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The Construction of Knowledge-based Economies versus Knowledge Societies:
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1. Introduction

In the past decades, terms s uch as 'knowledge-based economy (KBE)', and 'information/knowledge society' have been adopted by governments worldwide in order to underline their interest in developing their economies and societies further and assure future growth. Many governments used these catchwords as labels for govern ment programs and action plans aiming at economic and social prosperity. This aim of national governments to construct knowledge-based economies, information/knowledge societies, the actions taken and especially the ability or disability to do so, is the topic of this paper. As two cases of comparison act Singapore and Germany.

The term 'knowledge-based economy' is used by the Singaporean government by adopting the definition summed up by APEC: "A Knowledge-Based Economy is an economy in which the production, distribution, and u se of knowle dge is the main driver of growth, wealth creation and employment across all industries".[1] Furthermore, Singapore government states in its vision paper "Singapore21" that the "kn owledge-based economy is one in which information and knowledge, rather than material resources, drive activities."[2] The term 'information society', mainly used by the German government, exchanges the strong focus on economic growth with the emphasis on the role of information and communication technologies in future economic and social development. As stated in the action programme of the German government, "modern information and communication te chnologies (ICT) are crucial to harnessing knowledge and innovation in order t o raise growth, competitiveness and employment in today's networked world."[3] The term 'knowledge society' is mainly used in academic circles as well as in some action programmes of the German government. This term emphasises the increasing importance and value of knowledge in all economical, political and social actions and interactions. The knowledge society is often seen as a state

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[1] APEC Economic Committee (2000), Towards Knowledge Based Economies in APEC, APEC Secretariat.

[2] Accessible under: http://www.singapore21.org.sg/.

[3] Bundesministerium für Wirtschaft und Arbeit (BMWA) and Bundesministerium für Bildung und Forschung (BMBF) (2003). Informationsgesellschaft Deutschland 2006 - Aktionsprogramm der Bundesregierung. Berlin.

of societal development, which is one phase higher than KBE and information society. It can also be seen as a society, where every member of it actually can and does use knowledge in order to create new knowledge.

In the following, I argue that the political, economical and cultural structures in each country shape country-specific arenas of actors. Institutionally embedded actors cooperate and influence each other in specific ways which then again shape the arena of actors in each country. These actors, related to each other, define what is considered as valuable knowledge. The definition, which kind of knowledge is regarded as valuable and hence its creation as supportable in a country, determines the politics of knowledge production practised and hence, what kind of KBE, knowledge/information society is created. It is the focus of this paper to outline this development and process of creation in Singapore and Germany, looking at state activities that aim at the construction of KBE, information/knowledge societies.

The research, underlying the basic assumptions of this paper, was conducted in Germany and Singapore in the shape of semi-structured, qualitative expert interviews with representatives of government agencies, as well as publicly financed research institutes and political foundations. The interviews are codified and analysed using the grounded-theory approach developed by Strauss.[4]

2. The Arena of Actors

The focus of this article lies on the role of the state in constructing a KBE, information/knowledge society. Hence, I concentrate on institutionally embedded actors representing state administrative bodies, as well as state-financed research institutes. Apart of these actors, industry, media as well as society (non-governmental organisations and associations) are active groups in creating and shaping KBE, information/knowledge societies in both countries. This study nevertheless focuses on the state activities and hence looks at actors representing the state as well as actors intensively shaping the policies and activities of the state through advisory, expert committees and enquete-commissions.

In Germany the engagement into creating and shaping a German information/knowledge society by the state is conceptually headed by the Federal Ministry of Economics and Labour (BMWA = Bundesministerium für Wirtschaft und Arbeit) as well as the Federal Ministry of Education and Research (BMBF = Bundesministerium für Bildung und Forschung). Further federal ministries head separate activities that contribute to the information/knowledge society Germany. As examples can be mentioned the Federal Ministry of the Interior (BMI = Bundesministerium des Innern) coordinating BundOnline, the eGovernment-activities of the Federal Government, the Federal Ministry of Health and Social Security (BMGS = Bundesministerium für Gesundheit und Soziale Sicherung) supporting the introduction of the electronic health card, as well as the Federal Ministry of Finance (BMF = Bundesministerium der Finanzen) coordinating Elster, a programme for filing tax electronically as well as Atlas, a programme for electronicising custom duty.
In the process of conceptualising action plans such as the current "Information Society Germany 2006", the Federal Ministries cooperate closely with each other but also with academics and representatives of the industry. While academics influence the processes as

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[4] Strauss, A. L. (1987). <u>Qualitative Analysis for Social Scientists</u>. Cambridge, Cambridge University Press.
Strauss, A. L. and J. Corbin (1990). Basics of Qualitative Research. Grounded Theory Procedures and Techniques. London, Sage Publications.

members of expert committees a nd commissions, the industry takes influence mainly through private-public-partnership structures. The non-governmental sector/society has only limited influence. In Ge rmany the cooperation between state and indu stry with the aim of shaping and creating a n information/knowledge society is structured by the Initiative D21. The Initiative D21 is German y's largest p ublic private partnership. More than 400 representatives of enterprises, a ssociations, parties, p olitical institutions and other organizations are curre ntly involved, including board members from companies such a s Alcatel, AOL, Cisco Systems, debit el, IBM, Microsoft, Siemens and TNS Emnid. T hey are assisted by an Advisory Council chaired by German Chancellor Gerhard Schröder.

While non-governmental organisations and other groups representing society do not have much influence on government programmes such as "Information Society Germany 2006", it is important to mention that they d o have very strong impact on def ining which kind o f knowledge is regarded as valuable through int erest groups but also t he academia. The definition of knowledge, which then again structures the politics of knowledge production and dissemination in G ermany is carried out b y a very wi de range of actors in society including the state, the industry, the academia and various interest gro ups in socie ty. The academia takes a stro ng influence on this process for example t hrough the German Research Association (DFG = De utsche Forschungsgesellschaft), society in ge neral is represented in this pro cess for example by political and cultural foundations as well as the German Academic Exchange Service (DAAD = Deutscher Akademischer Austauschdienst).

