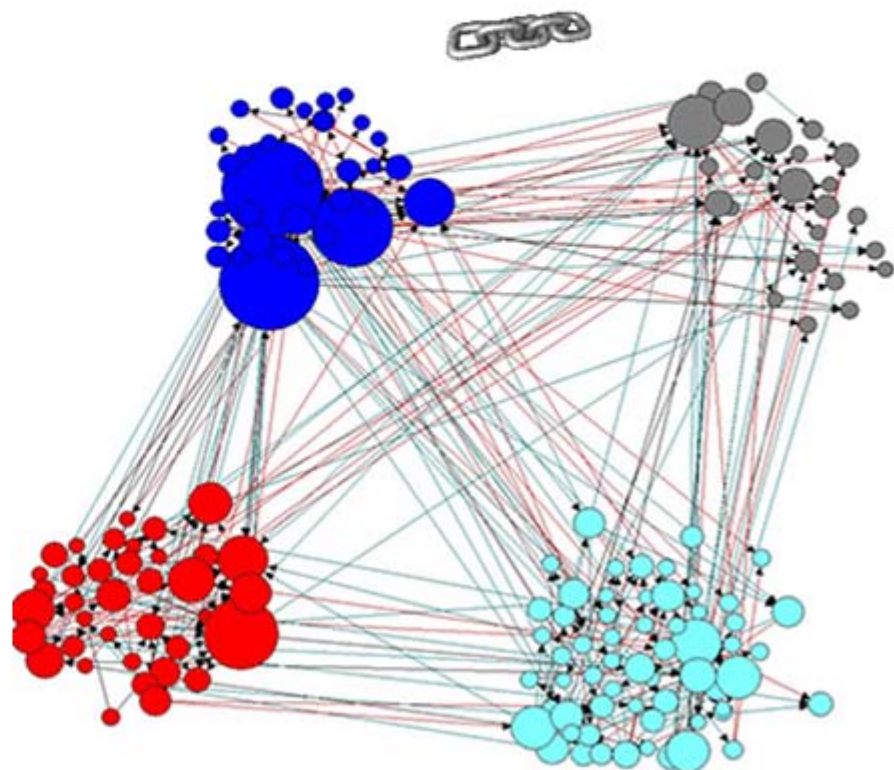
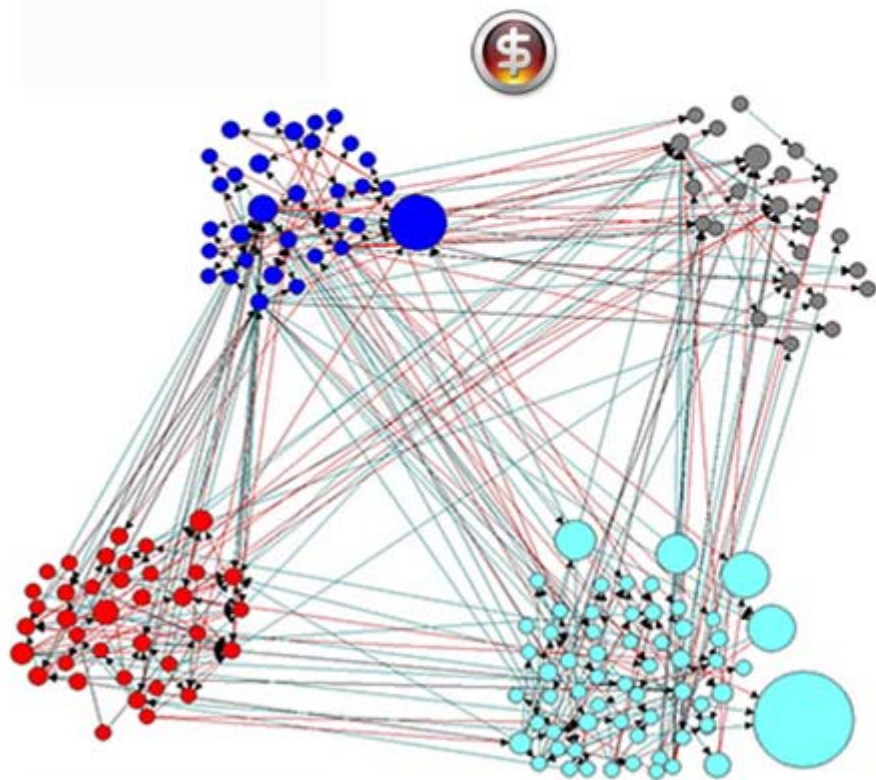


Dollars or Links?

