Buck Rogers or Duck Dodgers:

The Future of Technology at Homebush Bay.

Tony Mossfield

Introduction: What are the realities ?

Ever since the rise of PCs in the 1970s, the world has been surfing the "Technology" Wave. As consumers, we need everything bigger, faster and harder, as workers we need everything to be accessible, and as managers we need everything to be more efficient. But have these goals been met ?

Certainly, Technology has brought us many advances: PCs, the Internet, Multimedia, Cable TV, Digital Broadcasting, a Knowledge Economy, and a Global Village. But have the changes been all positive ? Have they made the world a better place to live in ? Is their still drought, famine, starvation, war and genocide ? Of course there is.

The reality is that Technology has always been with us. Ever since people crawled out of the primordial soup, and ordered their first schooner of new, they have had/invented/used technology. Some of that technology has served people, much of it has harmed people, and it most cases technology has worked both ways. It is very much a two-edged sword.

The New English Dictionary (1994) defines technology as "the application of mechanical and applied sciences for industrial use". Although both limited and limiting, this definition assists in focussing on that which is the topic at hand: the notion of planning for and realising appropriate Industrial Development at Homebush, based on Technology.

So, if technology has always been with us, what is the technology we are referring to today ?

Let me ask a few questions to clear the air:

Who discovered Australia ?

Who was the first European to discover Australia ?

Who was the first Englishman to discover Australia ?

If your answer to any of these answers was "Captain Cook", you would be incorrect. Indeed, Captain Cook was not even a Captain when he came to Australia in 1770. So why do we remember hie ? Was he the most celebrated thief in Australian History ?

But I did not come here to lambaste Cook. I simply use this example to demonstrate that many concepts that we hold to be true are often far from true. Remember that just because we teach them in schools does not make them true ! At best, these concepts are truisms, at worst falsehoods.

Let me ask you another series of questions:

From what did Silicon Valley derive its name ?

Which company first coined the phrase PC ?

Where was the Graphical User Interface (GUI) first developed ?

Like the answers to the previous questions, what has gone down as Technology History is as much a part of folklore, and as inaccurate, as the Cook legends.

Thus, in speaking about Industry at Homebush Bay, and in focussing on Technology at Homebush Bay, we have to clear our heads of the myths, look at the facts, and deal with reality as it presents itself.

Like both Buck Rogers and Duck Dogers, an Australian Computer Industry is a legend. We do have Technology Industries, however, so let's look at those in relation to Homebush Bay.

GWS Regional Indicators

Turnover - Medical, Health, Scientific
Current and Projected

Region	1995 $millions	2005 $millions	Growth %
Baulkham Hills	$320	$390	**21.9**
Blacktown	$244	$308	**26.2**
Blue Mountains	$112	$145	**29.5**
Camden	$25	$32	**28.0**
Campbelltown	$115	$145	**26.1**
Fairfield	$133	$170	**27.8**
Hawkesbury	$45	$60	**33.3**
Holroyd	$112	$135	**20.5**
Liverpool	$168	$215	**28.0**
Parramatta	$360	$710	**97.2**
Penrith	$195	$240	**23.1**
Wollondilly	$22	$27	**22.7**
GWS	**$1,851**	**$2,577**	**39.2**

GWS Regional Indicators

Employment - Medical, Health & Scientific Industries
Current and Projected

Region	1995	2005	Growth %
Baulkham Hills	3,000	3,600	20.0
Blacktown	3,600	4,600	27.8
Blue Mountains	1,950	2,500	28.2
Camden	420	540	28.6
Campbelltown	1,760	2,250	27.8
Fairfield	2,130	2,730	28.2
Hawkesbury	780	1,000	28.2
Holroyd	1,260	1,600	27.0
Liverpool	2,750	3,530	28.4
Parramatta	8,760	11,240	28.3
Penrith	3,100	3,400	9.7
Wollondilly	320	410	28.1
GWS	**29,830**	**37,400**	25.4

Source Greater Western Sydney Economic Development Board

Mossfield, UWS, 1997.

