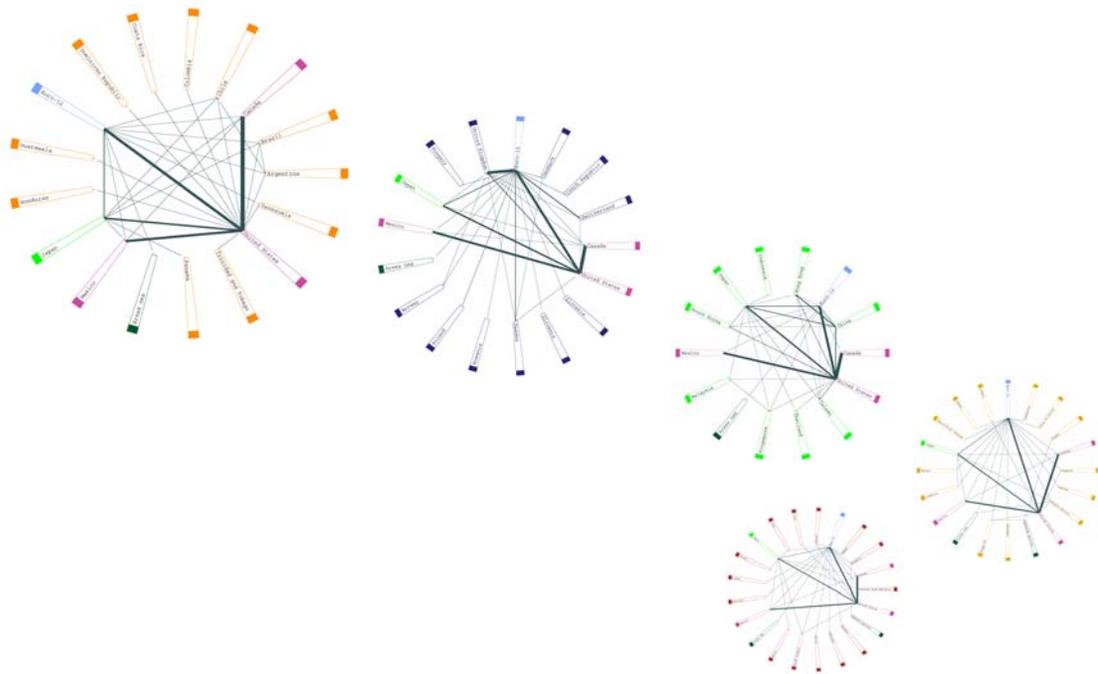


Leveraging Networks in Business 2006

GAP FORUM REPORT



10 - 11 April 2006 • Sydney, Australia

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EXECUTIVE SUMMARY

The GAP Forum on Leveraging Networks in Business was held on the 10th and 11th of April 2006 at the NSW Trade and Investment Centre in Sydney.

Convened by Global Access Partners in partnership with Qantas Airways, IMS Australia and ICAN Research at UTS, the Forum brought together **62 participants** from **47 organisations** (see App. 4, page 32) and featured a host of distinguished speakers including **Dr John Finnigan**, Director of the CSIRO Centre for Complex Systems Science, **the Hon. Sandra Nori MP**, NSW Minister for Tourism, Sport and Recreation, and **Prof Miguel Centeno**, Director of the Princeton Institute for International & Regional Studies at Princeton University. The Forum received a written welcome from the **Hon. Fran Bailey MP**, Federal Minister for Small Business (see App. 5, page 35).

The Forum explored the importance of network dynamics in the modern market place. Key points discussed at the Forum included the following:

- ▶ Network thinking facilitates the modelling of complex systems such as companies, economies and societies which otherwise appear to have little in common. A network's pattern or 'topology' imposes strong controls on its behaviour.
- ▶ The evolution of a network from largely unconnected collections of small, isolated 'nodes' to an integrated, interdependent system, in which almost all actors are connected, is precipitated by a tipping point, after a long period of slow growth. A heterogeneous, or 'scale free', network is comprised of many nodes with few connections and some highly connected 'hubs'. The targeting of such 'hubs' enables control of this network.
- ▶ A *network approach* helps pinpoint vulnerabilities in a supply or trading system. Such analysis can explain why apparently stable systems spontaneously collapse and how organisational reforms can degrade a firm's efficiency by severing the informal networks on which it depends. Stable networks tend to slow the transfer of information, increasing their long term vulnerability to competition and eventual collapse.
- ▶ Network analysis offers a plethora of *business applications*, from highlighting opportunities for effective marketing strategies by explaining how fashions spread through social groups to detecting illegal anti-competitive collusion in particular industries.

- ▶ *Globalisation* is a network phenomena, with a technologically driven revolution of interconnectivity greatly increasing world trade over the last 15 years. Globalisation has seen a tripling in GDP per capita in the OECD countries and massive increases in wealth of 'Asian Tiger' nations. It is centred on 3 hubs – North America, the EU and South East Asia, while other areas, such as Africa, have largely missed out. China and India are the fastest growing new hubs of world trade.
- ▶ Understanding *international networks* allows firms to target the right cities in which to base themselves, highlights potential choke points which might threaten trade in the future and reveals market opportunities in production, trade and retailing.
- ▶ A *network's efficiency* may be calculated by the time it requires to achieve a certain outcome or how well it taps into the knowledge economy to achieve a certain goal. Commercial opportunities exist for entrepreneurs able to audit a larger company's connectivity and network efficiency through freely available data, particularly if value judgments can be made regarding the relative productivity of discrete nodes and connections. Smart network analysis can highlight the existence of isolated 'silos' creating barriers to communication while experience of unexpected outcomes and unintended consequences highlight the need to understand the operation of networks before seeking to change them.
- ▶ Economic strengths can emerge from a small core of well connected people. Studies of the Australian economy reveal a dearth of medium sized manufacturing firms. Network analysis might offer clues as to why small firms fail to grow while a comparison with more successful foreign firms could suggest ways to foster growth through better connectivity.
- ▶ *Heterogeneous networks* can find new sources of information and opportunity, *homogeneous networks* of similar businesses can band together to gain economies of scale and *project oriented networks*, such as that based around a consultative committee, can pool expertise to solve specific problems.
- ▶ Network analysis can identify the relative importance of specific nodes and encourage links to the most influential ones, while encouraging diversity, which might not naturally occur given people's preference for associating with those similar to themselves.
- ▶ Though organisations can set a framework of encouraging or discouraging contact, only individuals can actually interact. Internal network structure enables or discourages individual innovation, leadership, outreach and external relations, but it is difficult to design a structure which encourages the necessary juxtaposition of different skills at different points in the development of the value chain. An organisation must choose a specific focus, e.g. reducing costs or improving efficiency, and proceed from that basis, rather than fruitlessly second guess the nature of creativity.

THE STEERING COMMITTEE

GAP would like to thank the following members of the Steering Committee who worked for over a year on the content and objectives of the Forum.

- ▶ **Dr John Finnigan** Director CSIRO Centre for Complex Systems Science
- ▶ **Mr Peter Fritz AM** (*Chairman*) Group Managing Director, TCG Group
Managing Director, Global Access Partners
- ▶ **Dr John Galloway** Chief Scientist, NetMap Analytics Pty Ltd
- ▶ **Dr Siggie Gudergan** Deputy Director ICAN, University of Technology, Sydney
- ▶ **Mr Bruce Hills** Head of Organisational Innovation, Banking & Technology Solutions & Services Westpac Banking Corporation
- ▶ **Mrs Kylie Ridings** Sales Development Manager, Qantas Airways
- ▶ **Mr Sean Rooney** Australian Government Business Manager, CSIRO Business Development & Commercialisation
- ▶ **Mrs Nikki Suters** Business Development Manager, Qantas Airways

PARTNERS & SPONSORS

'Leveraging Networks in Business' 2006 was coordinated by Global Access Partners (GAP) Pty Ltd and co-sponsored by the following organisations:

- ▶ **Global Access Partners (GAP) Pty Ltd**



- ▶ **IMS (Intelligent Manufacturing Systems) Australia**



- ▶ **ICAN (Innovative Collaborations Alliances & Networks) Research at the University of Technology, Sydney**



- ▶ **Qantas Airways Limited**



The Forum was held as part of the **2006 Australian Innovation Festival** – an annual national event celebrating Australian entrepreneurship.



