Net Work:
complex networks do real work within universities   Draft v 4.0

Chapter ?(new):
The
Purpose
of
Networks

intro story - single space

As argued throughout this book, networks of faculty, staff, students and administrators perform valuable functions for the university. This work that they do represents their value to the university but not their purpose. The purpose of a network is the reason that the participants formed a group. The purpose of the network is the purpose for forming and maintaining the extra social layer of a group. It follows that because the people involved have different uses for networks that there will be multiple networks within a university.

This chapter explores the different purposes for forming networks in a university, how these different networks interact with each other, and how faculty and administrators can work with, not against, the natural

organization of the different networks.

The four main purposes for networks

The reason people form networks is for purposes that can't be met through individual action. A network can be thought of as a set of connections outside the immediate group to which the person belongs. In universities that immediate group might be a small department, program or research group. Whether the formation of networks is conscious or cultural doesn't matter for the point that I will be making. The four main purposes can be categorized as self-protection, advancement of their society, individual improvement and building trust.

self-protection - The primary purpose for forming a network outside your immediate group is to protect the group from external threats. These threats include variations in resources, changes in administrative forces (including budget restrictions) and competition. Faculty unions are an example of a network that is used to band together to protect faculty rights, job security and working conditions.

group advancement - Network linkages that support information and material flows are crucial for developing the potential of the group. The purpose of forming these networks is to help the immediate group to grow or prosper. Interdepartmental alliances or centers that support graduate programs or research are a good example of this type of self-forming network. Even in the case where there are administratively constructed research centers in which faculty hold full or partial appointments, often the total network of faculty contributing to the work of that center involves many more people.

creativity and innovation - Faculty within a university will form collaborations, cooperative alliances and participate in larger groups to help

them develop their own potential. These networks amplify the innovative and creative potential of individual people. Several obvious examples of these networks are faculty reading groups or teaching mentoring and mutual support groups. In my experience these groups might be strongly facilitated by administrative offices (such as a teaching improvement center) but the participation by individuals is voluntary.

trust and social capital - The fourth category of networks are formed spontaneously to build trust between individuals and to communicate the culture and norms. In any organization in which people have to trust someone they don't know personally, trust brokering mechanisms are constructed. In universities there are a wide range of social activities and communications that help verify a person's trustworthiness. It is important to mention here that the presence of a rumor network is crucial for brokering trust. People feel that they can trust someone if they haven't heard anything bad about that person. If they do hear a rumor about someone they are working with they will try to verify the merit of that rumor. Our social norms that discourage spreading rumors, actually work very well (not by stopping rumors althogether) but by making sure that any rumor that is spread is serious enough to catch your attention.

Differences in structures of the different types of networks

Even though each of these four network categories probably has many instances in a university, the structure of networks within a specific category will have similarities. In order to work within or with these networks (as discussed in sections below) it is important to visualize the structure and workings of each type of network.

A protective network is probably either large (such as a faculty union or

association) or formed in response to a very specific threat. An example of a specific threat might be the loss of a computer program that is used across many departments. An ad hoc committee (i.e. spontaneous network of users) can form in days to fight for these.

In my experience group advancement networks form within the existing "official" committee structures of the university. This is usually because many of the issues that these networks need to deal with are to exploit the use of resources that are made available by the university. It is important to recognize however that the published committee structure is not the network. "The map is not the territory".

Groups for the purpose of individual improvement are often formed spontaneously to write grants or pursue research projects. There are also long-lived and informal communications channels for spreading innovations in teaching or research. These networks don't have to be continually active to be useful. One colleague can simply call another and ask for advice after not talking about that subject for years. Once established, these networks can be a constant source of value for the university. The creativity and innovation networks are used for propagation of ideas about very specific tasks, such as how to reformat a document in a new piece of software, but they are also instrumental in dealing with institutional change and disturbances. It is through this network that the university as a whole can access a large pool of old and new ideas. These ideas, when subject to authentic selection processes, are the working material for the evolution of the university.

The most nebulous of the networks is the social capital and trust building. The "rumor mill" is the most obvious example of a crucial network that is inherently ill-defined. In fact, I think it would be impossible to concoct such a group artificially, i.e. I don't think that a university administration or

faculty governance process could establish a "committee to promote trust". This process has to happen on its own in order to have authenticity **word-choice**. These social capital networks are also organized around the back channels for services between individuals. These back channels may not have any direct academic connection except for the fact that the people are at the same university. For example, you may help someone with their web page because they helped you take care of your cat while you were on vacation.

