Parking at the back of the building, i.e. dual entrance</li> <li>Federal and State flags</li> <li>Lush open space in front of the building</li> <li>'Lengthy' and spacious building</li> </ul>	<ul style="list-style-type: none"> <li><i>Persiaran</i> Sepang (Sepang boulevard)</li> <li>In front of the MMU, i.e. they share the same main boulevard</li> </ul>	<ul style="list-style-type: none"> <li>Modernity</li> <li>State</li> <li>'Protector'</li> <li>'Bureaucratic'</li> </ul>	<ul style="list-style-type: none"> <li>State</li> <li>Administrative modernity</li> </ul>
Setia Haruman Sdn Bhd (The building is attached to Cyberview Lodge, which is owned and managed by Setia Haruman)	<ul style="list-style-type: none"> <li>Palm trees</li> <li>Tropical architecture</li> <li>Golf course</li> <li>Five-star hotel</li> <li>Buildings named after birds in Malay i.e. <i>merak</i>, <i>kenyalang</i>, <i>helang</i>, <i>belatuk</i> etc.</li> <li>Tree Haus Fun Pub (English/German)</li> <li>Bistro Cascata (Italian)</li> <li>Karma lounge (Indian)</li> <li>Xing Zhu Restaurant (Chinese)</li> <li><i>Sembunyi</i> spa (Malay)</li> <li>Traditional Malay costume (<i>songket</i>, <i>songkok</i> etc)</li> <li>Malay wood carving</li> <li>Swimming pool with 'fake' waterfalls and surrounded by palm trees</li> </ul>	<ul style="list-style-type: none"> <li>Main entrance from Putrajaya</li> </ul>	<ul style="list-style-type: none"> <li>Man-made nature</li> <li>Leisure</li> <li>Global</li> <li>Multiculturalism</li> <li>Tropical : Southeast Asia</li> </ul>	<ul style="list-style-type: none"> <li>Nature</li> <li>Global</li> <li>Ethnicity</li> <li>Capital</li> </ul>
Multimedia University	<ul style="list-style-type: none"> <li>Main building at the entrance is Student Centre (significant triangle design)</li> <li>Loop road with two entrance roads (in-out)</li> <li>Flags of all states</li> <li>Significant blue colour</li> <li><i>Persiaran</i> Newron (Neuron boulevard)</li> <li>Siti Hasmah Digital Library</li> </ul>	<ul style="list-style-type: none"> <li>Main entrance is located at the main boulevard of Cyberjaya together with MDeC building</li> <li>Second entrance is located in front of MPSP</li> </ul>	<ul style="list-style-type: none"> <li>Triangle of man-nature-technology</li> <li>Corporate colour of Telekom Malaysia</li> <li>Nerve system to transmit information</li> <li>Focus on students</li> <li>Nurture students : entry-graduation</li> </ul>	<ul style="list-style-type: none"> <li>Academic modernity</li> <li>Technology</li> <li>State</li> <li>Capital</li> <li>Knowledge-sharing</li> <li>Political network</li> </ul>

Source: Individual websites, 2012; field data, 2009.

The most striking is the *Padi* Restaurant, as shown in Photo 3.3(c). *Padi* or rice grown by irrigated cultivation is the centre of Malay *adat* (Evers, 1977; 1997). *Padi* Restaurant's placement shows that at the 'heart of Cyberjaya' there is a Malay *adat* in action.



Source: Zulkifli, 1994; Field data, 2009

Another important feature of the building that exhibits similarity with a traditional Malay house is the floor plan. The moment I walked into the building for the first time, I could not help but relate the floor plan with a typical Malay house (Zulkifli, 1994; Chen, Ariffin & Wang, 2008). Figure 3.2 illustrates the comparable features of a Malay house with the MDec building. The *serambi* (reception area) of a Malay house is replaced with the reception area. Nevertheless, both the areas function in a similar capacity.

Guests to a Malay house are not allowed to enter the *rumah ibu* (core area) unnecessarily. Similarly, visitors are not allowed to enter the offices in MDeC unless they are accepted by the person in-charge. This acceptance requires obtaining security clearance and so on.

In a Malay house, the *dapur* (kitchen) is always located at the back. Interestingly, in MDeC this function is fulfilled by the café which is located at the back of the building. Food served in the cafe such as *nasi lemak* (rice cooked with coconut milk), *rendang* (spicy meat dish) and *nasi dagang* (steamed rice) show a strong connection with the Malay culture. Nevertheless, the English language seems to rule the communication in the building. I noticed that almost every communication, either written or spoken, is done in English. For example, once I entered the building, the receptionist greeted me with a warm 'Good Morning, sir'. In contrast, in most state organisations, the normal greeting would be either *Selamat Pagi* (Good Morning) or *Salam* (the Muslim way of greeting). It seems that the whole environment tries to symbolise the 'new Malay, global Malay'.

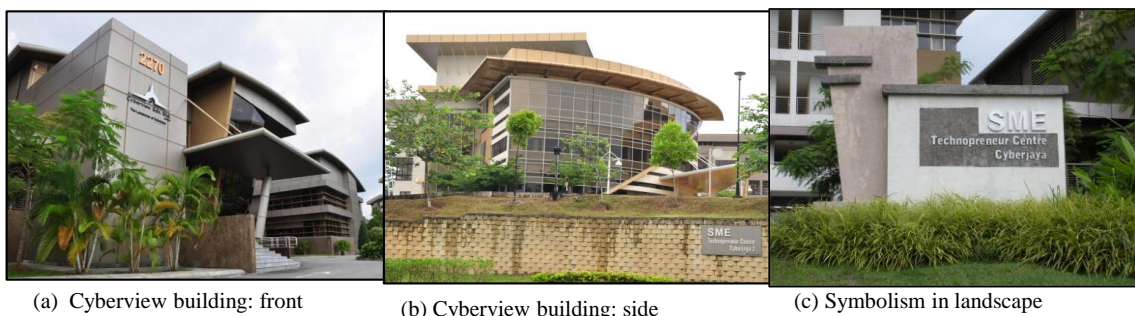
It appears the earliest building in Cyberjaya was not built in a contemporary architectural theme but rather tries to emulate the *kampung*. This is a strong statement by the ruling elites.

By having the most prominent building in Cyberjaya, the ICT capital of Malaysia located in the most prominent place in the city, symbolise a Malay *kampung*, the ruling elite makes a strong statement of the Malay supremacy.

Secondly, in contrast to the MDeC, the Cyberview building does not exhibit any particular reference to ethnicity or place, as shown in Photo 3.4(a) and (b). The building clearly suits the term ‘democratic architecture’ defined by Mohamad Tajuddin (2005: 76)<sup>47</sup> as a building in which ‘one either uses all the ethnic references or one does not refer to any at all’. Besides the architecture, the building is also located within the SME Technopreneur Centre. It was purposely built to cater to small and medium ICT-related companies. Tenants are required to pay a minimal rental compared to other buildings in Cyberjaya while being provided with all the necessary facilities. The building was supposed to be a training ground for the companies before they could afford to move to more spacious offices. Mr Osman, a senior manager working for Cyberview, makes a very relevant remark:

*We want to develop a complete eco-system for ICT companies. They can start their business at the incubator then moves to the SME building (SME 1 and SME 2) and finally, we hope they would buy or have their own building (Personal communication, 11 September 2009).*

**Photo 3.4: Cyberview building and SME Technopreneur building signage**



Nevertheless, a closer look at the building provides an interesting finding. The road within the building is known as *Jalan Usahawan* (Entrepreneur Road). Based on my personal working

<sup>47</sup> Prof. Mohamad Tajuddin Mohamad Rasdi is an architecture lecturer and one-time Director of KALAM (Center for the Study of Built Environment in the Malay World), Universiti Teknologi Malaysia. He was also a newspaper columnist writing on issues related to architecture.



experience, road names are normally determined by the local authority. So, it is safe to assume that the road name was given by MPSP. Although Cyberview tries to create a ‘democratic atmosphere’, it seems that others may decide otherwise. Ironically, the road outside of the building where other multi-national companies are located is known as *Jalan Teknokrat* (Technocrat Road).

In addition, the structure built to function as a signage for the building symbolises a Malay proverb. As shown in Photo 3.4(c), the line with different sizes which resemble gradual growth nicely fits into the proverb ‘*sedikit-sedikit, lama-lama jadi bukit*’ (bit by bit, in the end, it becomes a hill). The proverb means that, to do something big, one need to start with something small. The proverb suits the building’s function perfectly. It appears to suggest that the main factor needed to be a successful entrepreneur is to start small and be patience until bigger opportunities arise.

Thus, the Cyberview building clearly symbolises two groups of Malays. On one side, there is a group who feels it is time to move away from ethnic-based development, while on the other side, there is a group who still feels that the Malay culture should take precedence.

Thirdly, when I first saw the MPSP building, the first object that came to my mind was the Kuala Lumpur International Airport (KLIA). MPSP is the same local authority for the airport. With a spacious open area in front of the building, it looks ‘dominant’, as shown in Photo 3.5. The whole building is located on a spacious site. One will surely get the feeling of authority once making a trip to MPSP. Nevertheless, I feel that the building represents some sort of confusion faced by the local authority.

**Photo 3.5: MPSP building**



MPSP building: flying to the future?

Source: Field data, 2009

To begin, the main parking lot is located at the back of the building. This would require almost all visitors to use a small door at the back to enter the building. Only the VIPs (very important people) would be able to use the main entrance. Because there is no parking space near the entrance, one would need to be chauffeured and dropped at the main door. My guess is that the architect who designed the whole building got carried away with

creating an arrival or departure hall fit for an airport. The problem is that nobody is flying anywhere from here.

Next, upon entering the building from the back door, the confusion begins. In other words, one needs to be familiar with the building to get a sense of direction and orientation. For those first-timers or ‘amateur’ visitors like me, the building is not as friendly as the KLIA. During one of my visits, I encountered an incident when a man got lost in the building and had to refer twice to the receptionist for direction. Although it is a four-storey building, it does provide an elevator, and people do get lost. There is also continuous sound coming from electronic doors from some of the offices. I was told they have to force the doors open because it is inconvenient for them to key-in the access code every time they pass the door. Although the system was created for safety reasons, the bureaucrats would prefer convenience over security.

My personal experience and observations bestow different meanings for all the incidents. It shows that the authorities will give priority to those with VIP status, while the rest have to deal with the bureaucratic nature of the organisation. Furthermore, they are willing to relax the rules when it suits the ruling elite’s needs as indicated in my discussion at the beginning of this section. Thus, the whole building and area shows the authoritative nature of the local government while some are allowed to pass through the system for convenience or reasons known only to them.

**Photo 3.6: Symbols and signs at the Setia Haruman cluster of buildings**



(a) Setia Haruman: entrance

(b) Logo and sign of Cyberview Gardens

(c) Wood carving

Source: Field data, 2009

Fourthly, the Setia Haruman building is located in a large area that is divided into two sections, the upper and the lower, based on the gradient level. The upper level is where the Setia

Haruman office is located together with the Cyberview Resort<sup>48</sup>, while the lower part is mostly occupied by resort-style villas and offices, as shown in Photo 3.6. Although the building looks like any other tropical resort, or what Mohamad Tajuddin (2005: 9) would term as ‘primitive regionalism’, upon closer examination, it does have some significant features. I noticed the usage of *kekisi* (lattice) and wood carving, both of which are common features of old Malay houses (Mohd Sabrizaa & Sufian, 2008; Zumahiran & Ismail, 2008).

In addition, offices in the cluster are named after birds commonly found in a *kampong*, such as *belatuk* (woodpecker), *helang* (eagle) and *enggang* (hornbills). Guests of the resort are treated as Malay royals in the *istana* with the *dayang* (lady-in-waiting) and *hulubalang* (centurion). Likewise, the other two main ethnic groups in Malaysia are symbolised through a restaurant and a music lounge, namely Xing Zhu (Mandarin for ‘lucky bamboo’) and Karma (an Indian religious concept of cause and effect). In addition, there are symbols of globalisation as well with the English/German pub and an Italian restaurant. Hence, one advertisement on the websites reads:

*Selamat datang or welcome to the tropical paradise of this part of the world. Cyberview Resort & Spa is a 5-star boutique resort, a veritable paradise set on 28.8 acre of award-winning landscaped gardens, featuring world-class quality of service and unparalleled Malaysian hospitality (Cyberview-Lodge, 2012).*

Thus, the Setia Haruman building, or rather cluster, symbolises the idea that man-made nature is part and parcel of the city’s future. It also symbolises the capitalist nature of the city development, particularly in the upper-class treatment. My observation of different symbols in the Setia Haruman buildings concurs with Shamsul’s (1996) argument that, in Malaysia, the Malay culture occupies the ‘core’ while the other ethnic groups are at the ‘periphery’.

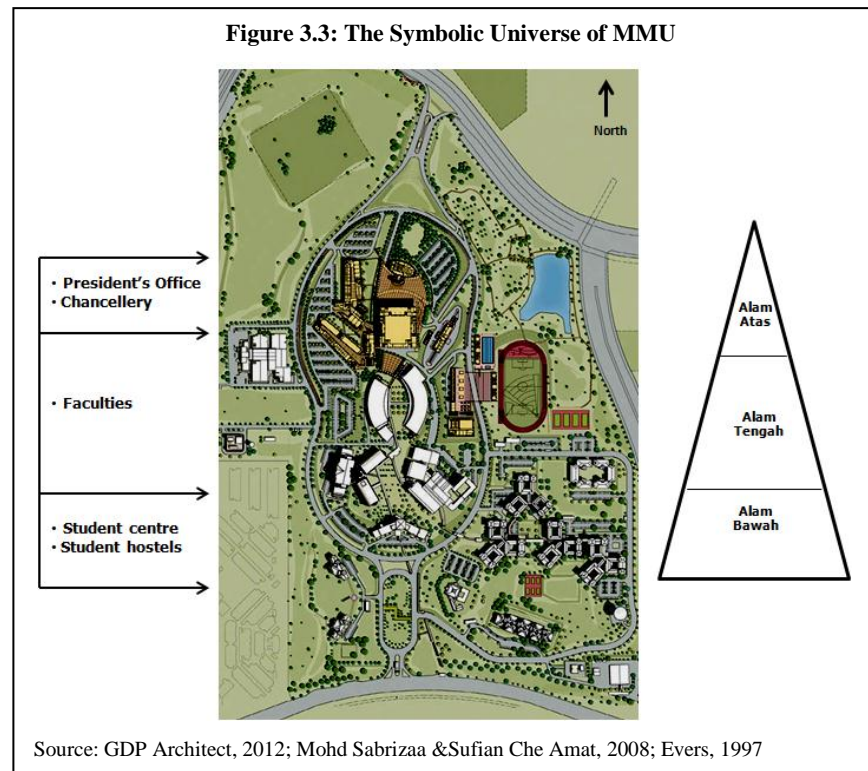
Finally, the most significant feature of the MMU campus is the triangle-shaped building of the Student Centre. One will not miss this building since it is located at the main entrance of the university. As Mohd Sabrizaa and Suffian (2008) highlighted, in the Malay world, the triangle is believed to symbolise the *Gunung Mahameru* (mountain). They further remind us of the

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<sup>48</sup> One should not confuse the name with Cyberview Sdn Bhd, i.e. the landowner of Cyberjaya.

three levels of the Malay cosmological world, which are *alam atas* (top), *alam tengah* (middle) and *alam bawah* (bottom). *Alam atas* is occupied by the *dewa* (divine being); *alam tengah* the human; and *alam bawah* the *soil*<sup>49</sup>. Although they use the cosmological terms to explain the Malay house building, the same can be applied to the campus building as well.

As illustrated in Figure 3.3, MMU visibly symbolises the three levels mentioned earlier. The *alam atas* is currently the administrative office, which also houses the University President’s office. Next, *alam tengah* is where most of the faculties are located. Finally, *alam bawah* provides space for the student centre and hostels. The MMU campus layout clearly symbolises the Malay cosmological world. Again, I would argue that Malay is the centre of MMU construction, hence, Cyberjaya development.



Likewise, the main library, which is the heart of the university, is named after Dr Siti Hasmah, a Malay lady. A brief biography on the MMU website describes her as:

*One of the first Malay women doctors in Malaysia and the second Malay woman to be appointed a medical officer in government service for the*

<sup>49</sup> I consider the soil to symbolise area where plant are grown. Students fit perfectly to the symbol.

*State of Kedah [...] Often a pioneer in her profession, Dr Siti Hasmah was one of the first Malay women to enroll for a medical course at the King Edward VII College of Medicine in Singapore after the war (MMU, 2012).*

As quoted, her Malay background is emphasised on the website. This is another example of how the political elites ensure that Malays are given prominent positions in Cyberjaya development. Again, it symbolises Malay's vital role in the overall development of MMU, which is also one of the main actors in Cyberjaya.

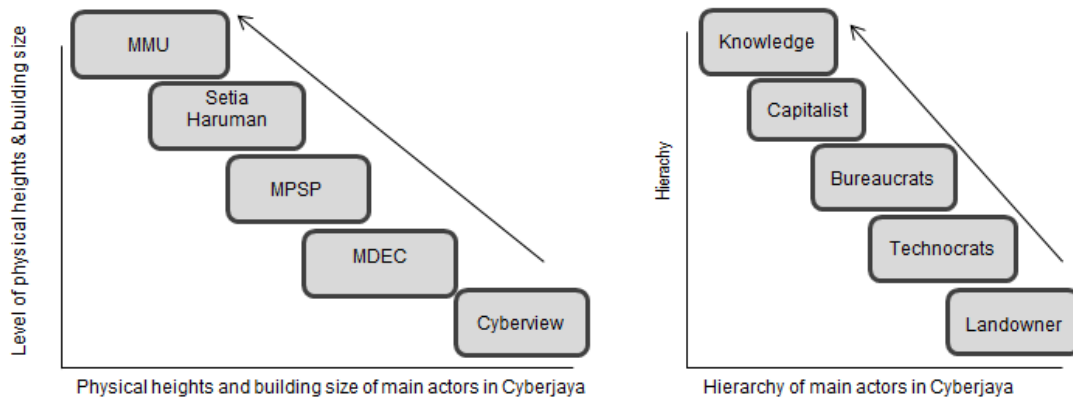
At the same time, MMU symbolises different Malay – a globalised one. During one of the Friday prayers I attended in MMU *surau* (place of prayers), the *khutbah* (sermon) was given in English. Although this might be because of the large international student population (the figure for 2011 is almost 20 per cent (MMU, 2012)), one cannot rule out the intention to 'globalise' the Malay Muslim student population. English is used in all situations, from their daily lectures to the house of god.

Thus, MMU does reflect the same symbolism as other buildings in Cyberjaya described earlier. At the same time, the MMU layout plan perfectly symbolises the Malay cosmological world. In an earlier study of UKM, Evers (1997; 1996) concluded that the emphasis on 'Malay cultural identity is replaced by modernity as the major semiotic theme in Malaysia's domain of meaning'. I would argue otherwise, as my analysis of Cyberjaya has proven. Malay cultural identity is still the domain of meaning, especially in new city development such as Cyberjaya. Nevertheless, it has gone beyond the *kampung* Malay to symbolise a 'globalised Malay', as my fieldwork has shown.

### **iii. Symbols and signs: Hierarchy of actors**

Buildings in Cyberjaya not only symbolise different meanings as discussed earlier but also represent a sort of hierarchy as shown in Figure 3.4. Whether intentionally or unintentionally, the planners of Cyberjaya have created symbolic meanings based on the physical sizes and locations of the buildings. Buildings are located at different gradient levels and cover various land areas which signify their importance in the city.

**Figure 3.4: Symbolic hierarchy of main actors in Cyberjaya based on their physical location and building size**



Source: Field data, 2009

Firstly, the MMU campus is located at the most spacious area and the highest point, symbolising the importance of knowledge in Cyberjaya. It is, after all, the first intelligent city in Malaysia, and knowledge is the backbone of its development. As lauded by the master developer, ‘Cyberjaya was developed to help affirm Malaysia's status as a country of Knowledge-Based Economy’ (Setia Haruman, 2012). Besides, ‘MMU serves to fulfil the nation’s human resource needs as it grows into a knowledge economy’ (MMU, 2012). Both aspirations are rightly symbolised through the physical location of the university. Hence, knowledge seems to lead in the city and is perfectly symbolised in its development.

Nevertheless, MMU is not a mere knowledge-producing institution but also symbolises the capitalist. As I mentioned in Chapter 2 of this thesis, higher education has become a major business in Malaysia since the liberalisation exercise in the 1990s. MMU is one such institution created by the political elites to generate business opportunities using education as the main source. Symbolically, it shows that, in Cyberjaya, the most important element is simply just knowledge but ‘capitalist knowledge’; in other words, the capitalist is given priority in the city.

Secondly, Setia Haruman, the master developer of the city, occupies the second largest area and is located at a slightly lower gradient level compared to MMU. While MMU emphasises ‘capitalist knowledge’, Setia Haruman symbolises the importance of Malay capitalists themselves. The political elites seem to have developed Cyberjaya within the framework of the New Economic Policy (NEP) which was formulated in the 1970s. Landownership and access

to urban activities were recognised as primary ways to urbanise the Malays (for a detailed discussion, refer to Chapter 4). As a result, Malay capitalists were given priority in major economic activities, such as property development (Gomez, 2009; Jomo & Gomez, 2000; Goh, 1998). Hence, the Malay capitalist is symbolically considered as the second-most important element in the city after knowledge.

Thirdly, MPSP occupies the next largest area among key actors in Cyberjaya. Its placement symbolises the importance of bureaucrats to the city. MPSP, which was originally situated in another district roughly 20 kilometres from Cyberjaya, was relocated to the city in 2006. MPSP manages the District of Sepang, which is described as being:

*[...] shaped like the head of a keris, elongating towards the south from Universiti Putra Malaysia (UPM) with the Kuala Lumpur-Seremban Highway at the eastern border till the village of Sungai Buah or Bukit Unggul (MPSP, 2012b).*

Descriptions of the district from a bird's eye view clearly try to relate it with the Malay way of life. It looks as if the bureaucrats intentionally try to show Malay supremacy.

Although the *keris*, which has cultural significance for the Malays, has never created any problems with other ethnicities, UMNO<sup>50</sup> seems to use it for their political gain. For example, during the 2005 UMNO General Assembly, one of the leaders who was the then-Minister of Education waved a *keris* and uttered a warning to other ethnic groups not to question Malay supremacy. This incident created shock and disapproval, especially among leaders of other ethnic groups, such as Lim Kit Siang, a well-known opposition leader who has criticised the act and highlighted the danger in a multiracial country like Malaysia (Lim Kit Siang, 2007). Thus, symbolically, the location and physical size of MPSP appears to highlight Malay supremacy in Cyberjaya. Malay-dominated bureaucrats are placed at the third rank after a university owned by a state-owned company and a Malay capitalist.

Fourthly, MDeC is ranked next after the three main actors. It was set-up by the state to function as 'a high-powered' 'one-stop agency' focused on ensuring the success of MSC

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<sup>50</sup> UMNO is the largest political party and heads the coalition that has been ruling Malaysia since independence. The party constitution clearly states their Malay supremacy view (UMNO-online, 2012).

Malaysia and the companies operating in it (MDeC, 2012). Clearly, it was created to assist ICT based capitalists interested in investing in MSC Malaysia. They are given special treatment to ensure the success of Cyberjaya. The building which houses them, as I discussed earlier, is embedded with Malay architecture and way of life. Most people working in MDeC have an ICT educational or working experience. For example, its Chief Executive Officer, Datuk Badlisham, was Hewlett-Packard's (HP) Malaysia Director and Country General Manager before joining MDeC. Symbolically, the building's location shows the technocrats' rank below the bureaucrats and capitalists in this city.

Finally, Setia Haruman is positioned at the lowest level in the hierarchy. It occupies the smallest building compared to the rest. In addition, the building is built as part of the small and medium enterprise cluster. Symbolically, this shows that land is not the priority in the ICT based city. Knowledge and capitalists take charge in the city development. This is against the traditional economy in which land is one of the most important factors of production. Symbolically in Cyberjaya, land is given the lowest rank compared to knowledge, capitalists, bureaucrats and technocrats. Nevertheless, control of landownership does limit access for other actors to the city, which I will discuss further in Chapter 4.

Therefore, physical location and building size in Cyberjaya does symbolise the hierarchy of different actors in the city. Knowledge appears to lead, followed by capitalists, bureaucrats, technocrats and landowners. Nevertheless, it is apparent that the focus of city development is the capitalist, especially the Malay capitalist. The political elites try to define how a new city should be built by ensuring the Malays are at the centre of its development. Symbolically, what they aspired to achieve based on the NEP has materialised in the city development.

In the next section, I will discuss how the physical development shows symbiotic relationships between different actors. I will illustrate how the symbiotic relationships are apparent especially among the Malay and Chinese.

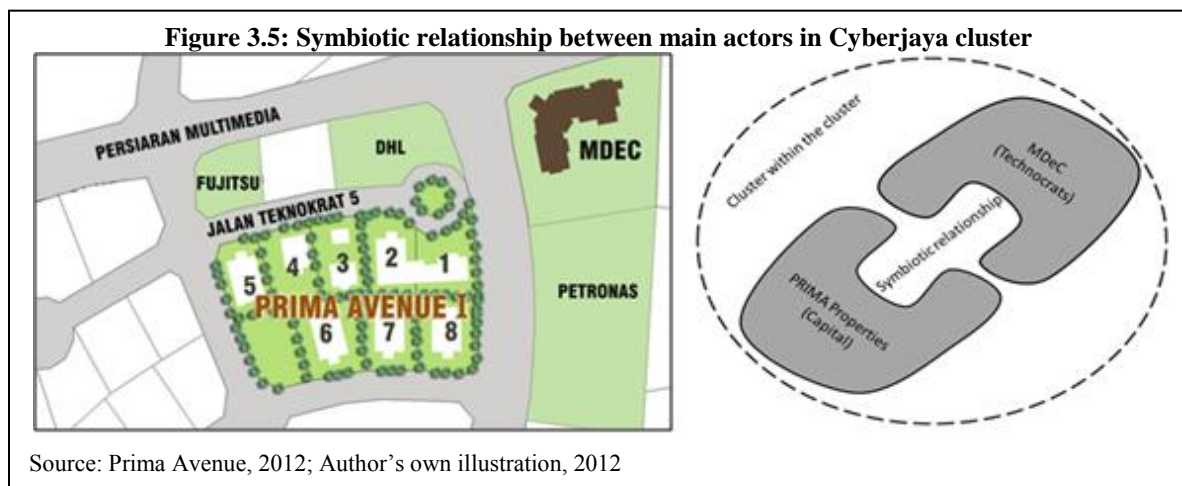
#### **iv. Symbols and signs: Symbiotic relationships**

The discussion on symbols and signs in Cyberjaya will be concluded with the symbiotic relationship symbolised in the development. An adjective of *symbiosis*, symbiotic refers to a



‘relationship between two types of animal or plant in which each provides for the other the conditions necessary for its continued existence’ (Cambridge Dictionaries Online, 2012).

Through my fieldwork, I realised that a striking symbiotic symbolism existed in many parts of the city. I will focus my discussion on one of the symbiotic relationships created between the MDeC and Prima Avenue<sup>51</sup>. I have chosen the actors because of their historical significance with Cyberjaya development. As discussed in the previous section, MDeC is one of the actors that hold the ‘key to the city’. Prima Properties, on the other hand, has a strong historical connection with the city development. It was the first contractor chosen to build Cyberview Resort and MDeC. Both are the two earliest structures which mark the foundation of the city. The company managed to complete the 20,000 sq ft resort within 100 days so that it could be used to host the Asia-Pacific Economic Cooperation (APEC) leaders retreat in November 1998 (Prima Avenue, 2012).



In addition, the company office is located adjacent to MDeC, as shown in Figure 3.5. This makes for an interesting case for discussion on symbiotic relationship symbolism. MDeC symbolises the technocrats, whereas Prima Properties represents the capitalists. Both actors provide the necessary conditions for the other’s survival in the city. MDeC requires the capitalists to ensure that the infrastructure needs of the city are fulfilled. On the other hand,

<sup>51</sup> Prima Avenue is the name of the commercial buildings, whereas Prima Properties is the name of the company. I will use the name interchangeably for the purpose of this discussion.

Prima Properties wants MDeC to attract more ICT companies to Cyberjaya to ensure their construction company will continue to be in business.

The symbiotic relationship refers not only to geographical relationship but also to emotional attachment. Mr Chong, Prima Properties' Executive Director, made a relevant statement when asked about his company involvement in Cyberjaya. During a media interview, he said, 'We had sentimental feelings about Cyberjaya' (Lee & Hamzah, 2010). He further highlighted the early years of Cyberjaya and his company's involvement in its construction.

This shows a new form of relationship created in Cyberjaya's development. I noticed that the Prima Properties building has an almost-mirror image architecture of MDeC (refer to Figure 3.4). The fact that the buildings were built ten years after MDeC makes it an exciting case study. Interestingly, other buildings in the same vicinity, such as DHL and Fujitsu, have totally different designs altogether. I also observed that the entrance to the Prima Properties building directly faces MDeC. This is not the case for the DHL and Fujitsu buildings. This placement shows that, in a symbiotic relationship, the actors themselves create connectedness to each other through various means. In this case, those means were not only geographical but also in design. It seems that Prima Properties wanted to be as close as possible to MDeC, which holds the key to the city. I would also argue that it symbolises the *hutang budi* (indebtedness) of Prima Properties to MDeC for all the opportunities given to them.

Next, I also discovered that the symbiotic relationship symbolised the partnership of two main ethnic groups in Malaysia. Prima Properties is a Chinese-owned company, but they managed to secure the first construction work from the Malay-owned Master Developer. Furthermore, state organisations such as the National Water Services Commission (SPAN) and the regional office of the World Health Organisation (WHO) are the main tenants for buildings owned by Prima Properties. According to the administrative officer of WHO interviewed during the fieldwork, they are provided a fifteen-year lease-free building by the state. This shows the symbiotic relationship between the company (Chinese) and the state (Malay majority).

In brief, I have discussed the different symbols and signs starting with the logos and crests used to symbolise the different actors. My discussion began with the discovery of the different meanings attach to the logos and crests used, which relate to how the actors define their

organisations. It can be divided into two groups, one which perceives the overall development from an Islam and global perspective, while the other still retains the Malay and traditional position.

I continued the discussion through detailed analysis of the meanings in buildings constructed to house the actors. I have discovered that Malay cultural identity is still the domain of meaning, especially in building construction in new city development such as Cyberjaya. Nevertheless, it has gone beyond the *kampung* Malay to symbolise a ‘globalise Malay’, as my fieldwork has shown. Here, too, the physical development can be divided into two groups. At one side is the group which holds firm to the Malay supremacy ideology, while at the other end there are those going against them.

I have also explained different symbols to highlight the hierarchy found in the city. It shows Malay supremacy is apparent, although the hierarchy is led by a knowledge-producing institution. Malay capitalists and bureaucrats dominate the upper part of the hierarchy.

Finally, I proposed the term *symbiotic relationship symbolism* to evaluate the meaning of space in urban development. I have discovered this kind of symbolism is obvious in Cyberjaya development, either through geographical location, building design or the emotions of the people involved. Hence, symbolism analysis has helped me to untie the meaning behind the city development which defines space and place.

### **3.6 Conclusion**

I have chosen the title ‘A Symbolic Universe of Cyberjaya: From Yap Ah Loy to Mustapha Kamal’ as the title for this chapter. Yap Ah Loy was a well-known Chinese businessman who contributed significantly towards the development of Kuala Lumpur during the middle of the 19<sup>th</sup> century<sup>52</sup>. Prior to independence, Kuala Lumpur planning, development and management were defined by the colonial master while Chinese capitalists contributed significantly to its growth. The period saw limited and insignificant contribution by Malay capitalists due to

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<sup>52</sup> Sharon A. Carstens’ (1988) *From Myth to History: Yap Ah Loy and the Heroic Path of Chinese Malaysians* give a very good account of history written about Yap Ah Loy from various sources.

inadequate access to landownership. Although the NEP managed to provide access for Malay capitalists to urban activities in Kuala Lumpur, the impact was still minimal.

Therefore, during the second half of his tenure as the Prime Minister of Malaysia, Mahathir, a well-known Malay nationalist, created two main cities outside of Kuala Lumpur where the definition of space was influenced by the Malay perspective. He believes urbanisation is one of the ways to change the Malays' way of life. Hence, Putrajaya and Cyberjaya were created and defined based on what he theorised in his book written in the 1970s. Access to landownership in both cities is controlled and dominated by Malay capitalists.

Based on this premise, I have divided this chapter into four sections revolving around urban development arguments. I started this chapter with a discussion on the formal decision-making process in Malaysian urban planning. I have shown that the decision-making process is centralised and influenced by the political elites. When there is a change in the political structure, it influences city development. At the same time, urban planning is used by the political elites to control access to the city's main activities, as I will demonstrate in my discussion in Chapter 4.

Then, I discussed the influence of colonial rules towards urban development in Peninsular Malaysia. They have created a segregated urban development based on ethnicity and class. In turn, this generated dissatisfaction among the different ethnic groups which finally erupted into a race riot. The opportunity was seized by the political elites to push forward a race-based development favouring the Malay majority.

Next, I have listed the key holders to the city of Cyberjaya. They are the main actors in Cyberjaya development. I have taken them as a sample to analyse how the political elites envision the city. I have shown that the main actors in Cyberjaya development from the landowner and master developer to the bureaucrats are all Malay-dominated. They directly control access to the city development.

Finally, I have applied symbolism analysis to find the meaning behind the city development. My discussion began with the discovery of the different meanings attached to logos and crests

used by the actors to represent them. It can be divided into two groups, one which perceives the overall development from an Islam and global perspective while the other still retains the Malay and traditional position. I continue the discussion through detailed analysis of meanings in buildings constructed to house the actors. I have discovered Malay cultural identity is still the domain of meaning, especially in building construction in new city development such as Cyberjaya. Symbolically, the city shows a clear hierarchy of the actors with Malay capitalists and bureaucrats dominating the main spots. I have also proposed the term *symbiotic relationship symbolism* to show the different relationships that exist in Cyberjaya development. Although the Malay perspective dominates the city development, there are Chinese capitalists which also benefit from it. Symbolically, their symbiotic relationship is shown through physical characteristics.

In the next chapter, I will continue the discussion using urban development framework especially knowledge-based city development. I will discuss the interlocking networks that exist in the city development in a continuation from this chapter which appears to show that Cyberjaya is a Malay-dominated city manifested symbolically.

## Chapter 4

### Knowledge City or Crony City: Inside Cyberjaya

*“Razak started all this - only those who support UMNO get anything”*  
(Tunku Abdul Rahman, c. 1970s)

#### 4.1 Introduction

As quoted above, Malaysia’s first Prime Minister, Tunku Abdul Rahman, voiced his disapproval of UMNO’s influence and involvement in business activities. He believes the business and politic relationships which started during the premiership of his successor will bring more harm than good to the overall economic development. He was referring to Tun Razak, Malaysia’s second Prime Minister, who happens to be the father of the current Prime Minister. Tun Razak is known for introducing the NEP to eradicate poverty and restructure the society after the 1969 racial riot. Although the policy was praised by writers such as Faaland, Parkinson and Saniman (2003), it was also blamed for the patronage and cronyism in Malaysia (Wain, 2010; Jomo & Gomez, 2000; Gomez, 2012, 2006, and 2002).

The patronage network or ‘crony capitalism’ was not created solely by the NEP but originated during colonial British rule, as revealed by White (2004)<sup>53</sup>. However, it forms a basis for the practice to be widely accepted as part of policy recommendation. In addition, massive infrastructure development especially during Mahathir’s premiership has produced more Malay capitalists inclined to support UMNO (Wain, 2010). For example, one of Mahathir’s Finance Ministers, Daim Zainuddin (2010: 15) shared his experience about politics and the economy in Malaysia and said:

*Many capital intensive businesses that were awarded to the Bumiputera investor to lead and develop, especially large infrastructure projects such as the North-South Highway under PLUS, needed government support since Bumiputera Community’s foundation in business was still weak.*

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<sup>53</sup> Crony capitalism is defined by White (2004) as the close relationship between the state and big businesses.

He further supported the political and business network widely practiced in Malaysia's development projects. According to him, the network helps to build a pool of capable Malay business leaders and contributes towards social and political stability.

Cyberjaya is one of the projects developed during Mahathir's premiership and a good example of how the main ruling party controls access to infrastructure work. The city was designed as a knowledge-based city parallel with the intention to create a knowledge-based society by the year 2020. At the same time, it provides opportunities for selected capitalists, especially the Malays, to benefit from the infrastructure work.

The infrastructure cost for the city when it first started was in the range of RM2 billion to RM5 billion (iProperty.com, 2010a; Wain, 2010)<sup>54</sup>. At the same time, compensation for the land acquisition process is RM1 billion (Personal communication, 21 October 2009). In an earlier research about corporate governance in Malaysia, Nor Azizah and Halimah (2007: 32) concluded that 'the state, in the ruler's capacity is also the enforcer of any rules and legislation gazetted by the government'. Hence, government intervention and political networks would definitely help the capitalists to relax or sometimes abuse some of the regulation and benefit from other state institutions.

Capitalists and political networks are an open secret and have become obvious since Malaysia started its major privatisation and massive infrastructure projects during Mahathir's premiership (Gomez, 2012; Wain, 2010; Jomo & Gomez, 2000). Cyberjaya development can also be analysed through the same interlocking relationship. The city was developed with one major Malay capitalist that controls access to all infrastructure projects, as discussed earlier in Chapter 3. At the same time, the political elites can ensure that their intention to create a knowledge-based city can be materialised. Therefore, patronage network or crony capitalism in the city's creation cannot be overruled.

Nevertheless, the questions remain of whether this backdrop has an impact on the overall development of the city and what people working and living in the city feel about the city. This is the basis of my discussion in this chapter. Generally, the main question in this chapter is;

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<sup>54</sup> RM or Ringgit Malaysia is the currency of Malaysia. Roughly, €1 is equivalent to RM4.