In Singapore, this process of defin ing which knowledge is regarded as valuable is mainly guided by the state. T he state bu dgeting for various fields of research and developmen t (R&D) as well as for different fields of study in the universities heavily structures the process of knowledge productio n. Interest groups representing society, as for e xample foundations hardly exist; the industry takes influence on the government decisions, as discussed below. The creation and shaping of a knowledge-based economy (KBE) was originally approached by the state by bu ilding vast information and telecommunication infra structure, computerising the public service and investing into computer education. Main actor was the National Computer Boa rd (NCB). As a result o f a merger between the National Computer Board and the Telecommunication Authorit y of Singapore in 19 99, the Inf ocomm Development Authority (IDA) was formed. IDA is since then a stat utory board of the Singaporean Government and oper ates under the Ministry of Information, Commu nications and the Arts (MICA). Besides the infrastructural emphasis of IDA, MICA focuses at the content development, which is seen as an important aspect of the KBE . Furthermore, the Ministry of Education (MoE) e mphasises the use of computer technology as well as the development of creativity in schools. Besides MICA and MoE, mainly statutory boards are focussing on shaping the KBE further. As example, the National Library Board (NLB) can be mentioned. Libraries ar e supposed to become centres of knowledge creation and social capital building. Creativity is seen as a key f or future su ccess and creative industries, industries dealing with design, p ublishing, advertising etc. are see n to beco me more important in the future KBE. Besides the creative industry sector, the stat utory board A*Star works actively on building a Singaporean life- and bioscience hub.
Up to what extend these activities lead to ec onomic growth, is monitor ed by the Economic Development Board (EDB) which is also responsible for attracting foreign investors.
Besides state bodies, the academia as well as the industry, but not so much social groups are important actors. T hrough a br oad engagement process coord inated by IDA, industry representatives take part in the planning of future infrastruct ural programmes. The influence of the industry on developing the "soft" sectors of the KBE, such as creative industr ies and the library scene is of f ar less importance. Yet, the overall conceptualisation of de veloping certain clusters, such as creative industries, inf ormation and telecommunication in dustries,

bio- and life sciences, media hub, is done by t he cabinet of the government and with the help of industry and academic consultancy from all over the world.

3. Definitions of Knowledge

In each co untry – as described a bove – either the state , the indust ry, the academia or interest groups representing society, basical ly the domi nant elite, define what kind of knowledge[5] is perceived as valuable and hence it s production and dissemination as support worthy. This definition or definitions are represented by action. Action in terms of government financing for certain sectors, curricula from p rimary up to tertiary education emphasising the importance of certain subjects, scholarship programmes for certain fields of study and research, just to name a few examples.

Looking at Singapore and Germany, one can state, that the differences in who acts, outlined in part 2, are also reflected in the definition of what is considered as valuable knowledge. In Singapore, it is the state, meaning the government and it s administration that defines which knowledge is valuable, according to which kn owledge might generat e future economic growth for the Singaporean economy.

In Germany, knowledge production and dissemination has a very long tradition at university level but also in form of privately and publicly financed R&D. Furth ermore, the federal system with education being under the right o f the state s, not the fe deral government, provides a much decentralised g round for defining which knowle dge is regarded as valuable. Definitions in different st ates regularly differ and this differing again enables a rather open approach to knowledge. Knowledge in general is seen a s something positive, whether it leads to economic growth or not. This rather humanistic definition of knowledge is represented by the sponsoring of h igh-technology research in Fraunhofer and Ma x-Planck-Institutes at the same time as fina ncing theatres in most German cities, museu ms and heritage preservation[6], hence finan cially supporting a wide range of different fields of knowledge production and dissemination. Another indicator for this rather liberal definition of which kind of knowledge is seen as valuable is the German educatio n system or what is known as "deutsche Allgemeinbild ung". While in most Anglo-Saxon systems and also in Singapore students de cide at the age of sixteen which three to five subject s they will concentrate on, it is common for stu dents in Germany to study ten to e leven subjects, with special focus on two to four, until graduation from secondary school.

The Head of the Centre for Advanced Media Technology (CamTech), a collaborative project between the Nanyang Technological University in Singapore and the Fraunhofer Institute for Computer Graphics in Germany, describes the resea rch situation in Germany and Singapore as follows:

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[5] Berger and Luckmann define 'knowledge' "as the certainty that phenomena are real and that they possess specific characteristics." This rather broad definition is also s uitable in th e context of this text. (Berger, P./Luckmann, Th., The Social Construction of Reality, The Penguin Press, London, 1967.)

[6] Specific numbers on the funding can be found in the following two references:
Statistisches Bundesamt (2004 (Berichtszeitraum 2002)). Ausgaben und Einnahmen der öffentlichen und öffentlich geförderten Einrichtungen für Wissenscha ft, Forschung und Ent wicklung. Wiesbaden, Statistisches Bundesamt.
Statistisches Bundesamt (2003). Bericht zur finanziellen Lage der Hochschulen. Wiesbaden, Statistisches Bundesamt.

"It is definitely important that the st ate creates a certain environment in which plants can grow; meaning that basic research can be conducted   without having to justify it with economic success. In Germany, still enough possi   bilities exist. In Singapore, A*Star looks into rese arch and not simply market orient ed development. Yet, i t is increasingly requested to conduct research along the demand of the market. This is problematic, in my opinion, sin ce research requires space in order to make creativity possible." (Translation by the author.)

The Managing Director of the German Centre f or Industry and Trade Pte Ltd in Singapore describes the different definitions of knowledge as follows:

"At the moment, knowledge is still b roken down to a very s mall element in Singapore, while in Ge rmany, knowledge and creativity   means abstract, critica l thinking. (…) Merely the knowledge of Singapore's government that the lack of creativity hampers development especially in the areas of brand   ing and tou rism lets th e government enforce these topics." (Translation by the author.)

The Dean of the School of Communication &   Information, Division of Journalism of the Nanyang Technological University describe s the dominant definition of knowledge in Singapore by relating to Germany in the 194 0s, when t he Nazis h ad to learn that the theoretical physics, which were oft en regarded as use less knowledge, only ena bled the Americans to build the atomic bomb. Drawing a parallel to today's Singapore, he states:

"Singapore is still where Germany was in   the 1940s, asking, what is the poin t in knowing how many atoms are in somewhere. The Singaporean approach is, how can we make economic value of certain knowledge and ideally fast. This mentality is very pervasive. (…) There i sn't the idea of producing knowledge just for t   he knowledge sake. So a lot of research in Singapore is applie d research. This might change slowly, but I think Singapore will be very cautious a   nd you pro bably will need some b asic output at least."

In the 1980s, Singapore's government invested heavily into computer education, fuelling the computer   and especially disk   drive industry in Singapore   [7]. Yet, with increasing manufacturing sites moving out of Singapore to the neighbouring countries, Singapore government had to identify new economic sectors to indulge into, in order to further move up the value chain and increase loca l content production as well as local development of advanced technologies[8]. Consequently, there has been a significant increase in government spending on R&D during the 1990s, which has resulted in a steady increase in the number of research scientists and engineers in Singapore[9].
In the beginning of the 1990s, Philip Yeo, then chairman of the Economic Developmen   t Board of Singapore ad vised the g overnment to put more emphasis on the prod uction of scientific knowledge as well as bio- and life science. This decision then formed the basis for the creation of A*Star, a statutory board of the Singaporean governme nt focussing on the

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[7] compare: Ang, P. H. (1992). Singapore's Disk Drive Initiative. The 42nd Annual Conference of the International Communication Association, Miami, Florida.
[8] compare: Anwar, S. and M. Zheng (2004). "Government spending on research and development and industrial production in Singapore." International Journal of Asian Managment 3: 53-65.
[9] The number of research scientists and engineers inversed from 4329 in 1990 to 17 074 in 2003
(Agency for Science, T. a. R. A.-S. (2004). National Survey of R&D i n Singapore 2003. Singapore, Agency for Science, Technology and Research (A*Star)., downloadable under http://www.A*Star.edu.sg/astar/front/media/content_uploads/Booklet_2003.pdf.)

development of research institut es in the field of bio- and lifesciences[10] as well as on the education of scholars in these fields at top-un iversities worldwide. The process le ading to the founding of A*Star and a heavily increased finan cing of R& D-institutes by the Singaporean Government was described by the Director of Temasek Laboratories, a research institute of the National University of Singapore (NUS) as follows:

> "The government realised, that all developed, industrialised countries were investing more than 2% of the GDP into R&D, while Sin gapore invested far less. So Singap ore Government decided to aim for 2% of GDP.   That was th e time when the Natio nal Science and Technology Board (NSTB) which later was renamed i nto A*Star was formed."