The two-day event took place at the **NSW Department of State & Regional Development** (Level 44, Grosvenor Place, 225 George Street, Sydney).



Department of State and
Regional Development

KEYNOTE SPEAKERS

The GAP Forum on 'Leveraging Networks in Business' 2006 featured two guest speakers – **Dr John J. Finnigan**, Director of the CSIRO Centre for Complex Systems Science, and **Prof Miguel Centeno**, Director of the Princeton Institute for International and Regional Studies and Director of the International Networks Archive at Princeton University.



Dr Finnigan has worked for CSIRO since 1972, when he joined the CSIRO Division of Environmental Mechanics as an experimental officer. He became Head of the CSIRO Centre for Environmental Mechanics in 1991. In 2001 Dr Finnigan became the founding Director of the CSIRO Centre for Complex Systems Science. Dr Finnigan has served on various scientific boards, task forces and advisory committees in Australia and overseas, and holds a number of international awards, research grants and patents to his name.

John is also author of over one hundred academic publications. His research interests include Complex Systems Science, network theory and its applications, Earth System Dynamics and Global change, and experimental and theoretical studies of environmental turbulence. Prior to joining the CSIRO, John worked in the UK Aerospace Industry. He obtained a BSc in Aeronautical Engineering from the University of Manchester in 1968, and a PhD in micro-meteorology from the Australian National University in 1978.



Prof Centeno is a multi award-winning teacher and author currently working on two new books: "*Visualizing Globalization*" and "*The Triumph and Dilemmas of Liberalism*" and an online "*Historical Atlas of Globalization*". Prof Centeno obtained his BA, MBA and PhD degrees from Yale University. He has received grants from the Harry Frank Guggenheim Foundation, the National Science Foundation, the National Endowment for the Humanities, and the Woodrow Wilson Foundation. He has been a Fulbright scholar in Russia and Mexico and has also been a Visiting Professor in Buenos Aires and Seoul.

In 1997 Prof Centeno was awarded the Presidential Teaching Prize at Princeton University. In 2005 he was elected to the Sociological Research Association as well as the Comparative Historical Section Council of the ASA. In 2000, he founded the Princeton University Preparatory Program, which provides intensive supplemental training for lower income students in three local high schools. For this work, Prof Centeno was recently awarded the Jefferson Award for Public Service and the Bonner Foundation Award. Through the International Networks Archive Prof Centeno is working on improving the quantitative scholarship available on globalisation.

PARTICIPATING ORGANISATIONS

GAP would like to thank the following for their attendance at the Forum:

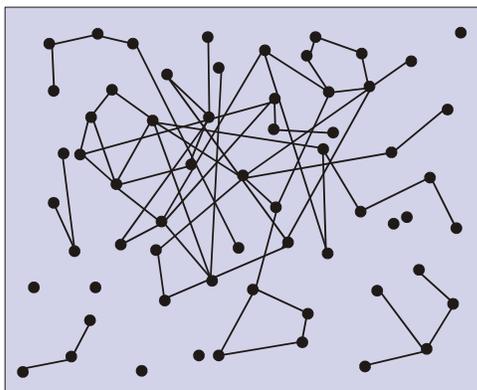
- ▶ Advanced Human Technologies
- ▶ Anecdote Pty Ltd
- ▶ Australia-Israel Chamber of Commerce
- ▶ Australian Business Foundation
- ▶ Australian Trade Commission
- ▶ Citrix Systems
- ▶ Colliers International (NSW) Pty Ltd
- ▶ Colonial First State Private Equity Limited
- ▶ CSIRO Centre for Complex Systems Science
- ▶ CSIRO Manufacturing and Infrastructure Technology
- ▶ Deloitte
- ▶ DL Strategic - Business & Sustainability Consultancy
- ▶ Ernst & Young
- ▶ ESD Land Management Pty Ltd
- ▶ Fairfax Business Media
- ▶ Forensic Technology Pty Ltd
- ▶ HolisTech
- ▶ IMS Australia
- ▶ Information City
- ▶ Information Integrity Solutions
- ▶ Internet Business Solutions Group, CISCO Systems
- ▶ Lenovo (Australia & New Zealand) Pty Ltd
- ▶ McLellan Foundation
- ▶ Mega Capital
- ▶ National Offshore Petroleum Safety Authority
- ▶ NetMap Analytics Pty Ltd
- ▶ NSW Department of State & Regional Development
- ▶ NSW Premier's Department
- ▶ Office of the Hon. Fran Bailey MP, Minister for Small Business
- ▶ Office of the Hon. Gary Nairn MP Special Minister of State
- ▶ Office of The Hon. Sandra Nori, NSW Minister for Tourism and Sport and Recreation, Minister for Women, Minister Assisting the Minister for State Development
- ▶ P&O Cruises
- ▶ PriceWaterhouseCoopers
- ▶ Princeton University
- ▶ Pylon Pty Ltd
- ▶ Qantas Airways Limited
- ▶ S2 Intelligence
- ▶ Smart Internet Technology CRC
- ▶ Sustainable Performance Pty Ltd
- ▶ Swinburne University
- ▶ Sydney Conservatorium of Music
- ▶ TCG Group
- ▶ The Ecos Corporation
- ▶ TiE Sydney
- ▶ Ugly Duckling
- ▶ University of Technology, Sydney
- ▶ Westpac Banking Corporation

These systems can be thought of as collections of diverse 'agents' interacting according to subtle rules. The full complexity of these interactions is impossible to compute, but analysing the connection patterns tells us much about the system's capabilities.

Part of a system's behaviour is determined by the information which passes across the links, but much is determined by the pattern of the connections, the structure or 'topology' of the network. The network pattern imposes strong controls on a system's behaviour, independent of what passes across the links.

Network Theory

Network theory began with Leonard Euler's analysis of the possible paths to be taken over 5 bridges linking an island in Königsberg in 1735. For more than 200 years network theory was limited to simple graphs and regular lattices until Paul Erdos and Alfred Renyi published the first major results on random graphs in 1960, tracing the evolution of a system from simple beginnings to a complex, interlinked entity.

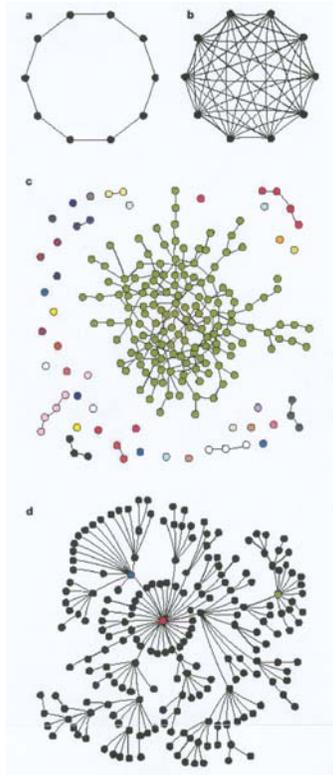


In an Erdos-Renyi random graph, a set of nodes (individual organisations or people) begin to spontaneously add connections at random, forming simple 'trees' of connections. A process of 'percolation' forms feedback loops and cycles as connections are increased. When the number of connections approaches the number of nodes, a 'giant group' of intricate connections has inevitably formed and most nodes are connected in some way (*pictured*).

The transition from a largely unconnected collection of small, isolated nodes to one where almost all the nodes are connected happens suddenly, not smoothly. After a long period of slow growth, a tipping point is reached in which a giant group suddenly emerges and connectivity is achieved through a 'double jump'. After this 'phase transition', connectivity continues to improve at the original, slower rate until full connectivity is achieved.

An example can be found in the calamitous outbreak of foot and mouth disease in the British livestock industry in 2000. The centralisation of abattoirs and bizarre EU subsidies, which encouraged needless production and transportation, increased the connections between herds to a critical point, after which an outbreak of the disease spread extremely quickly to the whole system. Changes to Foot and Mouth reporting rules may have delayed the isolation of infectious animals, while the highly integrated distribution system enabled its lightning spread across the whole country. The relationship between these actions and the epidemiology of Foot and Mouth was not appreciated in advance by the relevant authorities because the livestock industry was not viewed as an integrated system.

