

## OPEN ACCESS

## Social Capital, Social Engineering, and the Technopolis

Fred Young Phillips

Dept. of Technology & Society, State University of New York at Stony Brook, New York

**Abstract :** The paper briefly presents the social and cultural context of technopolis development. It offers a catalog of the social considerations a technopolis designer must attend to. Technopolis planners may use this list for preliminary assessment and benchmarking of their region against others, and to reach a realistic view of the challenges facing a new technopolis project.

**Keyword :** Social Capital, Social Engineering, Technopolis, Economic Development

There is now a substantial literature (Phillips 2006; Westlund 2006; Rutten and Boekema 2007) on the rôle of social capital in regional technology economies. This paper will put this knowledge into a form that is useful for technopolis planners, and will extend it to additional socio-cultural considerations for technopolis.

This paper emphasizes the social and cultural context of technopolis development. It presents the view that a technopolis region is an integrated, highly communicative collection of participating individuals and institutions from the public, private, and educational sectors of a metropolitan region – and one that engages in substantial and vital exchanges with distant techno-regions. The paper offers a catalog of the social considerations a technopolis designer must attend to.

A successful technopolis requires technology and technology companies; education, research and manufacturing; expertise in urban design and real estate; access to legal and financial (capital and accounting) services; entrepreneurs;

and the “glue” that ties these assets together and keeps them aligned to the overall goals of productive research, higher value-added manufacturing, and ultimately economic development for the region. Social capital is this “glue.”

This paper lists and comments on the elements of social capital and social culture that are indispensable for a successful technopolis. The list includes social structure, status of entrepreneurs, social custom, social values, social cohesion, social networking, social capital, possibilities for social engineering, and the detailed social design of technology business incubators.

### Elements of technopolis

Regions around the world hope to emulate California’s Silicon Valley, to leverage technology as a kick-starter of economic growth. It is easy to see that Silicon Valley is not a science park, nor an incubator, nor an economic development authority, nor a university; it is a collection of all these things and more. What is harder to see is the way all these institutions, and others, interact. This interaction is the key to knowledge-based regional economic growth.

Knowledge-based metropolitan regions are made up of:

- Strong universities
- New business incubators
- Research parks
- Critical masses of high-tech and knowledge-based companies

\*Correspondence to : Fred Young Phillips

Professor of Department of Technology & Society, College of Engineering and Applied Science, State University of New York at Stony Brook (Stony Brook University), Stony Brook, New York USA 11794-3760

E-mail : [fred.phillips@stonybrook.edu](mailto:fred.phillips@stonybrook.edu)

World Technopolis Review

Copyright©World Technopolis Association

© This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0>) which permits unrestricted noncommercial use, distribution, and reproduction in any medium, provided the original work is properly cited

- Strong supporting professional services – accounting, legal, investors
- Government and other agencies supportive of technological progress and entrepreneurship

Successful regions may be called knowledge economies, technopoles, techno-regions, or technopoles.<sup>1</sup> The mechanisms regions use to build the needed collection of institutions include “capitalizing” on these assets:

- Human capital
- Physical capital and quality of life
- Intellectual capital
- Social capital
- Relational capital
- Institutional capital (see North 1990)
- Quality of life in the region
- A culture of entrepreneurial support and inter-institutional knowledge transfer

Each of these was defined and discussed in Phillips (2009a); the present paper will deal in greater detail with social capital, and to some extent with relational capital. *Social capital* (Coleman 1988) is “the ability of people to work together for common purposes in groups and organizations.” Social capital depends on “spontaneous sociability,” that is, the ability to form viable new cooperative associations. These include civic, professional, trade, industry, and neighborhood associations.

### **Social culture and social capital**

History and culture create each other. Therefore, history matters. Your region may *leverage* a history of science and entrepreneurship. Or, your region may have to *overcome* a history of insufficient education and hostility toward private business.

There is a patent for cloud seeding (rainmaking), filed in the name of the king of Thailand. The Korean alphabet is attributed to a king of Korea. Though we might view these as cases of politically adept inventors allowing their kings to claim credit, there is more to the story. The king’s name, associated with a technological advance that benefits the entire population, does much to influence a culture of innovation for social betterment. In contrast to Thailand and Korea, all technological advance in dynastic China was solely

for the amusement of the emperor. Even today, long after imperial times, it will be difficult for China to overcome this and to establish a view, within the government and among the people, that technology can benefit everyone.

Social culture, say Stevenson and Jarillo (1991), determines:

- A region’s propensity to reinvest the rewards of business success in still more local businesses – rather than in real estate or offshore bank accounts – and in the social welfare of locals.
- A region’s attitudes toward the success of others. Does the society ostracize entrepreneurs, or celebrate their successes?
- A region’s willingness to embrace change.