Visioning: Chaos and Complexity

For those not enamoured of childhood Sci-Fi, perhaps I should explain Buck Rogers and Duck Dogers.

Buck Rogers is a kind of 'Boys-Own-Annual' figure, whose inter-galactic feats save the earth:

> "The year is 1987 and (the USA) launches the last of America's deep space probes. In a freak mishap Ranger 3 and its pilot Captain William 'Buck' Rogers are blown out of their trajectory into an orbit which freezes his life support systems and returns Buck Rogers to Earth 500 years later"…
>
> (Taylor c 1935)

In 1987 NASA launches a manned probe on a 5 month trip around the solar system. The probe's pilot is Captain William "Buck" Rogers. Something goes wrong, however, and Buck's life support systems are frozen and he is propelled into deep space. When the spacecraft returns to the vicinity of Earth, the year is 2491.

> (http://www.buck-rogers.com/)

Duck Dodgers, on the other hand, was a Warner Brothers Cartoon Series starring Daffy Duck:

> Daffy Duck
> D.O.B: April 17, 1937
> Debut: "Porky's Duck Hunt"

Co-stared in Porky Pig cartoons then starred in his own.

> In the early 70's Daffy stared in Duck Dodgers (... in the 24 1/2 Century).
> It's been said that George Lucas wanted Daffy to star in another Duck Dogers (sic) episode for the beginning of the Star Wars Movie.
>
> http://looneytunes.acmecity.com/melodies/310/bios.htm

Typical of Duck Dodgers is the following extract:

1. Doctor:
   I have sent for you, Dodgers, because we are facing a crisis. The world supply of Illudium Phosdex, the shaving cream atom, is alarmingly low ...
2. Doctor:
   Now we have reason to believe that the only remaining source is on Planet X ... somewhere in this area ...
3. Daffy:
   ... And you want me to find Planet X, eh?
4. Doctor:
   Can you do it, Dodgers?

5. Daffy:
Indubitibutly, sir ... 'cause there's no one
knows his way around outer space like ...
Duck Dodgers, in the twenty-fourth and a half century!!!

(Mike Maltese, Warner Bros, 1953 in
http://www.stanford.edu/~tonyn/duck.dodgers.html)

Despite the humour, there is something faintly troublesome about both Buck and Duck. Both Taylor and Maltese were offering us visions of the future. And now that people have been into space, AND landed on the moon, we know how inaccurate those visions were.

Even more scary, Duck Dogers was, in effect, more accurate in its portrayal of the technology that got NASA to the moon than was Buck Rogers (at least Daffy wore a helmet for example).

The reason that we so unable to accurately predict the "next big thing is most easily explained using the Theory (ies) of Chaos and Complex. Chaos Theory is like a scientific version of Murphy's Law '…anything that can happen will happen'. Complexity is Chaos's more sensitive cousin. Society, it is claimed, is most productive when it is exposed to Complexity, on the 'Edge of Chaos':

> Complexity is now an emerging science, one that many believe holds great potential. It is our premise that the language and concepts of complexity suggest promising new approaches, new ways of understanding a variety of situations we face every day. The language of complexity reflects nature and life. Research in this field has led to the discovery of common patterns of behavior in complex adaptive systems (CAS). John Holland, faculty member of the University of Michigan and Santa Fe Institute, and an acknowledged founder of complexity, defines CASs as "systems composed of interacting agents described in terms of rules." (3, p. 10). He notes further that these agents are "diverse in both form and capability" and that they adapt by changing their rules and, hence, behavior, as they gain experience. (3, pp. 6, 10) Examples of CAS are found everywhere. They include ant and termite colonies, immune systems, the brain, economies, ecological systems, the internet -- as well as… human being and organizational entities…
>
> (http://www.nhgmaine.com/Articles/life_at_the_edge_of_chaos.htm)

Indeed

> Gareth Morgan, in his newly revised classic work on management, Images of Organization, suggests that the machine metaphor may not be appropriate to all settings: "One of the most basic problems of modern management is that the mechanical way of thinking is so ingrained in our everyday conception of organization that it is often very difficult to organize in any other way." (2, p. 6)
>
> (http://www.nhgmaine.com/Articles/life_at_the_edge_of_chaos.htm)

One way to measure complexity, to think in other than mechanical forms, is to look for self-organisation, and self-organisation can be measured in terms of trend(s). We therefore rely on trends, and accept them as clues rather than answers. No-one has a crystal ball.