Most networks found in nature and society have structures which fall midway between regular lattices and random graphs. In a *regular network*, each node (individual) has the same number of connections. In a *homogeneous, or Erdos-Renyi, network*, the number of connections per node varies, but there is a clear average value. Networks like this result from nodes which connect at random. In a *heterogeneous, or 'scale free,' network* there is no average number of connections per node, it is comprised of many nodes with few connections and some highly connected 'hubs'. Living networks that grow by accretion often display this dendritic form.



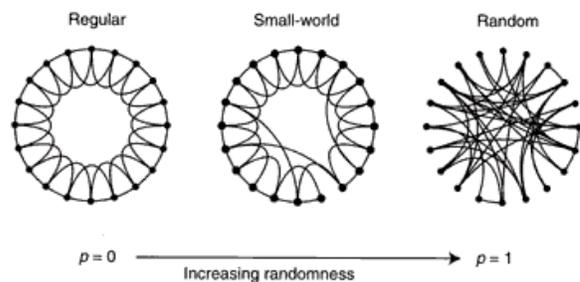
Regular Network

Homogeneous, or Erdos-Renyi Network

Heterogeneous, or 'Scale Free' Network

Network Evolution

Small world networks resemble regular networks at the local level but exhibit a few long range links, which allow information to be transmitted rapidly across the whole network. Scale free network topology evolves when, instead of nodes linking randomly, the most connected existing nodes are preferred, producing many weakly linked nodes and a small number of highly connected 'hubs'. This gives a great advantage to a 'first mover', such as Microsoft in software sales. Adding 'fitness' allows one hub to eventually dominate the whole system, such as the Google search engine.



Network Stability

The stability of a system depends on how robust it remains after the removal or addition of links. The addition or removal of even a few random links to an Erdos-Renyi random network at the 'phase transition' tipping point drastically changes its connectivity, and therefore the properties of the nodes which depend upon it. The foot and mouth disease outbreak in the UK in 2000 was a good example of this.

Scale free networks are very resistant to attacks on randomly selected nodes but are vulnerable to targeting of the hubs. For instance, the 9/11 terrorist network involved over 50 people, but the removal of its 3 'hubs' – Ramzi Bin al Shibh, Essid Sami Ben Khemais and Mohamed Atta would have severely undermined the conspiracy.

Systems that have evolved under natural selection for structural stability have adopted particular network topologies for good reasons. Embodying complex processing capacity in the network topology, rather than in the nature of the interactions, avoids unwanted and unpredictable non linear behaviours across the links, while allowing complexity to be incrementally built. Scale free topology guards against random attacks, be they gene transcription mistakes or environmental disasters.

Local stability depends on the capacity of the network to survive internally generated fluctuations and collapse. Some network configurations automatically damp out fluctuations that could lead to links breaking and the network or system collapsing. Other systems amplify small oscillations until the system tears itself apart.

If a network grows large enough, the number and strength of connections tend to create the potential for instability, and most large networks with many complex random connections become very unstable. However, if continual selection for stability is applied as a network grows, then very large stable networks can be produced. These networks superficially resemble random unstable networks, but have special features including many 'weak' links compared to a few 'strong' ones. Nodes which link only to similar ones (*assortative*) tend to produce unstable systems, whereas systems in which nodes link to different types of nodes (*disassortative*) tend to be stable, however this large system stability comes at a high cost in terms of the speed of information transfer.

Technological and biological systems, from the internet to metabolic networks and food webs, where stability is critical, are disassortative while social groups, where the ability to transfer information is critical, are assortative.

The cost of keeping a large system stable is paid in increasing vulnerability to external impacts or internal changes. Stable networks are a small subset of all the possible large random networks of similar size.

The network structure of a complex large society is by default selected for stability as it develops, or else it would never grow. Eventually, a society will exceed the limits of stability

even with selection or, more probably, a change in social organisation will move the network structure to a neighbouring unstable mode. The late Roman Empire may be seen as an example of the first kind of collapse, while the classical Maya may be an example of the second.

The same effects are at work in large companies. As a social organisation like a company grows, its overt organisational structure would usually lead to instability. In reality, informal links are made between employees or groups that keep the structure stable. Sweeping reorganisations aimed at tidying up the structure to gain efficiency often remove these links and leave a large unstable organisation where unexpected and frustrating oscillations in performance continually appear.

Analysis of the spread of ideas in a social group shows that the acceptance of a new idea, fashion or product depends on peer pressure as well as the attractiveness of the idea itself. Connectivity avalanches in the peer group network play a critical role. When all ideas are equally competitive, the equilibrium is dynamic as ideas and fashions continually replace each other. If the competitive advantage of one idea is changed, then periods of quasi equilibrium punctuated by rapid changes in fashion are observed.

Game Theory

In many situations in life or commerce we depend upon people obeying the rules, 'cooperating' rather than cheating or 'defecting' as in the 'Prisoner's dilemma' game. Cooperation of the majority depends on the enforcement of social norms which depend on the rules of the game and the social network it is played in.

Social norms can only be imposed in a sufficiently structured society. Patterns of behaviour corresponding to network organisation in such societies leave a trace that can be detected. For instance, in the 1950s and 1960s American manufacturers of large electrical equipment operated a secret cartel to artificially inflate prices. Despite the arrangements being known to very few and remaining well hidden, federal anti-trust proceedings were successful because the results of the organised behaviour were clear. The network structures optimal for information processing were overridden by the structures optimal for secrecy. The resultant tensions helped expose the conspiracy. Modern computer analysis would reveal this type of underlying network structure much more quickly.

Summary

- ▶ Many real life systems, especially those involving human actions, are too complex to be reduced to equations but much of the system's dynamics can be captured through an understanding of the network structure underlying the system.
- ▶ A key property of all networks that grow by adding links is a very sudden change in connectivity at a particular 'tipping' point, while adding or subtracting links at this point leads to abrupt changes in system behaviour.
- ▶ Many real systems in nature and society are 'scale free' and resilient to random attack but vulnerable to attack on their 'hubs'.

GLOBALISATION

Presentation by Prof Miguel Centeno, Director, Princeton Institute for International & Regional Studies, USA

Professor Miguel Centeno summarised a long term research project on globalisation undertaken at Princeton University in collaboration with UTS and the University of Washington. He stated that the network analysis used to study this subject could also be applied to any other complex issue or organisation.

As a term, 'Globalisation' is only about 15 years old, with citations growing through the '90s to peak in 2001 through a total of about 15,000 articles and books. These have failed to define the term, with commentators using it to imply a host of different meanings. The idea of globalisation involves interconnectivity, with an increasing density and velocity of contact leading to a greatly increased volume of world trade. 15 years ago travellers would ask their friends if they wanted a product unique to their destination, today such a question would be absurd as essentially everything is available everywhere. 'Exotic' goods are freely sold in every city in the developed world and the internet has broken down national trading boundaries.

On any number of criteria, from internet usage and TV ownership to the number of airline passengers, the world has seen a technological revolution in interconnection. Globalisation has seen a tripling in GDP per capita in the OECD countries and massive increases in wealth of 'Asian Tiger' nations. Less developed countries in other regions have experienced much slower growth. Although its extent and causes are disputed, there has been a clear growth in inequality within and between societies between the richest and poorest, perhaps because globalisation has greatly increased the value of certain skills and education. Globalisation has also seen a worldwide growth in political democracy and personal freedom over the last 30 years, even prior to the collapse of communism and Soviet occupation in Eastern Europe in 1989.

A massive increase in world trade has followed the lowering of trade tariffs; a more open world has created a more prosperous world.

In summary, globalisation is a trading and technological revolution which has generated both absolute wealth and relative inequality and has seen worldwide democratisation. To discern what lies at its core evokes Plato's famous analogy of our understanding of reality being no more than seeing our shadows cast by a fire in a cave. We can see the effects of globalisation without understanding its essence as a social phenomena.

World trade has been increasing since 1960, with a massive increase since 1990. The distribution of wealth in the world has not changed, with rich countries getting richer and poorer ones flat lining. The share of world trade of different regions has remained constant since 1960 with wealthy nations participating in about 80% of world trade.

