

Using Social Graphs
To Understand
Enterprise Social
Network Usage

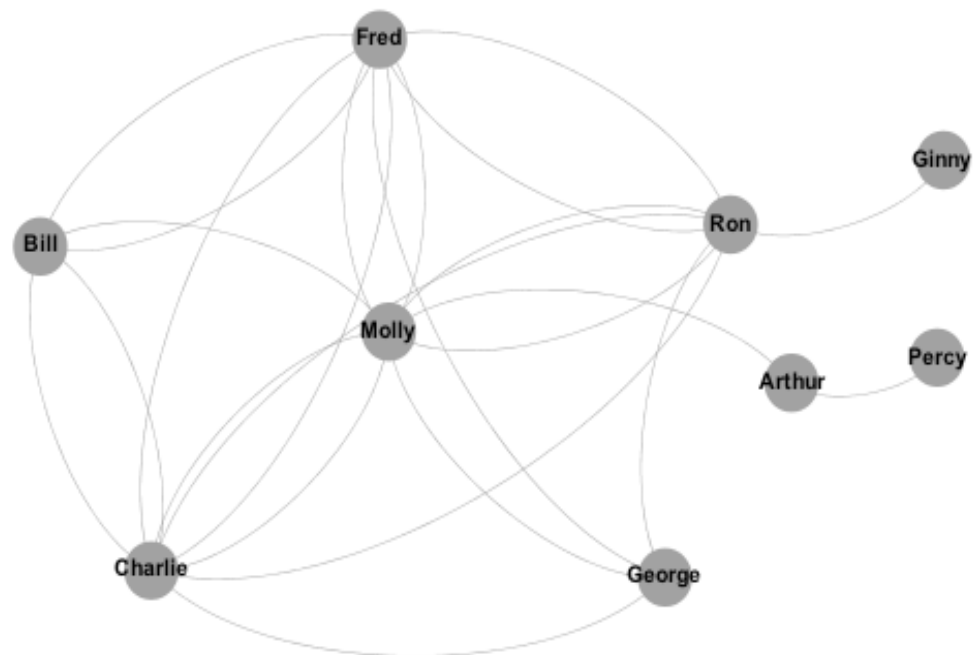
Using Social Graphs To Understand Enterprise Social Network Usage

One of the best ways of understanding precisely how your enterprise social network is being used is to visualize the activity through a social graph. This paper will look at ways of presenting the activity and connections in your social network to illustrate where it is working well, and where further work is required.

Basic Principles

The term social graph¹ was popularized by Facebook's use of it in 2007, but the principles of illustrating networks in this way is nothing new². The basic principle is that members of the network are represented by a *nodes* or *vertices*, and the connections between members are represented by *edges*. So the connections between nine members of a network may look something like this.

This is useful, because it shows who is well connected (Molly) and who is less so (Ginny and Percy). But it doesn't tell us much more than that, because it doesn't describe the nature of the relationships between each member. Indeed, this is the major failing of LinkedIn's InMaps³, which although beautiful, are of relatively little use because your connection with someone you have worked with for 10 years is represented in exactly the same way as someone you met just once. An enterprise social network has much richer information about the relationships between members, so let us consider how best to illustrate this.



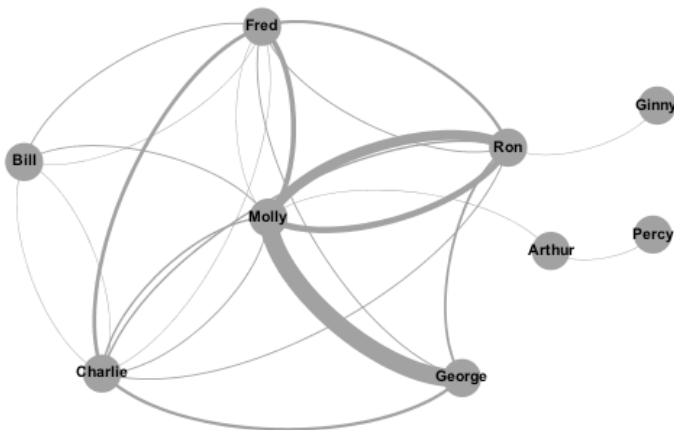
Firstly, we need to decide the type of relationship we want to represent. Most people initially think of showing who follows who, but this is little more useful than InMaps; following relationships often bear very little relation to how people actually communicate. A far more meaningful relationship to show is the number of comments exchanged between members, as this more accurately represents the extent to which members are collaborating.