How would you manage your portfolio of projects - by project cost, or by project interdependencies?



DOLLARS OR LINKS?

Caption

Complexity in a portfolio of projects can be viewed in many ways. In the exhibit the same network of projects is shown as two graphs. The nodes are projects coloured and grouped by business unit. Each business unit runs a discrete program of similar projects, and the four programs make up the portfolio of projects. The links represent an inter-project dependency of some sort, and are coloured by the importance of that dependency: red lines representing a critical dependency.

In the graph on the left the nodes are sized by the estimated final acquisition cost of the project. The large light-blue project at the bottom of the graph is obviously the project with the biggest budget. This “*dollars view*” of the business suggests that the bulk of effort should be directed to the light-blue business unit, and this is in fact how the organization works and allocates its resources.

In the graph on the right the projects are in the same relative position and use the same colour-codes. This time however they are sized by the number of incoming links (in-degree). A project that links to another project is reliant on that project to deliver part of its capability. Note the dramatic change in size of the projects when viewed this way. Also note how the light-blue business unit decreases in importance, relative to the other business units.

A couple of other observations are worth noting. The “*dollars view*” of the world is well understood in the organization – that is the program managers all know what the budgets of the projects are. The “*link view*” is not well understood at all. Few project officers see the linkages beyond the links to and from their project. Program managers tend to look inwards unless there is a “*big-dollars*” project in another business unit that directly impacts on them. No-one has a complete understanding of the inter-project linkages. The graphic is a visualization of collective knowledge, and is powerful because it has the potential to generate a paradigm shift in how the portfolio of projects is managed. In this case the visualisations caused some resources to be redistributed from the light-blue business unit to the other programs.

Commentary

The exhibit is from an almost complete doctorate entitled “*Visualising Collective Knowledge to Manage Complexity in a Portfolio of Projects*”. It uses data collected in a defence industry organisation in 2007. The organisation in question directly manages just over 200 projects and monitors a further 200 or so, with a portfolio value exceeding \$50 billion in total. For something to be considered as a project the acquisition

costs must exceed \$20 million – anything less is considered to be a ‘minor’. Each node therefore represents at least \$20 million, and some nodes are as large as \$3 billion.

The organisation was envisaged as a system of networks. Depending on how the networks were viewed, the nodes were individuals, projects, project teams, business units, as well as business functions, policies or documents. In this graphic the nodes are projects grouped by business unit.

Data were collected using two methods. First a desk top scan of portfolio and project documentation was used to identify known dependencies, and to collect initial attribute data such as cost, business unit, delivery date, and so on. Then a semi-structured interview technique, based around 23 main questions was used. Four questions were of a demographic nature; twelve questions specifically dealt with project interfaces; three addressed inter-organizational interfaces, and four focused on internal collaboration.

At the time of data collection the organisation’s population was 123 project officers, of which 104 were interviewed. Of the project officers that were not interviewed, five declined to participate, five failed to attend multiple appointments, and nine were deployed overseas. If the deployed overseas component is removed, because they simply could not be interviewed, then the adjusted population was 114, meaning 91% of the possible population was captured.

Answers were recorded directly in Microsoft Excel® 2007 workbooks and afterwards imported into a Microsoft Access® 2007 database. This later step allowed data to be manipulated across multiple networks, and structured for subsequent export for network analysis and visualization purposes into UCINET 6, NetDraw, or NetMiner® 3.

The network analysis techniques used in this research were novel to the organisation because project officers, and program and portfolio managers, typically adopt either a linear production task-driven approach, or a functional information-processing approach. Both these methods have their place and their utility; however a network relationship approach adds to the manager’s armoury, and offers a means to effectively manage, decompose, and understand program and portfolio complexity. It is a particularly good method to answer questions like: *“How do we keep track of all the interdependencies?”*, *“How do we share understanding and agree on what we have to do?”*, and *“How can we be in a position to anticipate, control or take advantage of changes, given they can occur at any time?”*