Describing the way knowledge had to legitimise itself, he continues:

> "At that time, it was also important to change th e mindset. Before that, people used to always believe that research nee ds to pay o ff immediately. But R&D that pays off directly, does not crea te substance. So A*Sta r was founded and together with th e universities it aims increasingly higher than just doing directly paying off R&D."

Even though a change, increasingly emphasising the importance of ba sic research, might be taking place, this ch ange is driven by the awareness that basic research might lead to a more sustainable econ omic development. This change is taking place only with regard to fields of knowledge that might potentially be of e conomic importance. It is not standing for a change in the overall definition of knowledge in society.

Local content production, the development of new ideas, or what could be named creativity often is interlinked with critical thinking. Criticism leads to new ideas, and to innovations. Yet, critical thinking requires space, the freedom to be cr itical, as well as t he awareness that ones own criticism might actually lead to chan ge. It requir es the know ledge and tr ust that being critical cannot harm the individual. As long as people self-censor themselves in a way, that is counterproductive to the de velopment of new idea s, the framework create d by the government, will not be able to make people creative. This space is given in Germany. The federal structure as well as the rig ht for free speech foste r critical th inking, socio-political activism and the development of ideas, which can be described as creative thinking.

4.   Three Concepts of the Future in the Political Sphere

The concept of knowledge and its importance t o society is very old. W hile, for instance, the philosopher Plato (428-347 BC) rated intelligence as the most important quality of a politica l leader, the philosopher and economist Mill [11] argued, in 1863, that intellectual an d moral education even surpasses industry and wealth in its effects on societal development. Yet, it was not until the mid 20th century that these co ncepts, connected to the terms "information and knowledge societies", advanced as political and economical slogans: in 1959, Drucker[12] addressed the increasing importance of " knowledge workers", while in 1962 Machlup[13]

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[10]   A*Star currentl y   oversees   12   research   institutes   and ce nters   in Sing   apore. (http://www.A*Star.edu.sg/astar/about/action/about_institutes.do)

[11] Mill, Joh n Stuart, Das S ystem der de duktiven und induktiven Logik, in: Friedric h Jonas, Geschichte der Soziologie 1. Reinbek bei Hamburg: Rowohlt, 434-445.

[12] Drucker, P. F. (1959). The Landmarks of Tomorrow. New York, Harper.

[13] Machlup, F. (1962). The Production and Distribution of Knowledge in the United States. Princeton, Princeton University Press.

published his findings on the importance of knowledge for the economy and the growth of a knowledge sector. In 1966, Lane[14] finally introduced the term "knowledgeable society", assuming that knowledge replaces industrial organisation and production as the major source of productivity. This thought was also adopted by Drucker[15] in his book "The age of discontinuity", in which he was contending that knowledge "has become the foundation of the modern economy" as we have shifted from "an economy of goods" to "a knowledge economy". Yet, in the meantime, the Japanese economist Umesao[16] invented the term "joho shakai" (information society), focussing on the effect of Information and Communication Technologies on economy and society. Also taking this technological approach, Bell[17], in 1973, spread the term further by concentrating on the increasing dependence of technological change on knowledge. As one of very few Europeans researching this subject, Alain Touraine[18] discusses in his book "société postindustrielle", in 1 972, the possibly arising conflict between knowledge have and knowledge have-nots.

Once introduced, the terms "information/knowledge society" rapidly entered governmental reform plans of many countries, including Singapore and Germany. Yet, the term "knowledge-based economy" was developed slightly later (end 1980s), mainly by economists, focussing on the role of knowledge in economic development, as product and source of production.[19] As such, it was – just as the terms "information/knowledge society" – quickly adopted and developed further in the political sphere. The OECD, for instance, emphasises the importance of knowledge as "the driver of productivity and economic growth, leading to a new focus on the role of information, technology and learning in economic performance".[20] APEC defines the knowledge-based economy as "an economy in which the production, distribution, and use of knowledge is the main driver of growth, wealth creation and employment across all industries."[21]

Until today the three concepts KBE, information/knowledge society are often used interchangeably and without clarifying their distinct meanings. In the following, I will outline briefly on how these three concepts are perceived in Singapore and Germany as well as discuss potential reasons for using one or the other term in the two countries political spheres. While Singapore mainly uses the term 'knowledge-based economy', Germany's politicians seem to prefer the term 'information society'. Nevertheless, 'knowledge society' appears rather regularly in government publications, speeches and newspaper articles, especially in Germany but also to a smaller extent in Singapore.

4.1. Germany

In Germany, a brief search for the terms information/knowledge society on the websites of all federal ministries yielded the frequency of usage shown in the table below. Nevertheless,

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[14] Lane, R. E. (1966). "The Decline of Politics and ideology in a Knowledgeable Society." American Sociological Review 5.

[15] Drucker, Peter (1969), The Age of Discontinuity. Guidelines for a Changing society. London 1969.

[16] Umesao, T. (1963). "Information Industry Theory: Dawn of the Coming Era of the Ectodermal Industry." Hoso Asahi Jan.: 4-17.

[17] Bell, Daniel (1979), Die nachindustrielle Gesellschaft. Reinbek.

[18] Touraine, Alain: Die postindustrielle Gesellschaft. Frankfurt am Main 1972, S. 33-91

[19] Harris, R. G. (2001). "The knowledge-based economy: intellectual origins and new economic perspectives." International Journal of Management Reviews 3(1): 21-40.

[20] Organization of Economic Cooperation and Development (OECD) (1996). The Knowledge-based Economy in 1996: Science, Technology and Industry Outlook. Paris, Organization of Economic Cooperation and Development (OECD).

[21] APEC Economic Committee (2000), Towards Knowledge Based Economies in APEC, APEC Secretariat.

one has to bear in mind, that such a search can only gi ve a very rough impression, on the frequency in which the two terms are used.