When Willie Sutton was asked why he robbed banks, he replied 'That's where the money is', and by definition most trade is conducted with wealthy countries which can afford to buy goods. The major exception is China, which once barely registered in world trade and now, after the liberalisation of its economy, if not its political system, accounts for 7% of the total.

NAFTA countries participate in global trade by running massive deficits. East Asian and Pacific rim countries absorb this by running large trade surpluses. Globalisation has seen increasing trade and connectivity in and between NAFTA, Europe and East Asian/Pacific nations but many other states hardly participate in world trade at all. Globalisation has been less an increase in the number of trading nations, than a greatly increased rate of connectivity in and between certain regions.

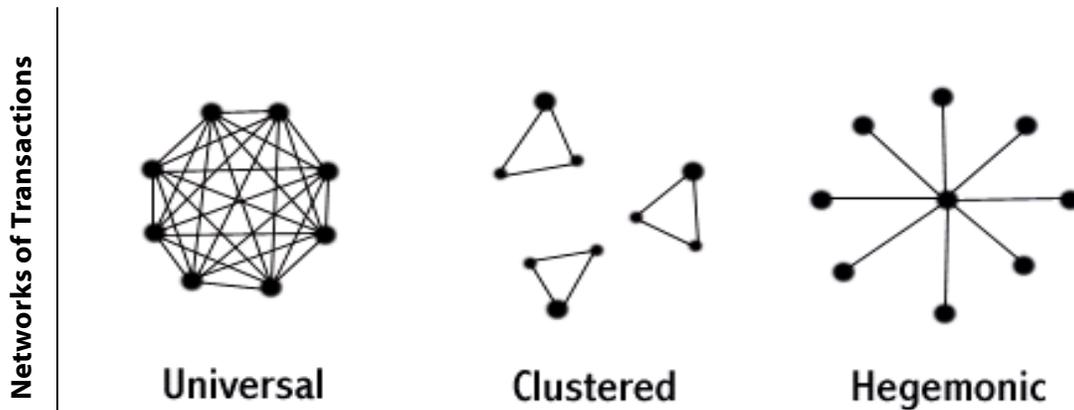
Globalisation remains a black box. Theory has raced ahead of evidence and little data is produced to substantiate the different political views taken upon it. Just as one's opinion on gravity depends on whether or not one is falling out a tree at the time, discussions of globalisation can depend on one's circumstances - whether one is a consumer or producer, in a protected or competitive industry or an international or domestic seller. Its proponents argue that it is an unalloyed good, while its detractors hold it to be evil, but the reality is that the dynamics behind it are poorly understood, especially in the way in which one part feeds into another. We do not know how tourism or the international telephone system feed into trade, for example, although the effects of migration are more clearly understood as migration tends to be a logical predictor of future capital flows.

Charles Perrow wrote a book called 'Normal Accidents', arguing that complex systems comprising millions of different parts, such as globalisation, will inevitably see accidents. The question is how to predict where and when they might occur and how serious their consequences might be. The robustness of globalisation to incidents such as the destruction of a port, the spread of a virus or strikes or civil wars can be examined through network analysis.

The gathering of empirical data, not the creation of overarching grand theories, will lead to understanding. Globalisation is the aggregation of billions of individual transactions and must be studied as such. Each communication, each e mail and telephone call, counts as a separate transaction. Although economic data is always recorded in terms of firms and countries trading with each other, it is more than simply counting the number of orders fulfilled, but a process of understanding the ways in which people interact.

Professor Centeno offered three simple network models in relation to globalisation. It can be seen as a *universal network* in that everyone is linked through it to everyone else, everyone is both a buyer and a seller regardless of location. Globalisation also sees *clusters of nodes*, be they NAFTA or the EU or constructs such as 'the Muslim world', which have far more internal links than links to each other, or it can be seen as a system in which there is one central node, to which everyone links, without links to each other.

The model which most closely approaches reality depends on the kind of transaction being monitored and one's opinion of the phenomena.



The world can be analysed by degrees of connectivity. The core countries everyone is attempting to connect to are the United States, Japan and the EU. A secondary group comprises countries which connect to these core countries, but do not connect with each other. A third group are unconnected and are essentially irrelevant to globalisation. This is not determined by geography – few countries are as isolated as neo-Stalinist Belarus in Europe – but such states only exist in terms of world trade if they uniquely possess a commodity in specific demand.

Overall measurements of world trade are of limited utility because they are so indiscriminate, but if one thinks in terms of larger fractions, the relationships become clear. One quarter of world trade was accounted for by links between the United States, the EU and Japan in 2001, just as one quarter of the world's network dynamics linked these three entities. The critical node in world trade remains the United States when looking at 50% or 75% of world trade, while Intra-African trade, trade that occurs inside Africa, accounts for just 0.13% of the global total.

Asia displays a different kind of network structure with many more interconnected centres, although the USA retains a vital role. Asian countries trade with each other to a great degree, and the system has seen a recent decline in the centrality of Japan and an increase in the importance of China. Saudi Arabia was the central node in the Middle East in 1980, but has since been overtaken by Dubai and Abu Dhabi.

This has business implications. The logical place for a corporate regional headquarters is now Abu Dhabi or Dubai, not Jeddah or Riah. The fastest growing node in the USA is Miami. An airline passenger may find it easier to travel from Buenos Aires to Lima via Miami, just as it can be easier to fly from Nairobi to Lagos via Paris or London.

One can track network connectivity by tracing trade in commodities. Though the price is set globally, there are three distinct networks in the distribution of oil, for example. The USA is supplied from Canada, Mexico, Venezuela and West Africa, while Western Europe relies on the North Sea, North Africa and Russia. The recent incident concerning gas supplies from Russia to Ukraine showed the connectivity of the system. The Russians found they could not limit supplies to Ukraine without affecting the gas pressure to Germany. Australia consumes Indonesian oil while the Asian economies are supplied from the Middle East through the Gulf. The effects of a collapse in supplies from the Gulf would be felt not in the USA, Australia or Europe, but in Asia.

The 'triad' nature of world trade is clear when looking at machinery imports, which are again dominated by NAFTA, the EU and Asia. The Asian component has grown dramatically since 1980, with strong links forged between the USA and Asia, and growing links between Asia and the EU.

The world clothing industry has changed very quickly by comparison and is dominated by China. If a disaster struck the Pearl River Basin, the world would run out of footwear and clothing within two weeks as firms do not keep inventories, but rely on 'just in time' operations to minimise costs and maximise flexibility.

This is but one example of specific vulnerabilities in the complex, integrated global system. In the 1990s Argentina decided to cease domestic production of insulin. Its production has overpowering economies of scale and so is increasingly traded and manufactured by a small number of companies, none of which have plants in Argentina. A financial crisis in 2002 left Argentina unable to trade in hard currency and so unable to buy insulin. It had virtually no stocks and so there was panic for several weeks when diabetic Argentinians could not buy the supplies they needed. Network analysis enables such vulnerabilities to be identified and so prepared for in advance.

Matrix can be compiled for trade, tourism, phone calls, air travel, freight and any number of other variables. Such studies identify central nodes whose loss would damage the whole system and highlight relational opportunities. A network which shows a great deal of trade between A and C creates opportunities for B to become the middle man. About one third of Dutch GDP is accounted for by the position of the Netherlands as a transit point for German trade.

Study of these networks also enables an understanding of the effects certain changes in the system might have. An overlay of all these various transactions will show how a change in one type of transaction, such as tourism, might affect all the others. Network analysis will enable governments, firms and individuals to protect, improve and profit from the system. High schools use a simple example of this, showing the world in terms of McDonalds restaurants to highlight the three main nodes of connectivity, but the possibilities are limitless.

Day One - Roundtable Discussions

Projects which might be undertaken by the National Consultative Committee were discussed, with views from company representatives sought as to suitable projects for development.

Steve Loader from Qantas said the airline networked with groups of other airlines and was aware of how the loss of vital nodes, such as a single fuel supplier, would adversely affect their business.

Fujitsu, like other Japanese companies, created complex networks with suppliers and other firms on an informal, rather than conscious, strategically planned, basis.