1 http://en.wikipedia.org/wiki/Social_graph

2 [http://en.wikipedia.org/wiki/Graph_\(mathematics\)](http://en.wikipedia.org/wiki/Graph_(mathematics))

3 <http://inmaps.linkedinlabs.com/>

Using Social Graphs To Understand Enterprise Social Network Usage

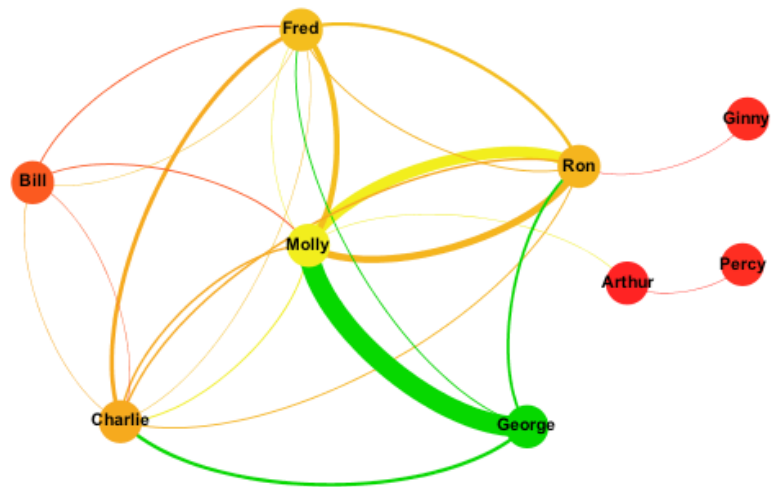


In the graph to the left, the weight of the lines between members indicate the number of comments they have given to and received from other members.

We immediately see the most active relationships in the network (Molly/George, Molly/Ron). We also see that some seemingly well-connected members (Bill) are actually weakly connected with several members, but not strongly connected with any.

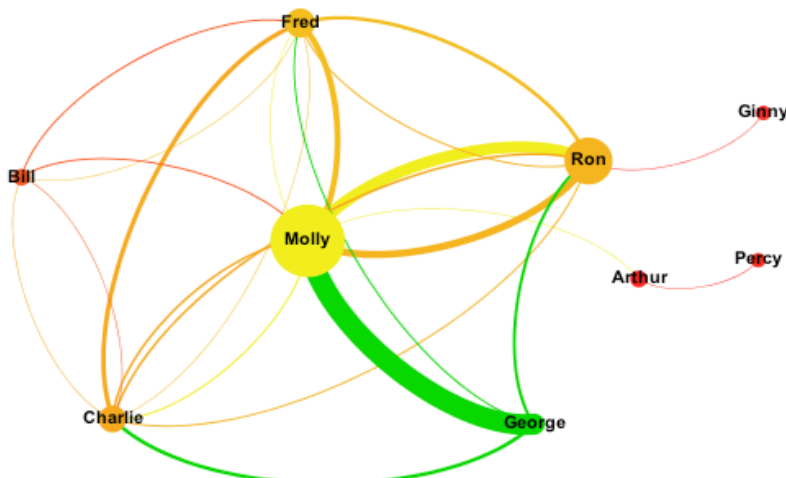
Of course, not all relationships are equal, so it is valuable to distinguish between comments created and comments received. You may notice that in the previous graphs there are two lines between some nodes. This is because it is a *directed graph*, with incoming and outgoing indicated separately.