*who benefits from Cyberjaya development, and do the people living in the city feel the effect of a knowledge city?*

I begin my discussion with the issue of cronyism in Cyberjaya development. I then discuss Cyberjaya development as a knowledge-based city. Finally, I conclude my discussion by analysing the experience<sup>55</sup> given by the people living or working in the city.

#### **4.2 Xing Zhu: ‘Lucky Bamboo’**

In Chapter 3, I mentioned a Chinese restaurant found within the Cyberview Resort. I have purposely chosen the restaurant name as the title for this section as it best describes the direction of my discussion. Being lucky is the key to gaining access to infrastructure projects in Cyberjaya. So, the question for this section is; who benefits from the development? I will focus on the main actors benefiting from infrastructure development in the city<sup>56</sup>.

Although construction activities contributed only slightly more than three per cent of the Gross Domestic Product in 2011 (EPU, 2011), construction has a high multiplier effect (CIMP, 2007). In addition, the Malaysian-German Chamber of Commerce divides them into general construction and special trade works (Brandt & Yong, 2011). The former refers to residential, non-residential and engineering construction, while the latter covers electrical, metal, plumbing, sewerage, sanitary, refrigeration and air-conditioning, painting, carpentry, tiling, flooring and glass work (Brandt & Yong, 2011:3-4).

Activities related to construction are worth RM57billion and provide employment to more than half a million workers annually (CIDB, 2007). It proves to be profitable and provide possibilities for different actors to benefit from one single activity. Hence, those who manage to get access to construction activities in Cyberjaya will certainly benefit from the massive infrastructure works to fill the greenfield.

To better understand the infrastructure development in Cyberjaya, I will now briefly explain the three stages of construction and provide a simple model of the different actors involved.

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<sup>55</sup> This is with the exception of the knowledge workers, where I will also discuss perception based on the statistical data findings.

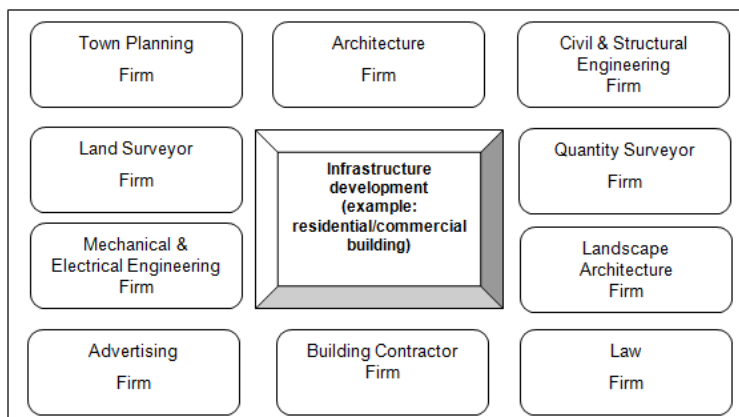
<sup>56</sup> I use the term *infrastructure* loosely to include housing, commercial, schools, roads, drainage etc.



First, the three stages are pre-construction, construction and post-construction. Pre-construction involves site survey and feasibility studies. It is followed by the construction stage, which is the most crucial part of infrastructure development and entails major design and engineering activities. Meanwhile, maintenance and management covers the post-construction stage. Thus, with the three stages of construction explained, infrastructure development provides different opportunities at different stages for similar or different actors.

As shown in Figure 4.1, commonly there are ten different actors involved in any infrastructure development<sup>57</sup>. Nevertheless, the landowner determines who should be part of the infrastructure development team. Metaphorically akin to a house, construction projects include the landowner, who holds the key and decides on the guest list.

**Figure 4.1: Actors of infrastructure development in Cyberjaya**



Source: Author's illustration, 2012

Basically, actors involved in infrastructure development can be divided into major and minor groups. The first refers to those getting the bigger portion of the activity while those with smaller shares can be classified as minor. Generally, builders and engineers benefit the most

while the balance is shared by the rest. In the example given, on average, the landowner takes 25% of the project's profit, and it is safe to assume that 55% will go to the builders and engineers while the remaining 20% needs to be shared amongst the rest<sup>58</sup>. Thus, allocation of infrastructure projects will certainly create competition among the different actors, while their strength within the group is determined through their function in the infrastructure development.

<sup>57</sup> This figure refers only to commercial-based infrastructure i.e. build for financial gain.

<sup>58</sup> Basic construction cost breakdown in Malaysia; land (25%), building (30%), engineering (25%) and others (20%) refer: <http://www.hbp.usm.my/costmanage/ekonbang.htm>

The model is not exhaustive and can be extended to a few more layers of actors, but the level of strength will diminish the further they get from the main actors. Nevertheless, in the simple model, I have illustrated how one activity can contribute to the survival of ten different actors.

Applying the same model on Cyberjaya development, at one level, the landowner would simply decide the survival of another ten companies. None of the actors can function without the other. This signifies the controlling power the landowner has on infrastructure development in the city. Hence, landownership and infrastructure development influence each other and form interlocking relationships.

As discussed earlier, the initial development cost for Cyberjaya was between RM2 billion to RM5 billion (iProperty.com, 2010a), but this figure increased to RM12.37 billion in 2011 (Haziq, 2011). Thus, such an amount of capital would definitely create competition among different actors to gain access to those who lead the development. Infrastructure development is one of the main attractions for the capitalists to be part of the city. Datuk Redza Rafiq, managing director of Cyberview, made a relevant comment:

*Cyberjaya's development is driven by hard infrastructure and real estate. Cyberview has taken this factor into consideration when managing Cyberjaya and has implemented several initiatives in the intelligent city (Charles Fernandez, 2009: M3).*

Therefore, the city is a good example of interaction between different actors to ensure access to its infrastructure development. As I mentioned earlier, the biggest share in any development would go to builders and engineers, but their access is determined by the landowner. As a result, those who control landownership would decide who gains access to other activities.

I will now discuss the current landownership and their Gross Development Value (GDV) in Cyberjaya<sup>59</sup>. As shown in Table 4.1, there are currently 17 active property developers in the city. The top developer is EMKAY Group (RM6 billion), followed by SP Setia (RM3 billion), OSK (RM1.5 billion), Mah Sing (RM1.5 billion) and UEM Land (RM1 billion).

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<sup>59</sup> Gross Development Value (GDV) basically refers to total sales value of the property.

**Table 4.1: Landownership and their Gross Development Value (GDV) in Cyberjaya, March 2012**

No	Developer	Land area (acre)	Gross development value (GDV)	Ownership
1	Andaman Property Management (Ecofirst Consolidated)	n.a.	RM880million	One of the board members, Dato' Boey Chin Gan, was in the 2004 Assemblymen representing <i>MCA</i> in the State of Kedah.
2	Country Heights Holdings	69.7 acre	RM70million	The Chairman of the company, Tan Sri Mohamed Hashim Mohd Ali, is <i>Tun Mahathir's</i> brother-in law. Another board member, Mr Nik Hassan Nik Mohd Amin, also served as board member for two state organisations, Danamodal and AKPK.
3	Emkay Group	n.a.	<b>RM6billion</b>	<i>Tan Sri Mustapha Kamal's</i> company.
4	Glomac (Berapit Properties)	7.0 acre	RM430million	The Group MD, Dato' Fateh Iskandar bin Tan Sri Dato' Mohamad Mansor, is the State of Selangor's <i>UMNO</i> treasurer. Dato' Fateh is also REHDA Deputy President for 2010-2012. Another board member, Dato' Haji Ikhwan Salim, is <i>UMNO</i> Head of Division for Petaling Jaya Utara, State of Selangor.
5	Laketown	40.7 acre	RM539.8million	The company Chairman, Tuan Hj Ahmad Khalif, is <i>Tan Sri Mustapha Kamal's</i> son.
6	Mah Sing Group	121.57 acre	<b>RM1.5billion</b>	The Executive Director, Mr Lim Kim Hock, previously worked as Chief Operating Officer for MK Land, a company owned by <i>Tan Sri Mustapha Kamal</i> .
7	Nadaya Properties (Harun Faudzar Group)	15.6 acre	RM447million	One of the board members, YB Dato' Omar Haji Faudzar, is an <i>UMNO</i> Senator from the State of Penang.
8	OSK Property Holdings (Wawasan Rajawali)	15.9 acre	<b>RM1.5billion</b>	One of the board members, Dato' Ikmal Hisham bin Abdul Aziz, is <i>UMNO</i> Youth Leader in Tanah Merah, State of Kelantan.
9	Paramount Corporation	50.01 acre	RM530million	One of the board members, Datuk Rohana Tan Sri Mahmood, is a Council Member of NITC. The Managing Director of Paramount Property (Utara) Sdn Bhd, Dato' Ricque Liew Yin Chew, is REHDA Secretary General for 2010-2012.
10	Prima Properties Management	10 acre	RM180million	The first contractor to be involved in Cyberjaya development. They built MDeC and Cyberview, two of the pioneer buildings in Cyberjaya.
11	Subang Alam (CrystalVille)	22 acre	RM870million	The Chairman, Dato' Azman Bin Mahmood, used to serve <i>UMNO</i> associate companies.
12	Shaftbury Capital (Ikhasas Group)	13.09 acre	RM700million	Parent company has close associates with Saidina Ventures Sdn Bhd, a bumiputera contractor. The Director of Saidina Ventures Sdn Bhd, YM Tengku Hishammudin Zaizi Tengku Azman Shah Tengku, is a member of the State of Selangor Royal family.
13	Suntrack Development	23 acre	RM115million	The owner's son, Mr James Tan Kok Kiat, is an active member of REHDA.
14	SP Setia	268 acre	<b>RM3billion</b>	Board members are retired senior civil servants, D.G of Public Service Dept/D.G Education Dept. One of the board members, Tan Sri Hari Narayanan a/l Govindasamy, also served as MIC link AIMST University board member.
15	Triental Land (Villamas Group)	10 acre	RM43million (estimates)	Parent company is a member of REHDA.
16	Tim Development & Construction	9.2 acre	RM96million	n.a.
17	UEM Land	98 acre	<b>RM1billion</b>	Company is a subsidiary of Khazanah, a state-owned organisation. The Managing Director, Dato' Wan Abdullah Wan Ibrahim, has worked for 10 years as Group Executive Director of Emkay Group.

Source: Compiled by author, 2012.  
n.a: not available

The volume of the GDV clearly shows that Emkay Group leads and controls access to landownership in Cyberjaya via their position as the master developer as discussed in Chapter 3.

Cyberjaya's infrastructure needs have created fierce competition and have been described as a 'property tsunami' (Lim, 2011). As a result, different developers are pushed to create partnerships, as explained by Mr Lao of Setia Haruman:

*This is by way of engaging meaningful joint-venture developments with reputable developers such as the recent innovative Setia Eco Glades development with SP Setia with an expected gross development value of RM3 billion (Lim, 2011: 10).*

This shows how competition for urban landownership forces different actors to form partnerships in order to benefit from its infrastructure development. A convenient partnership is considered the best alternative for interested property developers to gain from Cyberjaya development. They try to reduce the competition by having joint-venture projects together with those who are closer to the ruling party. In addition, companies also try to be closer to the source of power or decision-makers by having members of the ruling party or retired bureaucrats as their company's board members.

However, the situation in Cyberjaya is unique because the land is owned by the state, and one man has been given full access as the master developer. This man is Mustapha Kamal, a well-known Malay property developer.

Mustapha Kamal was one of the few Malay property developers who started his business during the property boom in the 1980s. He started at the age of 33 and has the full support of the main ruling party (refer to Chapter 3 for a detailed discussion on his connection with UMNO). His company also strongly supports policy created by the ruling party. For instance, in its website, their first property development project is described as:

*The privatization scheme was developed to create a planned township in accordance with the aspirations of the new economic policy as well as create*

*opportunities for Bumiputeras (translated literally, means ‘son of the soil’) to participate in the building industry (Emkay, 2012).*

Mustapha Kamal also gained iconic status in Malay language media as one of the most successful entrepreneurs in Malaysia (Ahmad Naim, 2010). His success fits perfectly into Mahathir’s vision of Malay entrepreneurship proposed in 1970 (Mahathir, 1970). Media reports prove his strong connections with the former Prime Minister. For example, in his speech made during the launching of the Mustapha Kamal biography, Mahathir, states:

*I am proud of Mustapha Kamal’s attitude. He took full advantage of the opportunities opened to him (as a Bumiputera), but unlike others, he never abused them. He was not interested in the ‘get rich quick’ route. He knew how to be ‘malu’ (ashamed) (Financial Excellent, 2009).*

Moreover, Mahathir is often invited as a guest of honour for most of Mustapha’s Kamal functions, as shown in Photo 4.1. He even attended a document-signing ceremony between Emkay Group and RHB Bank for RM120 million loans to finance one of the company projects in Cyberjaya (RHB, 2009). This confirms the close relationship between the company owner and the man behind Cyberjaya’s creation.

**Photo 4.1: Master developer and his social network**



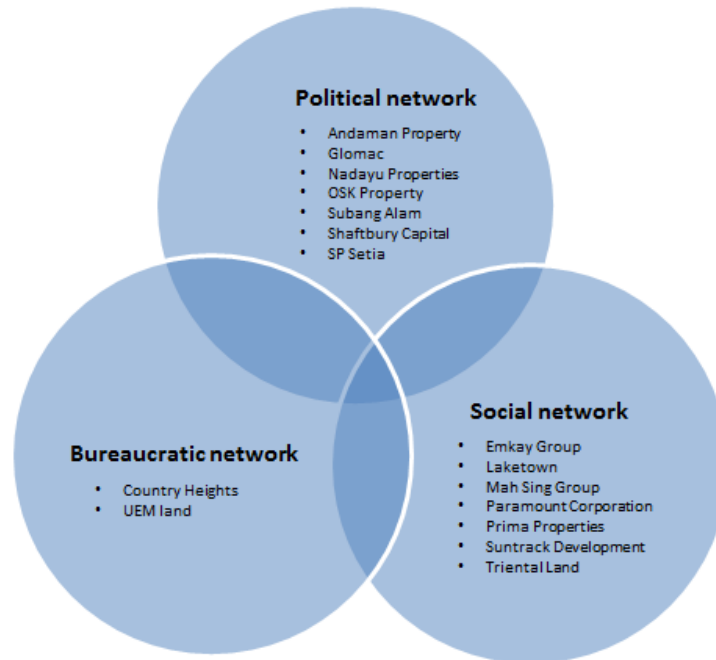
Source: Utusan Malaysia, 2009; RHB, 2009

Table 4.1 also explains major networks between the different developers in Cyberjaya. It shows how most of the companies have close relationships either with the ruling party or with Mustapha Kamal. For example, EMKAY, Laketown, Mah Sing and UEM Land are all related to Mustapha Kamal by having board members who have worked with him personally or with his immediate family members. Whereas some board members of Glomac, SP Setia, Subang Alam, OSK Property, Nadayu Properties and Andaman Property are also active members of the main political parties, i.e. UMNO, MCA and MIC.

Based on their board members, I have managed to group the main property developers in Cyberjaya into three major networks as illustrated in Figure 4.2. The first group is based on a social network centred on Mustapha Kamal, his family and friends. At least five of the developers have social connections with him either through family ties or as his former colleague. The other factor that contributes towards this type of network is membership in the Real Estate and Housing Developers' Association Malaysia (REHDA).

REHDA was established on 21 May 1970 to represent private sector property developers, and its current membership is over 800 developers (REHDA, 2012). As shown in Table 4.1, at least two property developers have board members who also hold high positions in REHDA. Glomac's Managing Director is REHDA's Deputy President, while one of Paramount Corporation's board members is its Secretary General. Memberships with this association create opportunities for the developers to widen their social network and expand their business prospects.

**Figure 4.2:**  
**Inter-locking network in Cyberjaya infrastructure development**



Source: Author's illustration, 2012

The second group is related to political networks and involves companies that have board members from the ruling party. UMNO seems to dominate this form of network in that three of the developers have party members on their board of directors. In addition to UMNO, MCA and MIC members are also present in two of the developers' board members. For example, Glomac's Managing Director is also the State of Selangor's UMNO Treasurer, while one of the board members of Andaman Property is a senior member of MCA. Thus, the ruling party benefits directly from massive infrastructure projects such as Cyberjaya by having their senior members involved in the decision-making process of almost all the major property developers. Finally, the bureaucratic network is comprised of companies whose board of directors previously worked for state organisations. Most of them are retired high-ranking civil servants. Although I only managed to categorise two developers within this network, the list is not exclusive. Some of the other developers also have retired civil servants among their board members, but they were not categorised under bureaucratic networks because I classified them under the two networks explained earlier. One example is SP Setia, which has the newly retired Director General of the Public Service Department as its board member. I categorised

SP Setia under a political network due to its increased significance compared to a bureaucratic network. Nevertheless, Figure 4.2 itself shows the interlocking nature of the relationship. It would be difficult to classify the relationship under an exclusive network. Furthermore, having retired senior civil servants as their board members is a common practice in corporate Malaysia (Mariarti & Kamarulzaman, 2005; Nor Azizah & Halimah, 2007).

Thus, Cyberjaya development is made up of inter-locking networks which create limited access to landownership and infrastructure projects. It could also be said that the ruling party benefits the most since they seem to control every single one of the networks. My study concurs with an observation made by Gomez (2012: 79), who reminded us that the ‘developmental state model employed during Mahathir’s regime justified parcelling out rents to elites’. Ultimately, the ruling elite can ensure their power base is retained or expanded since construction involves a high multiplier effect as discussed at the beginning of this section.

### **4.3 You Help Me, I Help You!**

Prime Minister Najib<sup>60</sup>, in one of his infamous speeches during a state by-election in May 2010, was recorded openly promising the voters during the by-election that he would grant their wish if the ruling party won the election. In his speech, he said:

*I want to make a deal with you. Boleh tak? (Can we?) Can we have a deal? Can we have an understanding or not? OK the understanding is quite simple. You help me, I help you. Ini bukan tipu (This is not a scam). Because Hulu Selangor, you read in the papers. I gave this; I made this deal with the people in Hulu Selangor. They wanted 3 million ringgit for a Chinese school. New bangunan (building). I said to them: Barisan Nasional wins on Sunday; on Monday I will ask a cheque to be prepared. They said yes. When we won on Sunday, Monday I called, prepare the cheque. Wednesday I delivered the cheque’ (15 May, 2010) available at:*  
*<http://www.youtube.com/watch?v=qbeZXjejsbU>*

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<sup>60</sup> Najib is Malaysia’s current Prime Minister and son of the second Prime Minister. The Prime Minister is also the leader of UMNO, which is the largest party within the ruling coalition.



This speech, delivered by the Prime Minister, shows the political influence on infrastructure development. The ruling party determines what and how much should be given to the voters as a token for their vote to ensure they retain their power. This proves that infrastructure projects are used as a tool not only for financial benefit, as I discussed in the previous section, but also to ensure that the ruling party retains their power. The action is done openly, as shown in the speech delivered by the Prime Minister himself, and it is used as a vote-buying mechanism.

In March 2012, the Prime Minister made a similar request to business leaders in the State of Selangor, where Cyberjaya is located, to help the ruling party win the election. This was widely reported in the national media, as shown in Figure 4.3.



The same news story reported that the Prime Minister appealed to the business leaders by saying that they would definitely benefit if the ruling party managed to recapture the State, which is currently ruled by a different party.

The news headlines and the Prime Minister's speech clearly show how politics plays a major role in infrastructure development in Malaysia. Cyberjaya is no exception, and the massive infrastructure projects to fill the city clearly benefit the ruling party. It not only provides financial gain but also

contributes towards ensuring their political survival.

What started as an affirmative action to help the poor and neglected Malays has turned into a power tool for the ruling party to maintain their power. Infrastructure projects were created and distributed among those who supported the rulers. At the same time, senior party members were given directorship positions in the companies to ensure they could maintain control in the decision-making process.

#### 4.4 Cyberjaya as a Knowledge City

What are the experiences of professionals<sup>61</sup> involved in the city's development as well as the knowledge workers and people living in the city? Do they regard Cyberjaya as a knowledge-based city? These questions form the basis for my discussion in this section, where I shall explore their experiences in this section based on their viewpoints or angles. There are several angles, in particular that of the professionals, the residents, and the knowledge workers.

The idea to create a knowledge-based city was developed as part of the government's plan to create a knowledge-based economy and society in 1996 (Edvinsson, 2006; Sarimin & Yigitcanlar, 2011; Sarimin, Yigitcanlar & Parker, 2010). It is part of a long-term vision for Malaysia to be a developed country by the year 2020 (refer to Chapter 2). Two main cities, Putrajaya and Cyberjaya, were created to materialise this dream (King, 2008; Bunnell, 2004). The cities are located next to each other, and in some part both share the same physical boundary. Putrajaya was developed and managed fully by the state through *Perbadanan Putrajaya* (Putrajaya Holdings). Although the land was originally owned by the State of Selangor, it was handed over to the Federal Government under a special treaty on 7 November 2000 (Moser, 2010; King, 2008; Bunnell, 2004, PMO, 2012). Since then, the city has been considered a Federal Territory together with Kuala Lumpur and Labuan<sup>62</sup>.

On the other hand, Cyberjaya still belongs to the State of Selangor, and there is no single body created to administer the city such as Putrajaya Holdings. Although MDeC was created to manage MSC Malaysia, its function is totally different, i.e. it serves as a one-stop centre for investors and is not directly involved in the physical development of the city. The development function is shared between the MPSP, Setia Haruman and Cyberview (refer to Chapter 3 for a detailed discussion).

The existence of two forms of authority at the state and federal levels is further divided amongst different actors at the implementation stage. This creates problems when the plan and vision are not given priority by the local political leaders since they are not from the same

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<sup>61</sup> Professionals include those from state organisations and the other actors involved in Cyberjaya development, such as the Economic Planning Unit, local authority, landowner and property developer.

<sup>62</sup> Labuan is located in East Malaysia and was previously managed by the State of Sabah.

political party. While capitalists created by the ruling party control the landownership and major infrastructure projects, another political party has the executive power in the State.

Against this backdrop, I will now discuss the experiences shared by professionals, residents and knowledge workers to evaluate the effects of the power struggle between the main actors on them.

#### **i. Viewpoint of the Professionals: Management Problems & Political Interference**

To begin, the Economic Planning Unit (EPU) is the highest authority that governs economic planning in Malaysia. The EPU determines and controls matters pertaining to the country's economy. Furthermore, knowledge-based development is also covered by them through a division called Knowledge Economy. Initially the creation of this division of EPU was carried out on the basis of knowledge-based development. However, the content and focus are heavily inclined towards ICT. The lack of focus by the management has created a different perspective of knowledge-based development. ICT, which was supposed to be simply an enabler, has become the forefront of knowledge-based development. This has created conflicts of focus among people working in the Knowledge Economy division.

The analysis presented in this section indicates two issues as raised from the experiences of the professionals working in the Knowledge Economy division of EPU. The first difficulty relates to management issues and the second to political intervention in their day-to-day work. I will elaborate upon these in depth.

During the fieldwork, I discovered that the organisation which used to advise the political elites had their function reduced. Economic planning is seen as another opportunity to make profit. They started to hire private consultants to do research on behalf of the EPU. This created dissatisfaction among professionals working in the organisation. They feel their professional knowledge and years of experience have been wasted because of political interference. In one of my interviews, the officer expressed her dissatisfaction with the decision made by the political elites to side-line them in the decision-making process simply

because they wanted to create business opportunities. Mrs Eyi, a senior officer in the EPU, made a relevant comment:

*You can see here, people who have been trained and understand the whole process are not being assigned to the right task. It is frustrating. EPU can't advice the government anymore. We are busy doing project implementation rather than policy recommendation. Consultants are doing our job now (Personal communication, 07 January 2010).*

She was one of the pioneering officers working on knowledge-economy when it first started in the EPU. Nevertheless, due to her dissatisfaction with the current management, she finally asked to be transferred to another section. I managed to interview her a few weeks after she started working in the new section. She is an example of the negative impact of changes in management due to political pressure which causes low morale and discourages employees from contributing positively to their organisation.

She and one of her colleagues see that the changes in the aspiration and spirit of planning which was the basis of the organisation for so many years has been compromised just because the political elites want to create business opportunities. She gave an example of the Knowledge Economy section, which was originally based on economic philosophy but has change into an ICT based section. This change has caused the officers working in the section to feel side-line and frustrated. She feels the EPU function has been reduced. She explained:

*Most of the planning part of EPU has been eroded because we are over consumed with managing projects. The thinking part is not as much as they used to be. The priority is not like what it used to be. We just compile, calculate and run the data. In economics it is different. If you don't know the trend you can't explain. Project monitoring is not our job. We are supposed to understand, plan and come up with strategic recommendation. We should have a bird eye view of things. EPU current focus has made its officers have less time to think and study through and give proper advice. The government do not trust EPU anymore (Personal communication, 07 January 2010).*

She believes the EPU's function was reduced to that of a project monitoring organisation rather than planning due to the political interest in giving the necessary studies to consultants outside of the organisation.

Since its establishment in 1961, the EPU has always been the most authoritative organisation in development planning in Malaysia. Nevertheless, on 16 September 2009, the political leaders established a high-level organisation known as the Performance Management & Delivery Unit (PEMANDU) under the Prime Minister's Department. Its main role is to oversee the implementation, assess the progress, facilitate as well as support the delivery and drive the progress of the Government Transformation Programme (GTP) and the Economic Transformation Programme (ETP). PEMANDU seems to have taken the task that was traditionally assigned to the EPU.

The total cost to set-up PEMANDU was RM66million, and most of the cost involved hiring either local or foreign-based consultants. For example, McKinsey and Co were paid RM36 million for their consulting services (Lee, 2010). The same company was also involved in conceptualising the idea to set-up MSC Malaysia, which eventually contributes towards the development of Cyberjaya (McKinsey, 2012).

At the same time, the establishment of PEMANDU also benefits the political leaders. For example, the Chairman of Ethos & Co, which was selected as one of the consultants, used to work as a Special Assistant to Prime Minister Najib (Ethos, 2012). This shows how the political leaders benefit through setting up a new organisation to function as an economic adviser, which is a role that was traditionally held by the EPU.

The management problem faced by professionals in the EPU also creates a similar dilemma in another organisation which has a major role in knowledge-based cluster development i.e. MOSTI. Dr Rudin, who has worked in the strategic planning unit of MOSTI for four years since completing his PhD from a reputable university in the United Kingdom, shared his observation:

*The reality is few people holding the top position in the ministry really understand what they are supposed to do. Take innovation for example,*

*they have different view among themselves. They just don't know things which they are supposed to know. We can't say anything. They just don't want to listen and appreciate our view. Nobody wants to say anything anymore. 'Silent is the best rule' (Personal communication, 05 January 2010).*

He concluded the interview by saying that most professionals who got frustrated with the way things are done just left. I noticed his passion about his previous job in MOSTI, but due to management problems, he has now started a new position in another ministry.

The weak leadership and management problems at the EPU and MOSTI combined with political interference have created a dilemma among professionals involved at macro level planning. This has an impact on the development of knowledge-based clusters such as Cyberjaya. Furthermore, what is being planned and conceptualised at the macro level does not seem to be properly understood at the implementation level.

During an interview with the town planners of Cyberjaya, I noticed that they were not properly briefed about the project. One senior member of the planning team could only give a vague answer when asked about the Cyberjaya development concept. She conceded that the development succumbs to the market. Her response when asked about the concept was simply:

*The concept was supposed to be different. It was supposed to be an IT and R&D based. There is no clear concept. We follow what the market wants (Personal communication, 23 December 2009).*

She further explained that only the senior management went for the technical tour abroad to draft the concept. The rest of the team members were involved only in preparing the planning guidelines together with other technical departments from the Federal Government.

At the same time, officers at the local level are pressured to fulfil the needs of political leaders. The town planner that I interviewed voiced her technical team's dilemma when asked to compromise planning guidelines:

*We compromise because we were pressured; there are people who want us to give approval. There are also instances when the investors try to justify their needs by looking into the loopholes of the guideline. They can change anytime. We were pressured to make Cyberjaya as what they want it to be (Personal communication, 23 December 2009).*

In her opinion, the pressure to change the planning guidelines is the reason that Cyberjaya development is transforming from a low to a high density city<sup>63</sup>. This, according to her, will create many problems in the future, such as environmental difficulties and unavailability of social facilities.

These experiences show how the political elites pressure professionals at every level of the development to suit their needs. Subsequently, it creates a dilemma and forces the professionals to surrender to the political pressures.

Political pressures also influence other actors in Cyberjaya development. In one interview with the General Manager of Cyberview, I was told how they create opportunities for more builders through contract distributions as required by the political leaders. According to Mr Mohad:

*We have to parcel out large contracts into smaller parts because there were complaints that we do not help small scale builders. This is what we were told to do so more builders can benefit from the infrastructure project (Personal communication, 30 December 2009).*

Although the consequence of breaking the contracts creates monitoring problems, they have no other choice. When asked how his organisation feels about the situation, his reply was:

*Our hands are tied. We just follow the instruction given to us. They are the one in power (Personal communication, 30 December 2009).*

When asked whether changes in political party at the State level have any significant impact on Cyberjaya development, his response was:

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<sup>63</sup> Density is calculated by dividing the number of population with the area.

*The state government commitment is very disappointing. The Exco<sup>64</sup> (executive committee) member in-charge of ICT does not monitor the progress (Personal communication, 30 December 2009).*

This shows how politics influences professionals from both sides of the political divide. They are left in a dilemma either to follow their professional conduct or surrender to their political master's pressures. Hence, Cyberjaya has created a predicament which finally affects the morale of the people involved in its development.

## **ii. Viewpoint of the Residents: Expensive Yet Lacking the Basics**

I will begin this section by looking at the experiences of the Cyberjaya Residents Association, which represents the residents. The findings suggest how the development of the city causes pressure on the overall price of the residential areas, which are also lacking the basic amenities. A respondent described how the situation in which different actors were assigned to different task has created an imbalanced power struggle between the different actors. This has resulted in most of the development in Cyberjaya not being properly coordinated. Furthermore, the developer fails to fulfil its role, while others neither have the authority nor the means to overrule the developer's decision.

Her argument intrigued me and led me to ask further about this, and she responded:

*I am particularly mad with Setia Haruman, they are not responsible. The quality of infrastructure and services in Cyberjaya is not up to the standard. They are a property developer who does not know how property development works! (Personal communication, 24 December 2009).*

Being an important member of the Cyberjaya Community Consultative Committee, her dissatisfaction represents the feelings of the majority of people living in Cyberjaya.

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<sup>64</sup> Common term used locally for state legislative council members.



After more ten years of its development, Cyberjaya still lacks major social amenities such as housing, medical and religious facilities. Houses built in the city are too expensive and beyond the capabilities of most of the knowledge workers. A human resource manager for an American-based telecommunication company made a relevant observation about the housing situation in Cyberjaya:

*There is not enough affordable housing. I mean those sold at the price range of RM 250,000 or less. Currently, the price is between RM 500,000 or more. This is ridiculous* (Personal communication, 03 November 2009).

Her view is also shared by a resident who bought a house and has been living in the city for almost ten years. According to Mrs Lis:

*The developer only developed houses at RM 700,000 and more. This is too expensive. Nobody would want to buy such an expensive house. This place should be for all and not only for those who can afford such expensive houses* (Personal communication, 24 December 2009).

Other than housing, she also highlighted the lack of health facilities based on her personal experience:

*When I was pregnant with my youngest child, I went to Putrajaya Hospital. There, I was asked to go to Dengkil because Cyberjaya is managed by the State of Selangor. You know both cities are located in two different administrative states. We are so near yet we are not allowed to use the facilities* (Personal communication, 24 December 2009).

She further explained that the health facilities provided in Dengkil are not as advanced as those in Putrajaya. Although the distance to Dengkil and Putrajaya from Cyberjaya is almost the same, due to administrative classification, the former is classified as a rural area.

She added that Cyberjaya is lacking not medical but also religious facilities for the Muslim majority population. Her comment about this was:

*We don't even have the basic infrastructure. We have been complaining about the mosque. We need a mosque. You know people would want to stay in a place where there is a mosque. My parents always complained about not being able to pray in a mosque* (Personal communication, 24 December 2009).

At the same time, some knowledge workers believe the facilities in Cyberjaya are limited compared to Putrajaya, although both were developed together within the MSC Malaysia. Mr Niz, who has been working in Cyberjaya since April 2007, opined:

*Cyberjaya is supposed to be an intelligent city but the decoration is outdated. It has good infrastructure but the landscaping is not up to the standard. In Putrajaya, you have the working place, shopping malls and also fast-food outlet such as KFC, McDonalds, and Pizza Hut* (Personal communication, 07 December 2009).

His colleague, Mr Maini, shared the same view and added another problem working in Cyberjaya:

*There is no public transport connecting Cyberjaya with certain cities. This creates problems for those who depend on public transport to come to work* (Personal communication, 07 December 2009).

He further explained that the limited number of affordable houses and high rental prices makes working in the city unattractive for those who depend on public transport. On the other hand, those who drive to work on a daily basis have to spend money on fuel and tolls.

Although Cyberjaya is portrayed as an ICT based development, people working and living in the city still feel that there is nothing significant about it compared to other new cities developed within the Klang Valley. For example, some engineers I met during the interview

process expressed their frustration with the internet connection. Mr Wei, a senior project engineer for a German-based company, said:

*The internet connection is not up to the standard. Most companies need this as a basic requirement (Personal communication, 10 December 2009).*

His frustration was shared by another IT specialist who lives in the city. According to her:

*There is nothing special about Cyberjaya except the low density development. We don't even have a library facility either conventional or electronic. Furthermore, there is no such thing as telemedicine which was supposed to be part of Cyberjaya. It was highlighted during the launching of MSC Malaysia (Personal communication, 24 December 2009)<sup>65</sup>.*

Thus, although Cyberjaya was developed and highlighted as a knowledge-based city, it does not seem to provide the basic facilities required for its residents. The most striking need which is not being met in the city is affordable housing. Religious and medical needs are also neglected in the city. In addition, the ICT element, which was supposed to be the backbone of Cyberjaya development, is not felt among people living in the city. All this has created frustration among Cyberjaya's residents. They are frustrated and do not seem to feel there is any difference living in the city compared to other cities.

### **iii. Viewpoint of the knowledge workers: Two Sides of the Coin**

In this section, I will outline the experiences and perceptions of knowledge workers in the city. There are two sides of the coin. One side of the coin is that the overall development is Malay-centred and lacks social facilities. The other side of the coin is that they regard the working atmosphere of the Cyberjaya cluster as being conducive to a green environment. This analysis is based on statistical inferences and in-depth interviews.

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<sup>65</sup> Telemedicine was one of the main applications announced during the launching of Cyberjaya. It was introduced as medical facilities that utilise ICT applications without having to go to the hospital.

In regards to the statistics, the views of knowledge workers in Cyberjaya were determined via the correlation between social variables such as gender, ethnicity, age, education, working experience, job specialisation and mobility with level of satisfaction. I have applied the cross-tabulation and chi-square test. The seven variables were chosen based on a pilot survey and an in-depth interview done prior to the distribution of the questionnaires.

**Table 4.2:**  
**Results of chi-square test between respondent's background and level of satisfaction with Cyberjaya development**

Variables	Value (x <sup>2</sup> )	df	Asymp. Sig
Ethnicity	<b>17.098</b>	<b>4</b>	<b>0.002</b>
Gender	2.736	1	0.098
Job mobility	13.236	9	0.119
Age	2.096	5	0.152
Field of specialisation	8.448	6	0.207
Working experience	2.868	6	0.825
Level of education	8.755	5	0.836

Source: Field data, 2009

First, the issue of Malay-centred development has a direct impact on knowledge workers' views on the overall development of the city. As presented in Table 4.2, ethnicity shows significant correlation against satisfaction level among respondents at 99 per cent confidence level. It illustrates that ethnicity influences respondents' views on the city development. This relates significantly to my argument in Chapter 3.

Cyberjaya's Malay-centred development has impacted the level of satisfaction among people working in the city. My field results have shown that other ethnic groups, especially the Chinese, are not pleased with its development.

I visited one company in Petaling Jaya<sup>66</sup> with a majority of employees comprised of ethnic Chinese backgrounds. The company used to have an office in Cyberjaya, but it was closed a few months before I conducted the interview. I asked the General Manager, an ethnic Chinese, what made them decide to cease their operation in Cyberjaya. Mr Chan responded:

*Well, we open that office because that's the requirement. You must have an office in Cyberjaya in order to get the MSC Status. We have limited choice so we decided to open the office in Cyberjaya. The problem is the rental is not competitive and not attractive. We did ask the property*

<sup>66</sup> The city is located approximately 10 kilometres from Kuala Lumpur and 20 kilometres from Cyberjaya. Refer to the discussion in Chapter 3 for a brief history of the city.

*manager to reduce the rental. If you compare i-City with Cyberjaya, it is much better* (Personal communication, 16 October 2009).

i-City is a cluster of buildings located in Shah Alam which caters to ICT based companies. It was developed by I-Berhad, a Chinese-owned company. I visited the area during my fieldwork and realised that it has a vibrant and lively atmosphere compared to Cyberjaya. If Cyberjaya symbolises the Malays, I can sense the Chinese flavours in the design and concept of i-City's development.

In contrast to Mr Chan response, Ms Kathy, an ethnic Malay and owner of a multimedia company previously based in Cyberjaya, replies to the same question:

*We have no choice. We can't afford the cost. When I first started the business everything is covered by MARA<sup>67</sup>. I personally would prefer to be based in Cyberjaya, to be close to MDeC* (Personal communication, 17 December 2010).

Assistance provided to Malay ICT businesses to operate in Cyberjaya has created dissatisfaction among other ethnic groups. Furthermore, the Malay-centred city development<sup>68</sup> contributes towards creating a Malay-supremacy environment which in turn causes uneasiness among the other ethnic groups. This situation shows that ethnically-based development in a knowledge-based cluster has resulted in dissatisfaction among knowledge workers, especially those not from the ones represented in the development.