Table: Terminological Preferences in Federal Ministries of Germany

Ministry	Informationsgesellschaft	Wissensgesellschaft
BMZ	1	5
BMBF	234	187
BMU	5	4
BMVBW	9	1
BMGS	14	4
BMFSFJ	581	766
BMVg	48	0
BMVEL	7	0
BMWA	181	42
BMF	3	1
BMJ	33	13
BMI	641	32
AA	19	29
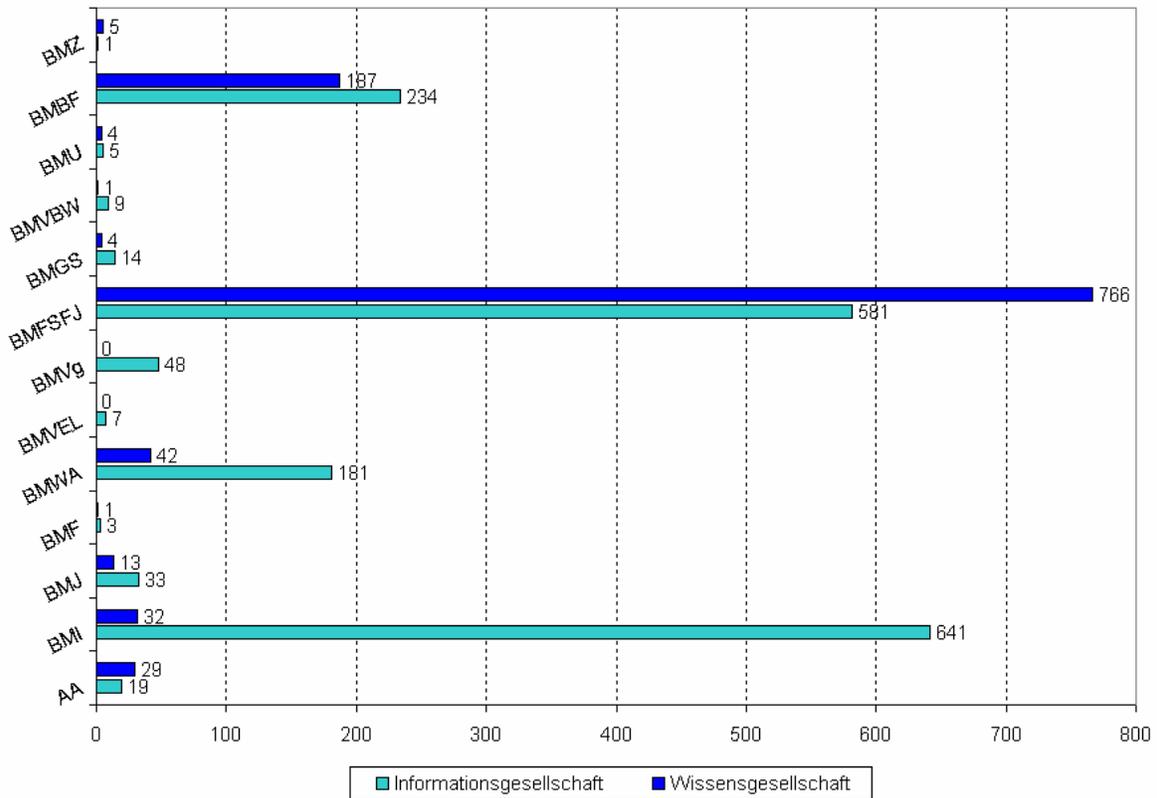
Source: Compiled from German government website data on 25 May 2005 by the author.

Apart of the Federal Mi nistry for Fa milies, Seniors, Women and Youth (BMFSFJ) all other ministries choose to use the term 'information society' more often than 'knowledge society'. Nevertheless, only two ministries (BMVEL, BMVg) do not us e the term 'knowledge society' at all. The findings of this surface-scratching sea rch are also confirmed when looking at the major action programmes of the German Government f ocussing on the creation of an information society. All major action programmes bear the t erm 'information society' in their titles, but n evertheless organised the Feder al Ministry of Education and Research a conference with the title "Europe on the way of becoming a knowle   dge society" in 2002 . Furthermore, decided the political t hink tank of the Green Party, Heinrich-Böll-Stiftung to establish a whole research field under the co ncept 'knowledge society', not 'infor mation society'[22], just to name two examples.

The Head of the Depart ment "Conceptual Questions and International Matters concerning the Information Society" (Referat "Grundsatzfrag en und internationale Angelegenheiten der Informationsgesellschaft") in the Federal Mi nistry of Economics and Labo ur, overseeing the

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[22] See: http://www.wissensgesellschaft.org/

activities of the Federal Government concerning the information society Germany, explains the ambivalent use of the two terms 'information/knowledge society' as follows:

"The term 'knowledge society' is surely the more comprehensive term. One can argue about the exact meaning and this is not unim portant. (…) But [the ministry] takes the more pragmatic approach and says, until now, t he term 'information society' is more commonly used. Everyone understands it everywhere. One could also say 'information and knowledge society' and in longer explanations, w e always use the te rm 'knowledge society' as well. But we see it rather from th e pragmatic side and say 'information society', everyone understands that." (Translation by the author.)

4.2. Singapore

In Singapore, the same search as conducted on the websites of the Ministries of the Federal Government in Germany, was also condu cted on the websites of the Sin gaporean Ministries, extended by the term "kn owledge-based economy". As abo ve, the frequency of usage illustrated by this search offers only a sketchy insight.

Table: Terminological Preferences in Singaporean Ministries
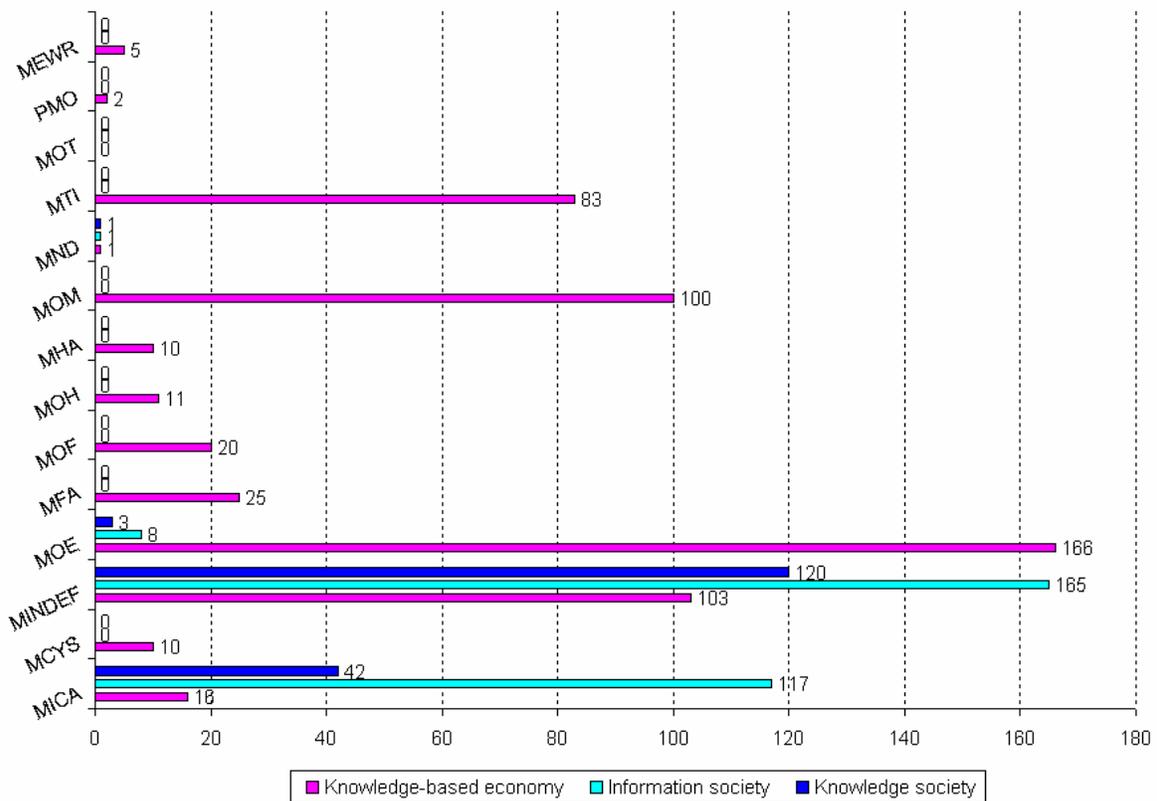
Source: Compiled from Singapore government website data on 25 May 2005 by the author.

