Software Test Community Uncovered using SNA
by Gerald Falkowski and Valdis Krebs

Introduction

A few years back, we were conducting a Social Network Analysis (SNA) in one of IBM's global operating units with the goal to improve overall collaboration among the geographically dispersed teams that made up a world-wide organization. We achieved our goal with the help of SNA diagnostics, yet there was an additional finding that surprised us. The "golden nugget" in the project was the uncovering of a group of professionals around the world that specialized in *testing software*. Upon further investigation, we found this group of professionals was still clinging together in spite of all the business process reengineering, down sizing and merging/consolidation activities that took place at their company during the early 90's. A professional network/community, once established, is hard to break up – even with much manipulation of the formal organization.

This brief story will provide you an overview of the insights that lead to this discovery and most important, what the client did with this finding to leverage his highly specialized community of testing professionals.

Discovery

Having conducted hundreds of social network analyses, we saw this SNA project like most others in that our SNA data collection process covered both *process* and *practice* around how effective our client's organization was in collaborating and bringing value to the business. Our client was particularly interested in answering several questions on his mind such as:
- Is effective collaboration taking place across organizational borders?
- Is my leadership team making informed decisions based on diverse information and knowledge?
- Who are the experts that are being sought out in my organization?
- Is experience being leveraged from one project to another by engaging in dialogue and exchange of information?
- Does a pipeline exist for new ideas and innovation to surface and be put to use?
- Are external sources such as customers, professional forums and academia sought out as part of day-day work flow?

We first wanted to see how work was *actually* performed in this organization – not how it was supposed to be done. We looked at what we commonly refer to as the job/task network: "With whom do you interact to perform the tasks and

responsibilities you are assigned (exchange information, documents, and other resources)?" Using InFlow[1] software, we mapped the data by department and saw both internal and external departmental information flows. About what we expected.

Next we asked our software for the SNA metrics of the displayed network. One metric "jumped" out at us – clustering. Clustering measures the connectivity around each node – are a node's neighbors also connected to each other? A high clustering measurement can reveal a clique or emergent community.

Next we colored the nodes in the network according to their departmental membership and asked InFlow to arrange the network based on the actual links. We were looking for the *emergent organization* – how work was really done – what the *real* structure of the organization was. Figure 1 below shows us how work was really accomplished in the organization. Two nodes/people are linked if they both confirm that they exchange and information and resources to get their jobs done. Each department involved in the study received a different color node.

The network visualization immediately revealed what our network metrics told us – there was an emergent cluster in the organization. It appeared to be very key in getting things done. The emergent cluster is revealed in Figure 1 by the black links – other network ties are drawn in gray.

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[1] Used by IBM since 1995. http://www.orgnet.com/inflow3.html

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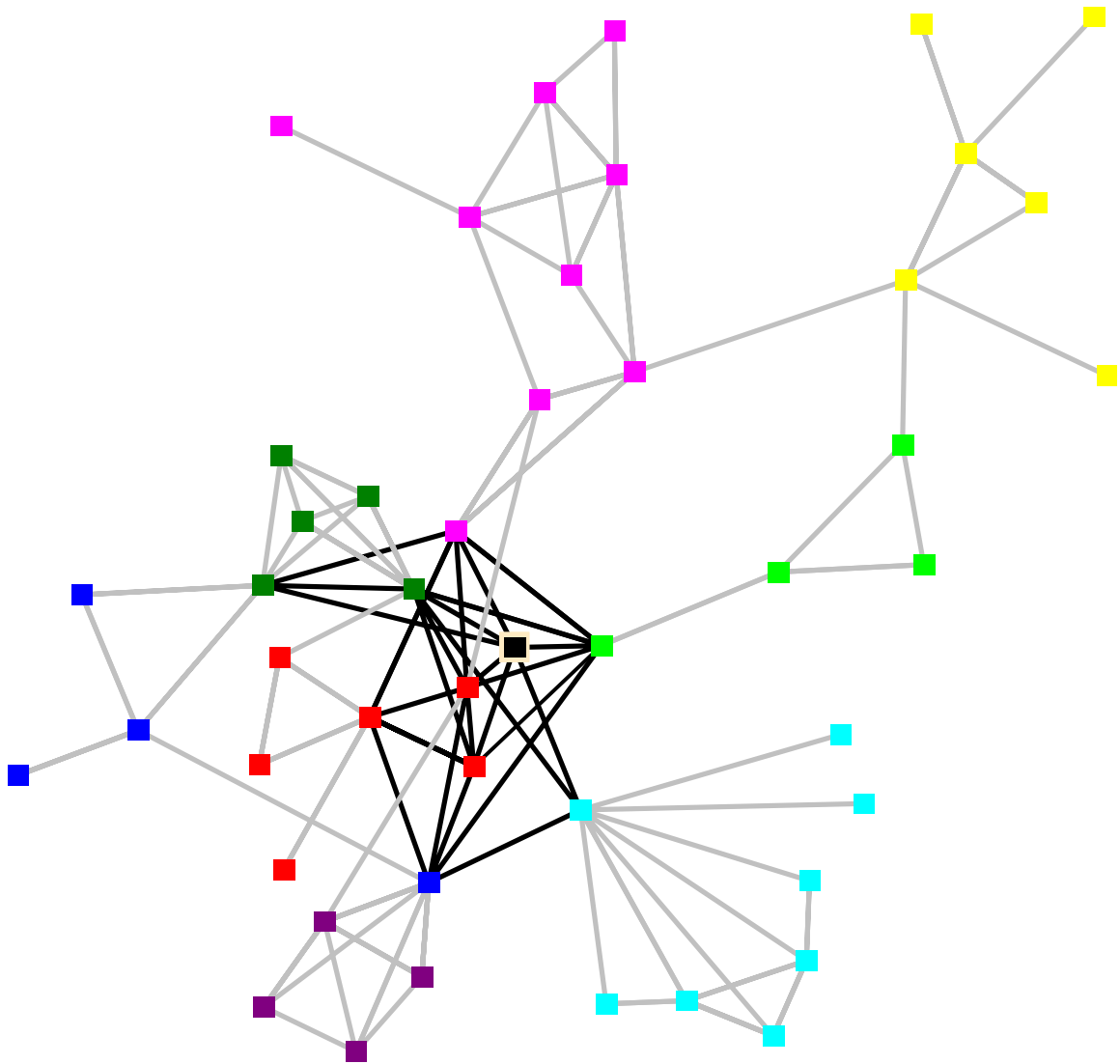**b**y Gerald Falkowski and Valdis Krebs