Second, frustration is shared in the overall development and infrastructure of the city. In addition to ethnicity-based dissatisfaction due to state policy, I have also managed to determine other factors which contribute towards knowledge workers' frustration with the overall development of the city. In the questionnaire, they were asked to list things which they deemed lacking in Cyberjaya. More than thirty-five per cent of the respondents provided an answer for the question. Figure 4.4 illustrates the four main factors which, according to the respondents'

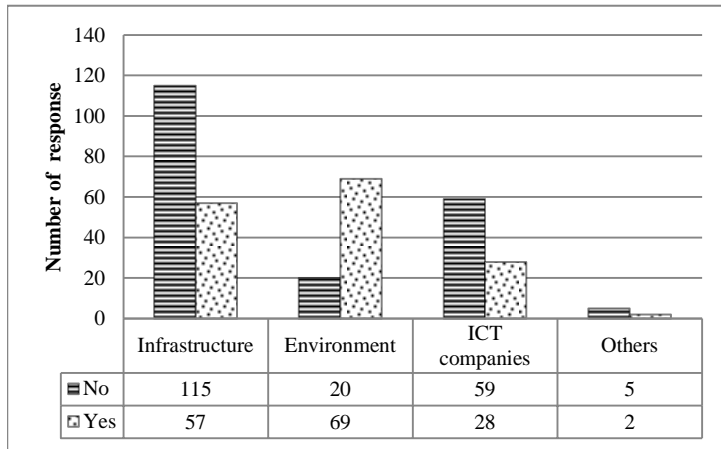
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<sup>67</sup> MARA is the Malay acronym of The Council of Trust for the Indigenous People, a special organisation created by the state which provides assistance to ethnic Malay or bumiputeras, especially in business and education.

<sup>68</sup> This is also discussed in Chapter 3.

viewpoints, are contributing to Cyberjaya’s unattractiveness. The results show that the majority are not satisfied with the level of infrastructure provided in the city.

**Figure 4.4: Level of satisfaction with Cyberjaya development**



Source: Field data, 2009

The most basic infrastructure which is neglected in Cyberjaya development is affordable housing for the knowledge workers. Hence, most of them have to stay outside of the city and commute on a daily basis. There are also limited places for people working in Cyberjaya to eat and socialise. Mr Zali, a

senior engineer with AT&T who travels daily to work, made a relevant comment when asked whether he would consider living in the city:

*To work in Cyberjaya is OK but I don't want to live here. There is nothing much to do here (Personal communication, 04 December 2009).*

He further compared the city with Putrajaya which, according to him, is better planned and properly managed. The city is equipped with basic infrastructures, such as various types of housing, a shopping mall and recreational facilities.

His experience is shared by Mr Madi, a university graduate in his early 20s, who has just started working in a German-based company. According to him:

*During the night it is quiet compared to the day. The supermarket is far. Place to hang out is also far. The residential area is secluded (Personal communication, 30 December 2009).*

Unlike the workers, the owners and managers of ICT companies looked at Cyberjaya from a cost-saving perspective. Dr Kuru, the owner of a software company based in Cyberjaya, explained:

*Our client is not here so we have to travel frequently. The travelling cost is high (Personal communication, 07 January 2010).*

Despite the shortcomings above, the unpolluted environment scores the highest percentage for level of satisfaction. The results correlate with the qualitative data. Most of the engineers voiced their satisfaction with the green spaces, quietness and less traffic in the city. They seem to enjoy the calm environment in Cyberjaya compared to other parts of the Klang Valley. Mr Ai, a technical analyst for an American-based company, described the city:

*Cyberjaya is good. There is less traffic and the parking is free. The environment is less hectic (Personal communication, 09 December 2009).*

Although, Cyberjaya is portrayed as an ICT based city, more than half of the respondents felt that the number of ICT companies in the city is not enough and does not correlate with the image of the city as an ICT based city. Mr Wei, a senior project engineer, opined:

*There are too many call and data centres. We don't want this type of IT companies. They do not allow for knowledge flow (Personal communication, 10 December 2009).*

Having a background in software engineering and currently involved in R&D work, Mr Wei is frustrated with the type of companies allowed to operate in Cyberjaya. During the interview, he compared his work with his friends working in some of the call centres. He considered his work more appropriate for Cyberjaya's image rather than the work of his friends.

Hence, Cyberjaya, which was created as the centre of a knowledge-based development, proves to be a 'gold mine' for the capitalists and also the political elites. They see Cyberjaya as a place to expand their profit-making activity. This has created a dilemma among professionals involved in the city development. Political interference and management problems have forced the professionals to either kneel down to their political masters or leave the organisation.

At the same time, residents in the city feel neglected. They are frustrated with the lack of facilities provided in the city. Even facilities to cater to their basic needs are not available. The

city seems to have given them false hope. For the residents, living in the city is nothing better compare to the other cities in the Klang Valley. All the buzz words are simply an advertisement gimmick to create a mental image which is far from the reality.

Next, people working in Cyberjaya are not emotionally attached to the city. They come to the city just because of their work. They spend less time outside of their office buildings because the city does not provide them with better alternatives. They are also forced to go to other cities outside of Cyberjaya to live, shop or do recreational activities.

Finally, Cyberjaya's infrastructure development shows that the capitalists chosen to lead the project use the opportunity to make profits. Infrastructure projects are built once the market value and demand increases to gain the highest profit. For example, I would argue that they purposely did not build the housing facilities because they want to drive the price up and make the maximum profit, which is purely capitalist in nature.

#### **4.5 Conclusion**

I began this chapter by discussing the interlocking relationships between landowners and capitalists in Cyberjaya's infrastructure development. These are the actors who benefit from the infrastructure development for the city. At the same time, they have created three forms of networks between them, namely social, political and bureaucratic networks. All three of them are inter-related and influence each other. Nevertheless, I would argue that the ruling party benefits the most since they seem to control every single one of the networks.

Meanwhile, I have also shown how infrastructure projects were created and distributed among those who supported the ruling party. To ensure that their interests are protected, senior party members are given directorship positions in the companies. In addition, retired bureaucrats are also given positions due to their close relationship with state institutions. This provides space for the ruling party and the capitalists to benefit from the infrastructure development.

I have also analysed the views of professionals, residents and knowledge workers on Cyberjaya's development. First, I have discussed the effects of political influence and management problems within their organisation on professionals involved in the city



development. They are left in a dilemma either to follow their professional conduct or surrender to their political masters' pressures. At the same time, internal problems within their organisation have frustrated the professionals and created a predicament which finally affects the morale of people involved in the knowledge-based cluster.

Second, although Cyberjaya was developed and highlighted as a knowledge-based city, it does not seem to provide even the basic facilities required for its residents. The most striking need which is not available in the city is affordable housing. Religious and medical needs are also neglected in the city. In addition, the ICT element, which was supposed to be the backbone of Cyberjaya development, is not felt among people living in the city. All this has created frustration among Cyberjaya's residents. They do not seem to feel there is any difference living in the city compared to other cities.

Third, by applying statistical analysis, I have managed to capture the frustration felt among knowledge workers in Cyberjaya. Ethnically based cluster development has created dissatisfaction among different ethnic groups.

Finally, Cyberjaya's infrastructure development shows that the capitalists chosen to lead the project use the opportunity to make profits. Infrastructure projects are built once the market value and demand increases to gain the highest profit. For example, I would argue that they purposely did not build the housing facilities because they wanted to drive the price higher and make the maximum profit, which is purely capitalist in nature.

Thus, this chapter illustrates how political interference and crony capitalism affects knowledge-based cluster development. This is reflected by the experiences of the professionals, residents and knowledge workers living and working in the Cyberjaya cluster.

## Chapter 5:

### Intelligent City with Intelligent People

*“I have a dream! A dream of Malaysia as a global talent hub”.*  
*Mohd Najib Abdul Razak, Prime Minister of Malaysia*  
*24<sup>th</sup> April 2012*

#### 5.1 Introduction

Cyberjaya was developed on the principle of integrating the elements of man, nature and technology (MDeC, 2008). It is the intention of the architect of Cyberjaya to blend all the three elements and create an environment which has a balanced ecosystem and the latest ICT infrastructure. The city intends to provide an attractive working and living environment for the people involved in the ICT business (Norhafezah Yusof, 2010). It is envisaged to be a regional ICT hub by providing a world class living and working environment and the first in a series of smart cities in Malaysia with ICT as the basis. The state believes a knowledge society and economy can be created by using ICT as the tool, and Cyberjaya is to be the first intelligent city of Malaysia (Bunnel, 2006, King, 2008). The concentration of highly educated and productive people is the key to the growth of knowledge-based cities (Yigitcanclar, et.al, 2007). They are the main contributors towards ensuring that creativity and technical capacity are developed and contribute towards creating and sustaining a knowledge-based urban development and economy.

It has been more than a decade since Cyberjaya was developed, and most of the main physical infrastructure such as the roads and office buildings are already functioning well. A tour of Cyberjaya would prove the size and also the substantial number of international ICT companies in operation. The existence of companies like Dell, IBM, Satyam, AT&T, Fujitsu, NTT and Ericsson is obvious with their impressive buildings and visible signage. Apart from the companies, Cyberjaya also houses Malaysia’s first and only multimedia-based university, the Multimedia University. At first glance, visitors to Cyberjaya will be impressed with the size of the city, the number of buildings, and the landscapes and facilities provided. By providing ICT infrastructure, the planners assumed they could create and offer a knowledge-

based environment. Does the assumption materialise in the newly built city? Does technology really contribute towards creating a knowledge-based environment?

The questions which this chapter will try to answer are as follows. *Is Cyberjaya a knowledge city? Does ICT influence the knowledge-acquiring process? How do people working in Cyberjaya acquire ICT knowledge? How does online technology influence knowledge-sharing in Cyberjaya? Does the Malaysian multi-ethnic society have an influence on the knowledge-sharing activities? How do people in smaller groups share their knowledge?*

The questions will be answered in different sections of the chapter. The chapter begins with a discussion on the profile of the people working in Cyberjaya. The understanding will help to assess the influence on the knowledge-acquiring and sharing activity. It will then focus on the factors contributing towards knowledge-sharing in different types, origins and sizes of companies. The chapter will proceed with a discussion on the influence of the local culture and technology on knowledge-sharing. It will conclude by evaluating the knowledge-sharing flows in an R&D team. Overall, the chapter intends to understand and evaluate the sharing activity at the micro level, i.e. the organisation and individual level.

## **5.2 Intelligent City with Intelligent People**

One of the fundamental characteristics of a knowledge city is the diversity of the population (Ergazakis et al., 2006). Diversity can be evaluated through the age of the population, level of education and other characteristics such as multi-ethnicity and internationalisation of the population. Evers et al. (2010) hypothesised that ethnic diversity has a positive impact on innovation, social mobility and economic development. In a study using population census data from the years 1970 and 2010, they have proven that the ethnic diversity in Kuala Lumpur and Klang Valley has declined and residential areas have become segregated. The impact of such a decline towards the overall economic development of the region is something to ponder. As one of the latest townships built by the state in the Kelang Valley region from Greenfield, Cyberjaya presents an opportunity for an interesting look into the impact of diversity on the overall development.

My fieldwork has shown that Cyberjaya is a very young and productive city based on the population living and working there. As can be seen in Table 5.1, the majority of people working in Cyberjaya are between the ages of twenty-one and thirty-two years old. The figures indicate that almost 70% of the population are from that age bracket. The vibrancy of Cyberjaya is shown in its ability to attract this young and productive population, especially among ICT graduates. This also shows the positive impact of the policy requiring ICT companies to be based in Cyberjaya in order to be granted the MSC Malaysia status. In an interview with the human resource manager of AT&T located in Cyberjaya, she stated that 70% of their staff are local graduates, and most of them are thirty-three years old (Personal communication, 03 November 2009).

Most of the people interviewed during the fieldwork agreed that Cyberjaya is attractive in terms of the number of IT-based companies. According to Mr Chesa, who works with Hewlett-Packard Multimedia Sdn Bhd, 'I like Cyberjaya because there is a lot of IT companies' (Personal communication, 04 December 2009). The city ability to attract a young and productive population should be complemented with the availability to meet the social and recreational needs of the age group. Sadly, Cyberjaya still lacks social facilities such as recreational locations, affordable eateries and meeting points. The limited social activities are more visible during the night, and Norhafezah Yusof (2010) concluded her observation of Cyberjaya as comparing it to a 'ghost city during the night'.

#### **i) Physical environment**

The focal point of Cyberjaya is limited to certain areas due to the regimented zoning plan of the city. The original development method of Cyberjaya which involved selling the land in different parcels has also contributed towards creating a dispersed rather than concentrated development. The main focus is the infrastructure development. The original agricultural land was cleared for the infrastructure work before the buildings were built. This has created a bare land with an artificial landscape that does not contribute towards creating an environment conducive to pedestrians. In their study of the Kuala Lumpur city centre, Illyani Ibrahim and Azizan Abu Samah (2011) concluded that land cover conditions influence the urban temperature, which then contributes towards the occurrence of an urban heat island. Based on their study, a similar conclusion can be made about the conditions in Cyberjaya, which is

located within the Greater Klang Valley Region. The distance, weather conditions and overexposed pedestrian walkways do not contribute towards encouraging people to go to the focal point areas, such as the main eatery and central business district. The limited choices and expensive prices of foods also contribute to the lack of interest among people working in Cyberjaya to patronise the main focal point. Ms Shih, an R&D Engineer in the SME Building, made a relevant remark:

*Here we don't have variety of food to choose from. We have Old Town<sup>69</sup> but the food is expensive (Personal communication, 28 December 2009).*

Cyberjaya's lack of social facilities further detaches the people working in Cyberjaya, especially among the younger population, from the main fabric of the city. The limited number of residential areas and the expensive prices attached to the properties further discourage people from making Cyberjaya their residence. All these elements create an unattractive environment and could jeopardise the chances of creating a vibrant and innovative city.

## **ii) Knowledge workers: Educational background**

Table 5.1 also provides information regarding the educational backgrounds of the study sample. Cyberjaya has a high percentage of people with a post-secondary level of education. They make up almost 99% of the sample. The majority of them have a bachelor's degree. A small number of them have only high school certificates and are primarily doing clerical or administrative jobs. This shows a high concentration of knowledge workers in Cyberjaya if the level of education were to be used as an indicator. The education level and age group of people working in Cyberjaya shows the positive results in line with the policy makers' intentions.

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<sup>69</sup> Old Town White Coffee is a Malaysian-based food and beverages chain. It serves local cuisine with a sleek Malaysian *kopitiam* (coffee shop) ambience.

**Table 5.1: Age group and highest level of education**

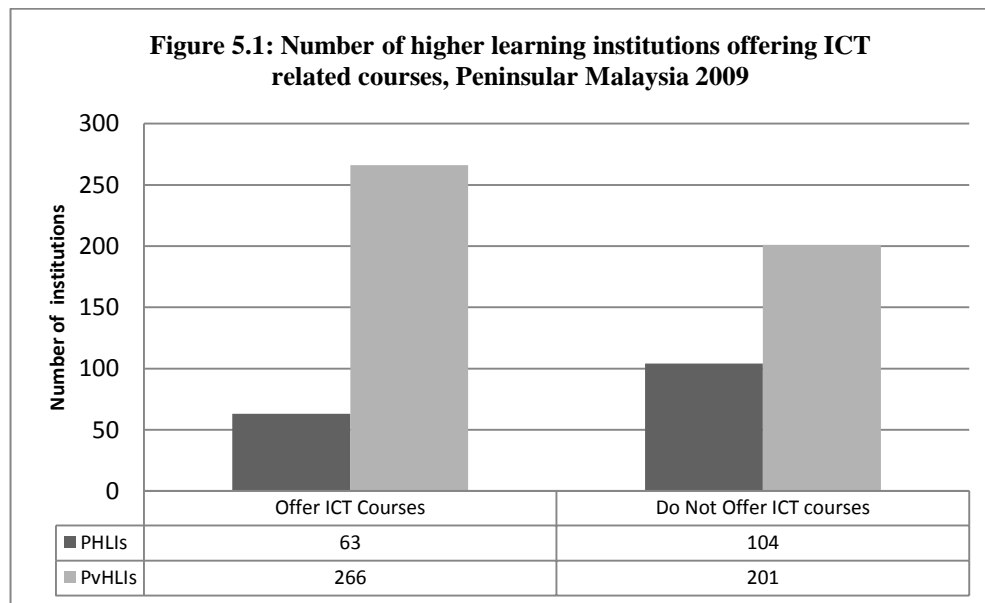
Age group (years)	Highest level of Education						Total
	Bachelor's degree	Master's	Advance Diploma	Diploma	Certificate	Others	
20 and below	0	0	0	1	0	2	<b>3</b>
21 - 23	21	1	0	3	0	1	<b>26</b>
24 - 26	117	0	0	3	1	0	<b>121</b>
27 - 29	90	16	1	3	1	1	<b>112</b>
30 - 32	58	9	1	7	1	0	<b>76</b>
33 - 35	34	6	2	2	0	0	<b>44</b>
36 - 38	17	10	0	5	1	1	<b>34</b>
39 - 41	7	2	0	1	1	0	<b>11</b>
42 - 44	2	0	1	0	0	0	<b>3</b>
45 and above	5	5	1	1	0	1	<b>13</b>
<b>Total</b>	<b>351</b>	<b>49</b>	<b>6</b>	<b>26</b>	<b>5</b>	<b>6</b>	<b>443</b>

Source: Field data, 2009.

Cyberjaya has successfully attracted local graduates to work in companies located within its boundaries. Based on the survey, 76% of the graduates did their post-secondary studies in Malaysia, compared to 24% who studied abroad. The fairly high number of foreign university graduates working in Cyberjaya correlates significantly with the age group. One of the reasons is that ICT education at the university or post-secondary level is relatively new compared to other field of studies in Malaysia. For example, at the University of Malaya, the bachelor's degree in ICT course started only during the 1990/1991 academic year, even though the Computer Centre began to function as early as 1965 (Universiti Malaya, 2011). The government also provided scholarships for Malaysian students to go abroad to study ICT based courses, especially before the liberalisation of the higher education sector in the late 1990s.

The other reason for a fairly high per centage of foreign university graduates working in Cyberjaya is due to the fact that companies prefer to hire foreign university graduates compare to their local counterparts. Foreign university graduates are considered the 'cream of the crop' (The Star, 13 June 2011), and local graduates often lack the necessary skills; thus, it is more feasible for companies to hire those with a foreign degree (Hoo et al, 2009; Rahmah Ismail et al, 2011). Based on these arguments, quite a substantial number of foreign-trained graduates work in Cyberjaya. However, the high per centage of local graduates working in Cyberjaya

correlates with the concentration of higher learning institutions offering ICT based courses in Peninsular Malaysia, as discussed earlier in Chapter 3. ICT became the buzz word in higher education after it was popularised in tandem with the introduction of MSC Malaysia. The special emphasis on and popularisation of ICT has encouraged sudden interest among school leavers to take ICT courses at the post-secondary level. Almost 40% of public and 60% of private higher learning institutions in Peninsular Malaysia offered courses related to ICT during the period of the fieldwork, as shown in Figure 5.1.



Sources: Ministry of Higher Education, 2009, Ani Asmah (ed.), 2009 and field data, 2009<sup>70</sup>

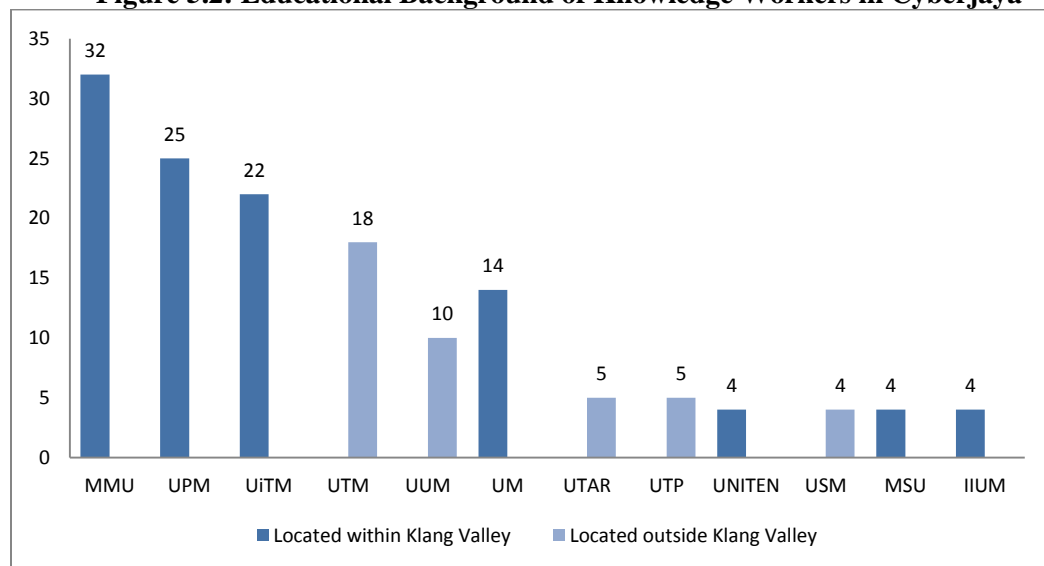
The liberalisation of higher education and the introduction of the Private Higher Educational Institution Act, 1996, have given the private sector a wider role in higher education in Malaysia (Abdul Rahman Haji Ismail & Mahani Musa, 2010). The change has helped the mushrooming of private higher learning institutions in Malaysia, and ICT is seen as the best course to attract the number of students interested in pursuing their post-secondary studies (Norshima Zainal Shah, 2008). The government interest and reform in Science and Technology (S&T) policy especially in the late 1980s and early 1990s (Felker & Jomo, 2007) also helped to increase the number of students pursuing ICT-related studies. Basically, ICT-related studies

<sup>70</sup> Data compiled through individual websites from April-December 2009. Institutions refer to those managed by the Ministry of Higher Education and offering courses at the post-secondary level.

expanded in tandem with the overall development policy that helped to generate a favourable environment.

Universities and other higher learning institutions within the Klang Valley provided the majority of knowledge workers surveyed during the field trip, with Multimedia University (MMU) leading the others. Figure 5.2 shows the detailed information of higher learning institutions that provided knowledge workers for Cyberjaya. The top three are MMU, UPM and UiTM, all of which are located within the Klang Valley region.

**Figure 5.2: Educational Background of Knowledge Workers in Cyberjaya**



Source: Field data, 2009.<sup>71</sup>

MMU seems to accomplish its function as a provider of knowledge workers for Cyberjaya. These also prove the success of some of the graduate training schemes provided by MDeC<sup>72</sup>. Even though the programmes are open to graduates from all institutions of higher learning in Malaysia, the locations of MMU and UPM make it more convenient for graduates from both universities to participate in the programme compared to their counterparts from other higher learning institutions. Higher learning institutions located within the Klang Valley provide 74%

<sup>71</sup> Only 54% out of the 327 respondents who graduated locally gave details of the name of their higher learning institutions. For higher learning institutions with different branches, the location of the main campus is used for the purpose of calculation.

<sup>72</sup> Some of the programmes are MSC Malaysia undergraduate skills programs (USP), MSC Malaysia undergraduate apprenticeship and development programme (UGRAD), MSC Malaysia graduate trainee programme (GTP), MSC Malaysia job camp (JC) and MSC Malaysia Industry-Academia collaborations (IAC).



of the knowledge workers in Cyberjaya compared to the rest of the institutions in Malaysia. The substantial number of ICT companies and various training programmes available offers employment opportunities for graduates within the Klang Valley, as can be seen from the high number of graduates from the region’s higher learning institutions working in Cyberjaya.

The employment opportunities are growing with the expansion and growth of companies. For example, IBM has announced its intention to invest RM1billion that will create 3,000 job opportunities (Bernama, 10 November 2011), and Dell is ‘expected to expand and grow’ (The Star, 18 November 2010) in Cyberjaya.

### iii. Knowledge Workers: Gender and Ethnicity

Another interesting feature of Cyberjaya is the reflection of gender, multi-ethnic and nationality diversity of the knowledge workers. Table 5.2 shows that ethnic Malay is the majority, which reflects the overall population of Malaysia.

During the fieldwork, observations revealed that the majority of the SME companies in the Technopreneur Building own or employ Malays. Same observation was made with start-up companies located within the MMU Campus. Though companies in Cyberjaya are guaranteed of unrestricted employment of local and foreign knowledge workers under the Bill of Guarantees (BOG, MSC Malaysia 2011), most of the companies still employ a significant number of Malays. This may also be the result of various educational opportunities available for them to further their studies in the field. Hence, a pool of knowledge workers among the Malays in the field is created.

**Table 5.2: Gender and Ethnicity**

Gender	Ethnicity					Total
	Malay	Chinese	Indian	Other Bumiputera	Others	
Male	119	73	56	3	6	<b>257</b>
Female	113	52	17	0	4	<b>186</b>
<b>Total</b>	<b>232</b>	<b>125</b>	<b>73</b>	<b>3</b>	<b>10</b>	<b>443</b>

Source: Field data, 2009

In Malaysia, the civil service is dominated by Malays due to preference given through the quota systems. The quota systems, which ensure that 80 per cent are Malays initiated by the British, have allowed them to dominate the civil service (Noore A.S, 2008). The figure is higher among PTD Officers, who occupy decision-making positions in almost all ministries and federal agencies. Some writers estimate that they dominate 85 per cent of the total key positions in the Malaysian Civil Service (Lim & Ramon, 2010). Due to the imbalance in racial composition in the Malaysian Civil Service, it is normal for companies to employ Malays if the job requires dealing with government agencies.

Companies employ the Malays to ensure speedy approval for ICT-based projects and to enhance the chances of getting government funding and procurement. Most ICT-based projects and funding is handled by the Ministry of Science, Technology and Innovation (MOSTI). A quick check on the organisation chart of the ministry shows that only three out of twenty-six people holding the senior management post are non-ethnic Malay. Even then, they are in charge of non-significant functions, namely International, Development and Sea to Space Division<sup>73</sup>. This shows how strong the Malays are in determining the main policy with regards to ICT development in Malaysia. Liew (2003) concluded the use of affirmative action policies based on ethnicity has led to a 'high level of alienation and low levels of social and political trust' between the main ethnic groups in Malaysia. Hiring ethnic Malays definitely benefits the companies when dealing with government agencies. Dr Kuru, an Indian national who owns an IT-based company in Cyberjaya, described his experience:

*The biggest problem is that they choose the people and not the product i.e. if they have contact. It is not based on merits. Here, you must know the people then they will take you. Favouritism is too much especially with the Bumiputera (Personal communication, 07 January 2010).*

This proves the importance of having a good rapport with the authorities to gain funding and the necessary assistance.

Table 5.2 also provides the gender perspective of the respondents. Male respondents form 58 per cent of the total population. It is interesting to notice that most of the SSO, support services

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<sup>73</sup> [www.mosti.gov.my](http://www.mosti.gov.my) dated 05 July 2011.

and internet-based business companies, due to the nature of their work, are dominated by male workers rather than female. The requirement of these companies to work during the night and the limited housing available in Cyberjaya fail to attract female workers. During the fieldwork, it was observed that forty-four out of the fifty-one Media Monitors workers were male<sup>74</sup>. The same could be seen in Forte Tech Solutions Sdn Bhd, a Malaysian-based Internet Business Company. Out of the ninety-seven companies surveyed during the fieldwork, only fifteen have a majority of female workers compared to male. The rest of the companies are still male-dominated, and five of the companies do not hire any female workers at all. Most hardware design and software development companies are dominated by males. These companies require a lot of programming work, which most female workers are reluctant to do. As voiced by Ms Airah, an Operation and Technical Executive in Star Fusion Sdn Bhd:

*I like IT, but I don't like doing programming work. So now basically I get what I want. Programming is too much for me. It cracks my head* (Personal communication, 30 December 2009).

#### **iv) Knowledge Workers: Foreign Expatriates**

Cyberjaya also attracts a significant number of knowledge workers from other countries. As can be seen in Table 5.3, Indian IT workers are numerous in Cyberjaya, contributing more than 70% of the foreign experts working there. The establishment of major IT companies, such as Dell, IBM and Satyam, combined with Malaysia's reputation as an ICT centre attracts Indian IT specialists to come and work in the city. This was explained by Mr Faro, a system analyst of an SME company:

*I have never heard of Cyberjaya. I wanted to work abroad so I choose to come to Malaysia. I just want to go abroad. I know there is IT companies in Malaysia* (Personal communication, 06 January 2010).

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<sup>74</sup> Media Monitors is one of the foreign companies involved in support services activities.

Although Malaysia manages to attract IT specialists to come and work in Cyberjaya, most of them are here on a short-term basis. Here is an observation of Mr Jayaraman, MDeC senior executive:

*All the Indian IT people they are here just for a while. They want to have impressive resume saying they have work abroad. They don't care; it is just a transit point for them...* (Personal communication, 21 May 2009)

My study proves that Cyberjaya attracts knowledge workers not only from developing but also from developed countries, such as Great Britain and Singapore, as shown in Table 5.3. In their research on the importance of diversity and high technology growth in urban areas, Florida and Gates (2003) found a strong correlation between foreign-born talents and technological success. Hence, Cyberjaya's ability to attract foreign talent and retain them is crucial for the long-term growth of the city.

**Table 5.3: Nationality and Religion**

Nationality	Religion					Total
	Islam	Buddhist	Hindu	Christian	Others	
Malaysian	233	93	42	38	6	<b>412</b>
Permanent Resident	0	0	0	2	0	<b>2</b>
Indian	2	0	17	2	0	<b>21</b>
Iranian	2	0	0	0	1	<b>3</b>
British	0	0	0	0	2	<b>2</b>
Singaporean	0	0	1	0	0	<b>1</b>
Bangladeshi	1	0	0	0	0	<b>1</b>
Indonesian	0	0	0	1	0	<b>1</b>
<b>Total</b>	<b>238</b>	<b>93</b>	<b>60</b>	<b>43</b>	<b>9</b>	<b>443</b>

Source: Field data, 2009.

Knowledge workers in Cyberjaya represent the multi-religious nature of Malaysia, as shown in Table 5.3. The majority identify with Islam, the official religion of Malaysia. The city was not only created as a development project for Malaysia but also as a role model for other Muslim

countries (King, 2008, Bunnell, 2003). Malaysia is seen as moderate and one of the most developed and progressive members of the Organisation of Islamic Countries. Cyberjaya's appeal as an Islamic cyber city attracts IT expert from other Muslim countries. In addition to Muslims, it also attracts people from different faiths, and these create a city with a diverse background.

Thus, my fieldwork has shown that Cyberjaya is rich with diversity. The job opportunities available appeal to young, well-educated individuals from diverse ethnic and religious backgrounds with almost balanced gender distribution. Although studies have proven that diversity does contribute to technological advancement and Cyberjaya has fulfilled the requirement, that itself does not contribute to innovation if there is no interaction between the diverse populations. The subsequent part will unveil the knowledge-acquiring practices among people working in Cyberjaya and later discuss the factors involved in the knowledge-sharing process.

### **5.3 Acquiring ICT Knowledge: Conventional Versus Virtual**

Cyberjaya is a city embedded with ICT technology. At least, this is what the policy makers try to portray. It was developed from a greenfield into a modern city with all the necessary ICT facilities. The political elites used Cyberjaya to legitimise and construct the Malaysian definition of being a developed country with ICT as the foundation. Bunnell (2004) argued that MSC Malaysia with Cyberjaya as the focal point was created with particular 'ideological meanings and symbolism'. The idea then penetrates into the society through various forms. Education is one of the forms used to highlight the importance of ICT and how both MSC Malaysia and Cyberjaya contribute towards achieving the status. As discussed earlier, the government was instrumental in ensuring the rapid growth of ICT education since the 1990s. Today, ICT is offered at all levels of education from the certificate level all the way to post graduate. Different forms of support were given to those interested in pursuing their studies in the field.

The people working in Cyberjaya are a reflection of the success of the policy. The majority of them are highly educated. As shown in Table 5.4, almost all the respondents in the survey have post-secondary qualifications, and the majority of them are in ICT-related fields. The figure

also shows that 79% of the people working in Cyberjaya have a bachelor's degree with information technology and computer science as the most common skills acquired. Only six people, i.e. 1% of the respondents, do not have a post-secondary qualification. Most of them work as clerical support personnel. Even though the sample does not contain anyone with a PhD qualification, during the fieldwork I encountered one interviewee who holds a PhD in artificial intelligence. The level of education among people working in Cyberjaya is evident in AT&T, an American-based telecommunication company. According to the human resource manager:

*We currently employ 230 staff. All of them are professionals with engineering background (Personal communication, 03 November 2009).*

The same was also observed in Ericsson during the fieldwork. According to the receptionist, all the clerical staff, i.e. those without post-secondary qualification, are hired on a temporary basis through a job-hunting service. The permanent or technical staffs normally have post-secondary qualification. This shows the educational level of people working in Cyberjaya and reveals that having a post-secondary qualification is a must in order to be part of it.

**Table 5.4: Level of Education and Field of Specialisation**

Field of higher education specialisation	Highest level of Education						Total
	Bachelor's degree	Master's	Advance Diploma	Diploma	Certificate	Others	
Information science / technology	127	11	5	9	1	0	<b>153</b>
Computer science / engineering	109	22	0	4	0	0	<b>135</b>
Communication science / engineering	12	5	0	0	0	0	<b>17</b>
Multimedia / creative multimedia	30	1	0	0	1	0	<b>32</b>
Electrical / electronic engineering	26	3	1	3	1	0	<b>34</b>
Other related ICT specialization	11	1	0	2	0	0	<b>14</b>
Other non-related	36	6	0	8	2	6	<b>58</b>
<b>Total</b>	<b>351</b>	<b>49</b>	<b>6</b>	<b>26</b>	<b>5</b>	<b>6</b>	<b>443</b>

Source: Field data, 2009.

Another factor that contributes towards acquiring ICT knowledge is experience. As can be seen in Table 5.5, the respondents' experience and job functions varied. Out of the 406 people who

responded to the question, the survey recorded that more than 50% of the respondents have between one and six years of working experience. Companies in Cyberjaya require workers to have at least some years of working experience in order to be able to function well within the organisation. Furthermore, experience contributes to less training requirements and better productivity. This observation was shared by most of the human resource managers or companies' owners interviewed during the fieldwork.

**Table 5.5: Main Job Function and Years of Experience**

Job function	Years of working experience							Total
	Less than one year	1 - 2 years	3 - 4 years	5 - 6 years	7 - 8 years	9 - 10 years	More than 10 years	
Management	10	5	15	12	10	9	22	<b>83</b>
R & D	10	6	8	6	8	6	4	<b>48</b>
Programming	19	17	15	11	4	5	3	<b>74</b>
Analyst	2	7	11	8	4	5	4	<b>41</b>
Design	7	4	4	5	3	1	6	<b>30</b>
Technical support	12	10	18	15	9	14	8	<b>86</b>
Other ICT related	3	3	6	6	3	1	2	<b>24</b>
Others	3	2	7	1	1	3	3	<b>20</b>
<b>Total</b>	<b>66</b>	<b>54</b>	<b>84</b>	<b>64</b>	<b>42</b>	<b>44</b>	<b>52</b>	<b>406</b>

Source: Field data, 2009.

For the workers, experience also allows them to obtain better remuneration or be promoted to higher positions. Mr Reeza, Team Leader at AT&T, described his experience:

*My degree was in general IT but I have programming background based on my working experience. I have work with Solsis Malaysia. I was doing programming and development work there. Then, I worked for Shell IT and doing helpdesk work. I was there for two years. In 2004 I was a system engineer and was promoted to the technical lead and remote access in 2007. In 2008, Shell IT outsources the whole thing to AT&T so I technically joined them (Personal communication, 04 December 2009).*

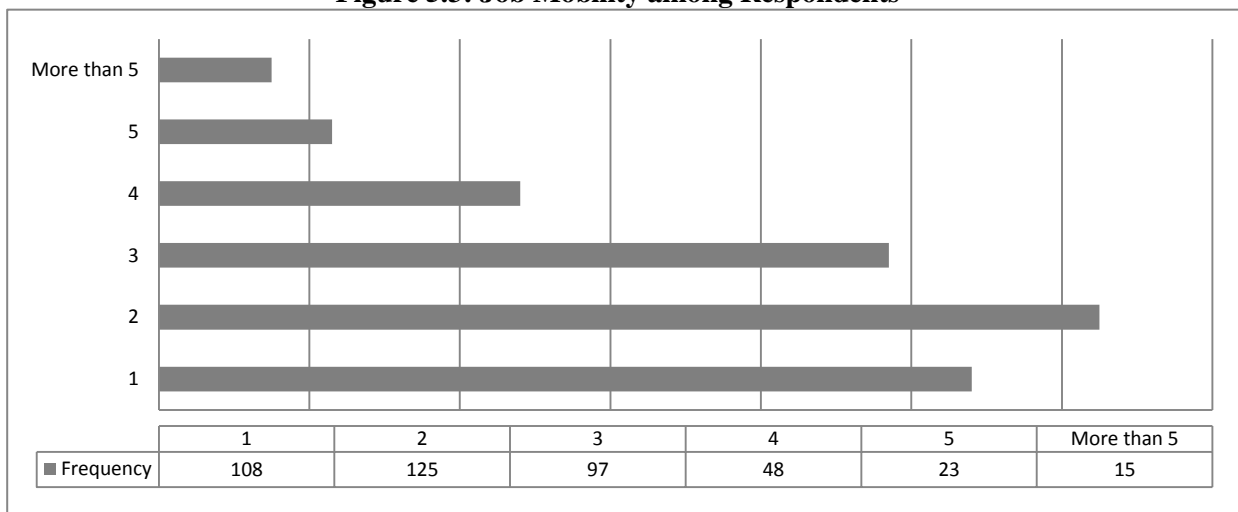
Individual knowledge and experience have a strong correlation with team dynamics. My study proves that both are important and the lack of either one has a negative implication to the

team's overall performance. It creates dissatisfaction and tension among team members. As voiced by Ms Hasminah, an Assistant Manager at TM Net Sdn Bhd:

*Well, some of the group member lacks the basic IT knowledge. This is especially among the junior staff. They just don't know. I don't know what they have learned in the university (Personal communication, 14 October 2009).*

In addition to the years spent in a particular profession, experience is also gained through job mobility. The chance to work in different companies exposes one to different working cultures and methods of doing tasks. Subsequently, this will enrich and enhance personal experience and work quality. Figure 5.3 shows the number of companies for which the respondents have worked. Based on the responses, almost 50% of them have worked in two to three companies prior to joining their current one. Moreover, 52% of the respondents declare that they have changed jobs in different companies within Cyberjaya. This proves that the high number of companies offers easy job mobility among people working there.