In the next graph, each node is coloured based on the number of comments created – green represents many comments, red represents few, yellow and orange somewhere in between. The edges are coloured to match the source node, making it easier to see the direction of the comments.



Here we see that although Molly is the centre of the network, the vast majority of her comments are directed towards Ron. We also see that it is George who is the most active commenter, and Bill's weak connection with the rest of the network becomes more apparent.

Finally, we can change the size of the nodes to represent the number of comments received.



Now, at a glance, we can see the rather more complex nature of relationships between network members. George creates a lot of comments but receives no more than Ginny or Percy. Molly receives a lot of comments, but creates few except on Ron's content. We can use this deeper understanding of network member behaviour to help formulate our network adoption strategy.

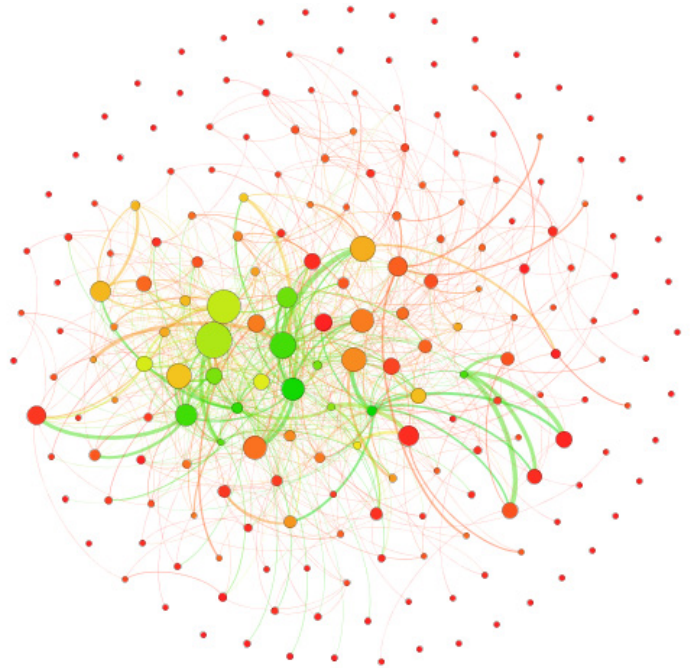
Larger Networks, Different Layouts

So far, we have used very small networks to describe the concepts of social graphs. Let us now apply these to larger networks, and see how different graph layouts can highlight different aspects of the network.

The graph to the right shows comments between members of a 200-user network during one month. The graph layout is determined by the Fruchterman-Reingold algorithm, a force-directed algorithm⁴ which encourages closely related nodes to be plotted near each other. The effect of this is that the best-connected members of the network gravitate to the centre of the graph, and the least-connected to the edges.

This immediately highlights which members are engaging well, and which are completely disconnected from other members.