Figure 1. Job Task Network.

One of the testers we interviewed said: "Our heritage is quality assurance; we formed our federation of testers back in the late 80's when it was common to meet for 2-3 days at one of our sites, Figure 2, to share best practices in testing tools and methods. I guess were probably the early adapters of what is today called communities of practices or purpose. Another person interviewed said: "We are the old quality assurance guard left over from the total quality management movement of the early 90's. It never occurred to me that we had formed what today is called a community of practice."

Our purpose as a world-wide testing group is to share and generate software testing knowledge to help achieve business goals. We will achieve this by….

- **Collaborating to solve problems and achieve business goals**

- **Exchanging knowledge**
  - –Share ideas
  - –Learn from mistakes
  - –Discover best practices

- **Generating new knowledge**
  - –Tools
  - –Methods
  - –Ideas

World-Wide Testing Symposium

Oct 1989

East Fishkill, NY

Figure 2. Testing Symposium.

Move to Action

What happened next is a consultant's dream. Our unexpected discovery of a cluster of software testers resulted in a sizable chunk of follow-on work with the client. **We designed and implemented what we believe one of the first formal communities of practice within IBM! But we did not start with a clean sheet of paper – we built upon the community that had already emerged!   After all these people had already shown their dedication to the topic and trust with each other.**

Our launch process, in Figure 3, put structure around a group of software testers that had formed informally and now were legitimized, had an executive sponsor, and were identified as a critical business need. A year later we conducted a second SNA and a set of interviews and saw an increase in the organization's ability to create, identify, share, and use knowledge. This mapped nicely into the executives goals and objective to achieve *competitive advantage* through productivity, competency, responsiveness, and innovation.