Narelle Kennedy, from Australian Business Foundation, discussed their 'People in the Nation' Mapping Exercise which examines Australian business dynamics and the role played by intangible social skills, tacit knowledge and network connections. One example offered was Australia's strength in electronics and related fields since World War II developing from a relatively small core of connected people. The importance of 'strategic serendipity' was suggested as a concept worth investigating.

The inward looking nature of large government bureaucracies was noted, as was the fast pace of change in the nature of government provision over the last 40 years from the administration of public services to problem solving. It is vital that government bodies network to form connections with other actors in the modern world, such as businessmen and academics, to find innovative solutions to fast moving problems.

A small number of people can make an important difference in terms of creating nodes in networks. Consultative Committees allow the pooling of their participants' networks and provide a centre for discussion and interaction.

Networking with people who are exactly the same as you adds very little value. A network must lead to new sources, rather than back to yourself.

Networks can be evolved or designed. The close links between Britain and Australia are a product of 200 years of shared history, though they make no sense in geographical terms, while Singapore has been very successful in consciously making itself a major centre of network connections in Asia.

Narelle Kennedy observed three types of networks being discussed – *heterogeneous* networks designed to find new sources of information and opportunity, *homogeneous* networks of similar businesses banding together to gain economies of scale and *project oriented networks*, such as that based around a consultative committee, designed to pool expertise to solve specific problems.

Self interest was observed to be important in driving momentum for engagement in networks.

Large companies, such as Qantas and BHP, have large pre-existing networks of contacts, customers and suppliers which could be better exploited, while smaller entities need to develop networks to expand, but are too busy with day to day activities to take longer term action. Businesses have traditionally joined trade associations, but potentially profitable links with academia have been very uncommon in Australia compared with the USA where 'silicon valley' businesses thrive around universities. The fault may lie with academics, as Australian universities tend not to be interested in links with industry.

Network analysis would be more useful if, as well as showing connections, it could make value judgements about which connections were productive or disruptive. Australian businesses tend either to be very large mining concerns or small businesses, with few medium sized manufacturing firms in between. Network analysis might offer clues as to why such firms fail to grow, and a comparison with more successful foreign firms might suggest ways to foster growth through better connectivity.

Fostering cultural networks, through classical music for example, can bring economic benefits to Australia. Sydney is a major centre of the arts and this provides significant tourist income for the city.

Network analysis, using freely available data, offers an opportunity for small businesses to provide valuable and profitable services for larger concerns. The data can be internal data relating to phone calls or world trade data from the United Nations, but analysis of it by small firms can provide great benefits for large firms. It is not necessary to create large expensive departments inside a firm, network analysis offers an opportunity for smaller skilled entrepreneurs to offer a niche service.

Prof Miguel Centeno observed the relation of cultural influences and networks as a 'chicken and egg situation' in which it was hard to ascribe causality. Networking can change cultures just as cultures influence the formation of networks. The most effective way of transforming or integrating a segregated culture is to provide it with links to other cultures, rather than seeking to transform it in isolation. Connections influence, and therefore change, the character of the people (nodes) in the network, creating a dynamic, evolving, system and this area needs to be studied more. Ideally networks create diversity through communication.

The Australian wine industry is a good example of networking in action. A host of small producers began to network through a host of ad hoc and chaotic systems to create a very successful national industry. A combination of individual champions, industrial, institutional and export structures and the wine makers' federation are the nodes which allow the system to thrive.

Network analysis could show which individual 'dots' have to be connected to allow a similar industry to take off. Australia currently benefits from large numbers of overseas students for example, which only became possible when the Department of Education, a major node in the system, dropped its opposition to foreign students studying here.

Network analysis can identify the relative importance of specific nodes and encourage links to the most influential ones, while encouraging diversity which might not naturally occur given people's preference for associating with people similar to themselves.

The role of the **Consultative Committee** might be to make such tools available to businesses and to help create networks which share knowledge and create commercial opportunities.

Diversity beyond academics and businessmen is important in creating effective networks. The mapping of networks enables one to identify the personnel one needs to co-opt for a project, and though the maintenance of such a network is expensive, costing up to 25% of the activity, it can prove invaluable.

Africa tends to lack the incentives, functioning authorities and societal co-operation needed to create effective trading networks. Africa's participation in the global economy has actually declined over the past 25 years.

The costs of not participating in networks far exceeds the costs involved in maintaining them. History can become destiny and actors uninvolved in the creation of a network may find themselves permanently sidelined and unable to communicate with the world. The best restaurant in the world will not thrive if built 10 miles from the nearest highway.

Australia relies on the export of primary goods. The only transformed product it exports in internationally significant quantity are gold coins. The more stages of manufacturing a product requires, the less competitive Australia is in its production. Countries which enjoy no competitive advantage in manufacturing can still sell their products through the employment of strong networks in the world economy, which highlights their importance in Australia's future.

Globalisation increasingly involves trade between multi national corporations, making national comparisons and boundaries ever less relevant. A large part of trade within NAFTA involves transactions within General Motors in Canada, the USA and Mexico.

Information sent through networks must be relevant and useful if it is not to be regarded as another form of internet spam.

Commercial opportunities exist for organisations able to conduct an audit of a company's connectivity and network efficiency.

The conscious building of networks may be of less importance than mapping and understanding existing structures to identify key hubs and the development of rigorous tools with which to assess their value. The acquisition of a firm's connections by another can be as valuable as its tangible assets in a takeover or merger.

The detailed mapping of complex systems can prove problematical, if not impossible. The 'Shannon estimate' showed the number of potential moves on a chess board, with a finite number of squares and pieces, approximates to the number of milliseconds the earth has existed. Some interrelated non-linear and highly dynamic aspects of human networks may prove inherently unpredictable. Productive patterns may be nurtured, and disruptive patterns discouraged, but pattern recognition, rather than auditing each transaction, may prove the best approach.

Network management may resemble risk management. Key risks can be identified and monitored as they change over time and procedures put into place to hasten recovery after an accident but they can never be completely controlled.

Tracking networks can highlight new business opportunities but high tech methods have shown their limitations. In terms of the fight against terrorism, low level personal contacts are as important as advanced surveillance technology and high powered computer analysis.

Firms which are transparent in their management of intangible resources tend to recover more quickly from market setbacks than more secretive firms. The mapping and reporting of network connectivity therefore becomes a value proposition to offer to companies.

Day Two - Workshop Discussions

Dr John Finnigan, Kate Phillips, Leo Silver, Andrew Rixon and Dr David Batten reported on the outcome of their group discussions.

Kate Phillips (Small Business Adviser to the Hon. Fran Bailey MP, Minister for Small Business) said, her group had discussed methods of assessing a network's efficiency by calculating the time it required to achieve each outcome. Another measurable criterion was how well it tapped into the knowledge economy to achieve a certain goal.

They also discussed how technology enhanced business networking and how to promote its uptake in the business community. They agreed that technology should help define and enhance the network and suggested case studies which might test this hypothesis.

Andrew Rixon (Director, Anecdote Pty Ltd) said, his group had discussed 4 topics, beginning with existing gaps in information, specifically related to small and medium enterprises (SMEs). He said two problems were deficiencies in education and the lack of links to large businesses. SMEs tend to link only to other SMEs, as big businesses link to corporations of similar size.

His group placed value on skills training for SMEs to foster understanding of networking and the methods by which forums and seminars can forge links between people and so increase connectivity across SMEs.

He stressed the need for trust in the sharing of potentially sensitive data and the need for long term thinking in the belief that improving networks would add real commercial value for SMEs. The role of key players was emphasised to drive the debate in businesses, industry and small business associations, community groups, the media and large service companies.

Dr David Batten (Coordinator, CSIRO Agent-Based Modelling Working Group) said, his group had related personal experiences to capture value propositions and highlight potential problems.

Graham Durant-Law had discussed knowledge networks in the defence industry and the existence of 'silos' of isolated groups which created barriers to communication.

Dr David Batten offered the example of new links in traffic systems creating unexpected outcomes and unintended consequences, highlighting the need to understand the operation of networks before seeking to change them. For instance, when New York's 42nd Street was closed to traffic, contrary to predictions of increased congestion, traffic flow actually improved, while a new road in Stuttgart, designed to ease congestion, actually exacerbated it and had to be removed. Results can be counter intuitive.