Projections Study

Perhaps the most recent trends data pertaining to Homebush Bay comes from my own Greater Western Sydney Projections Study (2001), and my recent work for the NSW Department of State and Regional Development. (2001). Both of these studies demonstrate that there are trends merging across Greater Sydney that might prove the source of developments) at Homebush Bay.

The main focus of both these studies has been to identify those industry sectors which have the highest likelihood (60%+) of achieving both a 60%+ increase in Production (by $A value), and a 60% + increase in employment (60/60)in the period 1996-2021. In addition, a number of other sectors with reasonable prospects for growth (50+) became apparent during the course of the study.

In short, the Industry Sectors, which appear most likely to achieve 60/60 growth in both Sydney and the Greater West, include:

- BioTechnology (Soft)
- Communications (including Telecommunications)
- Electronics
- Financial Services (primarily non-banking)
- Hospitality (Accommodation, Cafes & Restaurants).

Other sectors, which have been identified as having reasonable prospects for growth (50+), include:

- Advanced Manufacturing
- BioTechnology (Hard)
- Construction (non-Residential)
- Eco-Engineering
- Multi-Media (a broad, emerging industry and problematic definition)
- Research and Development

Of these, the most appropriate prospects for Homebush Bay appear to be in the areas of BioTechnology (especially soft) and Eco-Engineering. Speaking in generalisations, BioTech can be a low-pollution, high-employment, increased productivity and improved export industry. Certainly, legislation and enforcement is required to ensure that such standards are met, but in a holistic approach to the development of Homebush Bay, a legislative Infrastructure would surely be the first step.

I must admit, I did have thoughts about moving Fox Studios, Wonderland and Westmead Hospital to Olympic Park and renaming the precinct “Jurassic Park”, but that ideas already been done !

IT: A Sydney Perspective

As previously mentioned in this paper, Buck Rogers, Duck Dogers, and an Australian Computer Industry are the stuff of legend. We do have Technology Industries, however. Indeed, Sydney has technology Industries, so let's look at those in relation to Homebush Bay.

As you will likely be aware, the North Ryde corridor, as it is called, has developed as a series of Technology precincts stretching from North Sydney to Lane Cove and NorWest Park at Baulkham Hills. Many major multi-nations, including Microsoft, Sun, and Compaq have the Regional HQs in this corridor. In a sense, though, that it the point. These companies, whilst employing Australians and sharing their technology and expertise with Australia, are not Australian owned or based. Thus, in most cases, the technologies are imported and the profits exported. My comments are not meant as criticism, but rather to point out that Australian Industry, and international investors in Australia, need to be looking in new directions.

What interests me most about the North Ryde Corridor is that it is showing economic features symptomatic of Silicon Valley of the 1970s: High Tech, Electronics, and Tertiary Education. Yet if we are not going to build computers, what are we going to do.

My two recent studies (Mossfield 2001) demonstrate that the North-West Electronics Corridor, now running our of physical space in the North Ryde Corridor, is moving to areas in the Baulkham Hills Shire, Blacktown City and Hawkesbury City areas. This expansion can be harnessed, and the physical branching out might serve as the platform for accessing venture capital, growing companies, and producing knowledge, wealth and employment.