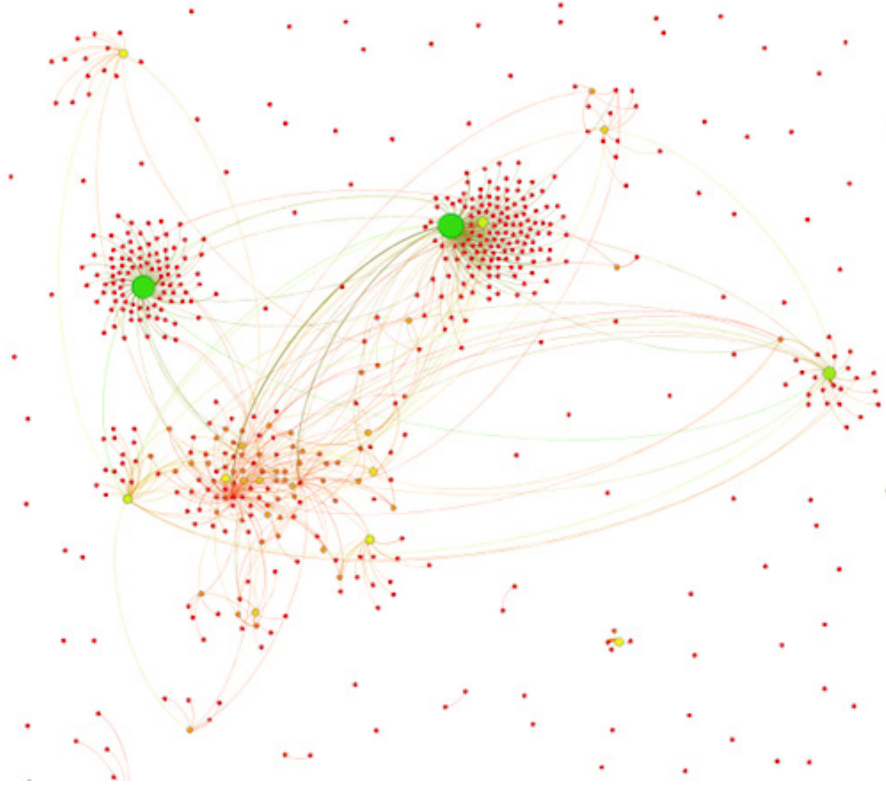
However, as the network grows, this layout becomes increasingly poor at identifying clusters in the network that represent groups of members who are working closely together. The graph below shows exactly the same data, with a different layout algorithm that aims to identify these clusters. Here we see one central cluster of usage, with several smaller clusters. However, the clusters remain fairly closely connected to each other, as one might expect in a small company.



⁴ http://en.wikipedia.org/wiki/Force-directed_graph_drawing

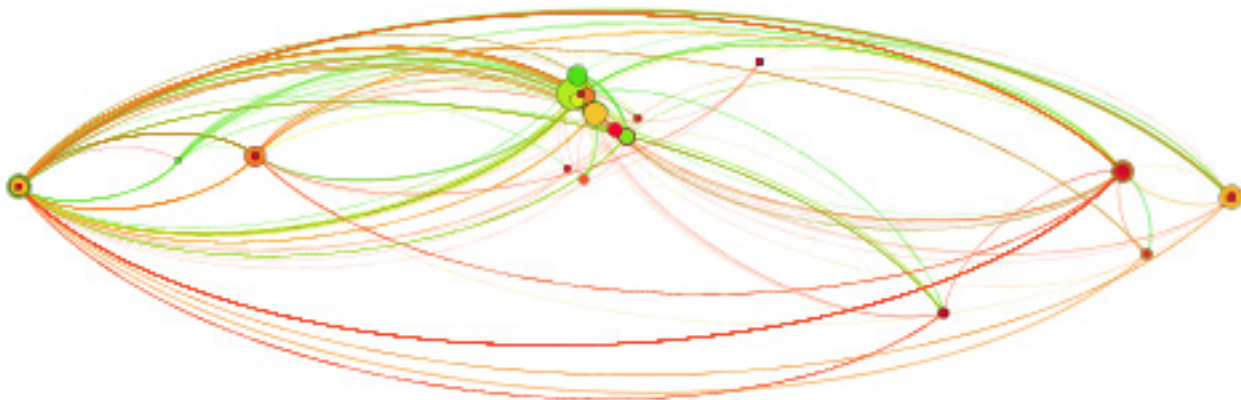
Using Social Graphs To Understand Enterprise Social Network Usage

In larger companies, the clusters are typically more distinctly separated, as shown in the graph below.