Interestingly, the Minist ry of Information, Communications and the Arts as well as the Ministry of Defence seem to use the term 'information society' more frequently than the term

'knowledge-based economy'. Nevertheless, all other ministries show a clear preference to the term 'knowledge-based economy'.

Looking at government programmes fostering the creation of a knowledge-based economy, information/knowledge society, one has to state the following. The Singaporean government and its a dministration does not have a sin gle major a ction plan which bears the term 'knowledge-based economy' or 'information/knowledge society' in its title. This is not to say that the Singaporean government does not have action plans focussing on the creation of a knowledge-based economy. The opposite is the case. The Singaporean govern ment was after Japan one of the first g overnments embarking on the step-by-step creat ion of a knowledge-based economy, information/knowledge society. Yet, each action plan focussed on concrete, sectoral aspects, such as on the further development of the informa tion and communication infrastructure, the development of a borderless library system, as well as in more recent years, the fostering of an art and heritage scene in order to raise the level of creativity in Singapore society. Most of these a ction plans state on the pages 1 to 5 their contribution to the Singaporean knowledge-based economy, but they d o not carry t he term 'knowledge-based economy' in their titles.

The Chairman of A*Star and Co-Chairman of t he Economic Development Board explains the use of the term 'knowledge-based econo my' rather t han 'information or kn owledge society' as follows:

> "If I have a n economy and people have good jobs, you can do anything you like. Society derives from there. Econo my is key to any society. When peo ple are hungry, there is no society, there is no culture, there is no poetry, and there is no building. So you start wi th economics. When people are economically employed a nd active, the rest will come."

The Chief Executive of the National Library Bo ard explains the preference of the term 'knowledge-based economy' as follows:

> "In Singapore everything is driven b y economics. The knowledge societ y is the lon g-term goal, yet at the moment we still focus on t he KBE. The KBE plugs you and the Singaporean market directly into a global system, the international market. Th e knowledge society is far more in ward looking. Also it is harder to grasp. The KBE is easier to be defined and grasped."

5. State Activities to create a German Information Society

In 1972, the Federal Ministry of Education and Science of Germany publishes the German translation of the Japanese report "Japan's Technological Strategy" [23], which emph asises the importance of cre ating an infor mation society in Japa n. Hence, t he activities of other countries in this field were monitored as well as this topic was indeed of relevance to the German politics at that t ime. Nevertheless, only with the beginning of t he 1980s, the term 'information society' advances into the politica l sphere of Germany and is overs hadowed until the be ginning of t he 90s[24] by discussions on cable television, the privatisation of the broadcasting services and the cabling of the whole republic, which is emphasised by the first

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[23] Bundesminister für B ildung und Wissenschaft (1972). Japans Technologische Strategie - W iedergabe und Kommentar einer Studie des Ausschusses für technolo gischen Fortschritt des japa nischen Wirtschaftsrates. Bonn, Bundesministerium für Bildung und Wissenschaft.
[24] See also: Hamburger Erklärung zur Informations gesellschaft (http://langlab.uta.edu/scottweb/cybergermania/h_e_i.html)

Commission on the Extension of the technical Communication Systems (Kommission für den Ausbau des technischen Kommunikationssystems) in 1975.[25] With the development of the interactive videotex, the concept of an information society become s increasingly present in public and political discourse. In 1981, the expert commission "New Media" [26] of the state Baden-Württemberg discusses the consequences of t he new media technologie s on our everyday life. In 1983, again financed by the state govern ment of Baden-Württemberg, the expert commission on the "Future Perspectives of societa l Development"[27] discusses th e path into an information society out of three perspectives: the social sciences, the informatics and computer technolo gy as well as the educational sciences and pedagogy. These commissions are followed by several expert commissions on the topic information society, some actually using the term, emp hasising its connotation of progress and economic development, others avoiding the te rm as a catchword without substan ce.[28] On the level of t he Federal Government the term is next used in 1996 by the Technologierat of the Federal Govern ment in it s report "Info 2 000: Germanys Way into the Inf ormation Society".[29] This report is followed up by a progress report one year later.[30] While this report is the first report of the Federal Govern ment emphasising the term and concept of an information society, it can be criticised, that it on the one side does not reflect the theoretical discussion since Bell, on the other side does not do justice to the social reality of Ge rmany with increasing, structural unemployment, financial deficits of the public as well as decreasing economic growth. [31] Nevertheless, this rep ort encourages the German Bundestag to the forming of the cro ss-fractional Enquete-Commission "Future of th e Media in Economy and Societ y - German ys Way to the Information Society" on December, 5 [th] 1995. It is t he aim of th is commission to analyse the political conseque nces that arise from the usage of information and communication te chnologies, to make use of the chances and restrict risks arising in the information society. Unfortunately, the final report[32], which is published in 1998 just before the end of the legislative p eriod, does not offer a stringent conclusion but is full of antagonisms between the different politica l fractions. In the following election campaign it is used by each political party differently and seems to be forgotten completely later on. As described b y Klumpp[33], the outcomes, meaning the final rep orts of most commissions concerning the information society Germany, were drowned by everyday politics, which reflects the (un-)importance of the topic to German politicians and their actions. In 1999, the Federal Cabinet assign s the Federal Ministry f or Economics and

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[25] Kübler, H.-D. (2005). Mythos Wissensgesellschaft - Gesellschaftlicher Wandel zwischen Information, Medien und Wissen. Eine Einführung. Wiesbaden, VS Verlag für Sozialwissenschaften.
Kleinsteuber, H. J. (2003). Abschied vom Konzept Informationsgesellschaft? Next Generation Information Society? - N otwendigkeit einer Neuorientierung. D. Kl umpp, H. Kubic ek and A. Roßnagel. Mössingen-Talheim, Talheimer Verlag.