Freiberger & Swain (2000) point out that in the 1940s "Electricity was making way for the emergence of electronics…" (p 7), and that from the emergence of electronics…

> … physicists working on solid-state elements introduced.. the transistor, a tiny, seemingly inert slice of crystal with interesting properties. The transistor was immediately recognised as a revolutionary development…
>
> Resulting from a series of experiments in the application of quantum physics, transistors changed the computer from a "giant electronic brain" that was the exclusive domain of engineers and scientists to a commodity that could be purchased like a television set.
>
> (ibid, p11)

Here, Freiberger & Swain provide a clue to what might occur at Homebush Bay. We have an electronics industry in the north-west, Universities nearby (Parramatta, North Ryde and Sydney), and the largest Medical Precinct in the Southern Hemisphere at Westmead.

Indeed, in their first Chapter Sub-Headings, "Steam", The Breakthrough", "Critical Mass", and "The Breakout" (ibid) Freiberger & Swain have might provided us with a loose blueprint for what we could develop at Homebush Bay: a Biotech Industry.

What is BioTech ?

In short, whatever you want it to be… but we can identify BioTech activities that may suit Homebush Bay.

Wells (1995), attempting to redress the "confusion" around definitions of bio-technology (which are "far too inclusive, and by definition inaccurate" p. 11), presents a taxonometric structure of eight bio-technology knowledge areas…

(http://scholar.lib.vt.edu/ejournals/JTE/v7n2/oriley.jte-v7n2.html)

Wells: ***Biotechnology Knowledge Areas and Subdivisions***	***Brown, Kemp, Hall:*** ***Biotechnology Content Organizers***
FOUNDATIONS IN BIOTECHNOLOGY	**NO EQUIVALENT**
Definition of biotechnology	
Historical background	
Relevant terms	
Career information	
Social impact	
ENVIRONMENT	**ENVIRONMENT**
Bioremediation	
Biological controls	
Biotreatment systems	
Biorestoration	
Environmental safety	
AGRICULTURE	**AGRICULTURE**
Tissue culturing	
Plant and animal applications	
Agrichemicals	
Aquaculture	
Food science	FOOD & BEVERAGE PRODUCTION
BIOPROCESSING	**MANUFACTURING ENERGY DEVELOPMENT**
Fermentation	
Bio-products	
Microbial applications	
Separation and purification techniques	
Process design: monitoring and growth	
GENETIC ENGINEERING	**NO EQUIVALENT**
Probing techniques	
Genetic engineering applications	
Genetic code	
Molecular bio techniques	
Analysis of DNA	
BIOCHEMISTRY	**NO EQUIVALENT**
Enzymology	
Control and regulation	
Proteins	
Methods of analysis	
Carbohydrates	

MEDICINE	**MEDICINE AND DRUGS**
Molecular medicine	
Immunology	
Genetic therapeutics	
Health care technologies	
Social impact	
BIOETHICS	
Principles of ethics	
Impacts of using biotechnology	
Potentials of gene therapy	
Patenting of life	
Forensics	**FORENSICS AND DIAGNOSTICS**

Wells (1995).

Indeed, BioTech and IT are closely related. So, instead of leveraging our burgeoning Electronics sector in order to develop a Computer Industry, as has been the case in Silicon Valley, perhaps we should be using Electronics, along with our Universities and Hospitals, to leverage a BioTech industry at Homebush Bay. This industry should include companies with an Eco Engineering perspective.