These observations highlight the importance of social capital and begin to suggest a framework for analyzing it in the context of technopolis. The following account of a difficult technopolis project in Spain clarifies still further.

#### *The case of Mallorca*

The Balearic Islands are a province of Spain in the Mediterranean Sea. The provincial capital, Palma de Mallorca, used a grant from the European Community to pursue a self-investment strategy, namely, an attractive facility for Internet-based businesses and teleworkers. The research park, “ParcBIT,” was intended to help trigger a diversification of Mallorca’s economy away from its dominant reliance on agriculture and charter tourism (Phillips 1995).

Mallorca’s advantages include a perfect climate with clean air, good air transport service (in summer, Palma’s airport is Europe’s second busiest), and some strong university departments. The university, IUB, has a school of hospitality and hotel administration that can be an effective partner in technology based tourism. There is a proud heritage of artistic and literary achievement and celebrity artists and performers vacation in the islands. English, Spanish and German are widely spoken in addition to the native Catalan. The clustering of British, German, and Scandinavian expatriates makes an interesting diversity that holds the visitor’s interest.

The Ministry of Finance and Economy seemed skilled and energetic in dealing with the province’s challenges, which include a fresh water shortage, and a government tradition of centralized decision-making. The Ministry was less successful in dealing with conservative sentiment in the business community, and this failure proved fatal to the quick success of the technopolis project.

<sup>1</sup> Bowing to the Greek origins of the word technopolis, we use “technopoleis” as a proper Greek plural.

Officials frankly admitted that the bulk of visitors were “alcohol tourists” – charter passengers from Scandinavia and the UK who came to Mallorca to buy and consume low-cost liquor. It was natural to hope to “upgrade” to tourists who would stay longer, spend on cultural attractions and patronize the islands’ planned information infrastructure. This included corporate retreats and “skunk-works” that would book the telework facilities for extended periods.

What the Ministry overlooked was that Mallorca’s “old money,” aristocrats accustomed to their influence over the islands’ affairs, do *not* despise the alcohol tourists. This is because short-term visitors, who stay in their rented condominiums quietly drinking, do not participate in Balearic politics and pose no threat to the islands’ social order. Educated, long-term visitors who are dedicated to technological modernity, the aristocrats realized, might want to change the way things are done in Mallorca. And they might be vocal and wealthy enough to do so. Thus the aristocrats were opposed to the technopolis project.

The Ministry moved ahead with a high-profile international architectural competition for the central ParcBIT structures. None of the competing entries dealt with the many European cultures that would be represented at ParcBIT, and how to accommodate the various lifestyle preferences they will bring.

What happened to Palma’s initiative? The EU grant expired, and the Minister driving the initiative was not re-elected. With no further funding available, no influential godfather on the scene, and in the aftermath of these cultural blunders, the initiative lost momentum for some years. Progress is now again evident, at <http://www.parcbit.es/>

### A socio-cultural check list for technopolis designers

*Social values.* Where does wealth come from? There are only four paths to wealth: Exploiting or stealing from others; controlling natural resources; owning under-valued stock; and launching new growth stocks created by innovative entrepreneurs. Throughout the majority of human history, only the first three have been popular. It takes quite a shift in values and in experience before the fourth path – which is the basis of the technopolis concept – can take hold in a society.

Does a society regard entrepreneurship as selfish, or as a contribution to society? Intellectuals had good reason to

laugh when George W. Bush said, “The trouble with the French is they have no word for ‘entrepreneur.’” Entrepreneur is, of course, a French word! However, the French identify entrepreneurs with *patrons*, the hated corporate bosses. If you start a business, says this Gallic logic, you are a *patron*, and we cannot be *amis* any more. French would-be entrepreneurs are going to the UK to start their companies. And so, in an odd sort of way, Bush was right.<sup>2</sup>

Technopolis development requires a second shift in social values, then: One that regards entrepreneurs as positive contributors who should be celebrated and emulated. Still other shifts are illustrated by the following questions, which may be asked about any national or regional culture, and the best answers to which should be self-evident:

- Does the society value prosperity and education, or preservation of the status-quo?
- Is it acceptable to talk to, and invest in, people of a “different class”?
- What is the society’s attitude toward (and level of resistance to) change and new ideas?
- Which phrase best describes the society’s attitude about the future? “The future happens, *que será será*” or “We create our own future”?
- Is the society oriented to patience and persistence? Or to quick discouragement or quick gratification?
- Does the society value precipitous action, well-reasoned action, or endless talk?