[26] Expertenkommission Neue Medien – EKM Baden-Württemberg (1981): Abschlussbericht. 3 Bde. Stuttgart.

[27] Kommission "Zukunftsperspektiven gesellschaftlicher Entwicklungen" (1983). Abschlussbericht. Stuttgart, erstellt im Auftrag der Landesregierung von Baden-Württemberg.

[28] Kübler, 2005.

[29] Bundesministerium für W irtschaft (BMWi) (1996). Info 2000 - Deutschl ands Weg in die Informationsgesellschaft - Bericht der Bundesregierung. Bonn, Bundesministerium für Wirtschaft.

[30] Bundesministerium für W irtschaft (BMWi) (1997). Info 2000 - Deutschl ands Weg in die Informationsgesellschaft - Fortschrittsbericht der Bundesregierung. Bonn, Bundesministerium für Wirtschaft.

[31] Kleinsteuber, H. J. (1997). "Informationsgesellschaft: Entstehung und Wandlung eines politischen Leitbegriffs der neunziger Jahre." Gegenwartskunde 1: 41-52.

[32] Deutscher Bundestag (13. Wahlperiode (22.08.1998)). Schlussbericht der Enquete-Kommission "Zukunft der Medien in Wirtschaft und Gesellschaft - Deutschlands Weg in die Informati onsgesellschaft. (Buchfassung: Bonn 1998), Drucksache 13/11004.

[33] Klumpp, D. (200 3). Informationsgesellschaft - nur eine "symbolische" Diskussion? Next Generation Information Society? - N otwendigkeit einer Neuorientierung. D. Kl umpp, H. Kub icek and A. Roß nagel. Mössingen-Talheim, Talheimer Verlag.

Technology as well as the Federal Ministry fo r Education and Research with the task to conceptualize the action program "Innovatio n and Jobs in the Informatio n Society of the 21st Century"[34] as an all embracing strate gy for the German information society until 200 5. This action programme is followed up in March 2002 by a progress report[35]. Closely connected to this action programme and its prog ress report is the eGovernment pro ject of the Federal Government. BundOnline, launched in 2000, is focusing on making all internet-applicable services of the Federal Government online available. Yet, th is requires German citizens to be connected and go online. This awareness leads to the 10-point-programm "Internet for Everyone – 10 Steps on the Way i nto an Information Society", introduced by Cha ncellor Gerhard Schroeder in September 2000 at a congress of the private-public-partn ership initiative D21. The program "Interne t for Everyone" concentrates on the equipping of public institutions such as schools, libraries, administrative bodies with free internet access for the public as well as the of fering of computer and internet cou rses for all groups of society in public educational instit utions. Shortly after pu blishing the progress report to the action programme of 1999, t he Federal Govern ment embarks onto the information campaign "Germany spells itself with .de" aiming at complementing BundOnline by summarising the online services of the states and communes on one internet portal (www.deutschland.de). In 2003, the current action programme of the Federal Government "I nformation Society Germany 2006"[36] is published. Once again the Federal Ministry of Economics and La bor as well as the Federal Ministry of Education and Research analyse their activities of the past years and emphasise the following four areas for future engagement: (1) Digital Economy for Growth and Compe titiveness, (2) Education, Research and Equa l Opportunities", (3) eGovernment, Security and Trust in the Int ernet, (4) e Health. In comparison with the preceding action programmes, this is rather a collection of separate initiatives and activities; it is not an all embracing concept for future politics.

Subsuming the results of these government commissions, one can state, that the dissents concerning details increasingly blurred the final aims of creating an information society in the German Government debate. While in the 1970s the topic of the information society stood for modernity and as s uch appeared to communicate an attractive image for t he parties aiming for it, the topic lost its attractiveness in the 1980s. With the boom of e-commerce and internet economy, the topic gained again attract iveness in the 1990s. Subsumed un der the formerly only rarely used catchword s such as information society, e-society, information or IT-economy German politicians revived the concepts, imitating their US-American colleagues. Yet, with th e explosion of the internet bubble and hence the end of the internet hype, one can observ e the sprea d of a grea t tiredness regarding this topic within the German government, administration and academia.

6. State Activities to create a Singaporean Knowledge-based Economy

In 1969, the Go vernment of Si ngapore requested the United Nations Development Programme (UNDP) to provide assistance in expanding the activities of the National

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[34] Bundesministerium für Wirtschaft und Technologie (BMWi) und Bundesministerium für Bildung und Forschung (BMBF) (1999). Innovati on und Arbe itsplätze in der Informationsgesellschaft des 21. Jahr hunderts - Aktionsprogramm der Bundesregierung. Berlin/Bonn, BMWT, BMBF.

[35] Bundesministerium für Wirtschaft und Technologie (BMWi) und Bundesministerium für Bildung und Forschung (BMBF) (2002). Informat ionsgesellschaft Deutschland - Inn ovation und Arbeitsplätze in d er Informationsgesellschaft des 21. Jahrh underts - Fortschrittsbericht zum Aktionsprogramm der Bun desregierung. Berlin/Bonn, BMWT, BMBF.

[36] Bundesministerium für W irtschaft und Arbeit (BMWA) und Bundesministerium für Bildung und Forschung (BMBF) (2003). Informationsgesellschaft Deutschland 2006 - Aktionsprogramm der Bundesregierung. Berlin

Productivity Centre (NPC). The UNDP report recommended that the Government formulates a national computer policy and makes arrange ments with the administration to fa cilitate electronic data processing (EDP) systems that would improve service to the public. Nevertheless, the recommendation s of UNDP were not fol lowed. Singapore had reached independence only fou r years ago (1965) an d computers seemed t o be a rat her cost intensive sector. Instead, Singapore Govern ment chose to follow the path taken by Japan focussing on the labou r intensive electronics industry. In the beginn ing of 1980 , then Minister of Trade and Industry, Go h Chok Tong appointed a Co mmittee to study, how the government should go about developing Sin gapore into a regional centre for computer software development and services. Two teams of the committee, headed by Dr. Tony Tan, Minister of Education, visited Hong Kong and the USA for studying computer installations there. The final report[37] was submitted to the Government in October 1980. It recommended focusing on developing manpower skille d in compu ter programming. In 1981, the Government set up the National Computer Board (NCB), a sta tutory board of the Government, subordinated to the Ministry of Finance, in or der to implement the plan. The founding of NCB resulted in heavily promoting the use of computers in the government, schools and businesses as well as the setting up of co mputer science as university and polytechnic courses. In order to computerize the public service the Civil Service Computerization Programme was launched.[38]