Nikki Suters, from Qantas, had discussed multi layered networks. She saw people and organisations as part of many different networks simultaneously, with Qantas, for example, having to fine tune a frequent flyer programme to meet the needs of a large client base in a fluid environment as flight and business patterns change. Qantas tackled the problem by partnering American Express to obtain a better sample of their customer's preferences and concerns.

Dr David Batten related the problems of trying to design a frequent traveller program for the Veneto government (Italy) to encourage people, through incentives and penalties, to shift from private cars to public rail during peak periods of congestion.

Jeremy Winer, from ESD Land Management Pty Ltd, stressed the role of incentives in encouraging people to change their behaviour in desirable ways and the need to build them into network systems. Incentives encourage people to communicate beyond their own 'silo' of operation.

Eugene Dubossarsky, from Ernst and Young, mentioned data warehousing and the difficulty of analysing the vast amount of data which modern systems can produce. The desirability of sharing information and information processing with other organisations, with necessary security provisions, was noted.

The role of the human factor in understanding how networks operate was emphasised, it being the element both most important and least understood in the internal workings of a business. In summary, Dr Batten stressed the need to find and eliminate blockages to communication and to build incentives into the network to improve its operation.

Leo Silver (Director, Ugly Duckling Pty Ltd) said, his group had examined a specific example by which network theory could help an organisation - the Asia Pacific Centre for Philanthropy at Swinburne University - which provides training in effective social investment for philanthropists.

It was important for the Centre, and by extension any network, to identify its purpose and goals to grow effectively and the issue of spontaneous versus sponsored networking was discussed. The importance of incentives in encouraging people to build networks was agreed, but the danger of these incentives creating useless networks and databases was noted.

The question of whether groups, rather than people, can network was debated, with the conclusion that though organisations can set the framework of encouraging or discouraging contact, only individuals can actually interact.

The notion of a mailing list as a network was examined with its quality seen as more important than the quantity of contacts, as size becomes an impediment to effective communication in the long term. A simple scaling and reliance on random connections and linkages will not add value.

Different types of nodes or connectors were discussed in terms of the value of different people to the project. The case study showed that nodes are not equal in value, one node may connect to many valuable people able to contribute, whereas others may be merely a number and email address. Some people attract others to the project themselves and so adding that person to your network would in itself bring other people on board.

The need to build bridges between disparate clusters of nodes, rather than multiple links between similar nodes, was highlighted. This showed a need to plan the development of the network, rather than letting it evolve through sheer scale of participation. Investment in structuring and building the connections was required, accompanying the focus on choosing the right nodes and participants. An email list is a very economical method of communication, but is probably the least effective. A thought experiment, in which one assumes the cost of sending email is very high and therefore that contacts have to be valued and prioritised, might bear fruit.

Dr John Finnigan (Director, CSIRO Centre for Complex Systems Science) said, the discussions of his group had ranged freely around the definition and examination of organisational networks. The importance of recognising both formal and informal networks was accepted, as were the problems caused when formal networks were reorganised without regard to how this affected the spontaneous informal structures on which organisations actually depend.

The need for inventive and careful use of formal tools to examine network operations was mentioned, as procedures begun to examine one trait would often highlight another. When individual contributions to the writing of a piece of university software were traced to highlight plagiarism, the results were found to map creativity too.

The dangers inherent in sweeping reorganisation were shown in the case of a public sector research group where rapid change in the top level structure inadvertently beheaded several other networks essential for the housekeeping of the organisation.

Internal network structure enables or discourages individual innovation, leadership, outreach and external relations in an organisation, but it is difficult to design a structure which encourages the necessary juxtaposition of different skills at different points in the development of the value chain. The organisation must choose a specific focus, be it reducing costs in private industry or improving efficiency in the public sector, and proceed from that basis, rather than fruitlessly second guess the nature of creativity.

It was agreed that there were some key generic steps any network design should try to facilitate including an awareness of the capabilities of the organisation, some confidence that those capabilities could be marshalled to tackle the task in hand, and finally, to ensure that the network enabled and facilitated trust between its partners.

Through Ross Dawson, CEO of Advanced Human Technologies, a contact was made with a group at the University of Virginia called the Network Round Table which is active in this area and it was agreed that a mutually beneficial link should be made through GAP.

Closing Panel

Bruce Hills related how Wespac are building an internal innovative capacity, looking to their staff to originate ideas. In the past, resources would have been sourced from a small number of large suppliers, but now global networks allow needs to be met in a wide range of alternative ways.

Given a theoretical opportunity to research this topic anywhere in the world, **Dr John Finnigan** said he would visit a group based in Montpellier in the South of France managing the natural resources of farmland using a technique called 'participative' or 'co-modelling'. This technique involves encouraging the people working on a project to build a model of the system they are trying to fix. This creates an understanding of the process in those involved in it, and the problem then tends to fix itself. It is particularly useful in the third world and has been developed to a high degree of sophistication by this French group.

Prof Miguel Centeno noted that while decision makers would never negotiate with another firm without consulting spreadsheets and balance sheets, they all operate without thinking of consulting network maps of their activities. He stressed the importance of empirically establishing network maps and said he would continue this work at Princeton. Ideally, firms should be able to create simple network maps of their activities in the way that excel spreadsheets have become ubiquitous, to highlight opportunities and potential problems which otherwise would remain hidden.

Dr John Galloway outlined his involvement with 'Netmap', a technology which aims to address these questions. Participants in the project come from a background national intelligence analysis and now use their skills in detecting irregularities and mapping interrelationships between diverse bits of data in business intelligence applications.

Speakers outlined a variety of potential uses for network analysis, including the better focusing of government resources on areas of need, facilitating links between self employed workers and larger firms and adding value in large companies such as Telstra. The potential for reducing the costs of compliance with government regulations was noted.

Nikki Suters noted the potential of Qantas to better utilise its large customer data base, going beyond direct mail and email to establish relationships and generate more revenue for the company.

Due to its geography, Australia has traditionally had relatively few links with the rest of the developed world, but modern technology allows an integration impossible in the past in high tech industry and bio-tech innovation. Research is increasingly conducted across national boundaries and it is vital that Australia improves these 'virtual' connections.

Leo Silver spoke about the company Integrated Wireless, which provides paging systems for a range of blue chip companies in Australia, and expressed an interest in helping to define networks between customers, in addition to that between the customer and the company.

Efforts to identify the 'hubs' of networks can lead to marketing opportunities in which they are given special status to encourage them to advocate that firm's products to their wide range of contacts.

Vessa Playfair of Deloitte expressed two areas of interest, reputation management and SMEs in the middle market. The loss of a company's reputation can devastate its position in the market, e.g. Anderson Accounting and non financial issues are of increasing importance. An understanding of a company's network of connections would greatly improve its ability to manage its reputation. SMEs are the future of Australian business and improving their connections with Asian business is a priority for future economic growth.

In closing, **Peter Fritz** thanked the sponsors of the Forum, including Qantas, the NSW Department of State Development, ICAN, University of Technology, Sydney and IMS Australia, and the keynote speakers Dr John Finnigan and Prof Miguel Centeno. He proposed the creation of a Consultative Committee and website to continue the work of the Forum, and invited attendees to participate. The Committee would aim to create business opportunities for its membership.