How purpose driven networks work together

The four categories of networks work together to accomplish the range of university functions. A sustainable university requires portions of the university to go through growth and rearrangement that I have described as "resiliency cycle" (Chapter **). The resiliency cycle can be described in four phases: 1) rapid growth and exploitation of available resources, 2) conservation of limited resources, 3) broad scale breakdown of structure to liberate resources, and 4) creative reformation of the resources into a form that will promote another cycle of phase 1 type rapid growth and exploitation. A diagram of the "resiliency" cycle is given in Figure 1.
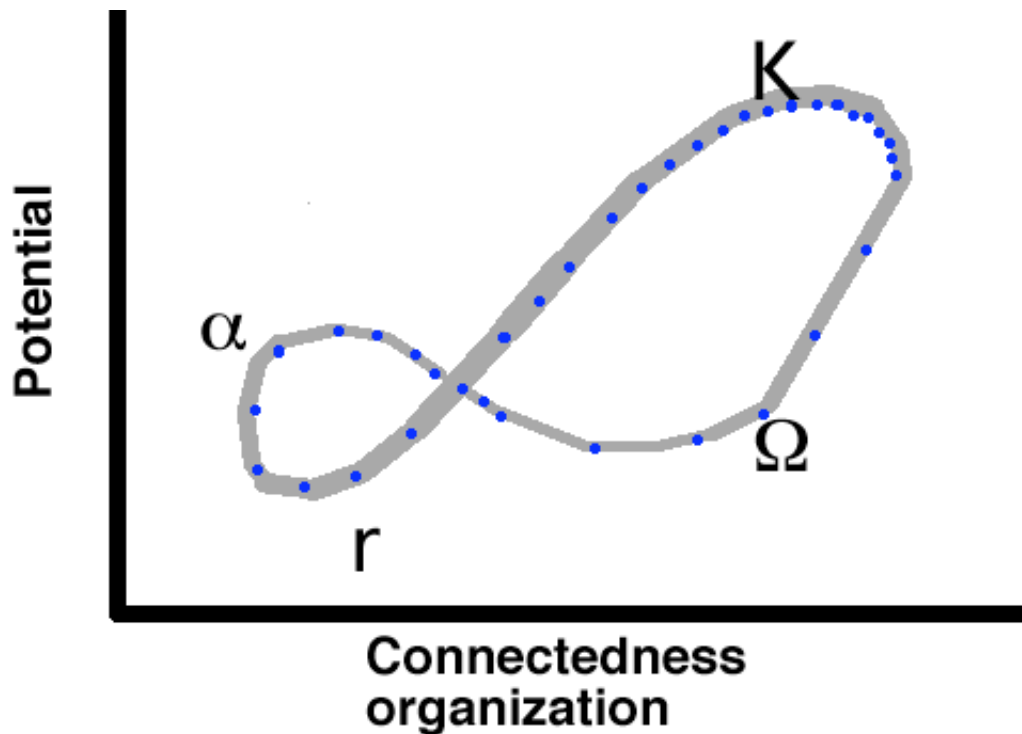
Figure 1. The "resiliency cycle as described by Hollings and Gunderson ****.

The four purposeful network categories are always important but may play crucial functions during different phases of the resiliency cycle. The most crucial network functions are always in pairs and rotate through the four in a specific order. This orderly rotation model demonstrates how the different networks would interact with each other (Figure "purpose-resiliency.png".) It is important to consider that individual faculty would be participating in many different types of networks but may play discrete roles in each. It is very possible that a person may play contrasting or seemingly inconsistent personal roles in different groups. For example, you might be the self-appointed skeptic on one committee but a gung-ho cheerleader on another type of group.

resiliency phase	network type	networks and interaction
r	group advancement	Networks that are working to build the curricula, research activities or other growth