In 1985, th e Government set up a working committee made up of officials from the Singapore Telecoms, Economic Developme nt Board (EDB) Institute of Syste ms Science (ISS) and t he NCB to produce a National Information Te chnology (IT) Plan. [39] This plan reflected the shift from mere computerization to IT by adding the elem ents of telecommunications and office systems. Compared to the national computerization policy offered by the plan for computerization from 1981, the National IT Plan from 1985 offered an integrated IT policy fo r the next five years. Main aims of the plan were the further development and spread of Teleview, the convergence of telecommunications and computer technology to improve business tra nsactions, the implementation of an island-wide integrated services digital netw ork (ISDN), as well as t he development of app lications such as a tr ade documentation system named TradeNet, MediNet for the medical industry and LawNet for the law industry. In the field of manpower training th e emphasis move d away from learning programming skills to l earning application software. In late 1990, together with the handover of the Prime Minister's position from Lee Kuan Yew to Goh Chok Tong, a document entitled "The Next Lap" [40] was published. The Next Lap was a government document, meaning to describe the hopes and aspirations of a new generation of Singaporeans. Right after The Next Lap was publishe d, work started on the IT 2000 Vision, beginning 1991, coordinated by NCB. Central to "IT 2000: A Vision of an Intelligen t Island"[41] was the creation of a National Information Infrastructure (NII), which should link computers in every home, office, school and factory. Te leview was still seen as future technology by the Singaporean Government and further developed. Nevertheless, the World Wide Web became increasingly interesting and was made available to t he public in 1994 by Singapore's first public Internet service provide r named SingNet. In 1996, Singapore ONE Network for Everyone was launched, which offe red services like video-conferencing, high-

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[37] Committee on National Computerization (1980). Report on National Computerization. Singapore.

[38] National Computer Board (1997). Connected government : using IT in the Singapore civil service. Singapore, National Computer Board.

[39] National IT Plan Working Committee (1985). National IT Plan: A Strategic Framework. Singapore, National IT Plan Working Committee.

[40] Singapore Professional Centre (1991). The Next Lap Together. Singapore, JM Publishers.

[41] National Computer Board (1992). A Visio n of an Intellig ent Island: T he IT2000 Report. Singapore, National Computer Board Singapore.

speed Internet, teleshopping, entertainment and electronic libraries t o its users. With increasing internet subscribers, the Government of Singapore was faced with the question of censoring the internet, but had to realise after years of battle, that the World Wide Web cannot be effectively censored. Hence, Sing apore ONE was the attempt of providing Singaporean citizens with internet and at the same time "creating an internal system which bonds people to the neighbourhood, schools, clubs and local community", as mentioned by the Government official George Yeo in 1995.[42]

But besides the focus o n building the informational and co mmunicational infrastructure, the recession in 1985 also lead to the increasing a wareness that Singapore's economy had to diversify, create local substance and content, in order to yield sustainable future development and move up the value-chain. T his awareness lead to the formation of the National Science and Technology Board (NST B) in 1991, which later was renamed into A*Star. Until today, it is the ta sk of A*Star to promote and further local develo pment of science and technology by conducting research and dev elopment mainly in the fields of life- and bioscience.[43] Additional to this highly specia lised R&D-development, the Go vernment also identified the need to raise the general level of education of Singa pore's population. In order to do so, the Government pu blished the action plan "Library 2000"[44] in 1994 a nd – in 1995 – for med the National Librar y Board (NLB) to implement the plan. The aim was the massive expansion and upgrading of the public library system in order to bring th e library closer to the people.[45]

The infrastructural development was further planed and implemented by a master plan entitled "Infocomm21"[46], published in 2000. This Master Plan is made up of several major initiatives, aimed at de veloping Singapore into a leading infocomm h ub in the re gion. To realise that vision, the plan focuses at developing Singapore into a key player in the provision of telecommunications services, e-business transactions and distribution of digital goods and services i n Asia. At the same time, the Government i s still a iming for a diversification of Singa pore's economy and e mbarks in 2002 into t he development of creative industries[47] as an economic se ctor. This is e stablished and formulated in the Creative Industries Development Strategy [48], published by the Minist ry of Information, Communications and the Arts under Tan Chin Nam. Including the aim of developing creative industries into the activities of the Infocomm Development Authority (IDA), a merger of the National Computer Board and the Singapore Telecommunication Authority, in 20 03, IDA

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[42] Straits Times, 26 May 1995.

[43] Toh, M.-H., H. C. Tang, et al. (200 2). Mapping Singapore's Knowledge-Based Economy. Singapore, Economics Division, Ministry of Trade and Industry.

[44] Library 2000 Review Committee (1994). Library 2000: Investing In A Learning Nation. Singapore, Ministry of Information and The Arts.

[45] Hallowell, R., C.-I. Knoop, et al. (2001). Transforming Singapore's Public Libraries. Boston, Harvard Business School.

[46] Infocomm D evelopment Authority (2000). Infocomm21 - Singapore: Where the Digital Future is. Singapore, Infocomm Development Authority. Downloadable under: http://www.ida.gov.sg/idaweb/doc/download/I2250/WHAT_IS_INFOCOMM21.pdf

[47] According to the Economic Review Committee Report, 'Creative Industries Development Strategy' Singapore, "creative industries" can be defined as "those industries which have their origin in individual creativity, skill and talent and which have a p otential for wealth and j ob creation through the gener ation and e xploitation of intellectual property." This definition is borrowed from the UK Creative Industries Taskforce, Creative Industries Mapping Document, November 1998. For further information on the definition of the Singaporean government of creative industries, see Toh, M.-H., A. Choo, et al. (2003). Economic Contributions of Singapore's Creative Industries. Singapore, Ministry of Inf ormation, Communication and the Arts. Do wnloadable under: http://www.mita.gov.sg/MTI%20Creative%20Industries.pdf.

[48] Economic Review Committee and Workgroup on Creative Industries (2002). Creative Industries Development Strategy. Singapore, Ministry of Trade and Industry.

publishes its current master plan, entitled "Connected Singapore".[49] Connected Singapore is a fine-tune of Infocomm21, emphasising t he role of information and communication technologies in developing creative industry sectors such as desig n and the arts. Th e master plan includes four strat egies: (1) Infocomm for Connectivity, Creativity & Collaboration, (2) Digital Exchange, (3) Engine of Growth, (4) Agent for Change. Strategy 1 emphasises the development of computer applications by everyone fo r work, play, lifestyle and learning. Strategy 2 focuse s on developing Singa pore as a leading global digital distribution and trading centre with hub status in the region. Strategy 3 aims to grow ne w economic activities and create jobs in the inf ocomm sector by enc ouraging the local development of technology and ca pitalising Singapore's hub status by establishing strong links into the region. Strategy 4 focuses at assisting businesses and government agencies in using information and communication technologies for higher efficiency and productivity.
The most current master plan published by Singapore Government is entitled "L2010"[50], the "L" referring to "Library". L2010 was published in July 2005 by the Na tional Library Board focussing on developing public libraries into t he third most important place in the lives of Singaporeans. Third most important besides ho me and work. Public libraries shall no longer just be centres of knowledge transfer, for life styling and spending le isure time. In stead, public libraries shall emerge as cen tres of disc ussion, interaction, cooperation; centres of social capital production. Social capital is identified by the Singaporean Government as the key to innovation, which is required for Singapore's economic survival. That socia l capital is closely connected to critical thin king, and innovation to change, is taken into account and accepted. As long as change is ne cessary in order to survive economically as well as – in the case of the People's Action Party (PAP), the ruling party – politically, it is accepted.