APPENDICES

App. 1 - PROGRAMME

Leveraging Networks in Business 2006

Breakfast Session - Monday, 10 April 2006

NSW Trade & Investment Centre
Boardroom, Level 44, Grosvenor Place
225 George Street, Sydney

8:45am

Registration. Breakfast served

9:00am

Welcome

Mrs Janine Ricketts

Executive Director, Policy and Resources
NSW Department of State & Regional Development

Introduction

Mr Bruce Hills

Head of Organisational Innovation, BTSS
Westpac Banking Corporation

Keynote Address

The Honourable Sandra Nori MP

NSW Minister for Tourism & Sport & Recreation
Minister for Women
Minister Assisting the Minister for State Development

9:15am

Presentation

"Network Dynamics & Dynamics on Networks"

Speaker

Dr John Finnigan

Director, CSIRO Centre for Complex Systems Science

Presentation

"Globalisation as Network"

Speaker

Prof Miguel Centeno

Director, Princeton Institute for International &
Regional Studies, USA

9:50am

Round Table Discussion

10:20am

Break

10:35am

Discussion continues

11:25am

Vote of thanks

Mr Peter Fritz AM

Chair of Steering Committee, GAP Forum

11:30am

Close

Leveraging Networks in Business 2006

Lunch Session - Monday, 10 April 2006

NSW Trade & Investment Centre
Boardroom, Level 44, Grosvenor Place
225 George Street, Sydney

12:15pm

Registration

12:30pm

Welcome & Introduction

Dr Saggi Gudergan

Deputy Director
Innovative Collaborations, Alliances & Networks
University of Technology Sydney

Keynote Address

Mr Stefan Trofimovs

Corporate Secretary & Planner
Australian Trade Commission

12:45pm

Presentation

"Network Dynamics & Dynamics on Networks"

Speaker

Dr John Finnigan

Director, CSIRO Centre for Complex Systems Science

Presentation

"Globalisation as Network"

Speaker

Prof Miguel Centeno

Director, Princeton Institute for International &
Regional Studies, USA

1:20pm

Round Table Discussion

1:55pm

Break

2:10pm

Discussion continues

2:55pm

Vote of thanks

Mr Peter Fritz AM

Chair of Steering Committee, GAP Forum

3:00pm

Close

Leveraging Networks in Business 2006

Workshop - Tuesday, 11 April 2006

NSW Trade & Investment Centre
Boardroom, Level 44, Grosvenor Place
225 George Street, Sydney

12:00noon	Registration	
12:15pm	Welcome	Ms Caroline Seagrove Senior Manager, Industry Division NSW Department of State & Regional Development
	Introduction	Mr Nick Crabb Manager, Tourism Development, Qantas Airways
	Keynote Address	Ms Kate Phillips Senior Adviser – Small Business Office of the Honourable Fran Bailey, Minister for Small Business & Tourism, Australian Government
12:30pm	Presentation Speaker	"Network Dynamics & Dynamics on Networks" Dr John Finnigan Director, CSIRO Centre for Complex Systems Science
	Presentation Speaker	"Globalisation as Network" Prof Miguel Centeno Director, Princeton Institute for International & Regional Studies, USA
1:15pm	Workshop/Lunch Facilitators	Dr John Finnigan Director, CSIRO Centre for Complex Systems Science Dr John Galloway Chief Scientist, NetMap Analytics Dr Sigg Gudergan Deputy Director ICAN - UTS Mr Bruce Hills Head of Organisational Innovation, BTSS, Westpac Dr Robert Kay Head of Strategic Innovation, Westpac
2:45pm	Break. Coffee & tea served	
3:00pm	Presentation of outcomes	
3:50pm	Panel discussion Facilitator	Dr Sigg Gudergan Deputy Director ICAN - UTS
4:25pm	Vote of thanks	Mr Peter Fritz AM Chair of Steering Committee, GAP Forum
4:30pm	Close	

App. 2 – WORKSHOP FACILITATORS

Dr John J. Finnigan has worked for CSIRO since 1972, when he joined the CSIRO Division of Environmental Mechanics as an experimental officer. He became Head of the CSIRO Centre for Environmental Mechanics in 1991. In 2001 Dr Finnigan became the founding Director of the CSIRO Centre for Complex Systems Science. Dr Finnigan has served on various scientific boards, task forces and advisory committees in Australia and overseas, and holds a number of international awards, research grants and patents to his name. John is also author of over one hundred academic publications. His research interests include Complex Systems Science, network theory and its applications, Earth System Dynamics and Global change, and experimental and theoretical studies of environmental turbulence. Prior to joining the CSIRO, John worked in the UK Aerospace Industry. He obtained a BSc in Aeronautical Engineering from the University of Manchester in 1968, and a PhD in micro-meteorology from the Australian National University in 1978.

Dr John Galloway is Chief Scientist at NetMap Analytics Pty Ltd, a company he founded in 1991. NetMap Analytics successfully develops and markets unique networking software and services applied to business intelligence problems and data mining. Dr Galloway pioneered Node and Link Analysis (NALA) and developed the NetMap network visualisation software and an accompanying methodology termed Network Data Mining (NDM). NetMap Analytics products and services are used by national security and intelligence agencies in various countries and by organisations in finance and banking, retail, telecommunications and other areas of government. Users of NetMap include 15 of the top 20 general insurers in the USA. Dr Galloway is also an Adjunct Professor in the Faculty of Business at the University of Technology, Sydney and the founder of the university's Complex Systems Research Centre. His research interests include visual modelling of the properties of networks and "emergence" in complex dynamic systems. This research has led to collaborative relationships with other institutions, including Princeton University, the Union of International Associations, the London School of Economics and the Fraunhofer Institute. Recently he was accepted as a Fellow of the Institute of Analytics Professionals of Australia. Dr Galloway's career began as a 'jackaroo' and then overseer on sheep and cattle properties in western NSW. He then worked for the ABC on such programs as Landline, the Country Hour and Country Wide. He gained a BA degree by external study from UNE and then Masters and PhD degrees at Michigan State University. He then held senior academic posts at UNSW and Macquarie, and published a book and many journal articles and conference papers before beginning his own company, NetMap Analytics.

Dr Siegfried Gudergan is an Associate Professor within the Faculty of Business and the Deputy Director of ICAN Research - a Research Centre on Innovative Collaborations, Alliances & Networks, both within the University of Technology, Sydney. He holds a Ph.D. in Management from the Australian Graduate School of Management which was awarded by both the University of Sydney and University of New South Wales. His research has a focus on network and alliance governance and their strategic performance. He is the recipient of a Distinguished Paper Award and several national competitive research grants from the Australian Research Council. The total research grant volume he has been awarded within the last three years exceeds \$2,000,000 including the largest research grant that was awarded in 2004 in the business/management category. In 2005 he also has been invited to become an expert assessor for the Australian Research Council. Themes of his research include the following works: Driving innovation in and improving the strategic performance of alliances; Strengthening negotiation practices in business relationships; Implementing successful governance structures and leadership systems in alliances; Developing effective customer clubs and customer networks; Making PPPs work: Beyond contracting. Prior to joining academia Siggi has worked in Europe, the USA and Australia for organization including Price Waterhouse, Coopers & Lybrand and the Dun Bradstreet Organization. He is also a Director of the newly formed Alliancing Association of Australasia Ltd which is affiliated with the US-based Association of Strategic Alliance Professionals.

Mr Bruce Hills is the Head of Organisational Innovation in the Banking and Technology Solutions and Services (BTSS) Group of Westpac Banking Corporation. He is responsible for institutionalising an innovation capability into the BTSS Group as a key contributor to the medium/ long-term growth of the Bank. Prior to this role Bruce was Head of Risk for the BTSS Group. Bruce has had a number of senior risk and audit related roles with both Westpac and other organisations.

Dr Robert Kay is the Head of Strategic Innovation in the Banking and Technology Solutions and Services Group of Westpac Banking Corporation. He is responsible for incorporating concepts, tools and techniques from the Systems and Complexity Sciences into the bank's strategic and innovation capacities. Before this role he was a Senior Lecturer in Information Systems at the University of Technology, Sydney. His central research interest is in the application of autopoietic and complexity theory to further understanding social system dynamics and organizational development. Robert has a PhD from the University of Western Sydney.

App. 3 – FORUM TOPICS

I. Large Corporations/Government

- ▶ Individual “stories” of how large businesses use network models, what has and has not worked, and what “success” means in the context of a network

II. Small and Medium-sized Enterprises

- ▶ What are the decision-making processes for SMEs?
- ▶ How do SMEs operate and form networks?
- ▶ How can SMEs improve their business relationships through networking?
- ▶ What are the barriers to get a message across to SMEs?
- ▶ What are the benefits for SMEs from understanding the laws and powers of networks?
- ▶ How do we leverage SMEs’ interest in creating new business relationships?

III. Network Management

- ▶ What are the most effective ways of leveraging network management?
- ▶ How do large businesses communicate to SMEs and the individuals?
- ▶ How do people influence each other within the framework of a network?