*Social custom.* How are successes celebrated? How are failures punished? The social reinforcement of entrepreneurship means sharing a celebration when an entrepreneur succeeds, when a new company enters the region, when a patent is won, or when certain employment goals are met.

In some countries, bankruptcy creates a permanent social stigma, preventing a bankrupted entrepreneur from being funded again. In the USA, venture capital investors prefer to invest in a serial entrepreneur, even if the entrepreneur’s earlier effort has been a failure. This is because the entrepreneur has proven s/he has the entrepreneurial personality, the persistence and drive to start again, and valuable experience gleaned from the failed venture. US states with the most liberal bankruptcy laws, like Texas, experience the highest rates of entrepreneurship. Bankruptcy in the US is no badge of honor, but it does not lead to permanent ostracism. This is a good thing for technology entrepreneurship.

<sup>2</sup> By the date this paper went to press, France had done much to reverse this trend.

*Social networking* (and professional, industry, etc. networking). *Relational capital* describes the breadth, intensity, connectivity and quality of the social and communication networks of local persons. This idea resolves the concern of Putnam (2003) about distinguishing “bonding” social capital from “bridging” social capital – the former being inward-looking and conservative; the latter, outward-looking and open to wider communication. Relational capital will distinguish communication networks reaching out of the region from those that are strictly local. This too is of central importance; a region can hardly hope to emulate Austin or Silicon Valley if its leaders do not communicate with people in Austin or Silicon Valley.

Saxenian’s 2006 book *The New Argonauts* credits relational capital for recent development successes in Taiwan, China, India, and Israel. Enhanced exchange of people and messages between these countries, on the one hand, and the centers of higher education in the US and Europe (where Chinese, Taiwanese, Israeli, and Indian students had studied and worked) on the other, created cross-investment, reverse brain-drain, and dual-country entrepreneurship.

Phillips (2008) also emphasized the relational capital of the “godfathers,” outstanding individuals who have led the transformation of many techno-regions. The godfathers are super-networkers, connecting entrepreneurs, financiers, researchers, legislators and other technopoleis, harnessing them to the cause of the local technopolis. The godfathers exert a social force, causing others to want to be close to them, and to show a public spirit, in support of the technopolis, perhaps in excess of that to which they would be naturally inclined.

Table 1. Godfathers of Established Techno-Regions

Austin, Texas	George Kozmetsky
Curitiba, Brazil	Jaime Lerner
Hyderabad, India	Chandrababu Naidu
Oita Prefecture, Japan	Morihiko Hiramatsu
Silicon Valley, California	Frederick Terman
Singapore	Lee Kwan Yew
Sophia Antipolis, France	Pierre Lafitte
Taiwan	Morris Chang

Source: Phillips (2006)

Skill in networking – passion for networking – is at the core of social capital. It means allowing and encouraging all interested parties to talk to each other, inward and outward, across organizations, across sectors, and across industries,

linking entrepreneurs, capital, technology, and management experience.

One of the Austin, Texas technopolis’ critical success factors was its ability to engage communities from Dallas to Monterrey (Mexico) in exactly this way.

*Social Cohesion* means a common vision – everyone “on the same page.” Former Austin City Manager Dr. Camille Barnett remarked that Austin’s community displayed this cohesiveness “more so than anywhere else I’ve seen.” The CEO of a company relocating to Austin commented, “Taxes may not be the lowest here, but it’s the only city where I get the same story from the Mayor, the Chamber [of Commerce], and the university.” It is an adage that companies value uncertainty reduction more than they value low cost. Local social cohesion delivers uncertainty reduction. Cohesion can only develop from good communication.

*Social capital: Voluntary organizations.* The sociologist James Coleman (1988) defined social capital as “the ability of people to work together for common purposes in groups and organizations.” See also Claridge (2010), Phillips (2006), and Westlund (2006). Where there is social capital, Fukuyama (1995) claims, there is wealth. Voluntary civil and civic organizations, each of a scope that is wider than family-level yet not organized by state or national governments, show a technopolis region’s confidence that it can shape its own future.

Voluntary organizations demonstrate the business community’s determination and unity – both to the community’s own government(s), and to relocating companies and to entrepreneurs. Voluntary organizations are platforms for highly connected leaders (whom I call “godfathers”) to do their super-networking.