**Figure 5.3: Job Mobility among Respondents**



Source: Field data, 2009.

Cyberjaya is filled with some of the biggest and most reputable companies involved in ICT. The ability to be able to secure a job in one of these companies also contributes towards job mobility. Mr Chesa, an electronics engineer in Hewlett-Packard (HP), shared his job-hopping experience:



*My first job after graduating from a Korean University was as an engineer in M-mobile. I did R&D work. The company is located in Shah Alam. The job didn't last long. I do not want to continue working there. I want a stable job. I joined Samsung in Klang. The job lasted for only five months. After Samsung, I joined an IT company in Cyberjaya for a few months. I was offered to join BAT in TPM (outside of Cyberjaya). It lasted for a year. Then I was offered a job in Dell Cyberjaya and subsequently I secured a better paid position in HP Cyberjaya (Personal communication, 04 December 2009).*

It was observed during the fieldwork that some workers do not want to work in small companies for various reasons. In one interview, an R&D engineer expressed disappointment with her current company because of the unchallenging job specification and insufficient workload. She believed that her current knowledge would not help her future career advancement. She opined that this is because the company's performance is deteriorating compared to previous years. Here is her observation of the company performance:

*Last year we had lunch together. We celebrated birthday, New Year, together with the directors. We have more events. My workloads were more. This year the company is just 'so and so' (Personal communication, 28 December 2009).*

Hence, the two interviews show that workers changed jobs based on the company's stability, working environment, job specification, location and financial returns. The criteria listed mostly refer to situations at the company level and show strong connections between the situations within companies with job mobility. Location is not the determining factor if the company is able to provide the best working environment, stability and the preferred remuneration package. Cyberjaya is well-connected to all major satellite cities in the Klang Valley. As a result, many people commute to work on a daily basis. This shows that Cyberjaya's location is not a hindrance to creating a dynamic cluster.

As discussed, two of the most common modes of acquiring ICT knowledge among people working in Cyberjaya are through formal education and working experience. My fieldwork

shows that only 5% of the total respondents attend courses related to their work on a part-time basis. The majority of the respondents depend on their prior knowledge through education and experience to complete their daily tasks. During the fieldwork, it was also observed that some company owners do not believe in sending their workers for training. They believe the best way to acquire the right skills and knowledge about ICT is through doing the tasks. Dr Kuru, the Managing Director of Asian IT, made a relevant remark:

*There is no need to send them for training. If a person cannot study then they are no good. That person is not useful* (Personal communication, 07 January 2010).

Most of the companies surveyed during the fieldwork share Dr Kuru's viewpoint that on-the-job training is the best method to acquire the right ICT knowledge and skills.

Some companies have a structured and well-organised work-based training programme. This is done to ensure that team members in a project are aware of the technical skills required from them. For example, a statement from Mrs Nora, an Assistant Manager in TM R&D, illustrated this training method:

*We also provide training on a project basis. The course will be identified by the respective head of projects. The budget is covered by the project cost* (Personal communication, 10 December 2009).

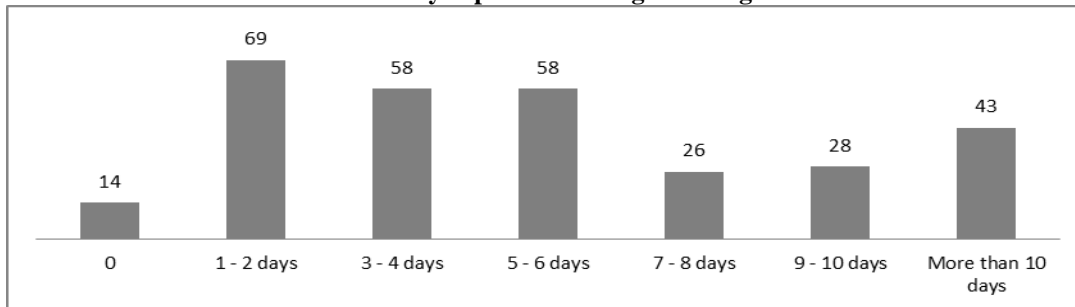
On the other hand, MDeC and some private companies provide free training for smaller companies which do not have the capacity to send their workers for training. Information about the training sessions are circulated through their companies and posted on Cyberjaya's networking site. This form of training is popular among people working in Cyberjaya, and 50% of the respondents have attended at least one course between 2008 and 2009. Mr Muhamad, a network engineer in AJV Multimedia Sdn Bhd, shared his experience:

*I have attended five courses in 2009. Each lasted for three days. Most of them are free. The courses are organised by MDeC and some private*

companies. The one organised by MDeC, I attended twice (Personal communication, 07 January 2010).

Most of the respondents spent between one to six days attending short courses or training related to their work in 2009. Figure 5.4 provides information on days allocated for training related to work. In the survey, 296 people responded to the question on the total number of days spent attending short courses, seminars, conferences or talks related to their work the previous year. The results show that a significant number of people working in Cyberjaya attended some form of training to upgrade their knowledge. Only a smaller portion of the sample, less than 4%, gave a negative response.

**Figure 5.4:**  
**Number of Days Spent Attending Training in 2008**



Source: Field data, 2009.

Thus, this section has discussed how people working in Cyberjaya acquire their knowledge related to their daily tasks. Although the city is embedded with all the latest ICT facilities and the majority of the workers are trained to utilise ICT in their daily tasks, it is evident that conventional forms of knowledge-acquisition are still the best modes. Cyberjaya proves that ICT knowledge workers are not living in a ‘virtual’ world, as most would suggest. They still require face-to-face interaction and human contact to enhance and enrich their ICT knowledge. Technology does not seem to lessen the importance of human contact.

#### **5.4 Knowledge-Sharing à la Cyberjaya**

In order to determine the factors contributing to knowledge-sharing in Cyberjaya, a statistical method known as Principal Component Analysis (PCA) was used. PCA is used to reduce the

number of variables and detect structure in the relationship of the variables (Statsoft, 2011). It is basically a data reduction or structure detention method (Statsoft, 2011).

**Table 5.6: Data for Principal Component Analysis**

<b>Input data</b>	<b>Detailed classification</b>
<b>Demography</b>	<ul style="list-style-type: none"> <li>• Age</li> <li>• Level of education</li> </ul>
<b>Experience</b>	<ul style="list-style-type: none"> <li>• Number of years working</li> <li>• Number of years in the current company</li> <li>• Number of companies worked</li> <li>• Number of companies worked in Cyberjaya</li> </ul>
<b>Social network</b>	<ul style="list-style-type: none"> <li>• Number of friends within company</li> <li>• Number of friends outside the company</li> <li>• Number of close friends</li> </ul>
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>• Number of days attending courses or training</li> <li>• Library membership</li> </ul>
<b>Technology</b>	<ul style="list-style-type: none"> <li>• Access to internet</li> <li>• Access to online social networks</li> <li>• Online membership</li> <li>• Online social network and knowledge-sharing</li> </ul>
<b>Company</b>	<ul style="list-style-type: none"> <li>• Size</li> <li>• Origin</li> <li>• Internal process and procedures</li> </ul>

PCA also helps to avoid redundancy in argumentation because it manages to cluster different variables into factor variables especially with variables that are considered as ‘stand-alone’. This will eventually allow easy description of the data because the different variables will be ordered to explain based on their correlation into factors contributing towards the results rather than individual variables explaining the same correlation.

In the beginning, a total of 18 variables were run through the analysis. The variables were chosen based on personal observation and interviews during the fieldwork. These are deemed influential and expected to correlate with each other. Table 5.6 shows variables covering all main criteria including individual information, organisational characteristics and access to technology.

The results extract a total of four principal components with total eigenvalues greater than 1.0 after using PCA. Table 5.7 shows that the four principal components generated 75% of the

total variance of original independent variables. Based on the results, specific categories were determined using the rotated component matrix as depicted in Table 5.8. Kaiser criterion was used because the sample size is more than 250; the number of variables is less than 30 and only eigenvalues more than 0.7 are retained as suggested by Field (2000).

The principal component one (1) is significantly related to individual background which covers variables associated with *number of years working* in the company (0.902)<sup>75</sup>, *age* (0.871) and finally *job mobility*, which refers to the number of companies they have worked for (0.780). These variables can be group and classified into **individual experience**. This factor accounts for 30% of the total variance of the original dataset.

The second principal component (2) is strongly correlated to *company size* (0.843) and *origin* (0.839). The two variables can be referred to as **company type**. These factors describe 18% of the total variance of the original dataset.

The third principal component (3) is strongly correlated to *internet access* (0.739) and *level of education* (0.723). Both variables can be grouped as **infrastructure**. These factors describe 14% of the total variance of the original dataset. The infrastructure factor can be divided into two, i.e. 'soft' and 'hard'. Basically, hard infrastructure refers to internet access, whereas the level of education is categorised as soft infrastructure.

Finally, **internal procedures** represent the fourth principal component (4) based on the variable that composed the component. The factor refers to *internal procedures* (0.944) which encourage knowledge-sharing or otherwise in the organisation. This factor accounts for 13% of the total variance of the original dataset. Hence, the four factors that influence knowledge-sharing in Cyberjaya are individual experience, company type, infrastructure and internal procedures.

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<sup>75</sup> Loading is the correlation between the factor and the variables i.e. the highest loading characterises the factor. Figures taken after rotation.

**Table 5.7: Total Variance Explained**

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative%	Total	% of Variance	Cumulative%
1	2.561	32.014	32.014	2.362	29.519	29.519
2	1.341	16.757	48.771	1.467	18.335	47.854
3	1.079	13.483	62.254	1.084	13.546	61.399
4	1.003	12.538	74.792	1.071	13.393	74.792
5	.769	9.608	84.400			
6	.551	6.884	91.284			
7	.461	5.765	97.050			
8	.236	2.950	100.000			

Extraction Method: Principal Component Analysis.

**Table 5.8: Rotated Component Matrix<sup>a</sup>**

	Component			
	(1) Individual experience (29.5%)	(2) Company type (18.3%)	(3) Infrastructure (13.6%)	(4) Internal procedures (13.4%)
Level of Education			<b>.723</b>	
Age	<b>.871</b>			
Working experience	<b>.902</b>			
Job mobility	<b>.780</b>			
Access to internet			<b>.739</b>	
Internal procedures				<b>.944</b>
Company size		<b>.843</b>		
Company origin		<b>.839</b>		

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

As mention earlier, PCA has shown eight variables which are important to knowledge-sharing in Cyberjaya and can be grouped into four influential factors.

The main factor that influences knowledge-sharing is individual experience. It shows that the number of years spent working in the company correlates strongly with an employee's

tendency to share their knowledge. This result also reveals that age is the second most influential variable contributing to individual experience. Next, in the questionnaire, the respondents were also required to specify the number of companies they have worked for after secondary education. This is then recorded as their job mobility trend, this resulting in them having more experience which increases the employee's tendency to share knowledge.

The second most important factor based on the analysis is company type. Within this factor, the leading variable is the company size, which refers to the number of employees and results in the company's ranking as micro, small, medium or large. The result shows that the number of people working in a company has a significant effect on knowledge-sharing activity. In addition to their size, company origin also has an impact, as reflected in the PCA results. Hence, whether a company is local or foreign-based is the second most significant variable within the company type. The different types of companies have different set of rule governing knowledge sharing among their employees. Most of the time foreign and well established companies have a strict rule when it comes to knowledge sharing.

The strongest variable in the infrastructure component is access to the internet. As most companies located in Cyberjaya rely heavily on the internet for their daily operation and the majority of people working there have ICT educational backgrounds, the facilities play a vital role in their daily life. Thus, the result shows that physical infrastructure like internet access highly correlate with an employee's motivation to share knowledge. In addition to physical infrastructure, the result also demonstrates a strong correlation between levels of education with knowledge-sharing activity in Cyberjaya. Therefore, infrastructure is the third most important factor after individual experience and company characteristics which contribute significantly towards knowledge-sharing among people working in Cyberjaya. It does not only involve physical but also soft infrastructure facilities.

The final factor which influences knowledge-sharing activity in Cyberjaya is related to the working environment within the company. The variable that has the highest and strongest correlation to this factor is the company's internal procedures related to knowledge-sharing. In the questionnaire, the respondents were asked whether the company has formal procedures to ensure lessons learned are passed to others doing similar tasks.

In conclusion, PCA has managed to capture and rank factors and variables which have significant roles in knowledge-sharing activity in Cyberjaya. Although only four factors and eight variables were captured, the outcome is neither exclusive nor exhaustive. In effect, there are other variables that contribute to knowledge-sharing. The remaining section will analyse them based on observation and in-depth interview data. Nevertheless, the analysis gives an overview of the knowledge-sharing activity in Cyberjaya and has clustered them into four main factors which will be used as a guide. The following section will discuss the factors thoroughly based on the listed variables and also others which were not found to be suitable to cluster together into factors through PCA.

## **5.5 What Makes Knowledge Flow in the ICT Companies?**

### **i) Moral and religious values**

In the previous section, we discussed factors contributing to knowledge-sharing at the macro level in Cyberjaya. Basically, knowledge-sharing is influenced by individual, physical and organisational factors. PCA ranked the factors based on their importance. The result is similar to research done by Chay et al. (2005) who analysed knowledge-sharing in an organisation from the social capital dimension, i.e. agency, structural and relational. Although in the research by Chay et al. (2005) it was found that individual knowledge-sharing motivation highly depends on the reward, especially among highly competent employees, in my research, the moral and religious values signify a vital role.

The observation of a small team suggested that employees are motivated to share knowledge out of their moral and religious beliefs. Ms Khaty, managing director of a multimedia company, described her experience:

*If there are others who want to know what we do they are most welcome. I am willing to share my knowledge with the society. We should share our knowledge. We do all this for Allah, not only for the monetary reason (Personal communication, 17 December 2010).*

The same reason was also given by the head of the R&D team in Telekom Malaysia. He stated that it is his moral obligation to share with the rest of the team members because he cannot



keep everything that he knows to himself. Nevertheless, it was observed that in both cases, all the team members were from the same ethnic group, and all of them were Muslims. Unfortunately, the fieldwork did not manage to capture the same obligation in a multi-ethnic group. This would be an interesting case study for future research.

The results also confirmed that those with the same shared values develop intimacy and trust easily. Hence, having the same religious beliefs, language and culture helps each team member to understand the others better. This also creates a high level of trust among team members. During the interviews, it was observed that two of the interviewees referred to the non-ethnic Malays as 'others' or 'them'. This shows a strong relation between knowledge-sharing among employees from the same ethnic group. The level of trust with an ethnic group is also enhanced by being close to each other.

## **ii) Hierarchy**

The other thing that influences knowledge-sharing in smaller groups is the hierarchy that exists in the respective team. A team is normally small, roughly in a group of four to eight people. This allows for some form of coordination, and the team is normally headed by somebody who is the most senior. This does not necessarily correspond to age but mostly refers to individual experience in the same field. The hierarchy in the team is structured into a team leader and senior and junior members. Daily operation of the team is influenced by the structure of the hierarchy. Hierarchy ensured that the team functions effectively. However, based on the interviews and observations, hierarchy does not necessarily mean that the leader makes the decisions. Informal, problem-based discussions typically occur on a daily basis, and the decisions are often made collectively. The hierarchy helps to create a line of order within the team. Although the team operates collectively, the team members are always reminded that there is a superior person within the team. Should there be a requirement to make a decision between opposing views, the final decision is made by the team leader. The leader plays an important role in ensuring the team dynamics are maintained at all times.

Hierarchy also helps new team members learn the 'tricks of the trade'. The seniors will normally guide them to function effectively within the team. The number of junior members is small, so it is easier for them to be properly trained to become effective members of the team.

It was observed during the interviews that even the youngest member had at least three years working experience. This shows that most team members are familiar with the work they do. Some of them have been together in the team for six years. This contributes towards a familiar and 'family'-based environment within the team. The long duration of being part of the same team creates a sense of togetherness, trust and reliability among them. This allows open discussion during meetings. The team members also understand their team leader and other members well. They know how and when to approach each other should they require further input or have something to highlight in private.

### **iii) Trust**

The third element in a productive team is trust. Long years spent together as a team play a critical role in ensuring that every member of the team is familiar with each other. The levels of trust are built through a long period, and once they are familiar with their team members, the relationships go beyond the formal office environment. Trust also helps avoid conflict among team members. This is a very important element in a team. Conflict can create feelings of unease among the team members and can be counterproductive, especially when it involves such a small group. Often, the team members are also friends and spend time outside of the office. They know each other's families, and it is common for them to visit each other's homes outside of the normal working hours.

This trust among team members allows every team member to voice his or her opinion openly and contribute towards creating a dynamic team. Trust also creates a willingness to help each other when facing problems.

However, there are instances when the experience of the senior team members tells them that a junior member's idea is going to fail. In some cases, the senior team members may not oppose these ideas from junior team members during group discussion. They will avoid conflict during discussions and meetings. Then they may try to meet the junior members in private to explain their opinions in a very subtle way. This example shows the importance of physical proximity to creating trust among members of a team.

Being close to each other allows team members to read the body language and emotions of different members of the team. This will then allow for better communication and the avoidance of conflicts among them. In an extended period of time, this will create trust among the team members and enhance their compatibility.

#### **iv) Level of maturity**

The fourth element which influences knowledge-sharing in a smaller team is the level of maturity. As mentioned earlier, team members comprise individuals with various working experience. This indirectly produces different levels of maturity, especially among new team members, and influences knowledge-sharing activity. The level of maturity plays a vital role in ensuring that every single member of the team is aware of his or her duties.

Different levels of maturity influence the quality of the outcome. Team members are free to express their opinions during discussion, but the level of acceptance varies based on the team's maturity level. Most of the time, senior members become passive during discussion if the new members are too vocal or too expressive. They require a more mature way of discussion which focuses on the content of the discussion rather than the way it is being discussed. Nevertheless, this itself does not discourage knowledge-sharing but rather allows greater flexibility among the senior members to accommodate the needs of the junior members of the team.

It was also observed during the fieldwork that the senior team members often act as mentors rather than seniors. They willingly share their knowledge with the new team members. The new members are properly guided to ensure the dynamic of the team is not broken. The age gap between team members can be a barrier in knowledge-sharing, especially at the beginning of a new project or when a newcomer joins the team. The senior member with their experience will try to reduce the worries or lack of self confidence among the junior members by allowing them to do basic work before continuing to a more difficult task.

#### **v) Face-to-face communication**

It was observed during the fieldwork that certain industries require frequent face-to-face communication to ensure the quality of work produced. This observation is pertinent especially

in the creative multimedia industry. Ms Khaty, the creative director of her own company, shared her experience:

*Face to face communication is still very much needed. In this business i.e. animation, production etc. things always changed so face to face communication helps us to control the quality. It really helps in term of quality control (Personal communication, 17 December 2010).*

Face-to-face communication shows the significant role of physical proximity. In most high-end industries, especially the multimedia or R&D-based businesses, face-to-face communication is a requirement for the team members to perform well. It guarantees that the quality of work is discussed thoroughly at the actual time and that any changes or amendments are made accordingly. Face-to-face communication also ensures the right and proper knowledge flows among team members.

One team leader also mentioned the significant of having ‘empathy’ while having discussions and this can be done only through face-to-face communication (Personal communication 23 October 2009). Furthermore, according to him, it is uncomfortable to discuss or communicate with someone without face-to-face communication and it improves the results of their work. He further explained that members of his team use internet communication only for the purpose of circulating project briefs. Team members will then do the necessary reading or searching for the relevant information. The dynamic of the whole process is achieved during the brain storming sessions, which are done face-to-face with all team members present. Hence, this emphasis on face-to-face communication shows the importance of physical attendance in ensuring the effectiveness of discussions as shown in Photo 5.1 (a) and (b).

#### **vi) Equipment and testing**

Companies involved in R&D require high-speed computers and special equipment. In some cases, special laboratories are needed while doing testing for certain projects. Telecommunication-related research is one of the best examples of a field that requires special equipment and laboratories.

Photo 5.1(a) & (b): Knowledge-sharing session in one R&D Company.



Face-to-face communication allows members of the team to evaluate each other's opinions in real time and make the necessary adjustments or corrections. This saves time and produces better results.

Source: Field data, 2009

Some tests involve facilities from different laboratories with different equipment. Most pieces of equipment are sensitive, expensive and require security. It makes sense to house the equipment in the same building and provide centralised security facilities. The researchers involved in such a test need to monitor the progress on a daily basis and also discuss the experiment frequently with other team members. Physical proximity is very important to ensure that the R&D work progresses accordingly.

Most R&D engineers involved in telecommunication projects do not engage in only one project. They are also involved in different projects, and their expertise is required by other team members as well. Being physically close to each other helps to utilise their expertise and contribute significantly to knowledge-sharing.

My fieldwork also revealed that physical proximity among ICT engineers allows better monitoring of product quality. One good example is the creative multimedia industry, which involves teamwork. All comments, input and recommendations are best given while preparing the product. This requires team members to work together, and every input is considered crucial. During the preparation stage, team members might do their parts separately, but once the product develops, they need to have frequent discussions and meetings. Hence, at this level of production, they must be physically close to each other. Ms Hasminah, an assistant manager for a creative design team, made a relevant remark:

*Our work requires a mixture of technical and non-technical staff. It helps to develop creativity. Any split in the group will create individuality and egoistic. This work requires interesting environment* (Personal communication, 14 October 2010).

Furthermore, being physically close allows team leaders to monitor the quality of work and performance of the team's other members. This will provide them with better evaluation especially in the R&D and creative multimedia industries, which are concerned not only with the final products but also the whole process as it can be used for future reference. As mentioned earlier, the industries requiring both teamwork and individual performance do not only refer to an individual's part of the work but also how well that individual works in the group. Hence, physical proximity is important to ensure better understanding of individual capability to function as a member of a team rather than as a person. This also helps the management decide on the necessary training for the respective staff based on their performance in a group. Mrs Nor of TM R&D human resource department explained this:

*In TM we have a 360 degree evaluation. The evaluations are done by the respective head of department, colleague and subordinates. Those who got 75% points and below are required to attend certain course based on their weaknesses* (Personal communication, 10 December 2009).

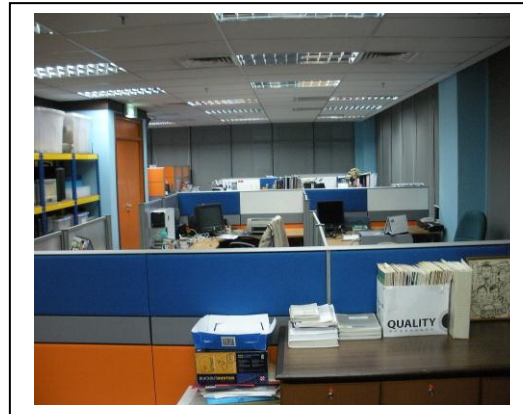
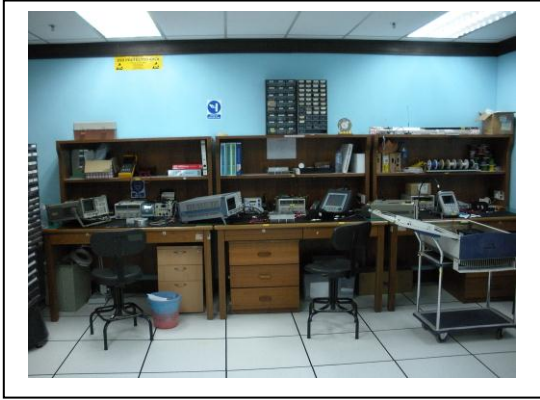
Thus, the example shows the importance of physical proximity while evaluating the staff performance. It is difficult to evaluate the staff performance if they are located in a different geographical location. Therefore, as proven by the discussion in this section, face-to-face communication and physical attendance is required even among ICT companies to ensure the creation of team dynamics. This also allows the management to rectify any weaknesses within the team to provide better results.

## **vii) Enabling physical environment**

The physical layout of a building contributes significantly to knowledge-sharing but seldom gets the right attention in knowledge-sharing research. Interaction requires a space and environment which are conducive in order for it to flow easily. Although the physical layout of Cyberjaya as a city is not conducive for interaction due to limited places and other factors as discussed at the beginning of this chapter, the fieldwork has proven that most companies have barrier-free interiors and encourage face-to-face interactions within the building. This view is shared by Mr Tej, business operations manager of Hewlett-Packard Multimedia:

*In HP open communication is the culture. Employee can freely talk to managers. You can see our office layout. We sit in cubicles, even the managers. There are no barriers. They can talk to any managers. It is an open door policy (Personal communication, 07 December 2009).*

It was also observed during the fieldwork that team members sit in the same physical areas. In one of the R&D-based companies, team members are assigned to different sections and sit next to one another. The cubicles between employees are separated only by a low partition which allows members to communicate without barriers, as shown in Photo 5.2 (a), (b), (c) and (d). In addition, every section is also provided with a round table for small group discussion.



*Photo 5.2 (a), (b), (c) and (d):* Physical layouts of the office contribute significantly towards knowledge-sharing. Barrier-free, easy access allows better face-to-face communication. Office furniture does help build closeness during discussions.  
Source: Field data, 2009.

The area surrounding the discussion table is also accompanied by a glass cupboard where some relevant documents are installed for easy reference. Discussion which requires multimedia equipment is done in a centralised shared facilities room. Locating all the research team in one building also ensures that common resources are utilised efficiently.

Research which requires laboratory facilities is normally located in front of the office areas. This allows easy access for team members, but the entrance is controlled through a common key which is in turn controlled by the team leader.

Finally, it was also observed during the fieldwork that most large companies have their own social facilities, such as an eatery, a gymnasium and a prayer room. Employees have access to all these facilities, which are normally located on the ground floor of the building. This creates informal space for the knowledge workers to ‘connect’ with their colleagues. It also allows



them to share their thoughts and emotions in an informal setting. Friendship and trust are built by having such a favourable environment apart from their formal office space.

In short, this section has discussed the knowledge-sharing environment in Cyberjaya. It covers the factors which were observed during the fieldwork and proves the importance of creating an enabling environment to enhance knowledge-sharing among knowledge workers.

## **5.6 Conclusion**

This chapter has argued that physical proximity is important even in ICT companies located in a geographical area embedded with ICT facilities such as Cyberjaya. The chapter began by introducing the city full of diverse knowledge workers. Job opportunities created by the different ICT companies attract young, well-educated males and females from various ethnic and religious backgrounds. This characteristic is the strength of this cluster. Either intentionally or not, the cluster has managed to create a unique character which fulfils the requirements of being successful as shown in other established ICT clusters in the world. Nonetheless, diversity itself does not necessarily contribute to innovation if there is no interaction among the workers, as shown in previous studies. Cyberjaya's lack of social facilities such as residential areas, focal points and recreational activities in addition to its dispersed development does not help either. The city is too 'formal' and 'fake' as it tries to portray modern and high-tech living at the expense of the local culture (Norhafezah, 2010). A previous study by Norizzati et al. (2009) has proven the importance of the informal communication that happens during activities outside of the office environment in encouraging knowledge-sharing. The limited number of places to ensure active interaction among people working in the city further creates a void in knowledge flows within the cluster. The city does not have a 'soul' – just like a rose without the scent, it is beautiful but nothing interesting.

The chapter proceeded by discussing the influence of ICT in acquiring knowledge. The results proved that conventional methods of acquiring knowledge are still important. The latest ICT facilities, skills and exposure do not lessen the significance of face-to-face communication in acquiring new knowledge in ICT. People trained and living in an ICT-based city such as Cyberjaya does not necessarily live in a virtual world. They still regard human contact and physical proximity as essential to enhancing their individual knowledge. The virtual world

only expands their avenue to knowledge acquisition but does not replace the importance of human contact.

The discussion then continued by analysing the data with a statistical analysis known as PCA. The analysis managed to group and rank the different variables into four main factors based on their importance. It covered the physical and social input of the knowledge workers' environment. The results suggest that individual experience is the most important factor and ranks it at number one. Nevertheless, the unique outcome of the analysis is the significance of internal procedures in the companies, which proves that knowledge-sharing activity depends highly on internal procedures present in the companies. This shows that physical proximity is significant to ensure that employees comply with the internal procedures. It also proves that physical proximity is used as a tool to encourage knowledge-sharing within the organisation and discourage knowledge-sharing outside it.

Finally, the chapter concluded by analysing knowledge-sharing activity within a smaller group. The result proves that, apart from face-to-face communication, knowledge flows – especially strategic knowledge in R&D-based companies – are limited to smaller groups. It also shows that the process happens in informal flows rather than formal especially among R&D team members. Furthermore, certain industries, in particular R&D and multimedia-based companies, depend highly on face-to-face interaction on a daily basis to ensure better quality and results. The other factor that is often neglected in discussions about physical proximity and knowledge-sharing is the layout of the inside of the building. Physical layouts and building interiors enable knowledge-sharing within the company. This study has proven how a barrier-free layout and interaction-friendly furniture encourage knowledge-sharing especially among small groups. Physical proximity alone is not enough; it must be accompanied with an enabling environment to ensure intimacy which will then contribute to developing trust among members and finally enhance knowledge-sharing.

To conclude, this chapter has discussed the importance of physical proximity among ICT companies. It has managed to show that ICT facilities fail to compensate for the importance of physical proximity. Face-to-face interaction is the most important mode in acquiring new knowledge, and it contributes towards creating dynamic knowledge-producing and sharing groups. Physical proximity ensures intimacy even among ICT-based businesses and personnel.

Enhancing the physical proximity by ensuring proper internal layout and barrier-free architecture can improve the intimacy levels among team members and further contribute to knowledge-sharing.

## Chapter 6:

### The Knowledge Network: In or *Out*?

#### 6.1 Introduction

Policy making in Malaysia is highly centralised in that the federal government is superior to the state government (Huat and Chin 2011; Loh, 2010; Siddiquee, 2008; Jomo and Hui, 2003). Centralised planning is the norm, including in industrial development. It is seen as the best way forward for industrial development including knowledge-based clusters in post-independence Malaysia. The success of industrial estates and FTZs has encouraged policy makers to further enhance the approach with detailed macro-level planning which initially focuses on specific areas and labour-intensive industries (refer to Chapter 2 for a detailed discussion).

The top-down approach practice in the development of Cyberjaya, however, is against the view of some prominent researchers in the field, such as Breshan, Gambardella and Saxenian (2005), who believe that such an approach towards knowledge-based cluster development is most likely to fail. Furthermore, most arguments with regard to cluster dynamics focus on the economic relationships and fail to capture interpersonal relationships among actors involved within the cluster. Motoyama (2008) further points out that most of the arguments have been weak in explaining how to develop the interconnectedness or network aspect which depends on the power relations of different actors in the cluster (Bathelt, 2005).

Reid, Smith and Carroll (2008) proposed the social network analysis as one method to analyse clusters in a way in which the economic technique mostly neglects. Dahl and Pedersen (2005) further remind us that the discussion should also include informal social networks which do contribute significantly towards knowledge-sharing at the individual level. It can be further enhanced by incorporating the knowledge mapping technique as suggested by Evers, Gerke and Menkoff (2011) into social network analysis.

If interconnection (Porter, 2000) and transfer of tacit knowledge (Evers, 2008) are the keys to a successful cluster, then they should be main indicators of a dynamic cluster apart from having a sophisticated physical infrastructure as argued by Saxenian (2004).

*I propose the use of social network analysis to understand knowledge workers' movement from the periphery to the core.* The discussion will proceed by focusing on different spaces for social networking to take place, i.e. physical, social and institutional. The discussion will then centre on access to social networks which hinder or facilitate knowledge-sharing. Finally, I will conclude the chapter by analysing the social network pattern in Cyberjaya and proving how the process itself shows imbalances that reflect the core and periphery in action.

In order to visualise the social network pattern, respondents to the questionnaire were instructed: '*Kindly, choose three of those with whom you normally discuss work-related issues and provide their company name and address*' (refer to the Appendix II for a complete version of the questionnaire)<sup>76</sup>.

The question produces answers sufficient to map a web of contacts and gain a more accurate picture of the extent of the social network (Dahl & Pedersen, 2004). The data were then converted to spatial data using the GIS geo-coding function <sup>77</sup>(Parker & Asencio, 2008). The data were also complemented by observation within the company premises and social facilities as well as interviews with engineers working in different companies.

## **6.3 Knowledge Flows through Social Networks in a Cluster**

### **6.3.1 Social Network**

The term *social network* was first used by John A. Barnes, an anthropologist who studied the connections among people on a Norwegian island in 1954 (Knoke & Yang, 2008). In Germany, the Social Anthropology Department of Cologne University ran an extensive research project on network analysis in the 1970s and 1980s (Schweizer, 1989). Research in the field progressed slowly and linearly until the 1990s, when interest in the field was renewed and has continued ever since (Wasserman, Scott and Carrington, 2005).

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<sup>76</sup> Originally, they were requested to list the friend's name and company address, but it was discovered during the pilot survey that the majority of respondents were reluctant to disclose their friends' details, stating confidentiality as the main reason. Hence, the question was redesigned to ensure at least the most important data were captured.

<sup>77</sup> The process of identifying locations on a map by using the latitude and longitude coordinates is known as geo-coding. The locations were determined based on the addresses given by the respondents.

A social network is basically the structure of relationships among different actors (Wassermann & Faust, 1994; Knoke & Yang, 2008). The structure is made up of social nodes or units, such as persons, teams, organisations or their combinations, as well as ties or connections among them, such as communications, dependence or vicinity (Kukkonen, Lyytinen & Loo, 2010). The exercise of power is essential in the relationships whether they are competitive, collusive or cooperative (Taylor, 2008).

For the purpose of this research, a social network is defined as the relationship among the knowledge workers spatially located in Cyberjaya. The relationship is determined by formal and informal relationships that exist among them. By formal, I refer to those relationships created because of their work, while informal refers to relationships created through friendships, alumni, social clubs and religious activities. I concur with the view that the relationships among different members represent the synergy of a cluster (Reid, Smith & Carroll, 2008), and the network strength and openness are both positively correlated with the overall growth of the clusters (Eisingerich, Bell and Tracey, 2010).

Furthermore, relationships and social networks among members in a knowledge-based cluster are vital to maintaining the dynamic of the cluster due to the tacit knowledge flow between knowledge workers. Evers, Gerke and Menkhoff (2010) emphasised the networking aspect of clusters by referring to ‘knowledge hubs’:

*Knowledge hubs are local innovation systems that are nodes in networks of knowledge production and knowledge sharing. They are characterized by high connectedness and high internal and external networking and knowledge sharing capabilities. As meeting points of communities of knowledge and interest, knowledge hubs fulfil three major functions: to generate knowledge, to transfer knowledge to sites of application; and to transmit knowledge to other people through education and training (p: 684).*

This distinction has the added advantage of pointing out that there may be clusters with no or limited networking. As a result, it has created an imbalanced distribution of knowledge flow in Cyberjaya. This issue will be discussed at greater length in one of the following sections.

### 6.3.2 Boundary of social network in Cyberjaya

This section will discuss the importance of social networks in Cyberjaya. It begins by discussing how the idea to develop knowledge-based clusters started from the social networks of elites who managed to transmit their ideas to the core of power. Next, I will analyse how social networks function to ensure the cluster retains the form of a core and a periphery at the spatial and organisational level.

Firstly, the idea behind Cyberjaya development evolved from informal discussion among the elites of the society through their social network. Tengku Mohd Azzman Shariffadeen (2011), Founding Director General of the Malaysian Institute of Microelectronic Systems (MIMOS), shared his experience on how his social network helped his proposal become a reality:

*Early in 1984, I attended a tea party at the invitation of the Minister of Trade and Industry. The Minister, Tengku Tan Sri Ahmad Rithauddeen, happens to be an uncle. Coming round to talk, he quickly shared some thoughts that troubled him. He was concerned about the electronics industry, which did not appear to be moving forward as much as his Ministry thought it should. He asked if I had any idea about it. This was the moment I had waited for (p.373).*

He further elaborates how the informal discussion secured him a meeting with the Prime Minister and subsequently prompted the idea to establish the Multimedia Super Corridor, which created Cyberjaya. This shows the significant impact of social networks especially among the society's elites. An idea by a group of people changed the development model of the whole country and established a new form of industrial development. It also marked the beginning of the core and periphery of power which was developed using ICT as the catalyst.

Spatial boundaries of clusters are frequently defined politically (Reid, Smith & Carroll, 2008; Sternberg, 2008). The planning and development process often involves demarcation by the authorities rather than an industry's dynamic. Cyberjaya provides exemplary evidence of a cluster created politically by the elites of the society which did not develop naturally like most established ICT clusters in which organisational and institutional frameworks function as the facilitator rather than the creator.

As a result, most local-based companies, especially the start-ups and SMEs, are unable to sustain business and progress independently. Ms Khaly, the Managing Director of a multimedia company, made a relevant comment:

*My company was actually established under a special programme introduced by MDeC and MARA. MDeC provides all the training and capital whereas MARA takes care of the office. That was then, now I am approaching the end of the programme. I have to manage everything by myself* (Personal communication, 17 December 2009).