rapid growth	& creativity	would be important. In addition the networks that supported individual improvement and creativity would be active. During times of growth it seems natural to invest in building potential that will help continue the growth phase.
K conservation	group advancement & protection	As rapid growth is slowing down, some sectors of the university may enter a conservation phase in which resources have to be used efficiently. During this phase there is a tension between supporting the purposes of growth and of protection. The protection networks would be focusing on job security for staff and faculty and in establishing benefits or securing promises that were made during the growth phase.
Ω release	protection & trust	The release phase of the resiliency cycle should only happen at smaller subunits of the university at any one time. In these units that are going through restructuring the faculty survival and protection networks will be in high gear but the networks for establishing and brokering trust will be need to be brought into play. The trust building network has to already established, but it is used during this phase. This can be a very difficult time for the reorganizing unit and it is important that they are able to connect with highly respected individuals in the faculty and administration for words of support and reassurance.
α creative renewal	trust & creativity	The creative reorganization of resources into a context that allows for subsequent growth is a complex and creative process. There may be many possible paths that a department or unit could follow to reestablish a new version of themselves. These multiple paths are probably associated with creative individuals in networks that provide a pool of ideas and innovations. The units involved in this process need to work within their networks that have established trust to really take advantage of the many

possible opportunities made at this time. In this phase, the arrow of trust works in the opposite direction. The trust networks must allow the administrative power and financial structure to be able to trust the faculty and departments to be creative.
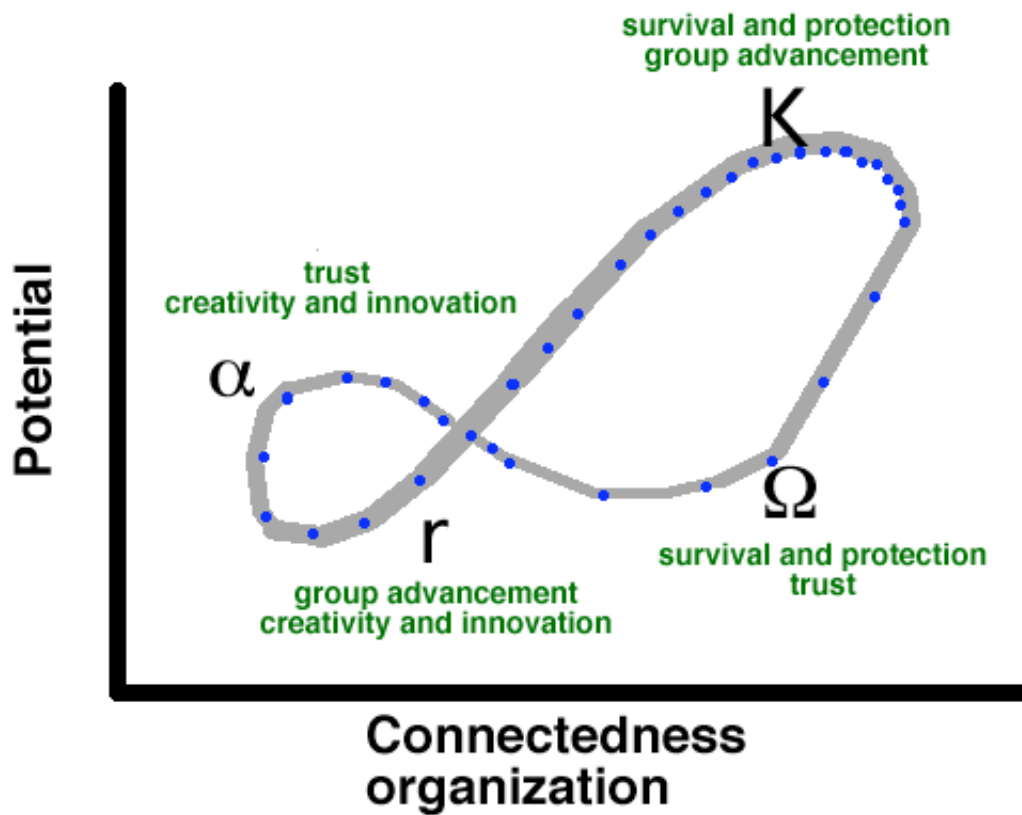