*Social capital: Trust.* Trust allows technology-based economic developers to pursue the *shared prosperity* that former US Labor Secretary Ray Marshall and US National Medal of Technology winner George Kozmetsky so strongly advocated (Phillips 2005). Shared prosperity means allowing distant (and perhaps disadvantaged) parts of the region to share in the technopolis development initiative. It means emphasizing, as did the Thai and Korean kings, benefits for the many rather than for the few – in contrast, for example, to the Balearic aristocracy, who wished to preserve advantage for the few. Practitioners will find that “bridging” social capital results in new and constructive “bonding.” It is

progressive, rather than reactionary, and in many locales this can represent another hurdle of social change.<sup>3</sup>

The will to action – and actually taking action – are additional important aspects of social capital. As Peter Drucker said in the context of the 1980s manufacturing crisis, “What we have to learn from the Japanese is not what to do, but *to do it*.” All the knowledge, money and infrastructure in the world, Drucker implied, cannot substitute for will, attitude and follow-through.

*Social capital in incubators and in low-trust cultures.* Fukuyama (1995) related social capital to trust. By titling his book *Trust*, he emphasized that high-trust cultures are more likely to build the social capital that can lead to vibrant tech-based economies. There is hope, however, for trust-based economic development in low-trust countries. Mohammed Yunus and others did this with micro-lending in Bangladesh, noting that small groups of women could exert social pressure on each other, resulting in high loan repayment rates. He deliberately identified and leveraged a sub-culture with higher trust than the surrounding society.

Incubator complexes can build their own mini-societies, enforcing high-trust norms of behavior. This is done by creating ritual and intense entrepreneurial experience, and by emphasizing mutual social reinforcement among entrepreneurs and between entrepreneurs and service providers. Most incubators are gated and guarded, not allowing unauthorized persons to enter, so insulating the incubator culture from outside influences is relatively easy.

An incubator tenant experiencing time-to-launch pressure from the marketplace and financial pressure from investors will find his or her family life strained, and his or her stress level heightened. Weekly beer or ice cream parties, and other amenities that form the social structure of the incubator, reduce entrepreneurs’ stress and raise productivity.

*Social engineering.* There is not space for this paper to essay prescriptions or a “how-to” for optimizing social culture for maximum entrepreneurial growth. However, the paragraph immediately above does suggest there are avenues for social engineering, i.e., ways to influence societies in directions amenable to technology entrepreneurship:

- Leadership development;
- Adroit use of opinion leaders and public relations;
- Creating communities of trust through geographic or

demographic strategies, e.g., the Mohammad Yunus example, and managing social interactions in the incubator;

- Effecting improved regional performance on other dimensions noted in the checklist above.

## Summary and discussion

Everett Rogers (1962) noted, “All innovation takes place within a social system.” Because voluntary organizations have done so much to instigate and drive technopolis initiatives worldwide, social capital is of paramount importance to all regions aiming to create a social support structure for technology entrepreneurs (Phillips 2009). This paper has catalogued elements of social capital that are relevant to technopolis designers. Few of its assertions have been subjected to statistical testing. Rather, they are based on the author’s long experience, on cases in the literature, and on many technopolis officials’ observed willingness to put them into use.

Successful technopoleis are metropolitan regions, and ultimately become networks of metropolitan regions (Gibson and Kozmetsky 1993; Phillips 2007). That is, with few exceptions (e.g., compact countries such as Israel and Singapore), technopoleis do not co-extend with national boundaries. Yet in many instances technopolis initiatives are launched by national governments. This usually implies a difficult social policy in which resources are funneled to already-advantaged regions, i.e., regions most likely to be the core of successful technopoleis. This geographically “unbalanced” economic growth within a nation, ultimately benefits all. National governments must learn to tolerate and support this trend, and explain it to the electorate, despite that it appears to be a threat to the relevance of the nation-state itself.

Pockets of interest are not only defined in terms of geography. Why do we build technopoleis? It is to ensure a future flow of new wealth via innovation, and the purposes of commonwealth are social betterment and political self-determination for the region. (One needs only to recall the uproar in the US when, in the 1980s, Japanese concerns bought up a number of American landmarks, in order to understand the psychological and nationalistic basis of the drive toward self-determination. Indeed this sentiment was the basis of the American Revolution of 1776. Much economic colonization still occurs in the world, to the detriment of local populations who would prefer not to be colonized.) A workshop

<sup>3</sup> A workshop participant from an authoritarian country asked, “What makes people cooperate?” Of course he was really asking, “How can I [he] persuade people in my society to cooperate for effective technology development?” This is a complex subject, not well understood. A good start is Robert Axelrod’s (2006) *The Evolution of Cooperation*. See also Fairbanks (2000) and Lawrence and Lynch (2011).



participant asked, "Political self-determination *for whom?*" His country is wracked by strife among ethnic factions. He understood that populations who believe they will never benefit from new regional wealth can hardly be counted upon to support the technopolis project. Technology development cannot paper over underlying social problems.

