Presentation Structure

- A few definitions
- Why do a network analysis?
- Some examples of network measures
  - Centrality
  - Ego roles and brokerage
  - Step analysis and degrees of separation
- How to do a network analysis
- My Research
- Conclusion
A Few Definitions

‘The most incomprehensible thing about the world is that it is at all comprehensible’.

Albert Einstein, Physicist, 1921.

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Nodes and Connections

- A node is a unit which may contain and pass on information – in this case they are individuals, otherwise known in the literature as ‘actors’.

- A connection between two actors means that there is some passing of information between them. These connections, also known as ties, mean an information network is established.

- An emergent network results from the myriad of decisions by individual actors to pay attention to, or not pay attention to, other actors - these decisions are egotistical.

Why Do a Network Analysis?

‘Each of us is part of a large cluster, the worldwide social net, from which no one is left out. We do not know everyone on this globe, but it is guaranteed that there is a path between any two of us in this web of people’.

Three Reasons

- To assess the state of individual and organisational social capital.
  - trust, support, and advice networks

- To ensure effective knowledge creation and sharing.

- To analyse the extent to which an organisation’s informal structures support strategic objectives.
People Relationships
Project Relationships
Inter-Department Relationships
Some Network Measures

‘Simplicity is the key to effective scientific inquiry.’

Caution!!

- Mathematical approaches to network analysis tend to treat the data as ‘deterministic’. That is, measurements are viewed as an accurate reflection of the ‘real’ or ‘final’ or ‘equilibrium’ state of the network.

- Observations are usually regarded as the population of interest rather than a sample of some larger population of possible observations.

Centrality

Centrality is the degree to which an actor occupies a central position in the network in one of the following ways:

- having many ties to other actors (degree centrality)
- being able to reach many other actors (closeness centrality)
- connecting other actors who have no direct connections (betweenness centrality)
- having connections to centrally located actors (eigenvector centrality)

A scale-free network is a specific kind of complex network. In scale-free networks, some nodes act as 'highly connected hubs' (high degree), although most nodes are of low degree. Scale-free networks have a power law distribution.
A high closeness score means an actor can access many other actors and is relatively independent of the influence of others. But remember there are many isolates in this network therefore closeness probably is not an appropriate measure.
A small-world network is a class of random graph where most nodes are also neighbours of one another. Most pairs of nodes will be connected by at least one short path. Small-world networks also have a power law distribution.
A higher eigenvector score means an actor can access many other actors and is relatively independent of the influence of others. This is a more appropriate measure because the data is ‘normalised’ and takes into account isolates.

Note the central hub-nodes which are characteristic of a small-world network.
Ego Roles and Brokerage

**Coordinator** – an actor who brokers connections within the same group or sub-group. B is coordinating the actions of the sub-group and belongs to the same sub-group.

**Gatekeeper** – an actor who transmits information and other resources to the network from sources usually, but not always, external to the network. B is in the same sub-group as C and acts as the gatekeeper for A.

**Consultant** – an actor who intermittently takes the central lead by connecting others in the same group or sub-group, but who belongs to another group or sub-group.

**Representative** – An actor who transmits information and other resources from one group to another usually, but not always, external to the network.

**Liaison** – An actor who transmits information and other resources from one group to another group whilst themselves belonging to a different group. This can also apply to a sub-group.
An Organisation's Middle Management Advice Network

Each node is a manager. Nodes are colour-coded by department.

Who is likely more important to the organisation?
Who is likely more important to the organisation?
Step Analysis Applied
Patrick Lambe Selected

Patrick Lambe

Step Analysis Applied
Patrick Lambe’s ego net

One Step – i.e.
Patrick Lambe’s ego net
Two Steps – i.e. Patrick Lambe’s ‘Circle of Influence’
Patrick Lambe

Three Steps – i.e. Patrick Lambe’s ‘Reach’
How to do a Network Analysis

‘Science is built with facts, as a house is with stones. But a collection of facts is no more a science than a heap of stones is a house’.