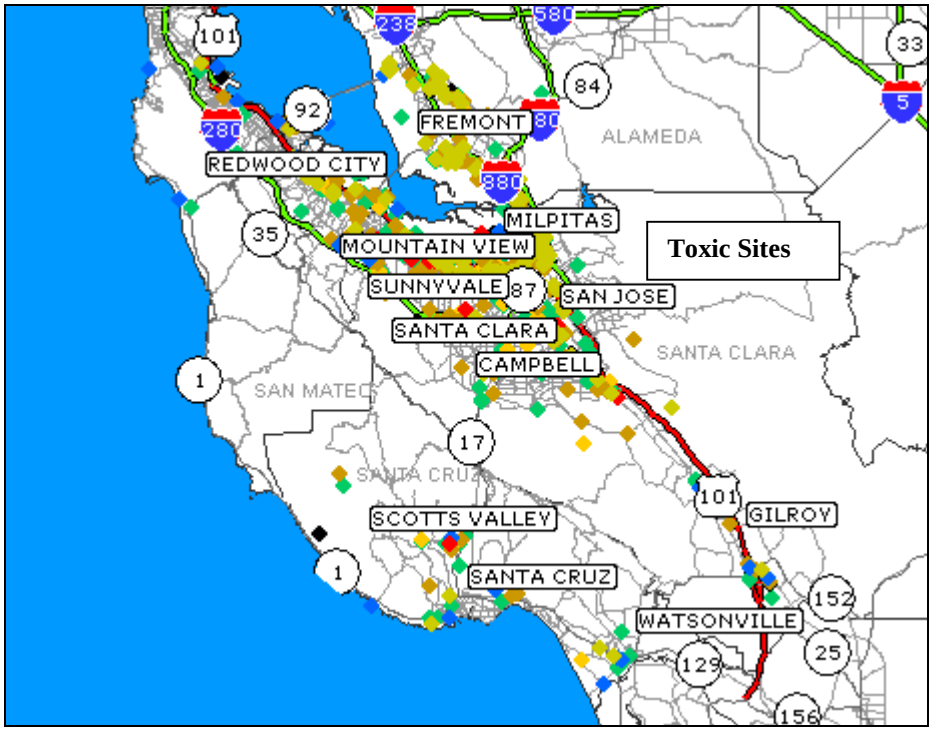
The Environmental Perspective: Living with Homebush Bay

Of all the New Economy Precincts that are held up to the global community as an example of how to make money in the Knowledge Economy, none stands out more than Silicon Valley. Yet, for all its economic and technological success, Silicon is rapidly turning into an environmental disaster.

The map below, along with those overleaf, demonstrate what can occur to the environment due to unmitigated economic expansion. And those communities, which are most likely to suffer the effects of such damage, are those that have spawned such environmental din the first place.

Silicon Valley Indicators

Map 1

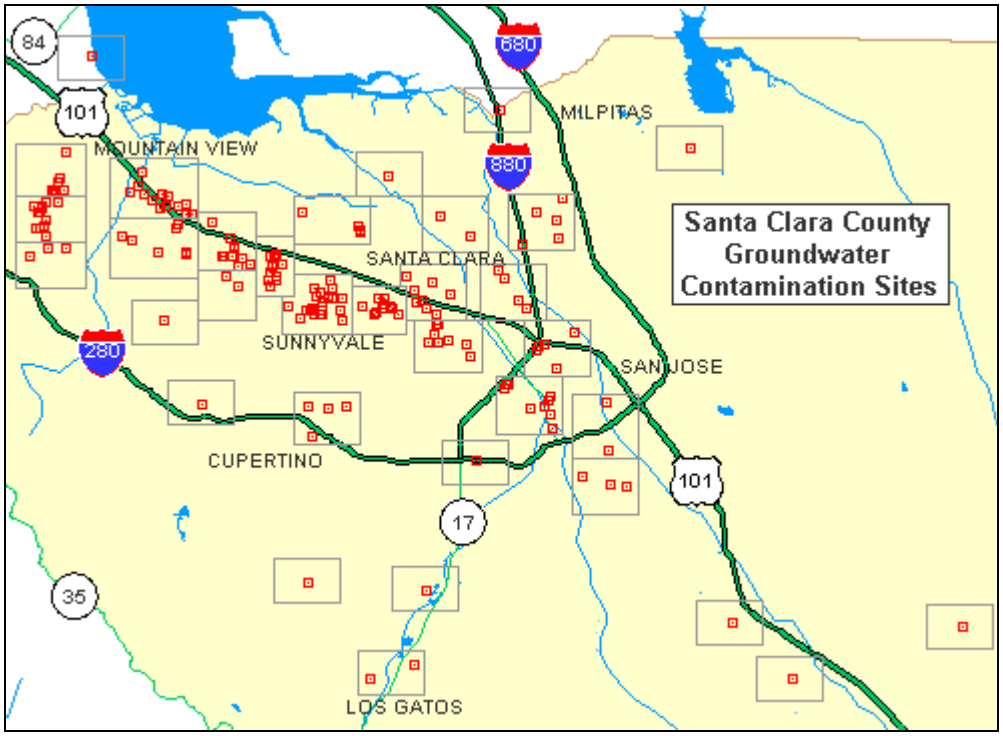


Source: Silicon Valley Toxic Coalition (1999)