Community of Practice Launch Process

```
┌──────────────┐  •Mission
│  Community   │  •Objectives
│  Definition  │
└──────────────┘
         ┌──────────────┐  •Sponsor
         │  Community   │  •Leader
         │    Roles     │  •Core team
         └──────────────┘  •Extended team
                  ┌──────────────┐  •Membership
                  │  Community   │  •Meetings and teleconferences
                  │  Logistics   │  •Collaboration technology
                  └──────────────┘
                           ┌──────────────┐  •Initiatives
                           │ Focus Areas  │  •Goals
                           └──────────────┘  •Action plans
```
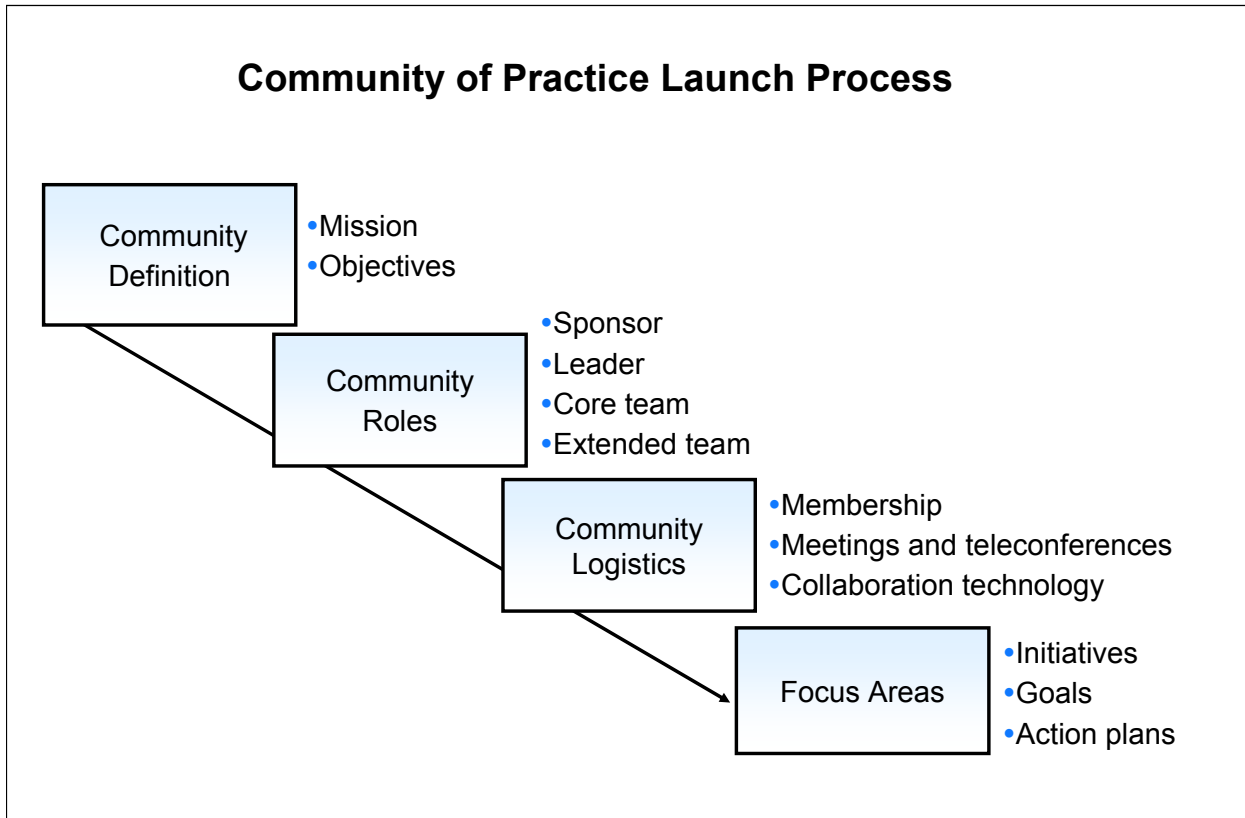
Figure 3. Community of Practice Launch Process.

Conclusion

Doctor's use x-rays and CAT scans to diagnose the human body because they are quick, non-invasive procedures that provide good information for diagnosis a wide range of possible medical conditions. We use SNA in a similar way, to scan or x-ray communication networks in a workplace and discover what is really happening inside complex organizations.

We have shown one of many examples where Network maps revealed the initial formation or well established communities of practice as well as how and where the human capital in the organization is – or is not -- being effectively utilized. In addition to the human capital, we have revealed the social capital that is so necessary for learning in today's knowledge-based organizations. There doesn't seem to be a better way to see what is actually happening in the organization now – and what it could be guided to become in the future.

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About the Authors

Valdis Krebs is a management consultant and the developer of InFlow, software based organization network analysis methodology that maps and measures knowledge exchange, information flow, communities of practice, networks of alliances and other networks within and between organizations. Through eye-opening graphics and revealing measures, this technique allows managers to see what was once invisible.

His work in organizational network analysis has been covered in major media including Discover Magazine, Business 2.0, New York Times, Wall Street Journal, USA Today, CNN, Entrepreneur, First Monday, Optimize Magazine, Training, PC, ZDNet, O'Reilly Network, Knowledge Management, Across the Board, Business Week, HR Executive, Personnel Journal, Forbes, FORTUNE, MSNBC.com, HR.com, Release 1.0, and several major newspapers around the world.

Valdis has undergraduate degrees in Mathematics & Computer Science, and a graduate degree in Human Resources and has studied applied Artificial Intelligence. He has given invited talks on organizational networks at many prominent business conferences and at the following universities: UCLA Anderson School, Michigan State University School of Labor and Industrial Relations, Weatherhead School of Management - Case Western Reserve University, Cleveland State University, University of Michigan Business School, Kellogg School of Management - Northwestern University and the University of Latvia.

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Gerald Falkowski is recently retired from IBM where he was a Partner in IBM Business Consulting Services. He has over 30 years of Industry experience in management, leadership development, human resources and business transformation consulting. He has built a national reputation in organizational change management, virtual teaming, social network analysis, and employee performance coaching. At IBM, Gerry developed and implemented organizational change management and SNA methodologies for large scale, global business transformation efforts that are still in use. Gerry is a faculty member with the University of Minnesota's Business and IT Department, and teaches courses in Virtual Teaming and Organization Change Management. He also serves on the University's advisory board for perfecting the implementation of Information Technology Infrastructure Library (ITIL).

Gerry has presented his work on virtual teaming and social networks at the Academy of Management and World Future Society as well as various business schools including Babson College, Universities of Michigan, Maryland

and Chicago. He has a degree in Engineering, Computer Science, and Business Management.

He is currently on retainer to several company HR directors to facilitate "360" panoramic assessments and provide individual and group coaching to help improve communication and interpersonal relationship skills.

His new book published May 2005 titled: "Remote Control: Working in a Virtual Teaming Environment" can be found at online sources such as Google, Amazon.com & BarnesandNoble.com.

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