In Singapore, three phases of government e ngagement and activism can be i dentified. While in the late 1970s and all of the 80s, Singapore's government embarked on build ing an island-wide information and telecommunication infrastructur e and devel oping IT-application for a knowledge-based economy, i n the 90s, the focus moved to ad ditionally increasing investments in R&D. In recent years, these two focal areas were further extended by the aim to develop creative industries, investing heavily in the arts and library scenes of Sin gapore as well as changing sch ool and university curricula with the aim of fostering creativit y. This creativity, defined by Singapore Government, is hoped to re sult in innovative ideas that can be translated into e conomically viable inventions. All three pha ses of government engagement and activism are hoped to contribute to the development of a knowledge-based economy of Singapore; all three phases were embedded into the vision of an 'intelligen t island', a Singaporean knowledge-based economy.

## 7. Analysis: A Four-Model-World

Provided that it is true t hat we are moving into a time where all kinds of knowledge become increasingly the basis for economic, politica l and social prosperity, knowledge production and dissemination beco mes crucial to further development. The role of the state in this process is important but at the same time restricted. Governments can build legal a s well as ICT infrastructures that enable kn owledge dissemination effectively. Furthermore , certain politics of knowledge production wit hin each co untry might foster knowledge production in

[49] Infocomm Development Authority (2003). Connected Singapore - A New Blueprint for Infocomm Development. Singapore, Infocomm Development Authority. Downloadable under: http://www.ida.gov.sg/idaweb/doc/download/I2235/Connected_Singapore.pdf
[50] National Library Board (2005). L2010 - O ur Vision for t he Future (Overview). Singapore, National Library Board.

certain or a ll sectors, others don't. But if ther e is only litt le knowledge production taking place, governments – of course – are not able t o force people to be creative, to ha ve ideas and to produce knowledge. Hence, the following four-model-world can be drawn:

Graphic: Four-Model-World
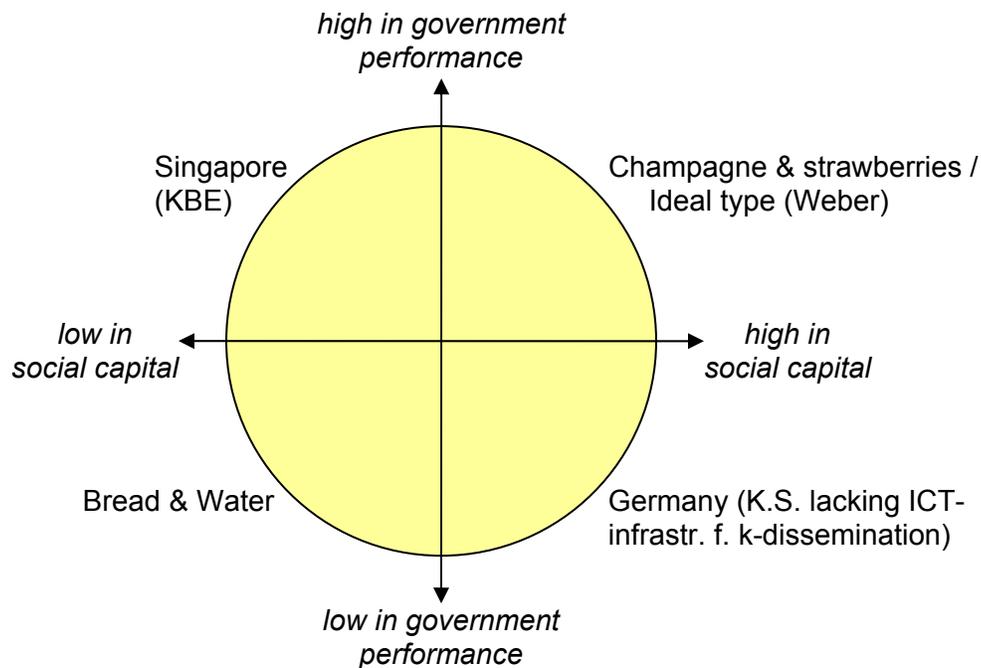
Source: A.K. Hornidge

The optimum, the most successful knowledge society in the "knowledge age" will have to be a highly performing society, meanin g high in so cial capital*,* creativity, and innovation as well as high in government performance in all a spects concerning the creation and sustenance of a knowledge society. Neither Singapore, nor German y can offer this. Possibly there is no country, which can offer both. Opposite to the optimum lies a country which is low in society, as well as low in government performance.

Singapore can be classified as low in society, creativity, and innovation, but therefore high in government performance regarding the planning for a knowledge-based economy. On the contrary, Germany can be seen a s high in society, crea tivity, and innovation but low in government performance towards an information society.

8. Conclusion

The above hopes to offer an insight into how two nation al governments approach the construction of a KBE, knowledge/ information society. Looking at one highly cent ralised state – Singapore – and one much bigger, decentrally organised, federal state – Germany –, I aim to show the advantages and disadvantages of bot h systems in creating a KBE, knowledge/information society. I argue, that the definition of which kind of knowledge is seen as valuable and support wort hy, dominant in one society, determines what kind of KBE, information/knowledge society is created. If knowledge generally has to be applicable and lead t o financial profit within a limited time frame, sectors su ch as scie nce and engineering will receive main attention. This might be helpful for a KBE, but does not lead to

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a knowledge society, if you regard a knowledge society as a society in which any kind o f knowledge can be produced, taken up and developed further by potentially every member of society. A knowledge society requires a more e galitarian definition of knowledge, meaning that any kind of knowledge is generally regarded as positive.

National governments are in the position to cr eate a legal as well as an information and communication infrastructure that w ill support the development of a KBE. Yet, it is much more difficult to create the infrastructure for a knowledge society, which requires knowledge production in all acade mic fields, ideas and t he possibility to develo p ideas furt her. The investment into research and devel opment in sectors such as science and technology is necessary. But above t hese sectors, the development of arts, social sciences, law and business are just as important, if not even more important. Knowledge with substance, ideas that will dev elop economy and society on a lo ng-term basis require the input of d ifferent sectors in order to inspire the creativity of the people. It requires the free dom to think freely and critically. In this a spect, Germany still h as a slight advantage over Singapore, while Singapore clearly shows an advanta ge in the inf ormation and communication infrastr ucture as well as the high effectiveness of the pub lic administration approaching the development of all kind s of different sectors/clusters contributing to a KBE as well as to a knowledge/information society.

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http://www.singstat.gov.sg/keystats/keystats.html.
http://www.wissensgesellschaft.org/