Map 1 shows the effects of Toxic Waste, and Toxic Waste Dumps. The centre of Silicon Valley is riddled with potentially dangerous sites, a number of which are in close proximity to, or on the headwaters of, San Francisco Bay. Thus, leeching is likely to ensure that the Toxic Waste produced in the Valley is shared with the whole San Francisco Metropolis.

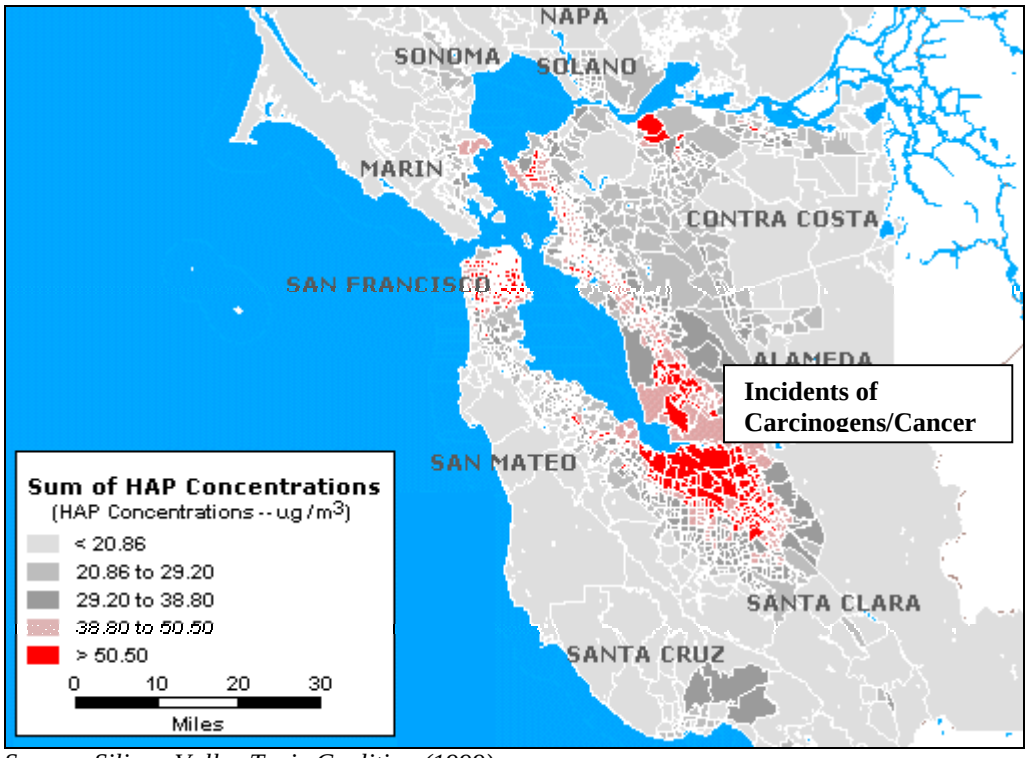
The parallels between the location of the Valley vis-à-vis San Francisco, and Homebush Bay vis-à-vis Sydney are all too obvious. The potential for damage to the whole of the Parramatta River/Port Jackson Catchment (not to mention Sydney's image) was one of the reasons for the focus on Toxic Waste dumped at Homebush Bay prior to the 2000 Olympics. Additional focus on such dumping was brought to bear when Sydney was announced as the "Green Games". I would imagine for the residents of Newington (the former Olympic Village), at least, such priorities might remain quite important.