Henri Poincare, Mathematician, 1901.
Part One: The Social Network Analysis

Thank you for agreeing to complete this part of the survey – I value your time and your responses. There are 10 questions in this part. The answers to the questions in this part will allow me to visually map the communication network of your organisation.

**What is your name?**

- 

**Whereabouts in your organisation do you work?**

- 

Please identify up to 10 people who are important to you in your professional network. Please enter at least one name. (You must enter at least four names to receive a personal network report with benchmarks and group findings once the survey has been completed and closed.) These can be people who provide you with information to do your work, help you think about complex problems posed by your work, or provide developmental advice or personal support helpful in your day-to-day working life. This may or may not be people you communicate with on a regular basis and must come from within your organisation.

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For each person you have identified please indicate where they work.

**For each person you have identified please indicate their hierarchical level relative to your own. For example, if you are an EL1 and Person 1 is an EL1 check the ‘Same’ box.**

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Please contact Graham Durant-Law at grahamduartlaw@bigpond.com or Professor Tim Milne at tim.milne@canberra.edu.au if you have any questions regarding this survey.
Questions marked with a * are required

For each person you have identified please indicate the primary benefit that you currently receive from them.

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<th>Information that helps me solve problems or capitalise on opportunities</th>
<th>Access to decision makers that allows me to move plans ahead.</th>
<th>Political support that allows me to move my plans ahead.</th>
<th>Problem-solving interactions that actively challenge my thinking on problems or opportunities in my work</th>
<th>Career advice or other developmental feedback that helps me be more effective in my work.</th>
<th>Personal support and the ability to vent or discuss a tough problem in my work in ways that help me to get back on track</th>
<th>Purpose or a sense that what I do at work has a positive impact and matters.</th>
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Please contact Graham Durant-Law at graham@durantlaw.info or Professor Trish Milne at trish.milne@canberra.edu.au if you have any questions regarding this survey.
E-Mail Data Compilation

January 2006 Archives by thread

- Messages sorted by: [subject] [author] [date]
- More info on this list...

Starting: Mon Jan 23 12:46:58 EST 2006
Ending: Tue Jan 31 22:15:52 EST 2006
Messages: 39

- [Action] naming list first message
- EWEB Systems
- [Action] Test
- Mark Schenk
- [Action] IBM donates analysis software to open source
- Bhargav G
- [Action] Making the most of mishaps
- Euan Sample
  - [Action] Making the most of mishaps
  - Mark Schenk
  - [Action] Making the most of mishaps
  - J Maloney (theuristic)
  - [Action] Making the most of mishaps
  - Kasey Vivian
  - [Action] Making the most of mishaps
  - Patrick Lambe
- [Action] Making the most of mishaps
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  - Patrick Lambe
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- [Action] Making the most of mishaps
  - David, d.j.aquets-watson at...
  - Patrick Lambe
  - [Action] Making the most of mishaps
  - David, d.j.aquets-watson at...
- [Action] Making the most of mishaps
- A Dyer
- [Action] AGLIN 2006 conference - call for papers
- Nerda Hart
- [Action] Making the most of mishaps
- nirmala.palanippan at wipro.com
- [Action] Mendo is Boeing's First Line of Defense for Learning Content Management
- Bill
- [Action] Registration needed for both lists?
- EWEB Systems
- [Action] Woffing?
  - Kasey Vivian
  - [Action] Woffing?
  - Euan Sample
  - [Action] Woffing?
  - Innovation, Thinking, Playing, Doing
  - Matt Moore
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  - Roots at rockdale.nsw.gov.au
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### Text Matrix Entry

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‘A theory has only the alternatives of being wrong or right. A model has a third possibility: it may be right but irrelevant’.

Manfred Eigen, Chemist, 1972.
A knowledge productivity model for the public sector
- Enabling knowledge productivity in the public sector
- Chaos into order: a model of knowledge productivity

Soft Systems Methodology
- Grounded Theory
- Case Study
- Social Network Analysis
- Survey
- Focus Groups
- Semi-structured Interviews

Methodologies

Research Approaches

Working Title

Philosophical Posture
- Ontology: social construction
- Epistemology: realist/pragmatist
- Axiology: applied

The models do not include sustainment or maintenance components.