Thus, she finally decided to move out of Cyberjaya in February 2010, citing financial reasons as the main cause. The programme that was set up to produce *bumiputera* technopreneurs is in line with the affirmative policy favouring the Malay majority. However, high reliance on institutional support fails to ensure their companies sustain growth, especially in knowledge-based clusters. These facts corroborated my field data analysis. It also helps prove that companies established in clusters through centralised planning require more than just financial and training assistance to grow, especially in a knowledge-based cluster. I discovered through my discussion with her that having the necessary technical background and assistance does not necessarily produce positive results in knowledge-based companies.

Furthermore, the situation in Cyberjaya became complicated because of the changes in the political landscape after the 2008 election. For the first time in Malaysian history, that election saw the opposition party take over five states and win the majority of seats in the Federal Territory<sup>78</sup>. This created a new paradigm in the federal-state relation, especially in Selangor which is the most developed state in Malaysia and where Cyberjaya is located. Hence, the strong centralised government model that has been practiced ever since Malaysian independence has taken a new direction and impacted Cyberjaya's growth.

The strong central government is still derived from 'racialist ideas' (Beng, 2011: 213), 'bullying' (Loh, 2010: 135), 'minimalist federalism' (Yeoh, 2010: 183) and disappearing state rights in policy making (Woo, 2009). The imbalanced federal-state relation has caused uncertainties in Cyberjaya's development especially during the early stages of power change at

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<sup>78</sup> The opposition party won the states of Penang, Selangor, Perak, Kedah and Kelantan in the 2008 election.



the state level. It is seen as a federal government project, and state governments do not have a substantive role in its development.

Centralised planning, which is a norm in Malaysian industrial development, has created a group of sceptics towards the current state government. The main political party, which has been ruling the state and country since independence, is seen as the ‘saviour’. For example, a senior member of the Cyberjaya Residents Association believes:

*Cyberjaya should be managed as a Federal Territory. Now everything is politically motivated. It is not developing because it is the Federal Government investment but the State Government interest is not here. The State Government is not helping* (Personal communication, 24 December 2009).

She and her husband, who holds a top management position in MDeC, live in an expensive bungalow overlooking the beautiful lake bordering Putrajaya and proudly declare that they have hosted Mahathir and his wife during one of the Hari Raya<sup>79</sup> celebrations. She openly expressed her dislike of the state government and blamed everything on the political situation. This stance is an example of how elites who benefitted from Cyberjaya’s development not only feel threatened with federal-state relations but also want the power to be given back to the ruling party. This also proves that the centralised planning system has created elites acting as ‘ICT tsars’ within the cluster.

Thus, spatial boundaries constructed politically have created a reciprocal relationship between the political elites and the ‘ICT tsars’. It also creates a business community, especially among the Malays, that relies on institutional support rather than building individual strength. At the same time, most of their companies do not have the drive to grow further and contribute significantly towards creating and developing ICT knowledge.

Furthermore, the physical boundaries created opportunities for social networks to start and to be used as tools to decide which members of the cluster should be at the core and which should be pushed to the periphery.

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<sup>79</sup> Hari Raya is a local name for Eid to celebrate the end of the Holy month of Ramadhan.

In natural clusters, however, the determinant factors vary from government policy and non-government policy to ‘soft’ factors, such as the environment. Sternberg (2008) nonetheless concluded that there is no single determinant factor for the origin after studying ten knowledge-intensive regional clusters in the US, the UK, Japan, France and Germany. The tendency towards creating a cluster is economic in nature, i.e. creating employment and links which will encourage a high degree of networking and tacit knowledge spill over to stimulate innovation (Shahid Yusuf, 2008; Evers, 2008; Porter, 2000). In terms of the element to create knowledge clusters spatially, Yigitcanlar (2009) listed the common strategies which include the following:

- i. Political and societal will,
- ii. Strategic vision and (dynamic long-term) development plan,
- iii. Setting-up of agencies to promote knowledge-based urban development,
- iv. Strong financial support, partnership and strategic investments,
- v. International and multi-cultural character of the city,
- vi. Creation of urban innovativeness engines,
- vii. Research excellence-universities, R&D institutions,
- viii. Metropolitan web-portal-e-government, e-democracy,
- ix. Value creation to citizens’ skill development, employment, social outcomes,
- x. Quality of place, life and affordable housing, and
- xi. Low-cost access to advanced communication networks.

Although the list is concise and covers all the fundamental factors, it somehow neglects the element of networking or inter-linkages among members of the cluster. Cyberjaya development, for example, has almost all the criteria listed, but it does not produce the results expected from a knowledge-based cluster (refer to Chapter 2 for a detailed discussion).

Thus, in both naturally developing and planned knowledge-based clusters, networking functions as an interlock factor and the role of networks should not be discarded. Social networks contribute to knowledge-based urban development through knowledge flows.

Social networks also influence company performance, especially in a country such as Malaysia where ‘selective patronage’ and ‘rent seeking’ (Gomez, 2012: 79) are common in the business

community. The fieldwork has proven how ICT companies compete and struggle to obtain government-based tenders. It is considered a big success for ICT companies to secure them due to their scale and project amounts. During the interview with Dr Kuru, he highlighted the importance of social networks especially to ensure R&D work can be done smoothly:

*It requires a lot of work. You know, to develop an idea it requires 2 to 3 month. Then you need the support, if you don't get the grant then it will not help. You must have enough. The problem is sustainability; if I can roll out my product then I can make more money* (Personal communication, 07 January 2010).

He further stressed the importance of having connections with funding agencies for R&D projects. Apart from getting funding, social networks also create business opportunities for people who want to capitalise on ICT. Dr Kuru, for example, first came to Malaysia from India to be involved in an IT project and saw a business opportunity, so he decided to set up a joint venture company with a Malaysian partner. This proves how social networks help individuals to build businesses and create knowledge transfer opportunities. He further says that the ratio of employees in his company is 70% Malaysian to 30% Indian.

Having a PhD in artificial intelligence and teaching experience in a local university helped him to share knowledge with his employees in a structured way. When asked about the biggest project his company has secured, he pointed to the special software used by Malaysian Arm Forces Cooperative. He opined that business opportunity is created through social networks, especially with government agencies. He emphasised the importance of having the right connections to smooth business dealings through social networks.

Social networks also create opportunities for the latest technology to be applied in company products. This is true especially among creative multimedia companies. In one of the interviews, a company owner explained how she manages to utilise the latest technology in animation through her social network. It helps her to provide a better and higher quality product. Miss Khaty shared how her social network helps her animators learn the latest technology in the industry:

*I bring in people who are very talented and experience. Normally, they are introduced by my friends. So they would come and sit down with my staff and train them in the things that they are not familiar or good at (Personal communication, 17 December 2009).*

She further asserted that in the animation industry social networks are important to ensure one's survival in the industry. In addition to learning new technology, it also provides an opportunity for joint cooperation between small companies and major established animation companies. Major animation companies will usually outsource certain portions of their product, and this creates business opportunities for smaller companies like hers. The government supports to major companies also ensure that small companies can gain from the cooperation. Social networks also create opportunities for her products to be promoted globally. She highlighted how a foreign television company approached her about the possibilities of business ventures through her friends.

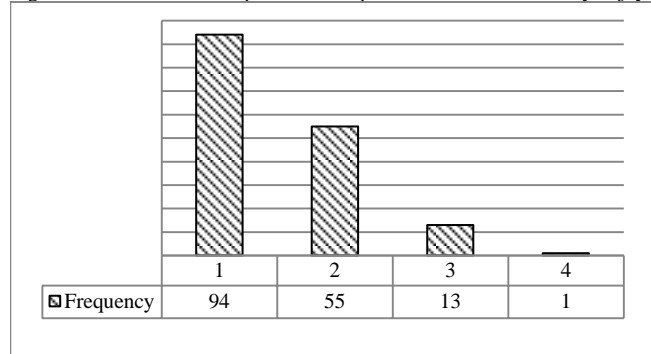
Hence, social networks function in various ways in knowledge-based clusters. In the case of Cyberjaya, I have proven how it creates opportunities for the elite to retain their power at the core by delegating resources at the periphery. It also creates a reciprocal relationship between the political elites and technocrats. While it creates business opportunities, it also extends the dependency attitude among certain ethnic groups. Nevertheless, social networks help to expand technology know-how among business owners and create wider opportunities for them to market their products. This situation shows the interrelation between what was planned by the elites and what transpired on the ground. In the subsequent section, I will further analyse my argument based on my empirical data.

### **6.3.3 Knowledge flows in Cyberjaya**

In this section, I will analyse how social networks among knowledge workers in Cyberjaya help to enhance the dynamics of the cluster. Friendship was used to differentiate the level of bonding between respondents and their social network. Basically, it was divided into friends and close friends. Statistical data were applied together with in-depth interviews and observations in order to better understand the data. This section begins by discussing the

physical space for social networks to occur and moves to social and institutional spaces that influence social networks.

Figure 6.1: Number of companies the respondents has worked in Cyberjaya



Source: Field data, 2009

The survey reveals that almost 52% of the respondents declared that they have worked in more than one company in Cyberjaya. It further disclosed that, out of the 163 people who responded to the question, 42% have worked in two companies or more in Cyberjaya, as shown in Figure 6.1.

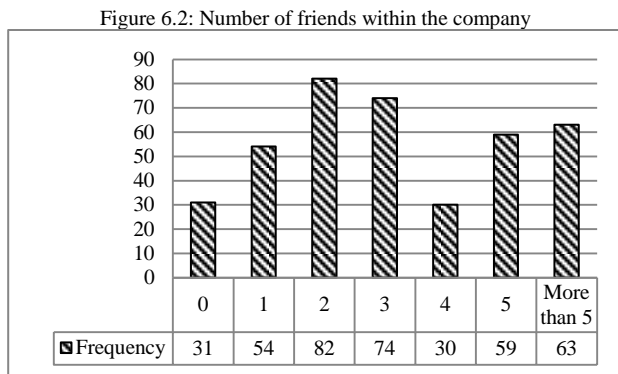
The result is further supported by in-depth interviews with some of the knowledge workers in Cyberjaya. Mrs Che, a manager in an American-based telecommunication company, cited salary and company global status as the reasons for her to change from a local-based company (Personal communication, 03 November 2009).

In addition to the two motives given, there are also reasons related to the company restructuring process happening in Cyberjaya. Mr Muhamad, a team leader at AT&T, shared a relevant experience:

*I have worked with Solsis Malaysia Sdn Bhd. I was doing programming and development work there. Then I worked for Shell IT and doing help desk work. I was there for 2 years. I was a System Engineer and was promoted to the Technical Lead and Remote Access in 2007. In 2008, Shell IT outsources the whole thing to AT&T so I technically joined them (Personal communication, 04 December 2009).*

Thus, Cyberjaya physically provided the space for social networking to happen. The large number of companies offers a chance for ICT graduates to search for the best place to work. This provides opportunities for their social network to expand and also further enhances knowledge flows within the cluster.

In addition to job mobility, the respondents were also requested to list a number of friends they have within the company and in Cyberjaya<sup>80</sup>. The result shows that more than 54% of the respondents have more than five friends within the company. The majority of them have between five and six friends, and almost 23% of them declare that they have more than ten friends within the company, as listed in Figure 6.2.



Source: Field data, 2009

Socialising and having friends among members of the company are traits which most companies require their employees to have. For example, some companies monitor their employees' socialising skills. Mr Asman, an administrative manager for an American-based SSO company, declared that the inability to socialise with others is considered a

problem in his company. He further explained that they do weekly monitoring, and employees found to have such a problem will be given advice (Personal communication, 07 December 2009). This statement shows that ICT companies encourage their employees to establish working relationships among each other to ensure they will be able to perform well in their jobs. Nevertheless, the internal networking is not done without limitation and differs in different types of companies.

In order to distinguish the networking, I have separated the variables into two main groups, either company or social. The three main variables related to company are type, size and origin. On the other hand, gender, ethnicity, age, education, experience, job mobility and job function are classified as social variables. The variables act as independent variables against the social network data and were analysed using cross tabulation and the chi-square test to determine the correlation.

<sup>80</sup> They were required to state the number of people with whom they normally spend time during lunch hours or in activities outside of their office hours.

Table 6.1:  
Results of chi-square test between company variables and number of friends

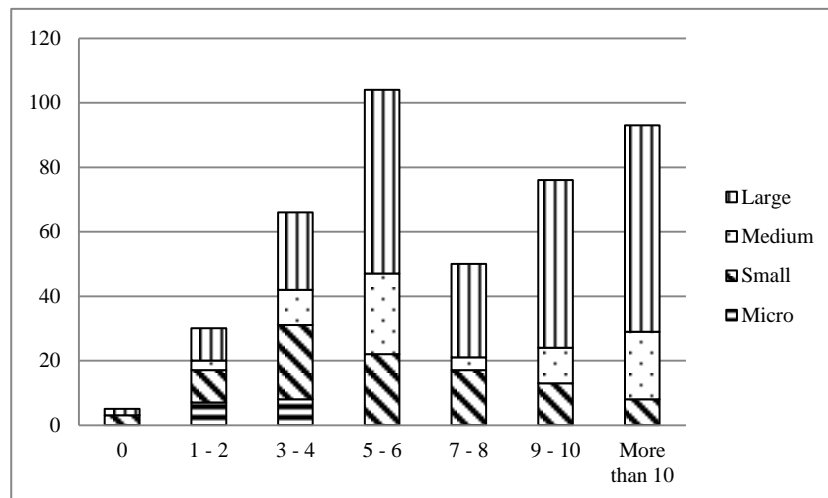
Company variables	Value	df	Asymp. Sig
Size	83.172	18	<i>0.000</i>
Sector	68.367	36	<i>0.001</i>
Origin	19.660	6	<i>0.003</i>

Source: Field data, 2009

Correlations between company variables and number of friends were examined using a chi-square test. As can be seen in Table 6.1, all the variables show significant correlation at 99% confidence level, which proves that company size, sector and origin influence employees' tendency to have more or less friends. The results also ranked company size as the strongest variable, followed by sector and origin.

Firstly, as illustrated in Figure 6.3, different sizes of companies in the survey show varied numbers of friends. The majority of respondents in the micro- and small-sized companies have fewer than four friends. In contrast, more than 80% of the people working in medium- and large-sized companies have more than five friends.

Figure 6.3: Company size and number of friends



Source: Field data, 2009

Furthermore, none of the employees in micro-sized companies and less than 10% of those from small-sized companies have more than 10 friends. On the contrary, almost 30% of those working in medium- and large-sized companies have more than 10 friends within their

company. It is quite obvious that employees make friends mainly in their workplace. A large company gives greater opportunities to make friends. Nevertheless, knowledge workers working in small companies find it easier to bond with their colleagues.

I also discovered that medium- and large-sized companies have organised non-work-related activities to enhance ties among their employees. They allocated special funds to organise activities, such as team building and annual dinners, to ensure that employees feel a sense of togetherness. Mrs Che, a human resources manager in her company, explained this:

*We conduct team spirit. The budget focuses more on gathering in and around KL or PJ. We have it twice a year. We have dinner and movie day (Personal communication, 03 November 2009).*

She further expressed the importance of such activities to improve employees' networking with others working in the same company. It helps them to familiarise with those doing similar work, especially for a company like hers, which just started to operate in Cyberjaya with a majority of new employees.

It was discovered during the fieldwork that most companies encourage social networks among employees. This is done through informal gathering on weekly, monthly or yearly bases. Some large companies even provide special funding for their employees to gather for informal recreational activities. Employees are encouraged to network internally to ensure a close-knit environment is created within the company. Large companies normally have a structured format to enhance social networking among employees compared to small companies. Apart from organised and large-scale activities, such as team building and annual dinners, there are also small group activities. This is sometimes organised by the employees themselves or a company administrator.

Nevertheless, knowledge workers working in small companies find it easier to bond with their colleagues. Apart from the small number of people to work with, the barrier-free physical space plays a major role in encouraging social networks among them. For example, it was observed during the fieldwork that companies located in the SME building and on the MMU campus provides a more conducive atmosphere for social networking among employees. The



physical layout and also the activities planned with the employees encourage social networking. It was also observed during the fieldwork that employees do spend time together outside of the office environment though sports activities and informal gathering on a daily or weekly basis. Sports activities are obvious especially among younger knowledge workers, as shown in Photo 6.1 (a), (b) and (c).

Photo 6.1 (a), (b) & (c): Sports activities in Cyberjaya



Sports and recreational activities are a major part of social networking among knowledge workers in Cyberjaya. Photo (a) show the young and active working populations using sports activity to reduce work pressure and also expand their social network. The procedural requirement to use sports facilities sometimes limits social network activities (Photo b). Sport activities are also used to create awareness of the existence of Cyberjaya among local school children, as shown in Photo (c).  
Source: Field data, 2009

I have also found out that some companies have social clubs which organise activities outside of the office environment. When asked how close he is with his colleagues, Mr Afi, an engineer working for a Malaysian-based SME company, answered:

*Yes, I am close with them, not only those working here but also those who used to work here. It's about networking. I am in charge of the sports activity in the office so I organise stuff like that. We go out for picnic, once in 2 or 3 months (Personal communication, 07 January 2010).*

He further declared that activities help them strengthen their relationship and mentioned popular recreational areas, such as Hulu Yam, Sungai Congkak and Morib as some of the places they have visited for picnics. The bond also helps to break the formal relationship that existed when they first started to work in the company.

I have observed the informal relationships among employees of the company during the interview session. The low-ranking employees address the engineers and officers informally either by their first name or *kak* or *abang* rather than *encik* or *puan*, which is a norm in most large Malaysian companies<sup>81</sup>. It should be mentioned that the company has a small number of employees, which contributes to creating an informal working atmosphere. It is only divided into two different sections, administrative and technical. The administrative section manages clerical matters, whereas the technical section handles all R&D work. When asked about the benefits, Mr Afi opined that social activities help solve their daily problems, both personal and work-related.

In another interview with a large American-based telecommunication company, I was told that all employees are required to attend a 'team spirit' course. Similar to the earlier company, they too organised such an activity within Kuala Lumpur and Petaling Jaya. Contrary to the smaller company, the large number of employees in the American company causes them to conduct their activities indoors at a hotel rather than outside in recreational areas. The company also organises an annual dinner and a 'movie day' for employees.

Hence, company size has a significant impact on social networking among people working in Cyberjaya. My fieldwork has shown how medium and large companies have a structured and well-organised method to ensure employees network together. One of the reasons is to ensure they can perform better and produce the results expected from them. It is also considered a trait that employees should have. On the other hand, in micro and small companies, the working environment and nature of their work enhance social networks naturally. In most cases, there is no clear indication that they are required to network by the company that employs them.

Secondly, the results show that people working in creative multimedia and software development companies have fewer friends compared to internet-based businesses, SSO and support services, as summarised in Table 6.2. It further reveals that almost 50% of people working in SSO companies have more than nine friends in their company, which influenced by the large number of people working in the companies. Another interesting finding is the high number of friends that people in hardware design companies have in comparison to creative

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<sup>81</sup> *Kak* or *abang* literally mean 'sister' or 'brother' and *encik* or *puan* mean 'Mr' or 'Mrs'.

multimedia and software development, all of which can be categorised as knowledge-intensive companies.

Hardware design requires employees to connect with more people in the company due to the nature of their work. It involves testing and laboratory work, which allows them to be acquainted with more people because different tests are required for various stages of product testing.

On the other hand, creative multimedia and software development companies have smaller numbers of employees and require them to work in small groups. They also operate on normal working hours and involve frequent discussions among team members. This limits the number of friends they have in the company.

Table 6.2: Company sector and number of friends

		Number of friends within the company							Total
		0	1 - 2	3 - 4	5 - 6	7 - 8	9 - 10	More than 10	
Creative multimedia	Count	1	3	9	8	4	3	8	36
	%	2.8%	8.3%	<b>25.0%</b>	22.2%	11.1%	8.3%	22.2%	100.0%
Software development	Count	2	11	29	21	8	13	14	98
	%	2.0%	11.2%	<b>29.6%</b>	21.4%	8.2%	13.3%	14.3%	100.0%
Hardware design	Count	0	1	1	2	2	6	9	21
	%	.0%	4.8%	4.8%	9.5%	9.5%	28.6%	<b>42.9%</b>	100.0%
Support services	Count	0	0	3	4	5	3	4	19
	%	.0%	.0%	15.8%	21.1%	<b>26.3%</b>	15.8%	21.1%	100.0%
Internet based businesses	Count	0	2	3	9	5	3	1	23
	%	.0%	8.7%	13.0%	<b>39.1%</b>	21.7%	13.0%	4.3%	100.0%
SSO	Count	1	11	15	51	17	44	48	187
	%	.5%	5.9%	8.0%	<b>27.3%</b>	9.1%	23.5%	25.7%	100.0%
Others	Count	1	2	6	9	9	4	9	40
	%	2.5%	5.0%	15.0%	22.5%	22.5%	10.0%	22.5%	100.0%
Total	Count	5	30	66	104	50	76	93	424
	%	1.2%	7.1%	15.6%	24.5%	11.8%	17.9%	21.9%	100.0%

Source: Field data, 2009.

By contrast, internet-based businesses and SSO companies require their staff to do work on a different time shift and sometimes in different groups based on the requirements of the weekly target. Mr Asman, an administrator in an SSO company, shared his company's working schedule:

*We have two different working hours. The first one is from 7.45am to 4pm from Monday to Saturday, the Saturdays are alternate and the other one is from 4pm to 1am from Sunday to Thursday. Every shift has 45 minutes break. We allow for morning and tea break for 15 minutes (Personal communication, 07 December 2009).*

He further explained they would need to work longer shifts during the peak season of their work. This allows employees from different shift to work together and thereby develop their friendships.

Apart from the nature of the work, company sectors also influence the amount of time knowledge workers spend with their colleagues. Table 6.3 provides the amount of time employees spend discussing work with their colleagues based on company sector. As presented in the table, the majority of employees in the creative multimedia, software development and hardware design sectors spend more than 10 hours weekly discussing work with their colleagues. This translates to roughly two hours a day. The amount of time spent discussing work is lesser in support services, SSOs and internet-based businesses.

Basically, all three types of companies can be categorised as support services due to the nature of their function. This proves that employees in companies which produce high-end products require more interaction compared to those functioning as call centres that provide support services.

The relationship between company sectors and time spent discussing work was further examined using a chi-square test, and the results were statistically significant at 95% confidence level. The result is as follows:  $\chi^2 = 51.345$ ;  $df = 36$ ;  $p < 0.05$ . It can be concluded from the p-value that there is a significant correlation between the company sector and time spent discussing work among employees.

Table 6.3: Company sector and number of friends

		Time spent discussing work (hours)							Total
		0	1 - 2	3 - 4	5 - 6	7 - 8	9 - 10	More than 10	
Creative multimedia	Count	0	6	6	3	3	5	8	31
	%	.0%	19.4%	19.4%	9.7%	9.7%	16.1%	25.8%	100.0%
Software development	Count	1	14	21	18	4	9	25	92
	%	1.1%	15.2%	22.8%	19.6%	4.3%	9.8%	27.2%	100.0%
Hardware design	Count	0	0	3	3	1	3	8	18
	%	.0%	.0%	16.7%	16.7%	5.6%	16.7%	44.4%	100.0%
Support services	Count	0	2	3	7	1	0	4	17
	%	.0%	11.8%	17.6%	41.2%	5.9%	.0%	23.5%	100.0%
Internet based businesses	Count	0	7	7	5	1	0	2	22
	%	.0%	31.8%	31.8%	22.7%	4.5%	.0%	9.1%	100.0%
SSO	Count	2	54	24	30	9	25	28	172
	%	1.2%	31.4%	14.0%	17.4%	5.2%	14.5%	16.3%	100.0%
Others	Count	2	10	7	5	3	6	5	38
	%	5.3%	26.3%	18.4%	13.2%	7.9%	15.8%	13.2%	100.0%
Total	Count	5	93	71	71	22	48	80	390
	%	1.3%	23.8%	18.2%	18.2%	5.6%	12.3%	20.5%	100.0%

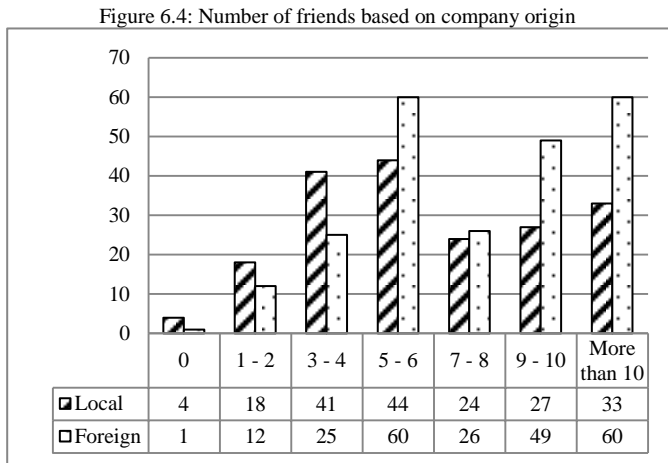
Source: Field data, 2009.

Furthermore, the results concurred with interviews conducted with some of the engineers working in Cyberjaya. Mr Afi, a network engineer involved in R&D work in a Malaysian-based creative multimedia company, shared his experience:

*Well the basic, you just need 3 months. You can gain all the required knowledge within 3 months. You need 2 years to reach the intermediate level of knowledge. The IT stuff change frequently but the basis is still the same (Personal communication, 07 January 2010).*

He added during the interview that junior engineers require daily discussions with their team leader and seniors at the initial stages of the project. Nevertheless, all team members require intensive discussion at every stage of the project to ensure major mistakes can be avoided and the results are as expected. This shows how, in some companies, daily discussion is part of the routine and helps strengthen their relationships to further accommodate knowledge-sharing activity.

Thus, the company sector has a strong correlation with knowledge workers' number of friends. The sector helps determine the nature of the work, the number of people on a team and the amount of time spent with each other.



Source: Field data, 2009

Thirdly, whether the company was established in Malaysia or abroad also has an implication on the number of friends. Most foreign multinational and large companies have structured rules and regulations in terms of knowledge-sharing.

Figure 6.4 illustrates number of friends based on company origin. It

shows that people working in foreign-based companies have more friends than those working in local-based companies. In addition, the number of those working in foreign-based companies with more than ten friends is almost twice of local companies. In contrast, the number of people working in local-based companies with four or fewer friends is 40% more. This again emphasises the size of foreign-based companies based in Cyberjaya compared to Malaysian companies. The biggest Malaysian company is Telekom R&D with a total number of employees slightly more than 300, as compared to Dell or Satyam, which employ 600 and 400 people, respectively. Besides, Telekom R&D is the only Malaysian company with such a big number of employees; the rest mostly employ fewer than 50.

Furthermore, as discussed previously, most foreign-based companies encourage bonding among staff either through 'team building' programmes or social activities such as a 'family day' and an 'annual dinner'. Foreign-based companies normally have a structured programme, and staffs are required to participate at least in the team building programme to ensure they can work well with others in the company. In contrast, in most Malaysian-based companies, due to the small number of employees, social activities are done loosely on a personal basis. Nevertheless, either planned or otherwise, both contribute towards increasing ties among knowledge workers in the same companies.

Clearly company sector, size and origin have significant impacts on knowledge workers' number of friends, and these have been discussed in detail. However, friendship is also influenced by social factors, such as gender, age, ethnicity, education and work-related influences. Issues related to social factors will now be considered, with a focus on individual personality.

A chi-square was once again applied, and the results are shown in Table 6.4. It shows that

Table 6.4:  
Results of chi-square test between social variables and number of friends

Social variables	Value	df	Asymp.Sig
Gender	11.456	6	0.075
Ethnicity	23.830	24	0.471
Age	41.742	54	0.888
Level of education	30.641	30	0.433
Working experience	49.269	36	0.069
Main job function	60.421	42	<b>0.033</b>
Job mobility	30.272	30	0.452

Source: Field data, 2009

'main job function' is the only variable which demonstrates a significant correlation with number of friends. The correlation is significant at 95% confidence level, and the p-value proves there is a strong correlation between respondents' main job functions in the company and their number of friends.

The main job function refers to the respondent's current job specification. They were asked to choose from a list the description of work that best fit what they do currently in the company. The list was compiled through a pilot survey conducted with 30 knowledge workers in Cyberjaya prior to the actual survey. Basically, there are eight categories of work which range from management to programming and technical support. Table 6.5 shows that almost half of the respondents are involved in technical support and management work.

Table 6.5: Respondent's main job function and number of friends

Main job function	Number of friends							TOTAL
	0	1 - 2	3 - 4	5 - 6	7 - 8	9 - 10	More than 10	
Management	0	9	15	16	10	17	21	<b>88</b>
R & D	2	3	13	11	8	3	11	<b>51</b>
Programming	0	6	14	20	6	12	13	<b>71</b>
Analyst	0	4	5	13	7	5	8	<b>42</b>
Design	1	5	1	5	2	5	12	<b>31</b>
Technical support	2	2	12	26	11	15	22	<b>90</b>
Other ICT related	0	1	5	10	4	8	5	<b>33</b>
Others	0	0	1	5	2	11	4	<b>23</b>
<b>TOTAL</b>	<b>5</b>	<b>30</b>	<b>66</b>	<b>106</b>	<b>50</b>	<b>76</b>	<b>96</b>	<b>429</b>

Source: Field data, 2009

In contrast, only 12% of the respondents are involved in R&D work. The results again prove the lack of emphasis on R&D in most companies located in Cyberjaya. Most of the companies are doing support services which do not contribute towards enhancing ICT knowledge. In comparison to other work in the list,

they can be considered as low knowledge-intensive companies. It was also discovered that

most of those who declare they are doing programming and design are working in SME companies.

Furthermore, the result shows that 50% of knowledge workers involved in management and technical support have more than seven friends. In contrast, almost 60% of those working in R&D have fewer than seven friends. Thus, it proves that those working in knowledge-intensive companies have fewer friends compared to the others. This might be due to nature of their work and the size of the companies.

Although the statistical test does not show any significant correlation, this does not mean the rest of the variables have no correlation with the respondents' number of friends. I have discovered through observations and in-depth interviews how the other variables influence a respondent's number of friends. Gender, age and ethnicity, for instance, do influence the type of social activities, which indirectly affects the number of friends.

For example, I have observed that sports activities are very much influenced by gender and age. Sports such as *futsal* and basketball are played by young males rather than older males or females (Figure 5.4(a) shows a *futsal* game). Mr Hari, an operation engineer in his mid-20s, made a relevant remark about his weekly *futsal* match with his new colleague:

*Most of them are from HP but they normally invite their friend from other companies in Cyberjaya. I am new so I don't invite my friend to join the game at least not now* (Personal communication, 04 December 2009).

He further revealed during the match that they seldom talk about work but that it does help them to develop friendship and hence create knowledge-sharing possibilities in the office. Informal activities such as sports, arranged by members of the company help to expand social networking among new members. It provides space for the newcomers to familiarise with senior employees and helps them to settle down.

Apart from gender, during the fieldwork I learned that ethnic background and language also influence the number of friends. In an interview with one Indian engineer, he declared that he spends time playing cricket during the weekends with friends from the same continent. He



further stressed that it is easier to get ‘connected’ with those who share the same interests and understand his culture because cricket is not a popular sport among Malaysian youth compared to those from the Indian sub-continent (Personal communication, 06 January 2010).

On the other hand, female knowledge workers ‘reported’ another platform to develop friendship. One female engineer shared that she gets to expand her social network through the sale of cookies, *tudung*<sup>82</sup>, small accessories and textiles for making clothes. She is also involved in small-scale freelance photography for special occasions such as weddings and birthday parties; hence, social networking helps to expand her business and share the latest happenings in the creative industry, especially regarding consumer behaviour and photography which helps her work as a creative design manager (Personal communication, 14 October 2009).

Furthermore, I also noticed the influence of religion on social networks among knowledge workers in Cyberjaya. I observed this in particular among male Muslims, especially during Friday prayers. It is common for men from different companies to share the same transport to the mosque, and after prayers, they were observed having lunch together. This is how they would develop friendships. In fact, during one interview conducted on a Friday, one of the R&D team leaders in OSCC received a call from his friend from another company asking about their prayer plan. He replied, ‘*tempat biasa*’ (the normal place), which shows the bond he has with those who join him for prayers. The weekly event creates a sense of ‘brotherhood’ among them. I was told in the beginning that there were only a few of them, but later the group expanded (Personal communication, 24 June 2009).

Next, job mobility also creates possibilities for knowledge workers to expand their number of friends. The large number of ICT companies in Cyberjaya provides more alternatives for them to work in different companies. At the same time, it allows them to make more friends. Since most of the companies are located within Cyberjaya, employees who have changed jobs do not find difficulty in meeting and catching up. According to Ms Lim, an R&D engineer in a software development company, she sometimes spends time with her colleagues from her

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<sup>82</sup> Tudung or hijab trends change just like any other fashion worn by women, and social networks help them to get the latest trends without having to go to the shops.

previous company. They normally chat and have ‘*teh tarik*’ in one of the *mamak* restaurants located on the main boulevard of the city<sup>83</sup> (Personal communication, 28 December 2009).

In short, I have discussed the various factors influencing knowledge flow in Cyberjaya. Basically the factors can be divided into two categories, which are those related to the company and to social profiles. Firstly, the company’s size, sector and origin have a significant impact on the number of friends. These factors determine the nature of the work and the number of people in the company, which in turn influence an employee’s number of friends. I have discovered that some companies have a structured and organised method to ensure that employees are ‘connected’ to each other, while in other companies the employees themselves create avenues for them to become acquainted with each other. Social networking is seen as a necessity for companies to ensure productivity (work output), and at the same time, individuals often feel a social need to be part of the group.

Nevertheless, these social networks create an imbalance of information flow which forms a core and a periphery within the company. In other words, some people or groups form the core of the company while the rest are pushed to the periphery. It seems there are groups of people who, due to their gender, ethnicity, experience or education, get better access to friendships, which in return allows for better access to knowledge flow compared to others. In the subsequent sections, I will analyse further this issue as well as space for knowledge-sharing activities and also the barriers and limitations.

#### **6.4 Power through Network: Access denied!**

As discussed in the previous section, knowledge workers in Cyberjaya have active social networks especially within their company. Nevertheless, the presence of social networks does not necessarily mean that knowledge flows freely in Cyberjaya. What and when to share depends on environmental, organisational and individual factors. All three factors create barriers and limitations to social networking which influences knowledge flows and

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<sup>83</sup> *Teh tarik* is tea with milk prepared in a special way. It is a popular drink commonly enjoyed in *mamak* (Indian Muslim) restaurants together with other dishes.

knowledge-sharing. I will discuss the influence of each factor by analysing the social network data.

As I discussed earlier in this chapter, almost all respondents have friends either within or outside of their company. Nevertheless, having friends does not necessarily mean that they trust their friends and share everything they know with each other. The level of trust determines the type of knowledge they share with their friends.

In order to examine patterns of trust among respondents, they were asked to declare the number of close friends they have within the company. They were also asked to state the number of friends they trust with their secrets. The answers were used to determine the level of willingness to share knowledge.

To evaluate the relationship between each of the three variables with the number of close friends, a chi-square test was applied to the data. In contrast to my previous test with the number of friends, the test statistically showed that company sector, size and origin have no

influence on the number of close friends as summarised in Table 6.6. Despite this lack of significance, my observations and interviews have shown that the three variables do influence knowledge-sharing in Cyberjaya. As such, I will discuss the influence based on company variables using in-depth interviews, observations and

Table 6.6:  
Chi-square test results for company variables and number of close friends

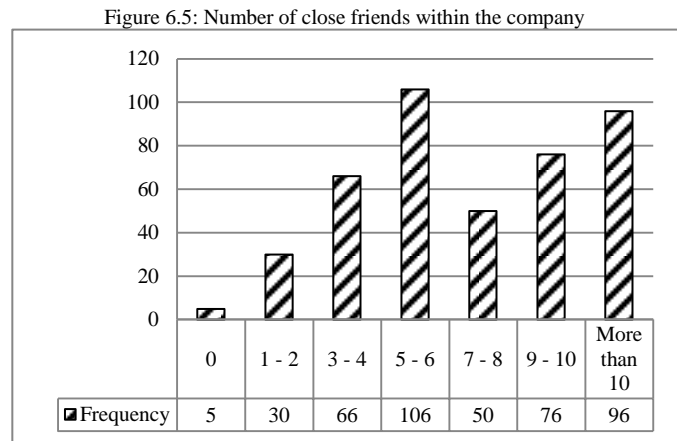
Company variables	Value	df	Asymp.Sig
Sector	46.855	36	<i>0.106</i>
Size	27.318	18	<i>0.073</i>
Origin	8.717	6	<i>0.190</i>

Source: Field data, 2009

descriptive statistical analysis instead.

As presented in Figure 6.5, almost 40% of the respondents declared that they have only two to three close friends within the company. This figure also shows that approximately 8% of the respondents claim they do not have any close friends within the company. This finding implies that employees are willing to share certain knowledge with their colleague but limit them when it comes to knowledge considered secret or classified. The analysis was further extended using cross tabulation to spot differences based on company sectors.

The results show that more than 50% of people working in creative multimedia and software development companies do not trust anyone or have merely two close friends in their company. On the other hand, more than 60% of people working in the support services, SSO and internet-based



Source: Field data, 2009

businesses have more than three close friends. Less than 10% of people working in creative multimedia and software development companies have five or more close friends. In comparison, close to 40% of those working in support services, SSO and internet-based businesses have five or more close friends. Table 6.7 provides detailed numbers of close friends based on company sectors. My survey has shown that creative multimedia and software development, which can be classified as knowledge-intensive, has a smaller amount of knowledge-sharing as compared to other types of companies. Thus, these findings prove that knowledge is not shared freely in Cyberjaya.