Map 2



Source: Silicon Valley Toxic Coalition (1999)

Map 3



Source: Silicon Valley Toxic Coalition (1999)

Approximately 30km north-west of Homebush Bay lies the Castlereagh Toxic Waste Dump. Castlereagh, which lies in the Hawkesbury-Nepean Catchment, has become infamous for the deleterious effects it has had on surrounding communities:

> Late last year a Total Environment Centre Report finally led to adverse findings against the Toxic Waste Dump. This after years of denials by successive State Governments, and inadequate reporting by the EPA.
>
> (Penrith Press 1997).
>
> The stillborn dogs and multi-headed deer had been no accident.
>
> (Mossfield 1997).

In his work, Believing Cassandra, Alan AtKisson points out that in the 1960s:

> The US government, acting through NASA and the Department of Defense, ordered mass quantities of (computer) chips, spurring extremely rapid innovation and a swift drop in prices. That intensive act of government purchasing made possible the sudden arrival of the computer era, years or decades ahead of when the market might have produced a transformation of its own.
>
> (AtKisson 1999:206)

So, we strike a balance at Homebush Bay between the innovation and economic growth of Silicon Valley, and the environmental disaster of Castlereagh. To achieve this goal, we need to ensure that Government, the Private Sector, and the Community are vigilant in establishing, monitoring and enforcing what are to be the "acceptable" environmental standards for economic development at Homebush Bay.

And, further, that…

> Hundreds of similar strategies are available to us, but we have to recruit the Change Agents and Transformers to champion a steady stream of new innovations to take us down the pathway of sustainability. We do not need to know where that path ultimately leads, but we need to be willing to take the first steps.
>
> (ibid)

Thus, BioTech at Homebush Bay might not only become an important growth industry for Australian production, employment, and exports, but it might well lead to new innovations for environmental sustainability.

The Socio-Cultural Perspective: Working in Homebush Bay

Not only do people live in Homebush Bay, but they work there as well. Given the importance of employment, and the skills, satisfaction and income generated for individuals, families and communities thereby, Employment at Homebush Bay should not be viewed as the traditional 9-5, but as an opportunity to build Socio-Cultural infrastructure as well.

Yet, in Future Shock, Toffler warns us about 'The dizzying disorientation people feel when the future arrives sooner than they expect it'…

> Recently, the computer has touched off a storm of fresh ideas about man as an interacting part of larger systems, about his physiology, the way he learns, the way he remembers, the way he makes decisions. Virtually every intellectual discipline … has been hit by a wave of imaginative hypotheses triggered by the invention and diffusion of the computer--and the full impact has not yet struck. And so the innovative cycle, feeding on itself, speeds up."
>
> (Toffler 1970)

Thus, there is a danger at Homebush Bay, as elsewhere, that technological advances might outpace our ability to keep up with them.

One of the answers to this dilemma might be found in the Knowledge Economy, and in BioTech as an important and emerging part of that economy. The Knowledge Economy means that we are no longer dealing with commodities, but with information and ideas. Knowledge can tell us as much about ourselves and society as it can about production and income generation.

As suggested by Cader, in his article *Human Genomes Give Birth to a New Knowledge Economy*…

> In the Knowledge Economy, every business is a knowledge business, whether one likes to admit it or not…
>
> On the other hand, we have to establish guidelines to protect individuals…
>
> We have to understand how this vast post genomic information fits together. The knowledge we gain from understanding the human genome and its complexity must be used wisely.
>
> (in Campus Review, Feb 2001:10-11)

We thus also need to acquaint ourselves with the notion of Lifelong Learning, how Lifelong Learning can and will affect us, and how our Schools, Universities and TAFEs might be harnessed to ensure the viability of Lifelong Learning for the Residents and Knowledge Workers at Homebush Bay.

The Economic Perspective: Business for Homebush Bay

We can describe Silicon Valley, both in Chaos and Economic parlance, as an example of clustering. And clustering has proven an extremely effective means of economic expansion worldwide. It is no surprise, then, that we often find fast food outlets all in the same precincts/economic zones.