IV. Network Assessment

- ▶ How can the efficiency of a network be assessed?
- ▶ How can technology enhance business networking and how do we progress the take-up of this technology in the business community?

V. Potential Projects

App. 4 – LIST OF PARTICIPANTS

Mr Steve Baird

Manager Partner Marketing, Loyalty Programs, Qantas Airways

Dr, Prof David Batten

Coordinator, CSIRO Agent-Based Modelling Working Group
CSIRO Manufacturing and Infrastructure Technology

Mr Shawn Callahan

Director, Anecdote Pty Ltd

Mr Simon Carter

National Leader of Innovation
Colliers International (NSW) Pty Ltd

Prof Miguel Centeno

Director, Princeton Institute for International & Regional Studies
Princeton University

Ms Katrina Colpo

Manager Membership Operations, Loyalty Programs, Qantas Airways

Mr Megan Cornelius AM

Expertise Australia Group
Deputy Chairman, National Offshore Petroleum Safety Authority

Mr Nick Crabb

Manager Tourism Development
Qantas Airways

Mr Andrew Croker

Project Director, IMS Australia

Mr Malcolm Crompton

Managing Director
Information Integrity Solutions

Mr Robert Crompton

Executive Director, Information City

Mr Ross Dawson

Chief Executive Officer
Advanced Human Technologies

Mr Selwyn D'Souza

President, TiE Sydney

Mr Eugene Dubossarsky

Director Business Intelligence
Ernst & Young

Mr Graham Durant-Law

TARDIS Team, Capability Development Group, Contractor to Defence
Senior Consultant, HolisTech

Mr Martin Duursma

CTO Office Chair, Vice President
Advanced Products Group, CITRIX

Dr John Finnigan

Director, CSIRO Centre for Complex Systems Science

Mr Peter Fritz AM

Group Managing Director, TCG Group

Dr John Galloway

Chief Scientist, NetMap Analytics

Dr Col Gellatly

Chief Executive Officer, NSW Premier's Department

Mr Michael Gill

Lead, Internet Business Solutions Group, CISCO Systems

Mr Michael Gottlieb

Director, Mega Capital

Dr, Prof Siggi Gudergan

Deputy Director, ICAN Research
University of Technology, Sydney

Mr Bruce Hills

Head of Organisational Innovation,
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Mr Justin Hyams

GM Business Improvement
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Mr Rod Irvine

Adviser, Office of the Hon. Gary Nairn
MP, Special Minister of State

Dr Robert Kay

Head of Strategic Innovation
Westpac Banking Corporation

Mrs Narelle Kennedy

Chief Executive Officer
Australian Business Foundation

Mr Roger Levy

Managing Director
Forensic Technology Pty Ltd

Mr Chris Liell-Cock

Chief Operating Officer
Sustainable Performance Pty Ltd

Dr Michael Liffman

Director, Asia-Pacific Centre for
Philanthropy and Social Investment
Swinburne University

Mr Steve Loader

Manager, Corporate & Government Sales
NSW, Qantas Airways

Ms Debbie Ludwig

Principal, DL Strategic - Business &
Sustainability Consultancy

Mr Marcus Mandie

CEO Victorian Division
Australia-Israel Chamber of Commerce

Mr Jon Mason

Business Development Manager – IT
NSW Department of State & Regional
Development

Mr Bruce McCabe

Managing Director
S2 Intelligence

Mr Tony McLellan

Company Director, McLellan Foundation

Ms Diane Minnis

Policy Adviser, Office of the Hon. Sandra
Nori MP, NSW Minister for Tourism and
Sport and Recreation

Mr Alan Munro

Managing Director, Lenovo (Australia &
New Zealand) Pty Ltd

The Hon. Sandra Nori MP

NSW Minister for Tourism and Sport and
Recreation, Minister for Women, Minister
Assisting the Minister for State
Development

Prof Imre Palló

Conductor, Sydney Conservatorium
of Music

The Hon. Victor Perton MP

Member for Doncaster

Ms Kate Phillips

Adviser - Small Business
Office of the Hon. Fran Bailey MP,
Minister for Small Business

Ms Tamara Plakalo

Business Development Manager,
Partnerships & Transition
Fairfax Business Media

Ms Vessa Playfair

Director of Communications
Deloitte

Mr Ross Regan

former Executive Director, P&O Cruises

Mrs Janine Ricketts

Executive Director, Policy and Resources
NSW Department of State & Regional
Development

Mr Nick Ridehalgh
Partner, PriceWaterhouseCoopers

Mr John Riedl
Chairman, Pylon Pty Ltd

Mr Andrew Rixon
Director, Anecdote Pty Ltd

Mr Neville Roach
Chairman, Smart Internet Technology
CRC; National ICT Australia

Mr Nick Rowley
Head of Carbon Management,
The Ecos Corporation

Ms Caroline Seagrove
Senior Manager, Industry Division
NSW Department of State & Regional
Development

Mr Leo Silver
Director, Ugly Duckling

Ass. Prof Simeon Simoff
IT Faculty
University of Technology, Sydney

Mr Nitin Singhi
Investment Director
Colonial First State Private
Equity Limited

Ms Nikki Suters
Business Development
Qantas Airways

Mr Stefan Trofimovs
Corporate Secretary & Planner
Australian Trade Commission

Mr Khimji Vaghjiani
Director, Innovative Partnership,
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Westpac Banking Corporation

Prof Murray Wells
ICAN Research Innovative Collaboration,
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University of Technology, Sydney

Mr Jeremy Winer
Managing Director
ESD Land Management Pty Ltd



THE HON FRAN BAILEY MP

MINISTER FOR SMALL BUSINESS AND TOURISM

PO Box 6022
PARLIAMENT HOUSE
CANBERRA ACT 2600

Mr Peter Fritz AM
General Manager
Global Access Partners
Level 3
53 Balfour Street
SYDNEY NSW 2008

Dear Mr Fritz

Thank you for your letter of 3 March 2006 inviting me to attend the Global Access Partners (GAP) 'Leveraging Networks in Business' Forum. I regret that I am unable to attend the Forum, however, wish to provide this letter of support.

I looked forward to sharing my views on how networks help to drive business value and lead to growth in capability. Small business is an important and integral part of the economy. It contributes to almost one-third of economic production and employs over half of the workforce.

Businesses that are able and motivated to take advantage of a competitive environment through innovation, improved efficiencies, keen pricing, quality service standards and other forms of vigorous competition are likely to be successful. Small business is able to respond to a competitive environment more quickly and with more flexibility than many of its larger competitors.

The relationship between big business and small business in Australia has been the subject of much discussion. This usually focuses on the negatives; largely, big business taking advantage of small business through the misuse of market power and unconscionable conduct. The Government is aware of these issues and is addressing this through the Trade Practices Act with measures such as collective bargaining arrangements.

However, many positive outcomes are generated from the relationship between big business and small business. Small business owners learn to be risk takers and innovators. Innovative small businesses are welcomed by large businesses that wish to outsource niche requirements and often find it more cost-effective to purchase them than to innovate on their own. Over the last ten years in particular, this has allowed small businesses to thrive and prosper.

The role of big business is an important one. Their economies of scale benefit the nation in the production of commodities such as vehicles as well as the construction of infrastructure such as communication networks. This generates opportunities for small businesses that have the ability to specialise in the provision of particular projects or services which they can then supply to big business. Central to the success of those small businesses who build productive relationships with big businesses is the development of networks. This business skill can never be underestimated.

In addition to the above views, I attach information on how the Australian Government is facilitating networks in small business. I welcome this information to be shared with Forum participants.

I understand the GAP Forum is an event of the Australian Innovation Festival, a national event established in 2002 to celebrate Australian innovation and increase public awareness of the importance of innovation and entrepreneurship. As Minister for Small Business and Tourism I am very supportive of these goals and I would therefore like to be represented by Ms Kate Phillips, one of my Small Business Advisers, at the GAP Forum.

Again, thank you for the kind invitation. I hope the Forum is a success.

Yours sincerely

A handwritten signature in black ink, reading "Fran Bailey", written in a cursive style. The signature is positioned to the left of a vertical red line.

FRAN BAILEY

11 April 2006