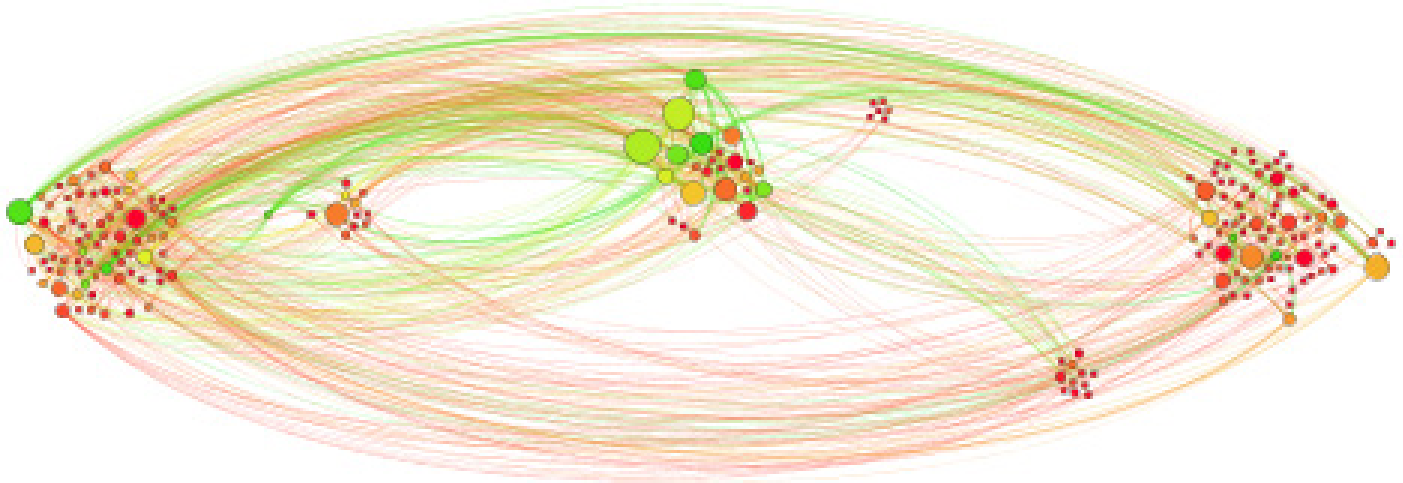
It also becomes very obvious from a layout like this how some clusters are too heavily dependent on single members to hold them together.

Another interesting way to lay out the graph is based on geographical location. This highlights the communication across regions in a globally-distributed organization. The graph below plots all the members of the network from the first example based on their primary office location (centred on zero line of longitude).



Using Social Graphs To Understand Enterprise Social Network Usage

Of course, the problem with such a layout is that it plots members at the same location on top of each other. This is a useful reminder that the most scientifically-correct graph is not necessarily the most useful. If we force members at the same location slightly apart from each other, we get a much clearer picture of inter-region communication.



What we lose in geographical accuracy, we gain in insight into network behaviour. Here we can quickly see three major centres of activity and three smaller, less active locations. We also see very strong cross-region links, suggesting the network has been successful in connecting a geographically-distributed workforce.

Conclusion

So which layout is best? The answer, of course, is that it depends on what you want to know. Social graphs can show a wide variety of different relationships – all of the examples covered here have focused on comments between members but it is also useful to visualize relationships such as members viewing other members' content and members assigning tasks to other members. Members can also be grouped together into departments to see the connectivity between departments within an organisation.

About Clearvale

Clearvale by BroadVision is the social network for business, where transparency and accountability mean real work gets done. Clearvale can be used as a social intranet or a social extranet. But only Clearvale lets you manage those individual networks together as a 'network of networks', allowing you to easily manage your entire ecosystem of employees, partners, and customers. For more information on how Clearvale enables social business processes, please visit www.clearvale.com.

About BroadVision

Driving innovation since 1993, BroadVision (NASDAQ: BVSX) is an innovative provider of e-business and social networking solutions for organizations seeking to grow profitably by improving online business processes through invited participation and social interaction. Our solutions — including Clearvale, the world's first network of networks for the socially driven enterprise — enable mission-critical e-business for next-generation organizations around the globe. The customers benefiting from BroadVision® solutions include Aeroexchange Ltd., Centre for Railway Information Systems, Controller General of Defence Accounts, Fiat S.p.A., Iberia, Indian Railways Catering and Tourism Company, Kotak Mahindra Bank Ltd., Malayala Manorama Co. Ltd., Promart Retail India Pvt. Ltd., SINA, SOFTBANK TELECOM Corp., Thomas Cook India Ltd., Vodafone, and more. Visit www.BroadVision.com for more details.