Table 6.7: Company sector and number of close friends

		Number of close friends within the company							Total
		0	1	2	3	4	5	More than 5	
Creative multimedia	Count	7	3	8	6	2	4	3	33
	%	21.2%	9.1%	<b>24.2%</b>	18.2%	6.1%	12.1%	9.1%	100.0%
Software development	Count	9	19	20	20	8	8	10	94
	%	9.6%	20.2%	<b>21.3%</b>	21.3%	8.5%	8.5%	10.6%	100.0%
Hardware design	Count	1	0	2	3	3	3	6	18
	%	5.6%	.0%	11.1%	16.7%	16.7%	16.7%	<b>33.3%</b>	100.0%
Support services	Count	0	1	4	1	3	3	4	16
	%	.0%	6.3%	25.0%	6.3%	18.8%	18.8%	<b>25.0%</b>	100.0%
Internet based businesses	Count	0	2	4	7	1	3	3	20
	%	.0%	10.0%	20.0%	<b>35.0%</b>	5.0%	15.0%	15.0%	100.0%
SSO	Count	10	20	38	29	10	33	32	172
	%	5.8%	11.6%	<b>22.1%</b>	16.9%	5.8%	19.2%	18.6%	100.0%
Others	Count	4	8	5	6	2	5	5	35
	%	11.4%	<b>22.9%</b>	14.3%	17.1%	5.7%	14.3%	14.3%	100.0%
Total	Count	31	53	81	72	29	59	63	388
	%	8.0%	13.7%	20.9%	18.6%	7.5%	15.2%	16.2%	100.0%

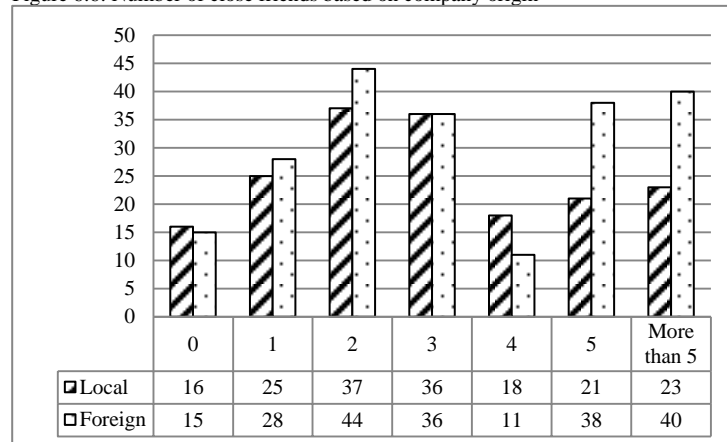
Source: Field data, 2009

In addition, a study of company origins shows that the majority of those working in foreign-based companies have more close friends than those working for local-based companies.

Figure 6.6 illustrates the number of close friends based on company origin. It shows that close to 40% of people working in foreign-based companies have more than five friends, compared to 25% from local-based companies. This again proves the nature of work in most foreign-based companies located in Cyberjaya mostly do not involve R&D work. Most knowledge workers serving in those companies do not consider their jobs to be secrets and is willing to share with more people.

Mr Niza, who has been working for two years in an American-based SSO company with 50 staff, said that they are free to discuss and share their knowledge without any restrictions (Personal communication, 07 December 2009). I also observed that his office does not require much technical skill. The workers do repetitive work in a casual environment, and employees are free to mingle and share knowledge with each other.

Figure 6.6: Number of close friends based on company origin



Source: Field data, 2009

However, another foreign-based SSO company requires their employees to be cautious on the knowledge they share with others, especially if they handle client data. In this case, the employee would be required to sign a confidentiality letter. Significantly, this restriction does not relate to the knowledge or skills they have developed through their work.

Although there is restriction, employees find their own way to share knowledge especially with those they trust. When Mr Ziru was asked whether his company has any restrictions on knowledge-sharing, his response proved my point:

*There is, we are not allowed to share with those who are not from the same department. Your accesses to different department are also blocked. This is Dell policy. We use the phone or best effort (Personal communication, 09 December 2009).*

I was later invited to a coffee session with his friends from the university. They meet on a regular basis for a chat and supper. Although not all of them work in the same company, they do similar work in the other companies and sometimes discuss work-related issues. My observation of one of these dinners shows how informal activities can provide an avenue for knowledge-sharing, especially among those who trust each other.

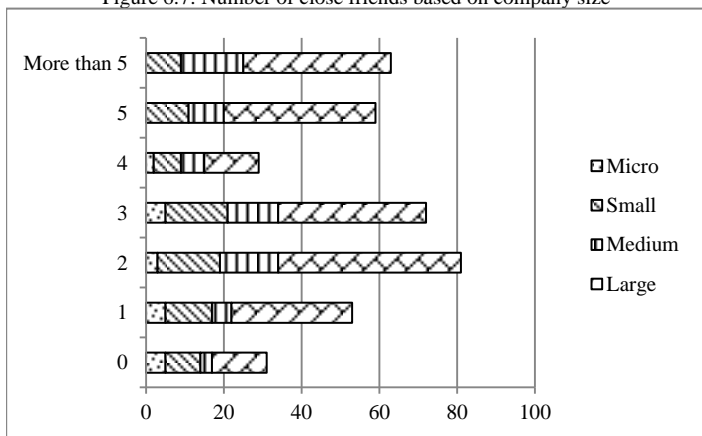
In short, respondents are willing to share only basic information that they consider not to be secret or classified. They would willingly share knowledge for the purpose of getting the work done but would be cautious if they felt that the things they shared could jeopardise their position or place in the team or group. Knowledge functions as a status symbol for people working in a knowledge-intensive company. It determines the rank of a person in the company or group.

Hence, these findings prove that within the company there is a core and a periphery of knowledge flow. One person or a small group of people serves as the core for the whole team, and the rest simply function at the periphery. The cores normally comprise people with experience and higher positions. They also serve as a reference point for the whole group. In

other words, knowledge locates one position either at the core or the periphery of the company or organisation.

Furthermore, employees working in medium- and large-sized companies have more close friends than those in small and micro companies, as shown

Figure 6.7: Number of close friends based on company size



Source: Field data, 2009

in Figure 6.7. The number of people who declared that they trust nobody is three times more in micro and small companies as compared to medium and large companies. This discrepancy shows that knowledge-sharing is limited in micro- and small-sized companies, especially with certain knowledge which they consider to be secrets or classified. I would assume that the small number of employees contributed to the results.

Nonetheless, employees working in companies of any size in sectors which are knowledge-intensive do limit the knowledge they share to ensure they retain their status at the core of the company. Mr Afi, a network engineer in a small creative multimedia company, described his experience working in his team:

*The confidence level is different, those who graduated from abroad are more confident compared to the locals. Maybe because they study abroad, they feel that they are better than the rest of us. He acts differently. The level of thinking is the same but he is more 'talkative' (Personal communication, 07 January 2010).*

He further explained that knowledge-sharing is encouraged in his company, but not everyone is doing it. They need to discover certain knowledge individually by themselves. This creates rivalry among those who know and those who do not.

In another interview with a researcher with the largest Malaysian company located in Cyberjaya, she described her teammates' attitudes in meetings:

*The junior staff they are young. There is age gap between us. They are not matured. Their ideas show their immaturity and lack of experience. We on the other hand give ideas based on our experience (Personal communication, 14 October 2009).*

In short, this statement shows how age and experience create barriers in knowledge-sharing even in a Malaysian-based large company. Those with experience are reluctant to share their knowledge openly when it involves younger people in the team. Insecurity over their position

and feeling threatened by newcomers has an impact on knowledge-sharing activity in a team. This is more visible at the early stages when a new member joins the team.

In addition, chi-square tests were also applied to see the relationship between social variables and the number of close friends. Table 6.8 reveals gender to be the only social variable that influences the number of close friends in Cyberjaya. The correlation examined using a chi-square shows:  $\chi^2 = 18.178$ ;  $df = 6$ ;  $p < 0.001$ ; the p-value proves there is a significant correlation between gender and the number of close friends at 99% confidence level.

Table 6.8:  
Chi-square test results for social variables and number of close friends

Social variables	Value	df	Asymp.Sig
Gender	18.178	6	<b>0.006</b>
Ethnicity	22.221	24	0.566
Age	33.210	54	0.988
Level of education	34.394	30	0.265
Working experience	29.410	36	0.773
Position	47.017	42	0.275
Job mobility	18.002	30	0.959

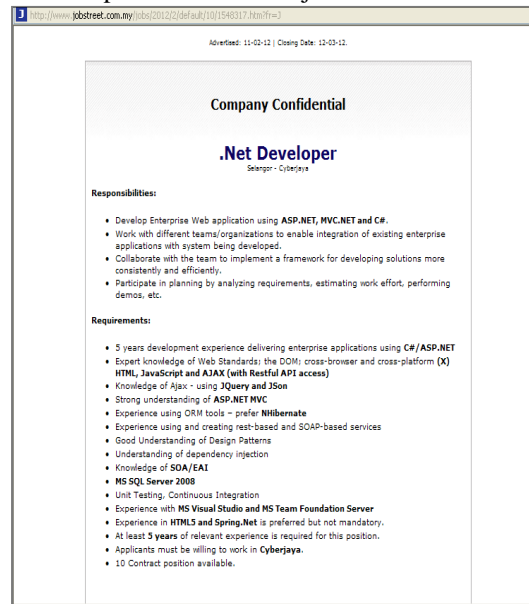
Source: Field data, 2009

Although the other six variables do not show any statistical significance, their influence was not ruled out. I have applied observations and in-depth interviews to determine their correlation with respondents' inclinations to bonding. I will first discuss gender and its influence on friendship.

Firstly, I did not observe any segregation of work based on gender in any of the companies visited during the fieldwork. Companies themselves do not dictate any specific preference for one gender or the other. This can be seen from the advertisement for an ICT-related position as shown in Figure 6.8. It illustrates an example of a net developer position located in Cyberjaya. Advertisements like this are common in employment search portals such as JobStreet.com.my, which is one of the most popular sites for ICT job seekers. ICT work requires skills and experience, regardless of gender. In fact, there seemed to be balanced distributions of both genders in all the companies I visited.

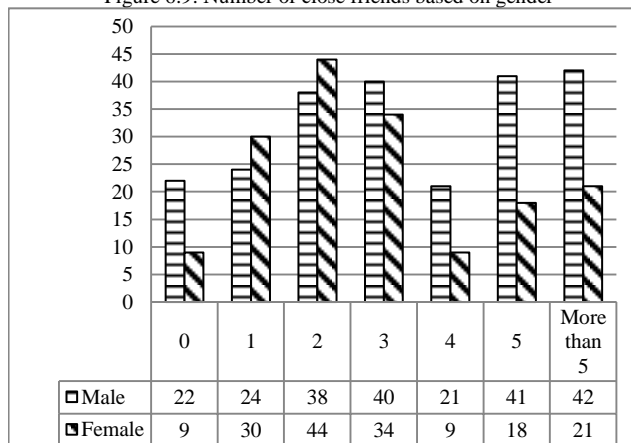


Figure 6.8:  
Sample of ICT-related job advertisement



Nonetheless, it was observed that gender determines the type of social activities in which the respondent participates. As I discussed in the previous section, social activities influence the respondent's number of friends, and they also encourage stronger bonding among them.

Figure 6.9: Number of close friends based on gender



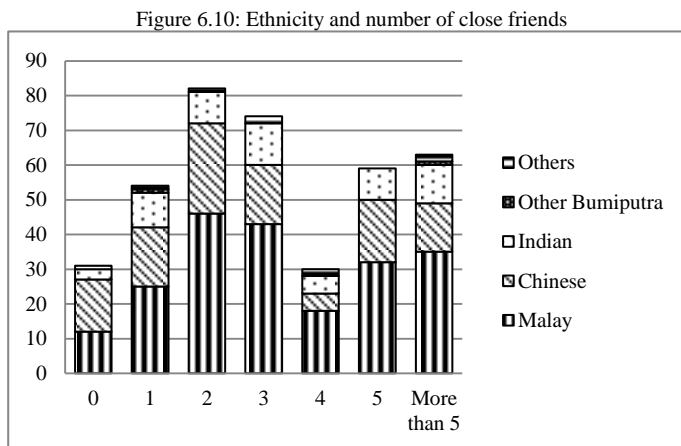
Source: Field data, 2009

Figure 6.9 shows that almost 70% of women in the sample have between one and three close friends. On the other hand, more than 60% of men declared that they have three or more close friends. The findings also indicate that men reported having more than five close friends twice as often as women did. Nevertheless, the number of men who declared that they have no

close friends in their company is almost 60% higher than the number of women with no close friends. It seems that men find it easier to trust their colleagues once they become acquainted with them, while at the same time some of them do not trust their colleagues at all. This again suggests that some employees, in this case a man who already occupies a place at the core,

always want to retain their positions by not allowing some knowledge to be shared even with those they consider friends. Knowledge is shared only when it does not jeopardise one's position in the company or team. It becomes a tool to retain one's position and at the same time is used to ensure that others are kept at the periphery.

Next, I will discuss ethnic influences on knowledge-sharing. As Liew (2003: 99) has pointed out, 'affirmative action policies based solely on ethnicity and not class has led to a high level of alienation and low levels of social and political trust between Malays and non-Malays'. Furthermore, in Chapter 4, I discussed the ethnic ratio of knowledge workers in Cyberjaya, which shows that the majority of them are Malays. However, against this backdrop, I have discovered that gaining trust is an issue even among Malays. As illustrated in Figure 6.10, almost 60% of the Malays and Indians have three or fewer close friends, whereas the Chinese record a higher number at 67 per cent. Furthermore, the Malays who declared they have no close friends in their company are close to 40% compared to 48% of the Chinese. On the other



Source: Field data, 2009

hand, the number of Indians with more than five close friends is higher than the other two.

This again proves how, in a knowledge-based development, the ability to trust in terms of knowledge-sharing goes beyond ethnicity. The ability to retain a position at the core of a team or

company is more important than aligning based on ethnicity. Knowledge workers are more cautious when it comes to sharing strategic knowledge which could jeopardise their position within the group. In the previous section, I have shown how they compete with each other regardless of their ethnic background. Their survival in the team or the company is more important than their ethnicity.

Nevertheless, I have observed a tendency for respondents to spend more time with members of the same ethnic group during social activities. As shown in Photo 6.2(a), (b) and (c), lunch hours are normally spent with the same ethnic group, either from the same company or

otherwise. The same observations were made during sports activities, which further showed that different ethnic groups prefer different types of sports. I noticed during the fieldwork that *futsal* is famous among Malays, whereas the Chinese prefer basketball. This indirectly contributed to creating limitations for them to become involved with different ethnic groups and also hindered the bonding process. The limitation is not only found among Malaysian but also among foreigners with different interests that limit their social networking possibilities.

Photo 6.2 (a), (b) & (c): Informal knowledge-sharing session



(a)

(b)

(c)

Knowledge-sharing is not limited to a formal setting within the office building. Informal discussions during lunch breaks contribute significantly towards bonding and building trust; hence, it contributes to knowledge-sharing among knowledge workers in Cyberjaya. Nevertheless, it does limit certain groups from taking part in the discussion.

Source: Field data, 2009

At the same time, religion and culture also limit the respondents' ability to bond and influences their knowledge-sharing attitude. As pointed out by Mrs Sue, a Malay Muslim engineer who has been working in her company for fifteen years:

*In the beginning our relationship was formal. We just do our work. Through time we become close. We have no problem working with each other. We share our problem. The relationship has become informal. We have known each other for so many years now (Personal communication, 14 October 2009).*

She further explained that her team members are very close and visit each other's homes during festive seasons and religious activities, such as *kenduri* and *doa selamat*<sup>84</sup>. Likewise, weekly Friday prayers are exclusively attended by Muslim men. Hence, religious activities

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<sup>84</sup> Literally, it means 'thanksgiving', and it is common among Malay Muslims to celebrate with the *kenduri* and *doa selamat* any joyous event, such as the birth of a baby, a job promotion or moving into a new house.

limit participation by others who do not profess the same beliefs or are of different genders, thereby hindering the bonding process.

Language also limits social networking and knowledge-sharing, especially during social activity. Although English is used widely in the office environment, I observed throughout lunch, coffee hour and sports activities that many workers prefer to communicate in their native language. This limits the bonding among those who are unable to communicate in certain dialects.

Nevertheless, in contrast to religious activity which totally excludes those who are not Muslims, the Malay language is understood and used widely among different ethnic groups. The language therefore creates opportunities for different ethnicities to share knowledge (refer to Section 6.2).

Next, limits to knowledge-sharing also involve factors within the organisation. Some companies have restrictions in terms of knowledge-sharing among employees. They are required to follow certain rules and regulations on the 'dos' and 'don'ts' while working in certain departments or sections of the companies. I observed that large and foreign companies are very strict and do not allow others to enter their buildings without proper clearance from security. Electronic devices such as cameras and voice recorders are totally restricted, and visitors are reminded through clear signage at the entrances.

Furthermore, in one company, I was also required to sign a document stating that no 'unauthorised' information would be brought out of the company without prior approval from the person in charge of administrative matters. In another international company, my questionnaires were held back for two weeks because the company required clearance from the management. This shows how organisations limit knowledge-sharing because they are afraid of espionage and 'knowledge leakage'.

Although most of the companies are involved in non-knowledge intensive industries, they still create limitations for knowledge-sharing due to the regulations created at their parent companies in the developed countries. This again proves my argument about the core and

periphery of knowledge-based organisations. The parent company in the developed countries functions as the core for companies located in Cyberjaya, which operate only at the periphery.

The restrictions to sharing knowledge are also institutionalised in certain organisations. I observed that large and established companies, whether local or foreign, require their employees to sign confidentiality documents once they accept an offer to work in the company. Mr Razak, an engineer with MEASAT, shared his experience during the first day of his job:

*There are things which only can be shared with MEASAT staff. We have to sign a document when we accept the offer (Personal communication, 15 October 2009).*

In another example, I was told by the human resources manager for an American telecommunication company that every employee is required to sign the code of business conduct on a yearly basis. This is to ensure that employees do not behave in an inappropriate manner. She further clarified that this includes sharing information with others either within or outside of the company (Personal communication, 03 November 2009).

Moreover, the limitation is also obvious through physical restriction by creating special rooms for certain specific jobs which are deemed to be sensitive. Although most of the companies have barrier-free environments, some areas are restricted to certain employees and others are not allowed to enter. This is obvious in companies which have R&D sections or departments. In fact, in one of the R&D-based companies, employees only have access to their own working areas, and entrance to other parts of the building is restricted.

In companies with laboratory facilities, only a limited number of employees are allowed to enter them. I observed that junior staffs need to get the key to the laboratory from their seniors or the head of the project every time they require laboratory facilities for their work. Even in this case, the entrance is limited to team members, and others would basically find it impossible to enter the laboratory without complying with strict procedures.

It was also noticed that in Cyberjaya most large companies have in-house recreational and social facilities. Although this contributes towards enhancing social networking among

employees working in the same building, by contrast it limits social networking with people outside of the building.

The limited number of places for social activities in the city of Cyberjaya also creates hindrances to social networking among knowledge workers. The high price of food and the limited number of restaurants force some employees to create a rotation system to buy food for the rest of the team. They will then eat together in their own offices without having to go out. This reduces interaction with other knowledge workers in the same building or area.

It was also discovered that a building's physical layout contributes significantly towards building social networks. A compact design with shared facilities contributes to encouraging social networking among knowledge workers in Cyberjaya. This was observed in the SME building, where tenants share common facilities such as the cafeteria, the gymnasium, *surau*<sup>85</sup>, and the meeting room. However, at the same time, it limits interaction with others who are not served by the facilities.

Seniority and experience also limit knowledge-sharing through the creation of a core and a periphery within a group. Those who have worked in the company for a long time would have more experience doing the job, and as such, they would act as the core for the team while the rest would only be at the periphery.

Employees' educational backgrounds, personalities and experience create barriers for knowledge-sharing. Furthermore, employees often try to be close to the core of the company or team where knowledge collates. The rest, especially those who are new, inexperienced and lack the necessary network are pushed to the periphery. They must prove themselves before they can be members of the core. If they are unsuccessful in the same company, they may have to go to another company. Thus, the core and periphery dynamic depends on the individual, the company and the environment. One of the ways to get closer to those who are more experienced in the company is to become involved in informal activities that will break the

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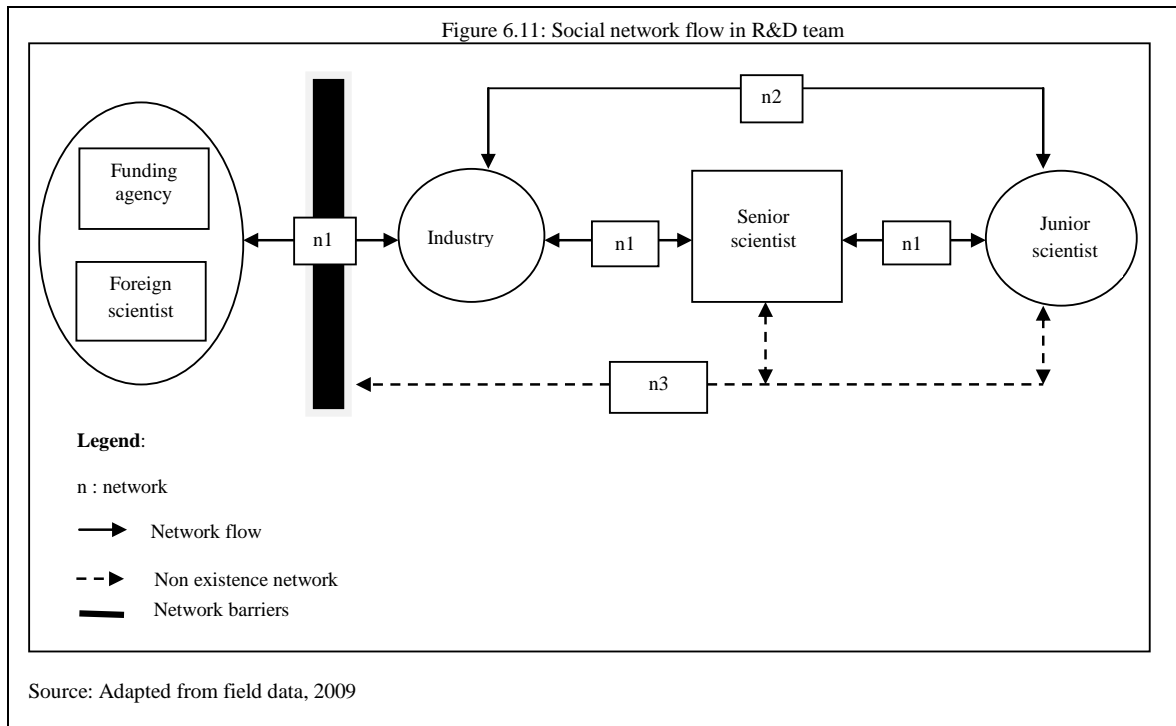
<sup>85</sup> Small prayer rooms for Muslims. They are sometimes used for short naps and resting areas during the afternoon break.

barriers and increase one's chances. As discussed in the previous section, sports and other social activities help to reduce gaps between those at the core and people at the periphery.

**i) Social Networking in a small R& D team: TM Research & Development (TM R&D)**

TM R&D is a subsidiary company of Telekom Malaysia, i.e. Malaysia's pioneer and largest telecommunication company. It was established in 2001 to execute basic and applied research related to telecommunication. One of the objectives is 'To undertake research and development activities to provide foundation for future growth' (TM R&D, 2012). Hence, being governed by the political elite through the Malaysian investment body creates a space for the elites to capitalise all resources to ensure the telecommunication sector is always owned by them. Research and development is one of the ways the elite ensure they are always at the core of power. In this section, I will argue that, within the TM R&D, there is a core and a periphery with knowledge as the determining factor and participation in social networks helps employees move them closer to or further from either one.

Social networking among engineers in Cyberjaya is influenced by power relations among them. Knowledge is considered to be the determining factor for social networking, especially in different stages of the networking. Figure 6.11 illustrates the social networking flow in one of the research teams interviewed in Telekom Malaysia R&D. The figure shows different levels of networking along with connectors and barriers. The illustrated case began with the idea to develop a biometric system, which was first initiated by a scientist working in the company. The idea for new products normally originates from the latest market needs and development.



The team would then after the idea was formed try to get the latest information about the technology through their previous social networks, especially those that include people with whom they have worked before.

Once they have gathered as much information as possible, they would submit a proposal to the funding agency, in this case the Ministry of Science, Technology and Innovation (MOSTI). Once the funding is secured, the company engineers would survey local scientists who are familiar with the proposed project through their academic writings. The respective scientist would then be contacted for possible cooperation. Once they have concluded the agreement, the senior scientist would then contact his own network to invite them to be part of the research team.

This description shows how networking level one (n1) involves only two interested parties, such as industry and funding agency; industry and foreign scientist; industry and senior scientist or senior and junior scientist. Figure 6.11 shows the industry and the senior scientist forming a connector. However, as illustrated, only the senior scientist manages to secure the second level networking (n2) with the junior scientist and the industry. By contrast, instead of



an active connector, the industry becomes a barrier for networking between the senior and junior scientists and the funding agency and foreign scientist (n3).

The results show how resources are controlled by the most powerful actor in the social network flow. Instrumental relations, i.e. actors, contact one another in efforts to secure services or information and power relations in which actors issue and obey commands (Knoke & Yang, 2008) proven to coexist in Cyberjaya.

Knowledge is treated as a resource which delimits social networking in Cyberjaya. Although different actors are involved in R&D work, they do not necessarily contribute to enhancing social networks among them. In fact, my interview has proven how, in some instances, strategic alliances are created through social networks in order to retain access to resources. Power to control and manipulate different situations ensures that actors maintain control of different resources.

It was also discovered during the interview that seniority plays a vital role in enhancing social networking among the engineers in the project. It creates opportunities among younger team members to expand their social networks either from the industry or the university.

Trust ensures individual freedom to share knowledge with others. Social networking creates the possibility for trust to develop and further encourage knowledge-sharing. A smaller group creates an environment for strong ties among team members and enhances knowledge-sharing. During the fieldwork, flexibility within the team was discovered to improve social networking among members and further develop bonding among them.

Nevertheless, the process of building trust requires prolonged interactions. In the interview, the engineers declared that they required at least two years for trust to develop with the rest of the team. This proves that trust can limit knowledge-sharing, especially in the early stages of team formation. In the beginning, the knowledge-sharing process happens through power relations. Only after a certain period of time would team members be able to share more than at the beginning.

I discovered that social networking among engineers in the project is not only confined to Malaysian scientists but extends to those abroad. For example, the head of the team declared

that he still refers to his scientist friend in Uzbekistan every time he encounters problems with his work. The scientist from Uzbekistan Academy of Sciences was previously sent to Telekom Malaysia under a special programme between both governments. He was attached for six years as a leading scientist in an R&D project with which he was involved as a team member. Although the scientist left the project three years ago, it does not stop the project leader from consulting him whenever required. He further stressed it took him two years to build trust between the two of them. He related an incident to illustrate how he managed to gain the scientist's trust:

*Well it happen unplanned. He was having some problem with his computer. It broke down. I help him to fix the problem. That's how we became friends. He trusts me after I help him fix his computer* (Personal communication, 10 December 2009).

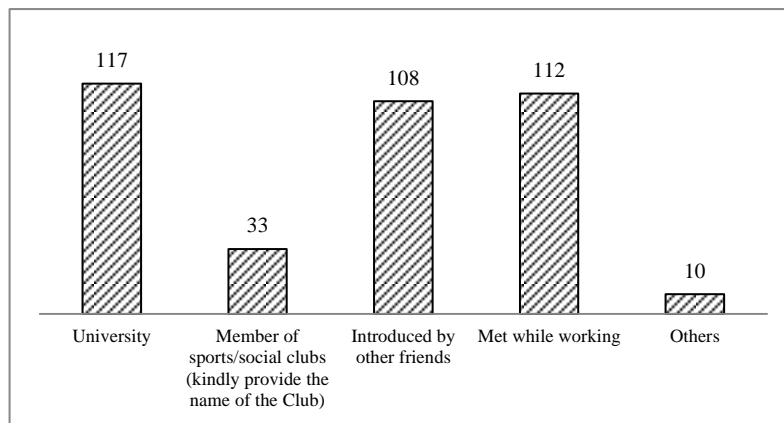
This shows how social networks may be created through non-work-related incidents but develop into strong knowledge-sharing platforms.

Hence, in small groups, the formation of a core and a periphery is observable, as shown in my study. Knowledge collates among a group of engineers that utilise their social networks to push forward their ideas to the funding agency. At the beginning of this chapter, I presented how the idea of Cyberjaya developed. Accordingly, incidents in companies located within Cyberjaya reflect the same scenario. Social networks function as tools for small groups of people to retain their positions at the core while the rest are pushed to the periphery.

## 6.5 Online or Off-line: Spaces for Knowledge Flows

Social networking among people working in Cyberjaya is not limited to those working in the same company. Through the survey, I discovered that social networks expand through work and leisure. Figure 6.12 shows different methods of establishing social networks among engineers in Cyberjaya. The survey shows that almost 90% of the respondents established their

Figure 6.12: Methods of establishing social networks



Source: Field data, 2009

social network in Cyberjaya through university, work and friends. The figure also proves that friendship and work play vital roles in social networking among ICT engineers in Cyberjaya.

The survey data is further validated by interviews with some of the engineers who mentioned informal activities organised by themselves and their companies to encourage bonding among employees. Mr Zifa, a network engineer who is also in charge of his office social club, shared a relevant experience:

*We normally organised day trip to places of interest in and around the Kelang Valley. The trip helps us to know each other better and help to strengthen our relationship. We can share our problem when we go out in a group (Personal communication, 07 January 2010).*

There are also limitations to social networks among employees. Some companies restrict employee relationships with vendors. This is observed mostly with foreign-owned companies, especially American-based. According to the human resource manager, employees dealing with vendors are specifically told what they can and cannot do. She further explained that

having a meal or drinking with vendors is strictly prohibited as is receiving any form of gift. According to her:

*The company is very strict with staff relationship with vendors. It is different from my previous company. Here they just don't allow staff to be too close with the vendors. We have a very strict policy on that (Personal communication, 03 November 2009).*

Apart from written documentation restricting social networks, I also discovered that facilities and organisational culture have direct impacts on employees' social networking within the company. One of the engineers from the same company was very cautious during the interview while discussing matters pertaining to his work. Mr Mohamad, who worked with Shell before joining the company, shared his experience working there:

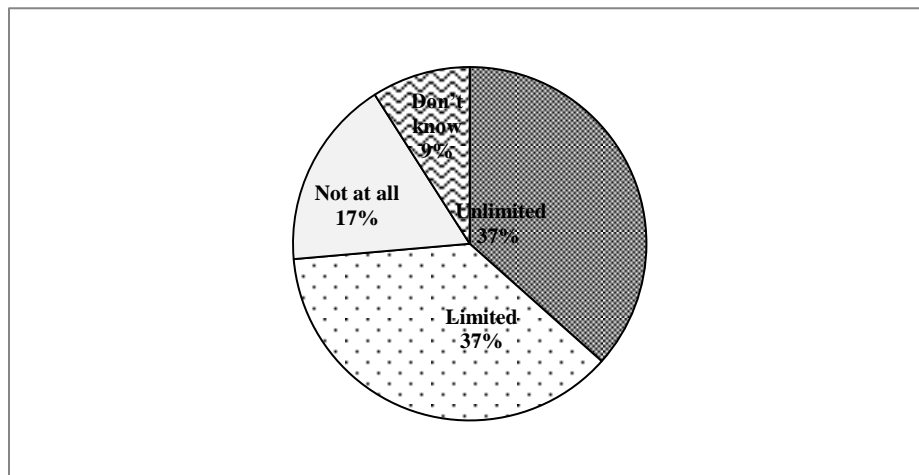
*Well, the Americans are more business centric. They don't have much social standards or benefits. The European concentrates on the people. That is why in Shell we have a lot of social activities, cafe, rest room i.e. it is very people oriented. Working in that environment is more enjoyable (Personal communication, 04 December 2009).*

He further stressed how the facilities and social activities provided by his previous employer create a more conducive working environment and allowed for discussion about work-related problems in an informal setting. I could see his dissatisfaction with the lack of social activities and facilities provided by his current company. He agreed that he still refers to friends outside the company if he encounters problems in his work. This shows the significance of ties generated through social networks in knowledge-sharing. It transcends the physical boundaries of the individual. In the case of Mr Mohamad, he still trusts and refers to his colleagues from his previous company. He also declared that he spends less time with his colleagues from the new company compared to the previous one. The lack of social activities and facilities limits the opportunity for bonding to be created among people working in the same company, thus hampering knowledge-sharing potential.

I also learned during the interview that networking in Cyberjaya is not limited to individuals but also occurs among different organisations. The government policy to create bumiputera ICT entrepreneurs has encouraged MARA and MDeC to work together to provide support for young bumiputera entrepreneurs in Cyberjaya. Malaysia aims to be a developed country that transcends racial bias, but this goal is difficult to achieve. The fieldwork proves that bumiputera entrepreneurs get various opportunities to be utilised, which in turn proves how the political elites use and allocate new resources based on their needs rather than the industrial needs. I discovered that half of the participants have since left the programme.

Cyberjaya as an ICT-embedded city provides an avenue for engineers to be connected through the cyber world. Respondents were asked whether their company allows access to online social networking sites such as Facebook, Myspace and Friendster. Figure 6.13 indicates that almost 80% of the companies in Cyberjaya allow their employees access to online social networking sites. There are, however, a small number of companies which do not allow their employees to access any online social network site.

Figure 6.13: Access to online social network services in the office



Source: Field data, 2009

Evidently, some companies are strict with employees' access to online social networking sites because they are considered to be an unproductive use of time that affects employees' work performance. Dr Kuru, who owns a software development company, shared his view:

*Well, they cannot use the internet for personal use. They are only allowed to use it to support their work. Online chatting is unproductive. We need people*

*to focus and produce good work. Based on the results, most of my staff is serious about their work (Personal communication, 07 January 2010).*

Nevertheless, some companies allow online chatting, such as Dell which has developed internal chatting sites for employees. This allows employees to chat online should they require any information or help. The sites are not restricted to friends but include people working in the same building. According to Mr Mafa, a Technical Analyst, the sites allow them to share work-related problems and search for possible solutions based on other people’s experiences (Personal communication 09 December 2009).

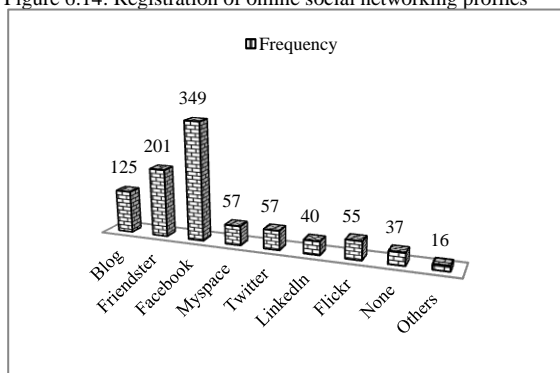
Figure 6.14 provides the respondents’ registrations on popular sites. The results show that almost 40% of the respondents have a Facebook account, compared to 20% with a Friendster account. The difference proves Facebook’s popularity among ICT engineers working in Cyberjaya, and it correlates with a survey done by SocialBakers.com that showed that Facebook is the most popular online social networking site in Malaysia with almost 72% of local internet users (The Star: 21 December 2011).

The respondents also showed active participation in online social networking sites with more than 40% updating their profiles on a weekly basis. On the contrary, only 10% of the

respondents showed less interest in updating their profiles.

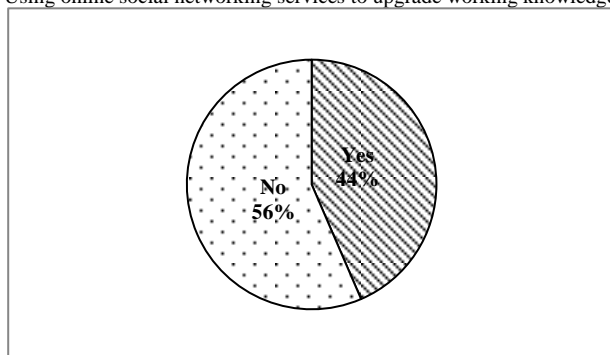
Being active on the online social networking sites also contributes to knowledge-sharing. Although they do not necessarily share knowledge on the sites, it helps them to keep in touch and bond.

Figure 6.14: Registration of online social networking profiles



Source: Field data, 2009

Figure 6.15:  
Using online social networking services to upgrade working knowledge



Source: Field data, 2009

Online social networking also plays a vital role in upgrading respondents' knowledge pertaining to their work. As shown in Figure 6.15, more than 40% of the respondents declared the use of online social network to upgrade their working knowledge. Hence, the use of online social networking sites proves to be significant among ICT engineers in Cyberjaya.

## 6.6 Visualising Social Networks in Cyberjaya

The discussion in this section will be based on data collected through the questionnaire which were incorporated with geo-coding methods to produce a networking map. It was overlaid on a Cyberjaya site map to provide actual orientation based on the main circulation system and building plot areas. The basic spatial information supplies a better visualisation of the social network data than one-dimensional information. It helps to illustrate social network patterns within the spatial context and allows better understanding of the effects of infrastructure and physical development.

The data were grouped and analysed separately based on company origin, category and size. Due to data constraints, the focus is on the company rather than the knowledge workers. Nevertheless, it is sufficient to illustrate the social network pattern and provide a better analysis of the Cyberjaya cluster.

First, it is important to analyse the company origins in order to understand the dynamics of Cyberjaya as a knowledge-based cluster. The number of foreign-based companies shows that the existing policy has been successful in attracting and locating them in Cyberjaya, creating job opportunities and indirectly generating active social networking activities among the knowledge workers. As shown in Table 6.9, the majority of the respondents are currently working in foreign-based companies. Most of the companies are based in the USA, Germany, Singapore and India, such as Dell, DHL, Emerio and Satyam. There is a tendency for

respondents to network with those from foreign-based companies rather than Malaysian companies. The result shows that more than 83% of the respondents working in those companies also choose friends from foreign-based companies.