Crowe (2001) explains that

> There is little doubt that a geographically concentrated collection of firms in related industries can be the source of economic growth. Industry clusters become virtuous circles, with the presence of each new firm increasing the attractiveness of the location to others, because of, rather than in spite of, the intense competition. Competition between rivals drives innovation and productivity growth, and employees create informal networks allowing good ideas to spread at a pace normally only associated with office gossip.
>
> (in Sydney Business Review Feb 2001:7)

Crowe uses Silicon Valley, the consumer electronics in Japan, medical devices in Massachusetts (I smell a case study coming on), chocolates in Switzerland, chemicals on the Swiss-German Border, and ceramic tiles (Sassuolo), Sofas (Murgia), and silk (Como) and woollen yarn (Prato) in Italy (in Sydney Business Review Feb 2001:7) as successful examples of Regional Economic Clusters. (he further describes the 'Multi Function Polis' as an example of a "hair-brain scheme designed to conjure up clusters of flavour-of-the month industries in ridiculous locations).

Gary Hamel (1999) of the Harvard Business School, explains that…

> In the traditional company, people with innovative ideas must go hat in hand to the guardians of the old ideas for funding and for staff. But in Silicon Valley, a slew of venture capitalists vie to attract the best new ideas, infusing relatively small amounts of capital into a portfolio of ventures. And talent is free to go to the companies offering the most exhilarating work and the greatest potential rewards.
>
> (in Harvard Business Review Oct-Nov 1999)

Further, Crichton (1995:74) states that "Self-organisation elaborates in complexity as the system advances…"

So, what is required for Homebush Bay is:

- a **focus**, and I am suggesting that Environmental Bio-Technology appears to be a more than appropriate focus, and
- a **process** of 'Strategies for Innovation'. In other words, we need to know how to establish and promote the process, then stand aside as the process takes over.

In order to establish the process of Environmental BioTechnology expansion at Homebush Bay, Rouse (1991) tells us to Design for Success. In 1992, he tells us to achieve this by focussing on the…

- Importance of Strategic Thinking
- Human-centred planning, organization (sic), and control
- Role of core product technologies, (and)
- Need to assess and balance stakeholder's interests.

(Rouse 1992:11-12)

And this process can be enhanced by…

1. Developing new top level management perspectives… (*especially* on notions of 'control')
2. Designing the use of power
3. Establishing self-organised teams
4. Developing multiple cultures (in business as well as society)
5. Presenting challenges and taking risks
6. Improving Group Learning Skills
7. Creating Resource Slack

(Stacey 1992:191)

Might I suggest now (by way of a small ad) that, in the case of small business at least, the NSW Small Business Development Corporation might be approached on the practicalities of undertaking the process(es) described here. People might even like to access the Department's Booklet *Brief on Information Technology for Small Business (2000).*

Conclusion: a Reality Check

By initiating any process, we have to be aware that Chaos & Complexity suggests it will not necessarily work, that it may achieve outcomes other than those intended, and that anything could happen.

To balance the pros of cons of the process(es) outlined in this paper, let me turn to both de Bono and Woog:

For the Pros, let us attend to de Bono's Lateral Thinking:

> Forward thinking involves moving forward. Forward thinking involves building up something new rather than analysing something old. Innovation and creativity involve forward thinking.
>
> (deBono, 1970:93)

For the cons, I offer Woog's *The Impact of the Information Revolution on Consumers in the Agri-food Chain* (although I should point out that Woog is a leading Chaos & Complexity Theoretician)*:*

> Likely e-trends…
>
> What is not likely to occur, despite extant predictions:
>
> - Half the world's CEOs will lose their jobs because they do not understand e-commerce
> - The majority of the world will trade and shop on-line (note the 'dot con' - Mossfield 2001)
> - The reduction in transaction costs will be passed on to the consumer.
>
> (in Agrifood 2000: Conference Proceeding, 2000:12-89)

I urge you to proceed, but the choice is yours (sounds like one of those new game shows….
There's an idea !?).

Remember… "Things aren't always as they seem" (Mossfield 2000 & 2001)

Goodbye !

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