There is little or no discussion on personal, collective and organisational discipline.

Organisations find it difficult to exploit knowledge because they don’t define what constitutes knowledge for them.

Organisations find it difficult to implement knowledge management initiatives because the examples in the literature are ‘models of knowledge’ rather than ‘knowledge management models’ with explicit processes.

Propositions
- Data, information and knowledge are interacting holons within complex social systems
- Each social system has its own data, information and knowledge holons.
- Public sector organisations are complex soft systems, consisting of formal and informal holons each with their own knowledge holons.
- Knowledge itself cannot be managed, but organisations that unite their holons with a common purpose and focus on individual and organisational productivity actually enable knowledge.

Supporting Questions

What constitutes data, information and knowledge for public sector organisations?
How do public sector organisations evaluate a knowledge claim, both at the personal and organisational level?
What workplace practices support individual and organisational productivity, and in turn enable knowledge?

Knowledge Productivity PhD

Desired Outcomes
- Produce a knowledge productivity model for the public sector
- Produce a generic model of knowledge productivity

Primary Question

How can public sector organisations enable knowledge for improved productivity and positive exploitation?

Principal Assumptions

Central Idea
Research Design

Phase 1
Preliminary Requirements

- Step 1: Present the Research Proposal
- Step 2: Gain Approvals and Permissions
- Step 3: Design the Research Instruments
- Step 4: Conduct a Pilot Study
- Step 5: Refine the Research Instruments and Methods

Phase Two Data Collection and Analysis

- Step 6: Conduct the First Organisation Wide Survey
- Step 7: Do the Initial Data Analysis
- Step 8: Lead the Initial Focus Group
- Step 9: Do the Second Data Analysis

- Step 10: Conduct Semi-Structured Interviews
- Step 11: Do the Third Data Analysis
- Step 12: Develop a Conceptual Model and Theory
- Step 13: Lead the Second Focus Group
- Step 14: Design the Second Organisation Wide Survey

- Step 15: Conduct the Second Organisation Wide Survey
- Step 16: Do the Final Data Analysis
- Step 17: Develop the Substantive Theory and Model

Phase 3
Thesis and Report Production

- Step 18: Write the Organisation Report
- Step 19: Write the Thesis
- Step 20: Submit the Thesis for Examination
Research Value

- ‘knowledge management project failure is a reality that both practitioners and researchers have to reckon with’.
  

- 84% of knowledge management initiatives have failed.
  

- ‘A good deal of the corporate planning I have observed is like a ritual rain dance; it has no effect on the weather that follows, but those who engage in it think it does. Moreover, it seems to me that much of the advice and instruction related to corporate planning is directed at improving the dancing, not the weather’.


- The research will produce a theory and model of knowledge productivity, which includes implementation, maintenance, and sustainment components.

- It will provide a basis for a public sector organisation to evaluate their existing knowledge management solutions.
My Requests

- I would be most grateful if you would:
  - Complete the online SNA survey (10 minutes of your time).
  - At a later date complete the online Meaning of Knowledge survey (10 minutes of your time).
  - If asked, or alternatively volunteer to, participate in the focus group (half a day).
Conclusions

‘If a man will begin with certainties, he shall end in doubts; but if he will be content to begin with doubts, he shall end in certainties’.

Sir Francis Bacon, English Philosopher, 1605.
The Tools

- All of the tools are very easy to use, and misuse!
- Colours and layers are more easily applied in NetDraw.
- Spring diagrams are easier to layout in NetDraw.
- NetMap Analytics is very good at Step Analysis.
- UCINET is good for analysis, but the understanding of the measures is assumed.
- NetMiner brings analysis and visualisation together. The strength of NetMiner is the visualisation of many of the measures, and particularly centrality measures.
- PAJEK and NetMap Analytics are best at handling large datasets.
Essential Reading


Thank you!
Do you have any questions?

‘The real questions refuse to be placated… They are the questions asked most frequently and answered most inadequately, the ones that reveal their true natures slowly, reluctantly, most often against your will’.