**Table: 6.9: Social networks based on company's country of origin**

Respondent company origin	Total numbers	Friend 1		Friend 2		Friend 3		Total friends	
		Foreign	Malaysia	Foreign	Malaysia	Foreign	Malaysia	Foreign	Malaysia
<b>Foreign</b>	115	104	11	69	23	48	10	221	44
<b>Malaysia</b>	84	51	33	32	25	21	19	104	77
<b>TOTAL</b>	<b>199</b>	<b>155</b>	<b>44</b>	<b>101</b>	<b>48</b>	<b>69</b>	<b>29</b>	<b>235</b>	<b>121</b>

Source: Field data, 2009

On the contrary, less than 17% of knowledge workers in foreign-based companies identify people working in Malaysian-based companies as part of their social networks. This result highlights the contribution of the large number of foreign-based companies in enhancing knowledge-sharing in the cluster

One of the reasons for the high number of social networks among knowledge workers in foreign-based companies relates to the number of their employees compared to Malaysian-based companies. For example, Telekom R&D, which is the largest Malaysian company in Cyberjaya, has a total of 378 employees compared to Dell or Satyam with 600 and 400 employees, respectively. Furthermore, other than Telekom R&D and MEASAT, most Malaysian-based companies located in Cyberjaya have fewer than 50 employees.

Another possible reason is that foreign-based companies are normally more established and structured. They require people with working experience, which contributes to a high number of networks among them. As explained in Chapter 5, job mobility enhances working experience and contributes significantly towards knowledge-sharing activities. It was discovered during the fieldwork that job-hopping is popular among knowledge workers in Cyberjaya. They often start with smaller companies and move to bigger and more established companies once they acquire the necessary experience. Furthermore, foreign-based companies have a better reputation and are willing to pay higher salaries as compared to local companies.



Table 6.10 provides basic salary information for the major foreign-based ICT companies in Cyberjaya. It shows that the average salaries paid by foreign-based companies are more than RM 2,400.00. On the contrary, the average salary for entry level ICT executives in Malaysian companies is RM 2,100.00, as shown in Table 6.11. The salary difference proves that most foreign-based companies require those with working experience, i.e. junior executive level. My interview with the human resource manager for an American-based telecommunication company revealed that candidates are required to have at least two years working experience before they can join the company (Personal communication, 03 November 2009).

In addition to company origin, another indicator used to differentiate social networks was the company category. The categories were based on the classification used by MDeC. Table 6.12 provides detail information about the respondents and their social networks. It shows that the sample of 199 employees was able to create connections with 446 people, which is more than two times their actual number. Although there is a substantial drop in the number of friends from *Friend 1*, 2 and 3, the overall figure still signifies a multiple of the sample number.

Table 6.10:  
Salary scale for foreign-based ICT companies

Company	Monthly salary
Hewlett-Packard	RM2,627.00
IBM Global Services	RM2,300.00
Dell	RM2,825.00
T-Systems	RM1,957.00
DHL	RM2,564.00
Ericsson	RM2,719.00

Source: Payscale, 2012

Table 6.11:  
Salary scale for ICT executives

Position	Monthly salary		
	Minimum	Average	Maximum
Senior executive	RM2,700.00	RM3,250.00	RM4,000.00
Junior executive	RM2,100.00	RM2,500.00	RM2,870.00
Fresh/entry level	RM1,800.00	RM2,100.00	RM2,500.00

Source: Jobstreet.com, 2012

At the same time, the declines also suggest a strong knowledge network between respondent and *Friend 1* compared to the latter two. Likewise, the result implies that there are very strong knowledge networks among 398 people working in Cyberjaya. They interact and share knowledge whenever a problem occurs in their work. This confirms the potential of social networks to create a web of interaction among people working within the physical boundaries of a knowledge-based cluster.

Table 6.12: Social network based on company classification

Company classification	Respondent	Friend 1	Friend 2	Friend 3	Total friends
Creative multimedia	28	7	8	7	22
Hardware design	10	0	1	1	2
Software development	34	11	5	3	19
Internet based business	9	2	3	2	7
SSO (Outsourcing)	100	155	101	69	325
Support services	13	0	2	2	4
Higher education	0	7	10	5	22
Government office	1	16	15	4	35
Others	5	1	4	5	10
<b>TOTAL</b>	<b>199</b>	<b>199</b>	<b>149</b>	<b>98</b>	<b>446</b>

The interaction produces a flow of knowledge from one individual to another and indirectly helps to enhance organisational knowledge capacity-building. These signify one of the intangible factors to ensure the success of knowledge-based urban development, as suggested by Sarimin and Tan (2011).

Besides the number of friends, the classification data was also used to produce a cross-tabulation of the respondents' company sectors with their social network. Table 6.13 shows that outsourcing (SSO) companies have the highest number of social networks compared to the rest. Creative multimedia, however, shows the highest number of social networks when compared to software development and hardware design. All three sectors can be classified as high-end ICT industries compared to internet-based businesses, outsourcing and support services, which can be classified as ICT support companies. Software development records as high as 10% social networking among those from the same sector, whereas the creative multimedia records an almost 8% figure. As discussed earlier in this chapter, both sectors require a high level of interaction in their daily work. This data again proves my earlier argument which stated the importance of face-to-face interaction among creative multimedia companies. In contrast, the hardware design sector has a high restriction on knowledge-sharing among their employees. This might be one of the reasons for the small number of social networks among employees from this sector. The lack of social networking is also influenced by the small number of hardware design companies in Cyberjaya

Table 6.13: Social network based on company sector

Respondent company sector	Social network									Total
	CM	HD	SD	IBB	SSO	SS	GOVT	EDU	Others	
Creative multimedia (CM)	5	1	2	0	42	1	8	5	0	64
Hardware design (HD)	3	0	2	1	11	0	2	1	0	20
Software development (SD)	3	0	7	0	48	1	4	5	2	70
Internet based business (IBB)	2	0	0	0	12	1	4	3	1	23
Outsourcing (SSO)	7	1	6	2	186	1	10	8	5	228
Support services (SS)	2	0	1	2	17	0	6	0	1	29
Government office (GOVT)	0	0	0	0	3	0	0	0	0	3
Higher education (EDU)	0	0	0	0	0	0	0	0	0	0
Others	0	0	1	0	6	0	1	0	1	9
<b>TOTAL</b>	<b>22</b>	<b>2</b>	<b>19</b>	<b>5</b>	<b>325</b>	<b>4</b>	<b>35</b>	<b>22</b>	<b>10</b>	<b>446</b>

Source: Field data, 2009

The sector requires laboratories with different facilities to conduct testing for their work, and only large, established companies can afford to do this. It was observed during the fieldwork that companies with laboratory facilities require larger office space and strict security measures to ensure safety.

Finally, the social network data were analysed based on company size. The SME Corporation of Malaysia company classification was used as the basis to categorise the companies based on size. However, the suggested ranges of employees for micro, small and medium companies create an unbalanced distribution of the data based on the sizes of companies operating in Cyberjaya. ICT companies are categorised as micro, small and medium<sup>86</sup>. Nevertheless, the results show an unbalanced distribution of the data based on the sizes of the companies operating in Cyberjaya. For the purpose of the analysis, I have re-categorised all companies

<sup>86</sup> The classification is based on number of employees. Companies are classified as micro if they hire fewer than 5 people, small if they have 5 to 19 employees and medium if they have 20 to 50 employees.

using the same classifications but with different ranges of employees<sup>87</sup>. As presented in Figure 6.16, employees working in large companies are also active in social networking activities. Although 3% of the respondents are from micro companies, none of the respondents identified people from these companies as people they would contact if they encountered a problem in their work. In contrast, the results show that more than 80% of the social networks involve those working in medium- and large-sized companies.

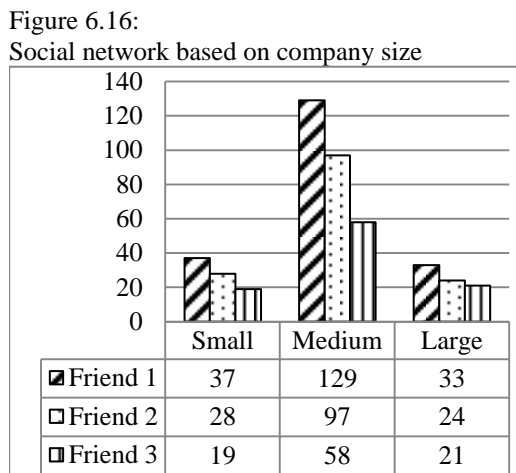
The results also show that 60% of the social networks in Cyberjaya involve knowledge workers working in medium-sized companies. As discussed earlier in Chapter 4 of this thesis, most people working in small companies tend to share knowledge with their colleagues. There are also fewer restrictions on sharing knowledge among them compared to bigger and more

structured companies. Internal procedures practiced by most established companies also reduce the knowledge-sharing possibilities among their employees.

Subsequently, the data were utilised to produce a spatial-based analysis. Map 6.1 illustrates the social network of knowledge workers in Cyberjaya. Firstly, it shows a high correlation between physical infrastructure and the social network. As demarcated by the

red circle on the map, a high concentration of social network activities can be observed at the main boulevard of Cyberjaya. This was the original area where Cyberjaya started to developed with the MDeC building as the main trademark. There is also a high number of commercial activities such as banks, restaurant, cafes and the main public transport hub. It has a high number of office premises compared to other areas in the city. These features themselves prove the importance of physical development to encouraging social networks.

The map also suggests that high density development, i.e. compact development, contributes to higher social networking among people. Although ICT helps to enhance social networks, the



Source: Field data, 2009

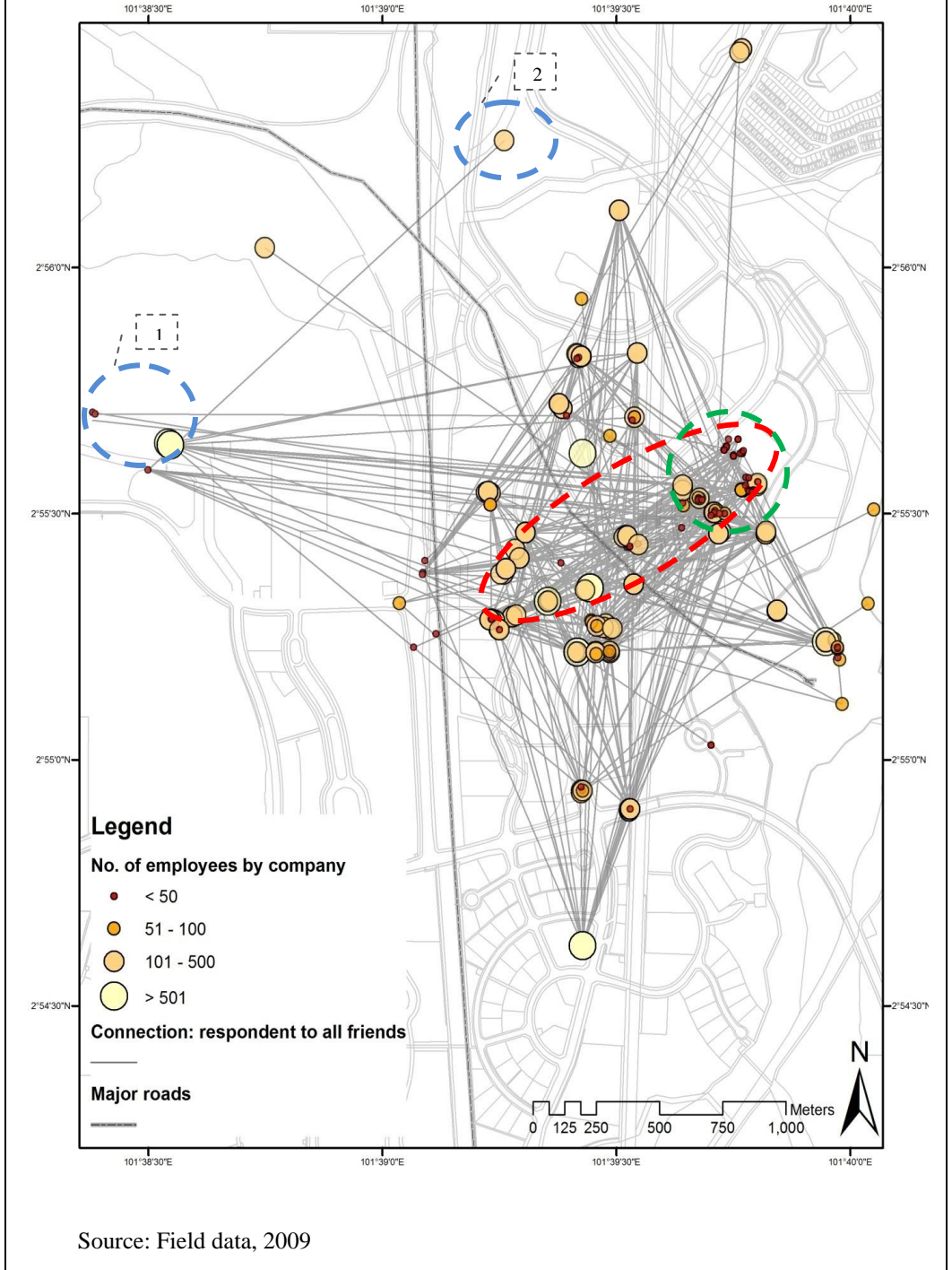
<sup>87</sup> The new classification was needed due to the extreme range of the data gathered based on the sample. It was reclassified to micro (50 and less), small (51-100), medium (101-500) and large (501 and more).

sample proves that distance does have an impact on social networking. As discussed earlier in Chapter 4, the majority of the knowledge workers still consider face-to-face communication to be the best communication method even in an ICT-embedded city such as Cyberjaya.

Secondly, there is a high concentration of social network activities in the area marked with the green circle. Upon further evaluation of the concentration spot, I noticed that the area houses the SME companies. The buildings are located physically close to each other with high density development, and they have shared social facilities such as sports activities and a food court. During the interviews, it was discovered that typically restrictions exist in larger, more structured companies than the SME companies. The companies themselves are small in size and foster a higher degree of closeness. This increases the level of trust among people working within the areas.

Thirdly, the final finding from the map is that knowledge-producing institutions, in this case universities, do not necessarily contribute towards higher social networking, i.e. knowledge flow. The first blue circle demarcates the incubators that house start-up companies located within the MMU campus. The area records a low number of social networks, and there is no substantive networking happening within the campus area. The knowledge workers in the companies declare their social networks among people working in other companies rather than consulting those within the campus area. The second blue circle is Limkokwing University, which is spotted with only one social network activity. This lack of social networking proves that the majority of knowledge workers in Cyberjaya would consult their friends who are working in other companies rather than consulting those working in the universities. Additionally, this could indicate that they do not have any friends they trust in either university.

Map 6.1: Social network in Cyberjaya



Further analysis of the map indicates that knowledge workers working in companies located far from other buildings have a low number of social networks. The social network map has shown that the concentration is in the core area of the cluster. This again proves that physical isolation does not enhance social network and indeed has negative implications on knowledge flows in knowledge clusters such as Cyberjaya. It also proves that the planning zone has a direct impact on social networking in a knowledge cluster. On the map, the highest concentration of social networks is located in the high density development zone, which has a high plot ratio compared to the rest of the city. The existence of the main road also ensures easy access from any point of the city to the area. Furthermore, the main residential areas in Cyberjaya are also located in the same area.

Hence, the social spatial map provides a valuable lesson for future knowledge cluster development. My study of Cyberjaya city development has shown that a knowledge city should be developed as a concentrated (compact) rather than dispersed development (Figure 6.17 and 6.18). Since the city was developed by a private property developer, the financial requirement determine the development direction. In contrast, the development should have considered the needs of the city's residents rather than the needs of the property developer, who basically decides based purely on cost analysis rather than best practices.

Therefore, knowledge networks can create a 'virtual' interlock that bonds all the physical development in one specific area, as can be seen from my analysis. The density shows the strength of the cluster and helps to determine the locations which require attention from the physical planner to ensure the web is maintained at the strongest possible position to produce a dynamic cluster.

Figure 6.17: Current physical development method

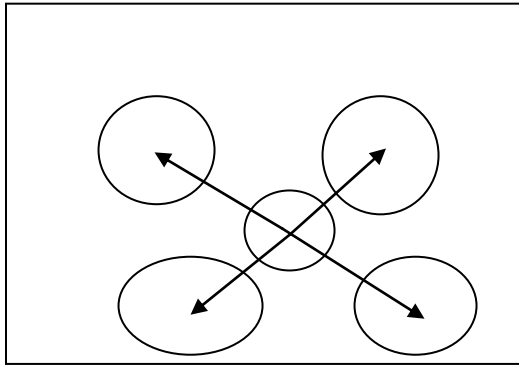
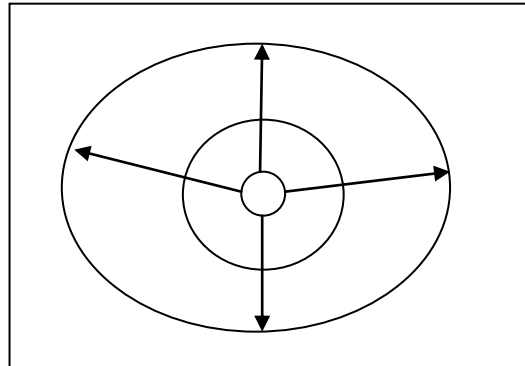


Figure 6.18: Proposed physical development method



Legend:  
○ Development area  
→ Development direction

Source: Author's illustration

## 6.7 Conclusion

My intention for this chapter was to discuss the dynamics of Cyberjaya as a knowledge-based cluster. The underlying argument is that knowledge flow and knowledge-sharing plays vital roles in determining the dynamics of the cluster. Nevertheless, the flow created an imbalanced distribution of knowledge either within or outside of the companies. I have applied the core and periphery dichotomy to the phenomenon. Basically, the core controls the flow of tacit knowledge to the periphery through social networks. I have also proven how social networks help tie the core to the periphery and vice versa.

I begin by arguing that Malaysian federalism and the policy-making process have influenced knowledge-based cluster development. Policy developed at the core with a strong federal government has influenced clusters developed at the periphery. Cyberjaya was developed to expand the power base for the central government. It has created a group of technocrats at the periphery who form an extension of the political elites at the core. Both parties benefit from the development model created at the core. Nevertheless, I have discussed how a change at the periphery impacted the overall development of the cluster. The beneficiary feels threatened once the power shifts from the core to the periphery, and this situation creates imbalances which threaten the whole dynamic of the cluster.



Next, I argued that the core is also the periphery. In the case of support services, internet-based businesses and SSO companies located in Cyberjaya, the parent companies are still located in other, more developed countries such as the US, European countries or even Singapore. Only small or insignificant R&D works are done in their branches in Cyberjaya, when they are conducted there at all. In this case, the branches located in Cyberjaya function as a periphery for the core company, while within the company a small group of people function as the core for the company.

Then I have used statistical analysis to show that the number of friends, i.e. the social network, within the company is influenced by the company type, size and origin. I have proven how the nature of the work in creative multimedia and software development companies influences the number of friends of its employees. Both types of companies require a high level of interaction and working in small teams.

On the other hand, none of the social factors, such as gender, ethnicity, level of education or main job function, influences employees' number of friends in companies. This shows that a knowledge worker's social background is not a determining factor when it comes to knowledge-sharing in Cyberjaya, especially while conducting daily tasks.

Nevertheless, the work-related network does not necessarily develop into trust, as my analysis has shown. Gender seems to be the only influencing factor to determine the number of close friends, deemed to be the ones an employee trusts with secrets. This discrepancy proves the strong correlation between informal activities and knowledge workers' tendency to share certain knowledge. Informal activities provide the platform for bonding and enhancing trust between participants, which contributes significantly towards knowledge-sharing.

Finally, by applying GIS tools, I have illustrated how the physical development contributes to the imbalanced flow of knowledge in Cyberjaya. It forms a core and a periphery of knowledge flow at the spatial level. Although physically, Cyberjaya is developed based on disperse development, my results have shown that socially the interaction is still very much clustered within the most concentrated areas. In turn, this finding shows that the Cyberjaya cluster fails to take into consideration the importance of social networking in its physical development. Disperse development and isolated buildings do not contribute to creating a dynamic

knowledge-based cluster. Physical proximity is vital to encouraging social network activities which contribute to knowledge flows even in an ICT-embedded cluster such as Cyberjaya. In other words, geographical proximity is still relevant even in an ICT-based city.

## Chapter 7:

### Revisiting Cyberjaya as a Knowledge City: Concluding Remarks

In 1997, Malaysia began construction on the biggest knowledge-based cluster in the form of a new township known as Cyberjaya<sup>88</sup>. The cluster was designed to be an Information and Communication Technology (ICT) hub following other Science Park models in developed countries<sup>89</sup>. The planning and development of the cluster is highly centralised and focuses on hard rather than soft infrastructure. If interconnection (Porter, 2000) and the transfer of tacit knowledge (Evers, 2008) are the keys to a successful cluster, then they should be some of the main indicators of a dynamic cluster apart from having a sophisticated infrastructure, as argued by Saxenian (2004). Therefore, the main question addressed in this research is; *how do knowledge flow, knowledge-sharing and urban planning contribute to the development of Cyberjaya as a knowledge city?*

This research has three main objectives; the first objective was to contribute to the understanding of how physical development impacts the formation of knowledge-based clusters in Peninsular Malaysia. Following this, spatial planning and the influence of urban development on Cyberjaya as a knowledge-based cluster was analysed. Finally, the last objective was to thoroughly examine knowledge-sharing, knowledge network, and the importance of spatial proximity among people working in ICT companies in the city.

In an attempt to answer the question and fulfil the three objectives, this research has applied case studies (Yin, 2008) and mixed methods combining quantitative and qualitative approaches (Cresswell, 2009). It uses a bottom-up technique in which the research begins by understanding the situation of individuals living and working in the city before proceeding to

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<sup>88</sup> Knowledge-based clusters are agglomerations of organisations that actively use knowledge both as input and output, for instance universities and colleges, research institutions, think tanks, government research agencies and knowledge-intensive firms (Evers, 2010).

<sup>89</sup> The term *ICT* is used loosely and covers all related industries including multimedia as well as software development and hardware design.

analyse the development at the macro level. In addition, ‘Verstehen’ is exercised to understand the symbolic meaning connected with the city and its inhabitants<sup>90</sup>.

I argue that political influence and ethnically based policy have an impact on the epistemic landscape. Furthermore, physical infrastructure alone will not produce innovation and knowledge outcome. Malaysia’s centralised administrative system as well as ethnic groups, political elites and crony-based capital distribution have also impacted the growth of knowledge-based clusters. These problems have created an opportunity for the political elite to benefit from massive infrastructure projects such as Cyberjaya.

### Knowledge Cluster Formation in Peninsular Malaysia

The purpose of this chapter is to trace the formation of knowledge-based clusters in Peninsular Malaysia. The questions asked are as follows: if the formation of a knowledge cluster (especially in the ICT industry) has been the government policy, what has been the result? Has Malaysia developed an epistemic landscape of knowledge clusters? Has the main knowledge cluster really materialised in and around Cyberjaya?

In an effort to answer the questions above, the chapter begins by looking at Malaysia and its path towards a knowledge-based economy. I first describe the development strategy of the Malaysian government which has used cluster formation as one of its prime targets. I then provide evidence of the current state of knowledge cluster formation in Peninsular Malaysia.

As a result of the decades of institutionalised development planning, knowledge-based clusters were formed in various locations in Peninsular Malaysia with different degrees of ‘knowledge density’. I have produced a density map based on the number of institutions together with the number of knowledge workers. The results show that the knowledge-based clusters in Peninsular Malaysia are still concentrated in the West Coast. Three main locations with the highest concentrations of knowledge-producing institutions and knowledge workers are Kelang Valley, Johor Bahru and Penang.

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<sup>90</sup> This method was utilised in Chapter 3 in which the symbolic meaning of the city was analysed following an earlier study by Evers (1997).

On the contrary, the East Coast of Peninsular Malaysia has fewer developed knowledge clusters, and they are still concentrated at major cities in the region such as Kota Bahru, Kuala Terengganu, Dungun and Kuantan. Kuantan has the highest density of knowledge workers in comparison to the other three cities. One interesting finding from the density map is that knowledge clusters in the East Coast did not spread along major highways like they did in the West Coast but rather concentrated in the main urban areas.

In addition to the knowledge density map, I have also produced an ICT knowledge cluster map based on data gathered during the fieldwork. It shows that ICT clusters in Peninsular Malaysia also correlate with the knowledge clusters discussed earlier. Again, the Kelang Valley area, which includes Cyberjaya, shows a significant number of ICT-based institutions. Obviously, the MSC Malaysia has contributed towards the creation of an ICT-based cluster within the Kelang Valley.

In post-independence Malaysia, R&D activities still focus on primary economic activities such as agriculture and fisheries. Not until Mahathir's premiership beginning in the 1980s did R&D activities start to diversify from the traditional sectors to high technology, including ICT, automobile, aeronautic and space-related research. As a result, though only 14 R&D institutes existed before independence, the number rose to 101 in 2009. At the same time, new groups started to rise in the form of board members and advisory panels composed primarily of senior ruling party members and retired civil servants that benefit from establishing such institutions.

In addition to government-owned knowledge-producing institutions, there are also privately owned institutions starting with Goon Institute, Kuala Lumpur, in 1936. Due to the increase in the demand for higher education beginning in the 1970s, the number of private higher learning institutes increased significantly from then on. This changes were further enhanced with the liberalisation and restructuring of higher education in the 1990s. The process helped the remarkable increase in the number of both public and private knowledge-producing institutions. As a result, the number of public universities nearly tripled from merely 8 before 1990 to 20 in 2009. While there were no private universities in the 1990s, in the year 2007 a total of 37 private universities were allowed to operate in Malaysia. At the same time, other forms of private higher learning institutions grew from 156 in 1992 to 460 in 2009.

I then discussed the most important question of whether this clustering process has also resulted in higher knowledge production, as predicted by clustering theory. For this purpose, knowledge production in the form of scientific publications, patents and trademarks was used as an indicator of innovation and knowledge output. The outputs for scientific publications were derived from the ISI Web of Science. The results indicate that public universities produce more publications than private ones. For example, on average, public universities produce almost 10 times more publications each year as compared to their counterparts in privately run universities.

Besides the number of publications, I have also collected patents and trademarks data to evaluate the dynamics of the knowledge clusters. The results show that from 2005 to 2009, Selangor and Kuala Lumpur had the highest numbers for both, followed by Penang and Johor. At the same time, Perak, Malacca and Negeri Sembilan, which are located in the most concentrated knowledge clusters in Peninsular Malaysia, also show significant records of patents and trademarks applications. On the other hand, all the states in the East Coast show low numbers of applications for both patents and trademarks. Hence, Kelang Valley still dominates the knowledge output in Peninsular Malaysia, which shows that the patents and trademarks output strongly correlates with economic growth.

In conclusion, data collected from websites, directories, government publications and expert interviews have enabled me to construct the epistemic landscape of Peninsular Malaysia. Several knowledge clusters of a high density of knowledge-producing institutions and their knowledge workers have been identified and described. The analysis of the knowledge output, measured in terms of scientific publications, patents and trademarks, shows that existing knowledge clusters have, indeed, been productive as predicted by cluster theory. The results are, however, not as clear-cut once the output is disaggregated by institutions. Politically motivated developments planning as well as social networks have influenced both the epistemic landscape and the results of knowledge clustering. This is evident when the distribution of knowledge workers and the government planned development corridors are compared. Several corridors do not have a high concentration of knowledge workers to bring about development, whereas other areas with a good knowledge base have not been designated as corridors.

## Malay Supremacy in Urban Development

The chapter analyses how various actors use urban symbols to lay claim to their vision of a modern Malay nation and society in the construction of the newly founded knowledge-based city of Cyberjaya. It aims to observe the usage of symbols and signs in the social space of Cyberjaya. This is carried out by the *Verstehen* approach, which attempts to interpret and understand the symbolic meaning of the physical development in which signs and symbols are used to define urban spaces. Political elites make use of symbols to stake their claim to supremacy. In the same manner, interpretation was also carried out on websites, news archives and pictures taken during the fieldwork. As the ruling government elite controls land and the urban planning process, they are able to impose their vision of Malaysian society on urban spaces and urban constructions, as shown in the analysis of the logos of government corporations and of architecture and the use of urban space. It is shown that both regress to traditional patterns of Malay life as well as visions of a modernised Malay society vying for spatial and symbolic expression.

In Malaysia's multi-ethnic society, symbolic space is highly contested. Whereas Chinese symbols, like signboards with Chinese characters and Chinese temples, have dominated urban space, Malay symbolism was relegated to national Mosques, the Sultans' palaces and rural areas. With the NEP, instituted by the Malay-dominated government after independence, Malays have claimed a larger share of economic opportunities. This could only be achieved by occupying more urban space, where economic activities are concentrated. This proved to be difficult, and eventually the foundation of new urban centres opened avenues to symbolically claim a place for Malay dominance in government and the economy. The creation of Cyberjaya was the outcome of the battle for symbolic domination.

The new urban space of Cyberjaya – like all urban spaces – is subjected to a constant process of contestation and negotiation. Imagined, planned and built as the heart of the ambitious MSC project, Cyberjaya is seen as the major driver that will enable Malaysia to accelerate towards its long-held goal of attaining 'developed country' status by 2020. The transformation has been spectacular by any measure. As Ross King (2008:xxii) describes the rise of nearby Putrajaya – a description that applies equally well to Cyberjaya – we have seen 'the landscape of oil palm

plantations succumb to bulldozers and excavators to yield the red-earth scars of construction sites, then roads, formal avenues, monuments and domes, engineering extravaganzas, high-rise offices and housing estates'. As such, Cyberjaya is deeply implicated – iconic even – in the *national* development project that has been shaped by the state over more than five decades.

However, in the Malaysian context, the material realities and symbolic significance of Cyberjaya raise important questions about whose development is being advanced and for what immediate and long-term purposes. Malaysia is a multi-community society of long-standing, yet Cyberjaya was presented by its planners, not the least of which was Mahathir himself, *simultaneously* as a manifestation of multiculturalism and as a monument to particularistic Malay-Muslim achievement. In this divide, Cyberjaya reflects the wider ambivalence of identity politics as it permeates every aspect of life: political control, patterns of ownership, spatial segregation, the emblems of affiliation, the meanings of culture, and much more besides. Then there is the impact of global dynamics – part of the promise to liberalise and open up the economy in order better compete as a technopole in the informational network society.

Can Cyberjaya hold all three identities at the same time? Can it be Malaysian and multicultural, Malay-Muslim and communal, global and borderless? Most of the evidence appears to suggest that the *primary* identity of Cyberjaya is as part of the Malay-Muslim world. This is certainly the view of Ross (2008: xxiv) who, in discussing the origins of the MSC project as a whole, says 'the underlying agenda is the advancement of Malaysia as a Malay-Muslim polity, a new kind of high-modernist Muslim nation, one pole is an emerging pan-Islamic world and noble counter to more venal globalist ideas'. Much of the evidence I have gathered in the chapter would seem to bear out this assertion, both materially and symbolically. In the case of the latter, my discussion of the significance of the logos and crests used to define and project the key actors in the evolution of Cyberjaya clearly draw on specifically Malay-Muslim referents, both 'traditional' and 'modern'. In examining the architectural motifs and use of space, it is equally clear that Malay identifiers predominate but not exclusively so. There is a mixture of styles at play here: Sepang Municipal Council, Cyberview and the MMU each use a fairly conventional international modernist style of architecture. In keeping with the modernist tradition, Cyberjaya follows 'a zonal pattern is corresponding to each function of the



city’ with distinctive flagship, residential, commercial and recreation zones. As Brooker goes on to suggest, ‘Zoning was designed to produce specific psychological effects on the citizens who inhabit the “intelligent city”’ (Brooker, 2012: 9). These include such modernist tropes as order, rationality, discipline and hard work through which ‘creativity and innovation’ are meant to thrive.

There is much greater symbolic and aesthetic ambivalence and inconsistency in Cyberjaya than initially appears the case. In light of this, it is not possible to suggest that Malay-Muslim cultural identity is the only domain of meaning in Cyberjaya, even though it may be the predominant one for the time being. Between now and 2020, the Malaysian political elite will have to steer a careful path between the competing claims of what Cyberjaya is and should be: between a genuinely Malaysian project that is inclusive of the whole population and an exclusivist Malay-Muslim urbanscape that, ironically, looks more and more away from the traditional *kampung* world and to the wider Islamic world for its inspiration. Added to the mix is the way that global forces themselves – in the making of a knowledge society – will also impact of the dynamics of social change. For the time being, Cyberjaya seems to reflect nothing that is ‘real’ in the Malaysia that exists outside the MSC. It is a postmodern fantasy that mixes symbolic cultural referents in all kinds of promiscuous ways, perhaps not knowing what it really stands for. Where it goes from here in large part will depend on the balance of political forces that might emerge in the coming years. But, equally, it will depend on global structural and ideational influences whose effects are much less straightforward to predict.

### Crony-capitalism and Cyberjaya Development

The point of departure in the chapter is the formation of the knowledge city as shaped by the various linkages and informal ties of the actors. I focus on physical infrastructure projects as the determining factor of constructing the city as well as the allocation of resources. Thus, the main questions in this part are ‘who benefits from Cyberjaya development, and do the people living in the city feel the effects of a knowledge-based city?’

The capitalist political network is an open secret that has become obvious since Malaysia started its major privatisation and massive infrastructure projects during Mahathir’s

premiership (Gomez, 2012; Wain, 2010; Jomo & Gomez, 2000). The infrastructure cost for the city when it first started was in the range of RM2 billion<sup>91</sup> to RM5 billion (iProperty.com, 2010a; Wain, 2010). With such a massive amount of capital involved, it creates opportunity for the capitalists and political elites. Hence, those who managed to gain access to construction activities in Cyberjaya would certainly benefit from the massive infrastructure works to fill the greenfield.

Currently, there are 17 active property developers in the city. The top developer is Emkay Group (RM6 billion) followed by SP Setia (RM3 billion), OSK (RM1.5 billion), Mah Sing (RM1.5 billion) and UEM Land (RM1 billion). The volume of the GDV (Gross Development Value) clearly shows that Emkay Group leads and controls access to landownership in Cyberjaya via their position as the master developer. Although the land in the city is owned by the state, one man has been given full access as the master developer, i.e. Emkay Group. The *man* who owns the company is Mustapha Kamal, a well-known Malay property developer. He has a strong connection with Mahathir, the man behind Cyberjaya's creation.

At the same time, most of the companies have close relationships either with the ruling party or with Mustapha Kamal. For example, Emkay, Laketown, Mah Sing and UEM Land are all related to Mustapha Kamal by having board members who have worked with him personally or his immediate family members. Whereas some board members of Glomac, SP Setia, Subang Alam, OSK Property, Nadayu Properties and Andaman Property are also active members of the main ruling party. Besides political and social networks, there are also bureaucratic networks, which is evident by the election of former senior civil servants as members of the board. This is a common practice in corporate Malaysia (Mariarti & Kamarulzaman, 2005; Nor Azizah & Halimah, 2007). Hence, the infrastructure work has created three forms of networks among the major actors in Cyberjaya, namely social, political and bureaucratic. All three of them are inter-related and influence each other. Infrastructure projects were created and distributed among those who are part of the interlocking networks. This situation shows how infrastructure projects are used as a tool not only to create business opportunities for Malay

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<sup>91</sup> RM or Ringgit Malaysia is the currency of Malaysia. Roughly, 1Euro is equivalent to RM4.

capitalists but also to contribute to ensuring benefits for the ruling party by having their party members elected as board members of the companies.

Nevertheless, against this backdrop, one must ask if it has an impact on the overall development of the city and how people working and living in Cyberjaya feel about the city. By analysing the viewpoints of professionals, residents and knowledge workers on Cyberjaya development, I discern their experience and perceptions about the city.

My interviews show that the professionals involved in the knowledge-based cluster development are facing a dilemma in determining whether to uphold their professionalism or to succumb to their political master. Meanwhile, the internal leadership and management problems within organisations such as the EPU have contributed to the demotivation of professionals that forces them to leave their organisations. Secondly, although Cyberjaya was developed and highlighted as a knowledge-based city, it does not seem to provide even the basic facilities required for its residents. The most striking need which is not met in the city is affordable housing. Religious and medical needs are also neglected. In addition, the ICT component, which was supposed to be the backbone of Cyberjaya development, is not felt among people living in the city. Hence, this has created frustration among people in Cyberjaya, as they do not seem to feel any difference living in this city compared to others.

Finally, I draw inferences on the basis of statistical analysis. By doing so, I manage to capture the frustration felt among knowledge workers in Cyberjaya. Cluster development is predisposed in benefitting a certain ethnic group, namely the Malays. Due to limited access to business opportunities in Cyberjaya, the Chinese feel dissatisfied. This has aggravated the situation and created additional dissatisfaction among different ethnic groups. I have so far summed up the distinct viewpoints expressed by Cyberjaya's professionals, residents and knowledge workers.

Cyberjaya's infrastructure development shows that the capitalists are the ones chosen to lead the project. They use the opportunity to realise their profits. Infrastructures such as housing and social facilities are built once the market value and demand increases to gain the highest profit,

which is purely capitalistic in nature. This in return has created frustration and demotivation among professionals, residents and knowledge workers living and working in Cyberjaya.

### Knowledge Sharing in ICT Companies in Cyberjaya

The questions which the chapter will try to answer are; is Cyberjaya a knowledge city? Does ICT technology influence the knowledge-acquiring process? At first glance, visitors to Cyberjaya will be impressed with the size of the city, the number of buildings, and the landscapes and facilities provided. By providing an ICT infrastructure, the planners assumed they could create and offer a knowledge-based environment. Does the assumption materialise in the newly built city? Does technology really contribute towards creating a knowledge-based environment?

Although there were studies which indicated that ICT would reduce the need for physical proximity, my results show otherwise. Thus, the chapter argues that physical proximity is important even for ICT companies located in a geographical area embedded with ICT facilities such as Cyberjaya.