Further research will attempt to develop formal scales for measuring the socio-cultural variables presented here. Meanwhile, technopolis planners may use this paper's list of considerations to informally assess and benchmark their region against others, and to reach a realistic view of the challenges facing a new technopolis project.

## REFERENCES

- Axelrod, R. (2006) *The Evolution of Cooperation*, rev. ed. (New York: Basic Books).
- Claridge, T. (2010) *Social Capital Research*, accessed February 13<sup>th</sup>, 2010. Available online <http://www.socialcapitalresearch.com>.
- Coleman, J.S. (1988) "Social Capital in the Creation of Human Capital," Supplement: Organizations and Institutions: Sociological and Economic Approaches to the Analysis of Social Structure, *American Journal of Sociology* 94(supp.): S95-S120.
- Fairbanks, M. (2000) "Changing the mind of a nation: elements in a process for creating prosperity," in *Culture Matters: How Human Values Shape Human Progress*, edited by Harrison, L., and Huntington, S.(eds.) (New York: Basic Books).
- Fukuyama, F. (1995) *Trust: The Social Virtues & the Creation of Prosperity* (New York: The Free Press).
- Gibson, D.V., and Kozmetsky, G. (1993) "Networking the technopolis: Cross-institutional alliances to facilitate regionally-based economic development," *Journal of Urban Technology* 1(2): 21-39.
- Hall, P. (1998) *Cities in Civilization: Culture, Technology, and Urban Order* (London: Weidenfeld & Nicolson; New York: Pantheon Books).
- Lawrence, P.R., and Lynch, R.P. (2011) "Leadership and the Structure of Trust," *European Business Review* (May 2011): 17-27.
- North, D.C. (1990) *Institutions, Institutional Change and Economic Performance* (Cambridge: Cambridge University Press).
- Oh, D.S. (2009) "Science Park in Context of the Sustainable Development toward Green Growth," *2009 UNESCO-WTA International Training Workshop: Green Growth based on the Science Park Initiatives* (Daejeon: World Technopolis Association).
- Phillips, F.Y. (1995) "ParcBIT and Balearic Economic Development," In *ParcBIT: toward new ways of living and working in the 21st century*, edited by Font, A. (Majorca, Spain: Conselleria d'Hisenda y Economia, Govern Balear, Palma de Mallorca).
- Phillips, F.Y. (2005) "Toward an Intellectual and Theoretical Foundation for 'Shared Prosperity,'" *Systemic Practice and Action Research* 18(6): 547-68.
- Phillips, F.Y. (2006) *Social Culture and High Tech Economic Development: The Technopolis Columns* (London: Palgrave Macmillan).
- Phillips, F.Y. (2007) "Economic Development Alliances," in *Encyclopedia of Networked and Virtual Organization*, edited by Phillips, F.Y. (Hershey, PA: Information Science Reference).
- Phillips, F.Y. (2008) "The Godfathers: Characteristics and Roles of Central Individuals in the Transformation of Techno-Regions," *Journal of Centrum Cathedra* 1(2): 74-89.
- Phillips, F.Y. (2009) "Assessing and enhancing the impact of innovation and entrepreneurship," in *Managing Innovation, Technology, and Entrepreneurship*, edited by Phillips, F.Y. (Aachen: Meyer and Meyer Media).
- Phillips, F.Y. (2009a) "Toward a Sustainable Technopolis," *2009 UNESCO-WTA International Training Workshop: Green Growth based on the Science Park Initiatives* (Daejeon: World Technopolis Association).
- Putnam, R.D., et al. (2003) *Better Together: Restoring the American Community* (New York: Simon & Schuster).
- Rogers, E.M. (1962) *The Diffusion of Innovation* (New York: Free Press).
- Rutten, R., and Boekema, F. (2007) "Regional social capital: Embeddedness, innovation networks and regional economic development," *Technological Forecasting & Social Change* 74(9): 1834-46.
- Saxenian, A. (2006) *The New Argonauts: Regional Advantage in a Global Economy* (Cambridge, MA: Harvard University Press).
- Stevenson, H., and Jarillo, J. (1991) "A New Entrepreneurial Paradigm," In *Socioeconomics: Toward a New Synthesis*, edited by Etzioni, A., and Lawrence, P. (New York: M.E. Sharpe)
- Westlund, H. (2006) *Social Capital in the Knowledge Economy: Theory and Empirics* (Berlin: Springer).