My survey results show that, whether intentionally or not, the city has managed to create a unique character with a diversity of people working in the cluster. This has fulfilled the requirement of being a successful cluster as shown in other established ICT clusters in the world. Nonetheless, diversity itself does not necessarily contribute to innovation if there is no interaction among them, as shown in previous studies.

Cyberjaya lacks social facilities such as residential, commercial and recreational ones. In addition, its dispersed development does not help either. The city is too 'formal' and 'fake' as it tries to portray modern and high-tech living at the expense of the local culture (Norhafezah, 2010). A previous study by Norizzati et al. (2009) has proven the importance of informal communication that happens during activities outside of the office environment in encouraging knowledge-sharing. The limited number of places to ensure active interaction among people working in the city further creates a void in knowledge flow within the cluster.

Data collected during the fieldwork suggests that conventional methods of acquiring knowledge are still important even among ICT engineers working in Cyberjaya. The latest ICT facilities and skills do not lessen the significance of face-to-face communication in acquiring new knowledge in ICT. People trained and living in ICT-based cities such as Cyberjaya does not necessarily live in a virtual world. They still regard human contact and physical proximity as essential to enhancing their individual knowledge. The virtual world only expands their avenues to acquiring knowledge but does not replace the importance of human contact.

To analyse the knowledge-sharing environment among knowledge workers, I have applied a statistical analysis known as PCA (Principal Component Analysis). I have managed to group and rank the different variables into four main factors based on their importance. The identified factors cover the physical and social input of the knowledge workers' environment. The results suggest individual working experience as the most important factor that encourages them to share their knowledge. However, the outcome of the analysis also shows the significance of internal procedures in the companies. Furthermore, it shows that physical proximity is significant to ensure that employees comply with the internal procedures. It also proves that physical proximity is used as a tool to encourage knowledge-sharing within the organisation and discourage knowledge-sharing with outside companies.

The chapter also discusses knowledge-sharing activities within a smaller group. The result proves that strategic knowledge-sharing in R&D-based companies is limited to a smaller group. It shows that the process happens in an informal flow rather than formally, especially among team members. Furthermore, certain industries, especially R&D and multimedia-based companies, depend highly on face-to-face interactions on a daily basis to ensure better quality and results. The other factor, often neglected in discussions about physical proximity and knowledge-sharing, is the layout inside the building. Physical layout and the interior of the building can enable knowledge-sharing within the company. My study has proven how a barrier-free layout and furniture that encourages interaction contribute significantly towards knowledge-sharing, especially among members in small groups. Physical proximity alone is not enough; it must be accompanied by an enabling environment to ensure bonding, which will then contribute to building trust among team members and finally enhance knowledge-sharing.

As a conclusion, the chapter has discussed the importance of physical proximity among engineers in ICT companies. It has shown that ICT facilities cannot reduce the importance of physical proximity. Face-to-face interaction is still the most important mode in acquiring new knowledge, and it helps create dynamic knowledge-producing and sharing. Physical proximity ensures bonding even among ICT-based businesses and personnel. Enhancing the physical proximity by ensuring proper internal layout and barrier-free architecture can improve bonding levels among team member and further contribute to knowledge-sharing.

### Social network and the dynamic of Cyberjaya

In the final empirical chapter, I intend to analyse how social networks among knowledge workers contribute to the dynamic of the cluster. By dynamic, I refer to tacit knowledge flow among ICT engineers based in Cyberjaya. I utilise social networks to visualise and to better understand the knowledge flow among knowledge workers. In short, the chapter will answer the question; how does knowledge flow in the social network of the knowledge workers and contribute to the dynamic of a knowledge-based cluster such as Cyberjaya? My argument in the chapter is based on the core and periphery spatial model developed by Friedmann (1966). I expanded the model to analyse not only the spatial but also the organisational and the individual contexts using the same dichotomy. I have also applied GIS (Geographic Information System) to visualise the social networks among the ICT engineers.

I begin the chapter by looking at how Cyberjaya was developed through the social network of elites of the society. The idea evolved from an informal discussion between Tengku Mohd Azzman Shariffadeen, Founding Director General of the Malaysian Institute of Microelectronic Systems (MIMOS), and a senior member of the cabinet in the late 1980s (Shariffadeen, 2011). This was the beginning of Malaysia's active participation in the electronic R&D activity which eventually progressed into creating the Multimedia Super Corridor (MSC) and Cyberjaya in the late 1990s. This shows the significance and impact of social networking, especially among the society's elites. An idea originally forwarded by a group of people has managed to change the development model of the whole country. It also marked the unfolding of the core and periphery of power which use technology as the catalyst.

Cyberjaya is an example of how spatial boundaries of clusters are frequently defined politically, as observed by Reid, Smith and Carroll (2008) as well as Sternberg (2008). The planning and development processes are often defined by the demarcation made by the authorities rather than industries' dynamics. The cluster depends heavily on organisational and institutional frameworks to start and develop from the greenfield site. As a result, most local-based companies, especially the start-ups and SMEs, are unable to prosper. High reliance on institutional support fails to ensure their companies sustained growth, especially in knowledge-based clusters. It also highlights that companies established in clusters through centralised planning require more than just financial and training assistance to grow, and this proves to be true especially in a knowledge-based cluster.

The situation in Cyberjaya becomes further complicated because of the change in the political landscape after the 2008 election. The election saw – for the first time in Malaysian history – the opposition party taking over five states and winning majority seats in the Federal Territory. This created a new paradigm in the federal-state relation especially in Selangor, which is the most developed state in Malaysia and where Cyberjaya is located. Therefore, the strong centralised government model which has been practiced ever since Malaysian independence has taken a new direction. This in turn affects the Cyberjaya growth. Inside the cluster, I have found the existence of groups who benefit from the development and are inclined towards the ruling party. They act as 'ICT tsars' who feel threatened when political change creates imbalances in the power structure between the federal and the state government. Thus, a politically constructed boundary has created a symbiotic relationship between the political elites and the 'ICT tsars' or so-called technocrats. In the case of Cyberjaya, I have shown how social networks create opportunities for the elites to retain their power at the core and by delegating resources to selected capitalists.

I have discussed the various factors influencing knowledge flow in Cyberjaya. Basically the factors can be divided into two, which are those related to the company and so social profiles. Firstly, the company size, sector, and origin have significant impacts on the number of social networks. I have learned that companies either have a structured and organised method to ensure employees are 'connected' to each other or the employees themselves create avenues to become acquainted with each other. Social networking is seen as a necessity for companies to

ensure productivity (work output), and at the same time, individuals consider it a social need to be part of the group. Nevertheless, the social networks may create an imbalance in the flow of knowledge and thus form a core and periphery within the company. It seems that some groups of people, due to their gender, ethnicity, experience or education gain better access to networking, which in return allows for better access to knowledge flow.

Secondly, I noticed that an employee's educational background, personality and experience eventually create barriers for knowledge-sharing. Some employees will try to be close to the core of the company or team where knowledge collates. The rest, especially those who are new, inexperienced and lack the necessary network, will be pushed to the periphery. They will have to prove themselves before they can become members of the core. This may happen in the same company, or they may have to go to another company. One of the ways to get closer to those who are more experienced is to get involved in informal activities that will break barriers and increase chances. For example, sports and other social activities help reduce the gap between those at the core and those at the periphery. It is the best alternative for people from the periphery to get closer to the core. Social networking among people working in Cyberjaya is not limited to those working in the same company. I discovered through the survey conducted that social networks expand through both work and leisure. The survey shows that almost 90% of the respondents established their social network in Cyberjaya through university, work and friends. The figure also proves that both friendship and work play vital roles in social networks among ICT engineers in Cyberjaya. Thus, the core and periphery dynamic depends on the individual, company and environment.

Thirdly, I argued the core is also the periphery. In the case of support services, internet-based businesses and SSO companies located in Cyberjaya, the parent companies are still located in other, more developed countries such as the US, European countries or even Singapore. Only small or insignificant R&D work is carried out in their branches in Cyberjaya, when it is conducted there at all. In these cases, the branches function as the periphery for the core company, while within the local branches, a small group of people function as the core for the local unit.



Finally, I have illustrated by applying GIS tools how physical development contributes to the imbalance in the flow of knowledge in Cyberjaya. The overall development of the physical infrastructure is polycentrically dispersed. In contrast, the social network depicts a core and periphery of knowledge flow at the spatial level. Although physically Cyberjaya is developed based on dispersed development, my results have shown that socially the interaction is still very much clustered within the most concentrated areas. These findings show that the Cyberjaya cluster fails to take into consideration the importance of social networks in its physical development. Scattered development and isolated buildings do not contribute to creating a dynamic knowledge-based cluster. Physical distance is vital to encouraging social network activities which contribute to knowledge flows even in ICT-embedded clusters such as Cyberjaya. In other words, geographical proximity is still relevant even in an ICT-based city.

To conclude, my study has shown that geographical proximity is still important in the creation of a knowledge city. It encourages knowledge-sharing and enhances social networking. At the same time, in the Malaysian context, the usage of symbols in the social space together with crony capitalism plays a vital role in constructing the city. This harkens back to the main argument that the knowledge city of Cyberjaya reifies the dominance of the Malays. The city of Cyberjaya is created by and benefits the elites. This contributes to the uneven development in the cluster of Cyberjaya and in overall Malaysia.

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## **APPENDIX I**

### **Methods and Data Collection**

This study required ten months of fieldwork; the data were collected from April 2009 to February 2010 in Cyberjaya and Putrajaya, which are located next to each other. Cyberjaya is the field location while Putrajaya houses all the relevant authority that provided the official data. In the study, quantitative as well as qualitative methods were used.

#### **1) Pilot Survey**

Before the actual fieldwork, a pilot survey was conducted for a month in April 2009. During this period, 30 questionnaires were distributed to people working in Cyberjaya. I got the sample by utilising my own social network. I updated my Facebook status by asking those who have friends or families working in Cyberjaya to contact me. This I did while I was still in Bonn, Germany. At the same time, once I was back in Malaysia, I sent text messages to all my friends and families with the same request.

The pilot survey allowed me to readjust my questionnaire and get a better understanding of the nature and specifics of ICT knowledge workers work and their perception of Cyberjaya's development. It also allowed me to prepare the necessary question for the in-depth interviews. The pilot survey was predominantly conducted through face-to-face interviews which allowed for questions beyond the questionnaire. This was when I started to draft the question for the interviews. It also allowed me to make friends with some of the respondents, which facilitated access to companies that were reluctant to participate in the survey. Some large companies do not allow their employees to participate in surveys. Not including them might have jeopardised the whole research because they hire the largest number of knowledge workers. Hence, the pilot survey ensured a better access to this type of companies.

#### **2) Knowledge Workers Survey**

The survey was conducted among knowledge workers in Cyberjaya with the objective of understanding their background, knowledge acquiring technics, knowledge sharing activities and their perception of Cyberjaya's development.

The pilot survey allowed irrelevant or sensitive questions to be reformulated or omitted from the questionnaire. One such question asked for the name and company address of their social network in Cyberjaya. Realising they were reluctant to disclose such an information; I have restructure the question by only requiring them to list the company’s name. The information is sufficient to locate the companies and allowed the mapping process to be done accordingly.

In total, the survey covers 97 companies and comprises of 443 respondents as shown in Table 8.1.

Table 8.1: Survey Sample

<b>Item</b>	<b>Total numbers</b>	<b>Sample numbers</b>	<b>%</b>
ICT Companies	381	97	<b>26</b>
Knowledge workers	8,854	443	<b>5</b>

Source: Field data, 2009

To ensure that the response rate is high, I distributed the questionnaires based on the following orders; first, I call the companies based on the list provided by the MDeC, and my own investigation based on my prior visits to all the buildings in Cyberjaya and also internet search. This is how I am able to determine whether the companies are still active or dormant. Once allowed to conduct the survey, I then asked the respective personnel how many questionnaires they were willing to accept. The expectation was giving them the chance to determine the number of questionnaire should decrease the number of no-returns. Nevertheless, I tried to include at least 10% of the total employees in the respective companies. Only if they were reluctant, I then reduced the percentage based on the negotiation through the phone conversations. Some companies would require formal emails or letters to be send to them before they decided to participate. Once they had agreed to participate, I then went to the companies and handed over the questionnaires to the person in-charge.

To follow up, I called them again, a week after the questionnaires were distributed, to ask if they had any queries. A subsequent call was made a week after that to get clearance to collect the completed questionnaires. The frequent contact helped to facilitate contact between the assigned individuals and me. The trust then allowed me to conduct in-depth interviews with some of their engineers and allowed access to their working areas.

The survey covers companies from different sectors to ensure the results are representative of all knowledge workers working in Cyberjaya. Table 8.2, shows the sample from the different sectors surveyed during the fieldwork.

Table 8.2: Respondents and Company Sector

Sectors	Total Number of Companies	Company Sample Size	Number of respondents
Shared Services Outsourcing (SSO)	63	32	192
Software Development	185	32	103
Hardware Design	21	5	21
Creative Multimedia	34	13	78
Internet Based Business	51	6	23
Support Services	27	9	26
<b>TOTAL</b>	<b>381</b>	<b>97</b>	<b>443</b>

Source: Field data, 2009

Almost no companies allowed face-to-face communication between their employees and me. They imposed high restrictions for this type of communication and were only willing to participate if the survey was done anonymously. Nevertheless, the results are sufficient for the purpose of my study.

Accordingly, data were then analysed using SPSS Statistics 17.0. Apart from descriptive statistics and cross-tabulation, I have also applied chi-square test and factor analysis to analyse the data.

### 3) Informal and Semi-Structured Interviews

Informal and semi-structured interviews were conducted with the knowledge workers and officers from the relevant organisations after the survey were completed. This was done to ensure a better understanding of the research area and issues relevant to the study. During the four months of the survey period, I have visited all the buildings in Cyberjaya, taking photos, making field notes and sketches of the relevant building's layout. I also spent time in the city from Monday to Sunday from morning to 8pm to get a sense of the liveability of the city. I also spent time in the different eateries during lunch hours (normally from 1pm to 2pm) and in the different sports facilities in the evening (normally from 6pm to 8pm). I took field notes during the different hours through observation and sometimes I joined some of the knowledge

workers that I got to know during the survey. This is how I got acquainted with them and earned their trust (at least for the purpose of my research). Since the majority of the companies in Cyberjaya have a 24 hours working rotation, some of the interviews were conducted in the late evening when they had their coffee break.

I should note that the fieldwork was conducted during the month of Ramadan and the Hari Raya celebration. This provided me with data with regard to informal activities done among the knowledge workers in Cyberjaya (see chapter 5). I also attended Friday prayers at the mosque in the city to allow me to get insides of the different social activities of the knowledge workers, especially among the majority Muslim male knowledge workers.

Hence, the trust gained by participating in different social and informal activities finally ensured me better access to the knowledge workers. As a result, I have managed to interview 28 knowledge workers with different technical background and working experience. The interviews roughly lasted between 45 minutes and one hour. Table 8.3 shows the profiles of the knowledge workers interviewed during the fieldwork. It shows that the majority of those interviewed has more than 3 years working experience. Nevertheless, there were a few with less number of working experience interviewed during the fieldwork. This was done to ensure that the interview data manage to capture different views among people working in Cyberjaya.

I conducted the interviews with the knowledge workers before proceeding to the different organisations involved in the city's development. This was to ensure that my questions to the authorities and government agencies were related to the knowledge workers' views and perspectives. It also helped the triangulation process of different information gathered from the knowledge workers with the authorities.

Table 8.3: Profiles of Knowledge Workers Interviewed

No	Designation	Company	Working experience	Date of interview	Duration (minutes)
1	Marketing Executive	iKED SYSTEMS	3 years	01.09.2009	45
2	Researcher	TM R&D	15 years	14.10.2009	45
3	Assistant Manager	TMNET	7 years	14.10.2009	40
4	Engineer	MEASAT	6 months	15.10.2009	30
5	Researcher	TM R&D	15 years	23.10.2009	45
6	HR Manager	AT & T	n.a	03.11.2009	45
7	Team Leader	AT & T	7 years	04.12.2009	60
8	Admin. Manager	Media Monitors	2 years	07.12.2009	45
9	Discovery Agent	Media Monitors	2 years	07.12.2009	35
10	Assistant Manager	TM R&D	6 years	10.12.2009	60
11	Building Management Assistant	FSBM Holdings	11 years	11.09.2009	30
12	General Manager	FBIC MSC Services	n.a	16.10.2009	60
13	Specialist	MMU	12 years	19.11.2009	60
14	IT Operation	Hewlett-Packard	6 months	04.12.2009	50
15	Manager	Hewlett-Packard	20 years	07.12.2009	40
16	IT Technical Analyst	Dell	1 year	09.12.2009	45
17	Senior Project Engineer	Salzbrenner	5 years	10.12.2009	25 s
18	Managing Director	Khalifah Production	3 years	17.12.2009	60
19	Network Engineer	Satyam	2 years	22.12.2009	75
20	R&D Engineer	Knowledge Channels Synergy	2 years	28.12.2009	35
21	National Professional Officer	WHO	n.a	29.12.2009	40
22	Quality and Process Improvement Leader	Wolters Kluwer	4 years	29.12.2009	60
23	Executive	Star Fusion	7 months	30.12.2009	40
24	IT Engineer	T-Systems	6 months	30.12.2009	50
25	System Analyst	Softsolvers Technologies	2 years	06.01.2010	30
26	Network Engineer	AJV Multimedia	2 years	07.01.2010	60
27	Managing Director	Asian IT R&D	6 years	07.10.2010	70
28	Project Head	TM R&D Sdn Bhd	17 years	10.12.2009	150
				06.01.2010	60 s
				08.01.2010	120

Source: Field data, 2009

n.a: not available



Interviewing the different authorities was easier since I am a civil servant. It allowed better access to the relevant departments, such as MOSTI, MOHE, MDeC, MPSP and EPU. My working experience as a civil servant also allowed me to ask the relevant questions and request the relevant data from the respective agencies. I assumed they were more willing to help provide the necessary information knowing that I am ‘one of them’. Table 8.4 provides the information of all the officials interviewed.

Table 8.4: Profiles of Authorities Interviewed

No	Designation	Department	Years working in the organisation	Date	Duration
1	Senior Manager Marketing/Resource Support Services Centre	Cyberview Sdn Bhd	n.a	11.09.2009	20 minutes
2	Head, Legal & Corporate Services	Setia Haruman Sdn Bhd	n.a	21.10.2009	75 minutes
3	Assistant Director	Security Trust and Governance, MCMC	10 years	24.11.2009	60 minutes
4	Principal Assistant Director	Planning Department, MPSP	10 years	23.12.2009	60 minutes
5	Treasurer	Cyberjaya Residents Association	9 years	24.12.2009	65 minutes
6	General Manager	Cyberview Sdn Bhd	n.a	30.12.2009	70 minutes
7	Senior Principal Assistant Director	Institutions of Higher Education Excellence Planning Division, MOHE	6 months	05.01.2010	45 minutes
8	Admin Assistant	Cyberview Sdn Bhd	n.a	07.01.2010	15 minutes
9	Principal Assistant Director	Corporate Services & International Section, EPU	12 years	07.01.2010	95 minutes
10	Principal Assistant Director	K-Economy, EPU	5 years	12.01.2010	55 minutes
11	Principal Assistant Director	K-Economy, EPU	6 years	13.01.2010	80 minutes

Source: Field data, 2009  
n.a: not available

#### 4) GIS Method for Cluster Mapping

For the mapping and the spatial analysis of the data on knowledge producing institutions in Malaysia, ESRI ArcGIS 9.2 is applied, a well-established Geographic Information System (GIS) software. Administrative boundary shape files were acquired from “Global Administrative Areas” ([www.gadm.org](http://www.gadm.org)) and other administrative data, like the road network was provided by the Official Malaysian Geoportal ([www.mygeoportal.gov.my](http://www.mygeoportal.gov.my)). In order to provide consistency, all available GIS data was converted and displayed in the Malaysian coordinate system GDM 2000 MRSO Peninsular Malaysia (Projection: Rectified Skew

Orthomorphic Natural Origin, Datum: D GDM 2000). The map showing the development regions of Peninsular Malaysia is based on information contained in the Ninth Malaysia Plan ([www.epu.gov.my](http://www.epu.gov.my)).

The companies and institutions compiled in the database are geo-coded in order to visualise and analyse the data in GIS. Geo-coding describes the process of locating actual geographic coordinates based on street addresses (Nolan & Kumar 2006). The free available program Google Earth was used to assign the addresses to coordinates. On the basis of the compiled information, the creation of point shape files was possible. Loading these shape files in ESRI ArcMap allows illustrating the spatial distribution. For a simple illustration a dot-density map based on the Research and Higher Learning Institutions was created (Nolan & Kumar 2006). The dots were created randomly within the state boundaries without considering higher levels of administrative boundaries. The binary classification shows the locations of institutes offering IT courses and those that do not. Based on the dot density map a preliminary estimate of patterns of geographic distribution and clustering is possible.

To create Kernel density maps from the point symbols the ArcGIS Spatial Analyst extension was applied. The Kernel density map illustrates the high density clusters of companies or institutions irrespective of administrative boundaries. Kernel density maps showing the clustering of companies and the clustering of Research and Higher Learning Educations were prepared separately. It is well established to use employment data for the identification of clusters based on regional employment agglomerations (e.g. European Cluster Observatory). In order to map the knowledge clusters in this study, support staff was excluded and only research staff, lecturers or employees with a basic degree or above were included. Employment data was then assigned to the dots representing the Research and Higher Learning institutions and the Kernel density was calculated based on the number of employee

[Type text]

### **5) Social Network Mapping**

All questions related to social networks in the questionnaire were given in an open-ended form. The respondents were free to answer at their own will. Hence, out of the total 443 respondents participating in the survey close to 66% responded to the social network questions.

In order to visualise the social network patterns they were asked: *'kindly, choose three of those who you normally discuss work related issues and provide their company name and address'* (refer Appendix II). Originally they were requested to list down the friends' name and company address but I discovered during the pilot survey that the majority of them were reluctant to disclose their friends' details, stating confidentiality as the main reason. Hence the question was redesigned to ensure at least the most important data were captured.

Nevertheless the responses to this question are sufficient to map a web of contacts and gain a more accurate picture of the extent of the social network (Dahl & Pedersen, 2004). Out of the total of 291 people responded to the social network questions, only 68% supplied the company name and address. Subsequently, the information was converted into spatial data, using Geographical Information System's (GIS's) geo-coding function<sup>92</sup>(Parker & Asencio, 2008). GIS methods were used to visualise the network for better understanding and precise results, as suggested by Evers, Gerke & Menkhoff (2010).

Finally, the data were also complimented with observation within the company premises, social facilities areas and interviews with engineers working in different companies.

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<sup>92</sup> The process of identifying locations on a map by using the latitude and longitude coordinate is known as geo-coding. The locations were determined based on the addresses given by the respondents.



**1.7 Field of your university education specialisation**

- 1. Information science / information technology
- 2. Computer science / computer engineering
- 3. Communication science / communication engineering
- 4. Multimedia / creative multimedia
- 5. Other related ICT specialization (please specify)

**1.8 University graduated**

- 1. Malaysia (kindly provide the name of your University)
- 2. Abroad (kindly provide the name of your University)

**SECTION 2: CAREER BACKGROUND**

**2.1 Please state your position title/designation in your current company**

\_\_\_\_\_

**2.2 How long have you been working after obtaining your first degree?**

(Please enter number of years) \_\_\_\_\_

**2.3 Which of the followings best describe your main job function currently?**

- 1. Management
- 2. R&D
- 3. Programming
- 4. Analyst
- 5. Designing
- 6. Technical support
- 9. Others (please specify) \_\_\_\_\_

**2.4 How long have you been working after obtaining your first degree?**

(Please enter number of years) \_\_\_\_\_

**2.5 How many companies have you been working after obtaining your first degree?**

(Including the current one) \_\_\_\_\_

*(If your answer is ONE, kindly proceed to question 3.1)*

**2.6 If your answer to question 2.5 is more than ONE, are any of the company located within CYBERJAYA?**

- 1. Yes
- 2. No

**2.7 If your answer to question 2.6 is YES, how many companies have you worked in CYBERJAYA?**

(Including the current one) \_\_\_\_\_

**SECTION 3: SOCIAL NETWORKING**

**3.1 Which of the listed mobile communication tools do you use?** (You may tick more than one)

- 1. Handphone/mobile phone
- 2. Smartphone i.e. iPhone, Blackberry, Communicator etc.
- 3. Netbook i.e. mini note book
- 4. Laptop
- 9. Others (please specify) \_\_\_\_\_

**3.2 Do you have access to internet at home?**

- 1. Yes
- 2. No

**3.3 How many hours did you spend using internet related to your work outside of your office last week?** (at home or cybercafé) \_\_\_\_\_ hours

**3.4 How many friends do you have within the COMPANY?**

(people you normally go out for lunch or spend time with) \_\_\_\_\_

**3.5 How many close friends do you have within the COMPANY?**

(people you trust and share your secrets with) \_\_\_\_\_

**3.6 How do you discuss work with your friends within your COMPANY?**

(you may tick more than one answer)

- 1. By e-mail
- 2. Online forums/chatting
- 3. Telephone
- 4. Face to face
- 5. Instant messaging
- 6. SMS/text messaging
- 9. Others (please specify) \_\_\_\_\_

**3.7 How much time did you spend discussing about work with your friends within your COMPANY last week?** (Please state in hours) \_\_\_\_\_

**3.8 How many friends do you have outside of your company but within CYBERJAYA?**

\_\_\_\_\_ (If your answer is NONE, kindly proceed to question 3.13.)

**3.9 Kindly, choose three of those who you normally discuss work related issues and provide their company name and address**( you don't have to mention their name, just the company name and address )

- i. \_\_\_\_\_
- ii. \_\_\_\_\_
- iii. \_\_\_\_\_

**3.10 Based on your answer in question 3.9, how do you know them?**

(please tick and specify where appropriate)

- 1. University (kindly provide the University name) \_\_\_\_\_
- 2. Member of sports/religious/social clubs \_\_\_\_\_
- (kindly provide the name of the Club) \_\_\_\_\_

- 3. Introduced by other friends
- 4. Met while working
- 9. Others (please specify) \_\_\_\_\_

**3.11 How do you communicate with your friends outside of your company but within CYBERJAYA? (You may tick more than one answer)**

- 1. By e-mail
- 2. Online forums/chatting
- 3. Telephone
- 4. Face to face
- 5. Instant messaging
- 6. SMS/text messaging
- 9. Others (please specify) \_\_\_\_\_

**3.12 How much time did you spend discussing with them about your work last week? (Please state in hours) \_\_\_\_\_**

**3.13 Where do you normally meet and have informal discussion with your friends?**

- 1. Within Cyberjaya (please name the most frequent/preferred location/shop/stall)  
\_\_\_\_\_
- 2. Outside of Cyberjaya (please name the most frequent/preferred location/shop/stall)  
\_\_\_\_\_

**SECTION 4: KNOWLEDGE OBTAINING AND SHARING**

**4.1 Are you currently attending any courses on a part time basis? (post graduate studies or professional courses related to your job)**

- 1. Yes (please specify) \_\_\_\_\_
- 2. No

**4.2 When was the last time you attended a short course/seminar/conference/talk related to your job? (Kindly state month/year) \_\_\_\_\_**

**4.3 In total, how many days did you attend a short course/seminar/conference/talk related to your job last year? (Please state number of days attended) \_\_\_\_\_ days.**

**4.4 Are you currently a member of any public library e.g. university/state/national library?**

- 1. Yes
  - 2. No
- (If your answer is NO please go to question 4.6)*

**4.5 If your answer to question 4.4 is YES:**

- 1. **How frequent have you visited the library last month? (number of visits)\_\_\_\_\_**
- 2. **What is the last book you borrowed? (either title/author/field)**  
\_\_\_\_\_

**4.6 Are you a member of any online information services e.g. news portal/e-library/journals?**

1. Yes, \_\_\_\_\_ (name the service)   
2. No

**(If your answer is NO please go to question 4.8)**

**4.7 If your answer to question 4.6 is YES, how much time did you spend visiting the site last week? (Please state in hours) \_\_\_\_\_**

**4.8 Do you discuss problems incurred during work with your friends?**

1. Yes   
2. No

*If you answer is NO please go to question 4.11*

**4.9 If your answer to question 4.8 is YES, how long did you discussed last week? (Please enter in hours) \_\_\_\_\_**

**4.10 Did your discussion help to solve your problems?**

1. Yes   
2. No   
3. Not sure

**4.11 Do you share your working knowledge with your friends within your company?**

1. Yes   
2. No

*(If you answer is NO please go to question 4.13)*

**4.12 If your answer to question 4.11 is YES, how much time did you spend sharing your working knowledge with your friends within your company last week?**

(Please enter in hours)  
\_\_\_\_\_ hours

**4.13 Do you share your working knowledge with your friends outside of your company but within CYBERJAYA?**

1. Yes   
2. No

*(If you answer is NO please go to question 4.15)*

**4.14 If your answer to question 4.13 is YES, how much time did you spend sharing your working knowledge with your friends outside of your company but within CYBERJAYA last week? (Please enter in hours) \_\_\_\_\_**



**4.15 How important are the following for you to improve/acquire knowledge in order to perform your job effectively?**

		Not Important	Less Important	Important	Very Important
Kindly rate based on the scale		1	2	3	4
1	Printed materials(books/technical magazines/newspapers)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
2	Online materials (web-sites)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
3	In-house/on the job training	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4	Courses/seminars/conferences	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
5	Discussions with colleagues/friends within COMPANY	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
6	Discussions with friends outside of company but within CYBERJAYA	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
9	Others (please specify) _____	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**4.16 Based on your answer in question 4.15, how many hours did you spend last week on?**

1. Printed materials (books/journals/technical magazines/newspapers) \_\_\_\_\_
2. Online materials (web-sites) \_\_\_\_\_
3. In-house/on the job training \_\_\_\_\_
4. Courses/seminars/conferences \_\_\_\_\_
5. Discussions with colleagues/friends within COMPANY \_\_\_\_\_
6. Discussions with friends outside of company but within CYBERJAYA \_\_\_\_\_
9. Others \_\_\_\_\_

**SECTION 5: ONLINE SOCIAL NETWORKING**

**5.1 Does your company allow you access to social networking services during working hours?**

1. Yes, unlimited
2. Yes, limited
3. No, not at all
4. Don't know

**5.2 How important are the following online activities to you?**

Kindly rate based on the scale	Not Important 1	Less Important 2	Important 3	Very Important 4
1 Email	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
2 Instant messaging	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
3 Getting news	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4 Making financial transactions	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
5 Shopping	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
6 Browsing topics of interest e.g. journals, books, technical papers	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
7 Being part of online communities e.g. forums, message boards, networking.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
8 Government activities e.g. income tax payment, quit rent	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
9 Others(please specify) _____	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**5.3 Do you visit any of the social networking services listed? (you may tick more than one)**

- 1. Blog
- 2. Friendster
- 3. Facebook
- 4. Myspace
- 5. Twitter
- 6. LinkedIn
- 7. Flickr
- 8. None
- 9. Others (please specify) \_\_\_\_\_

**5.4 Based on your answer in 5.3, how much time did you spend visiting the social networking services last week? (Please enter in hours)**

- 1. Blog \_\_\_\_\_
- 2. Friendster \_\_\_\_\_
- 3. Facebook \_\_\_\_\_
- 4. Myspace \_\_\_\_\_
- 5. Twitter \_\_\_\_\_
- 6. LinkedIn \_\_\_\_\_
- 7. Flickr \_\_\_\_\_
- 8. None \_\_\_\_\_
- 9. Others \_\_\_\_\_

**5.5 On which of the following social networking services have you registered a profile?**  
(You make tick more than one)

- |                                  |                          |
|----------------------------------|--------------------------|
| 1. Blog                          | <input type="checkbox"/> |
| 2. Friendster                    | <input type="checkbox"/> |
| 3. Facebook                      | <input type="checkbox"/> |
| 4. Myspace                       | <input type="checkbox"/> |
| 5. Twitter                       | <input type="checkbox"/> |
| 6. LinkedIn                      | <input type="checkbox"/> |
| 7. Flickr                        | <input type="checkbox"/> |
| 8. None                          | <input type="checkbox"/> |
| 9. Others (please specify) _____ |                          |

*If your answer is NONE kindly proceed to question 5.7*

**5.6 Based on your answer in question 5.5, when was the last time you updated your profile?**

\_\_\_\_\_

**5.7 Do you use any of the social networking services to upgrade your knowledge pertaining to your job?**

- |        |                          |
|--------|--------------------------|
| 1. Yes | <input type="checkbox"/> |
| 2. No  | <input type="checkbox"/> |

**SECTION 6: KNOWLEDGE SHARING IN COMPANY**

**6.1 Does your company create formal procedures to ensure that lessons learned in the course of a project are passed along to others doing similar tasks?**

- |               |                          |
|---------------|--------------------------|
| 1. Yes        | <input type="checkbox"/> |
| 2. No         | <input type="checkbox"/> |
| 3. Don't know | <input type="checkbox"/> |

**6.4 What is the major problem that you face in carrying out your daily task?**

\_\_\_\_\_

## SECTION 7: CYBERJAYA DEVELOPMENT

### 7.1 Do you like working in Cyberjaya?

1. Yes, why \_\_\_\_\_

2. No, why \_\_\_\_\_

### 7.2 Are you satisfied with the overall development of Cyberjaya?

1. Yes, why \_\_\_\_\_

2. No, why \_\_\_\_\_

### 7.3 Do you have any suggestion to enhance the physical development of Cyberjaya?

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- *Thank you for your kind cooperation*

## APPENDIX III

### Development Corridors, Cybercities and Cybercentres in Malaysia

**Table 8.5: Economic Development Corridors in Peninsular Malaysia**

Cluster	Main Investor	Region/States	Focus Industry	Specialisation	Major Infrastructure
Northern Corridor Economic Region (NCER)	Sime Darby Berhad	Perlis Kedah Penang Perak	Agriculture, manufacturing, tourism	Paddy cultivation, electrical & electronics, medical tourism	Penang Port, Penang International Airport, Sultan Abdul Halim Airport, Langkawi International Airport
Iskandar Malaysia	Khazanah Nasional Berhad	Johor	Services, manufacturing	Financial advisory & consulting, Creative industries, logistics, tourism, education, healthcare, electrical & electronics, petrochemicals & oleo chemical, food & agro processing.	Tanjung Pelepas Port, Pasir Gudang Port, Senai International Airport
East Coast Economic Region (ECER)	Petronas Berhad	Kelantan Terengganu Pahang District of Mersing (part of Johor State)	Tourism, oil, gas & petrochemical, manufacturing, agriculture, education	Ecotourism, coastal and island, cultural heritage tourism, propylene and ethylene based industries, boat-building and repair, automotive assembly and distribution, handicraft and textile, large-scale commercial farming, wood, latex and palm oil-based products, logistics and distribution services.	Kuantan Port, Kuala Terengganu Airport, Sultan Ismail Petra Airport, Sultan Ahmad Shah Airport

Source: Compiled by author, 2009.

**Table 8.6: List of Cybercities in Peninsular Malaysia**

Location	Region	Size	Status attained	Niche sector	Other Facilities
Cyberjaya	Klang Valley	7,000 acres	1998	ICT	Hotels 3 Universities
KLCC	Klang Valley	4,104,404 sq ft.	1997	MNCs	Shopping complex Convention centre Petronas Philharmonic Hall Petronas Art Gallery Science Discovery centre Fitness centre Aquaria KLCC
Technology Park Malaysia (TPM)	Klang Valley	92.7 ha (230 acres) R&D space is 2 million sq feet.	1996	R&D	12 buldings i.e. Innovation house, Incubator Centres and Enterprise Houses. Centre for Technology Commercialization (CTC) Conference and Training Facilities 2 Private Colleges (TPM College & APIIT College)
UPM-MTDC Technology Centre	Klang Valley	15.7ha (39acres)	1998	ICT, Multimedia and Agro business	1 Public University (UPM) Theatre Hall Training room
Penang Cybercity 1	North	753.1ha (1,861 acres)	2004	Semiconductor and electronics	1 Public University(USM)
Kulim Hi-Tech Park	North	1700ha (4000 acres)	2004	IC Design and Waterfab	Business centre International School Hospital 1 Private University 1 Public Polytechnic 1 Golf and Country Resort

Source: Compiled by author, 2009.

**Table 8.7: List of Cyber centres in Peninsular Malaysia**

Location	Region	Size	Status attained	Niche sector	Other Facilities
KL Sentral	Klang Valley	72 acres	2006	Creative content	Main Transportation Hub 1 Private College Sooka Sentral (6 storey lifestyle centre) 2 hotels Residential tower Mall Media & Technology Park
Menara Cyberport	MSC South	359,035 sq.ft. (8 acres)	2006	Logistics, electronics and shared services	Hotel Golf Club Health Facilities Institute of higher learning
Meru Raya	Central (Perak)	209 acres	2007	Education, SSO and creative contents	Business centre Convention centre Training centre
Melaka International Trade Centre	South (Malacca)	187 acres	2006	Bio-informatics, SSO, e-tourism and healthcare	Hotel Golf Club Health Facilities Institute of higher learning
i-City	Klang Valley	72 acres	2008	Web 2.0 content development	Shopping centre
Mid Valley City	Klang Valley	50.15 acres	2008	n.a	Hotel Shopping complex Leisure facilities
Bandar Utama	Klang Valley	1,000 acres	2008	n.a	Hotel Shopping complex Leisure facilities
TM Cybercenter Complex	Klang Valley	7.6 acres	2008	Telecommunications	Multipurpose Hall Gymnasium Medical center
Putra Square	East	0.56 acres	2009	Education, defence, logistics, integrated content, agro bio	
Bangsar South	Klang Valley	27.5 acres	2009	n.a	Shopping complex Leisure facilities
KL Tower	Klang Valley	7,770 sq m	1997	Telecommunication	Telecommunication tower

Source: Compiled by author, 2009.

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