Figure 2. The resiliency cycle labelled with the group types that would be most active in a portion of the overall institution that is involved in that particular phase.
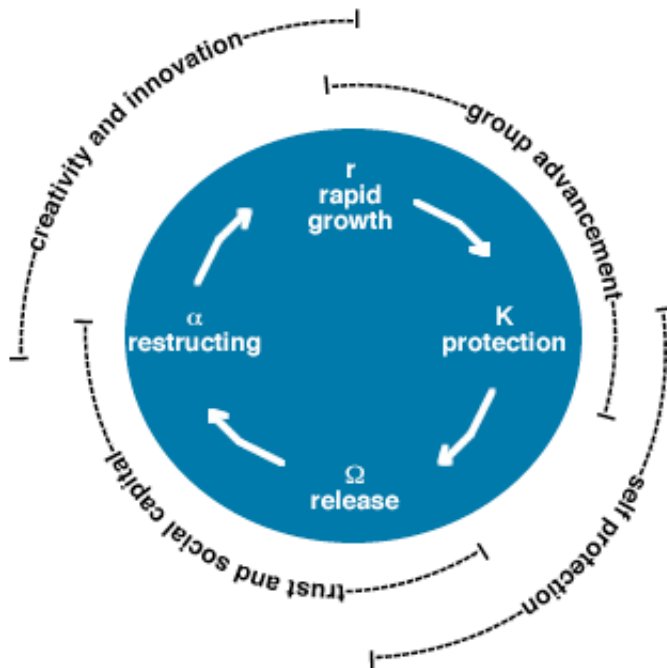
Figure 3. The four different types of networks proceed through an orderly cycle of importance in overlapping pairs. For each phase in the resiliency cycle, two network types are mostly active. As the resiliency cycle proceeds (clockwise) the group pairs change.

Faculty interactions and manipulations of different types of networks

Individual faculty, staff and students probably are involved in several instances of networks that serve each purpose. This is because these purposes are universal and people form groups to serve their own purposes. Each of us should assess what networks we are involved in and whether we could strengthen that network be more involvement. A strong network doesn't necessarily mean that you are intensely involved. The protection, group growth, and individual improvement networks may benefit by more involvement, but you can't push a trust network by simply being more involved. Even some aspects of the personal improvement networks that

draw on creativity and innovation have to be slowly built over longer periods and, this is crucial, have to be already in place before you need them. In this sense, the trust network and some aspects of the personal improvement networks are like hidden assets that aren't necessarily producing value for you all the time, but you need to have them already in operation when you need to draw on them.

Each individual faculty should compare their portfolio of network assets to their own set of purposes. Here are several guidelines based on the purposes of these networks:

> group advancement - Your involvement in group advancement network needs to extend beyond your immediate group. The work of your department or research group is a given, but your network needs to extend beyond that.

> protection - Because of the large nature of some of these networks (such as unions and faculty associations), most faculty only have to be minimally **but visibly** involved in such activities.

> individual improvement - If you are not already involved in a network of people within your own institution who share intellectual ideas and innovations, there are usually university sponsored activities that help develop these groups. My university has many opportunities through our teaching improvement center. If you are already involved in such groups it is important to nurture this involvement for the long term.

> trust and social capital - There are two types of trust that are necessary. People need to be able to trust you to do the work that you say you are going to do, to deliver on promises and commitments. The other type of trust is that people need to rely

on you not to take advantage of their weaknesses or vulnerability. This second type of trust relationship is especially important in creating the conditions necessary for promoting the long term evolution of the university.

How administrators can work with purposeful networks

The purpose of a university's hierarchical administrative structure, from the president down to the department structure, is to distribute power (money, space, positions and other resources). Without faculty, staff, and students the administration has no place to distribute this power. Without fully operational networks of faculty, staff and students the dissipation of this power becomes just a hopeless welfare operation rather than a vibrant institution.

The official committee structure, faculty governance and union structures form the interface between the real networks within the university and the administration. Many times the committee structure provides a workable avenue for interaction and the distribution of power. For example, faculty development grant committees may be very effective at distributing monies to deserving individuals from across a broad range of disciplines. Similarly, a faculty union or association may be a valuable partner to the administration in working on faculty work related issues. In many cases however, the committee structure is a cumbersome artifact. Many committees are just too large and try to be representative of arbitrary disciplinary units rather than formed for the purpose of getting some particular piece of work done. I've served on many committees in which a few people did all the work (which is fine) and the other members of the

committee were there to make sure that none of the committee's work impinged on their own department or school (which is also fine). The problem is that this dichotomy wasn't explicitly acknowledged. Both aspects of those committees could have been more productive if it was divided into "doers" and "reviewers". At my institution, both the faculty governance and the administration are unknowingly involved in making committees too large. Many of the key committees have a large number of members, who turn out to be non-teaching faculty (such as in student services) or staff. Although it is commendable to see the devotion of the non-teaching faculty and staff to sharing in the committee work, the large committees that result are sometime unwieldy. It would be much more effective to have smaller committees that contain just a few hard working members and have have access to administrative support for help with gathering data, selecting procedures and project analysis. In order for this to work, the rest of the faculty and staff would have to trust the few to represent the interests of many.

One of the problems I see with administrative involvement with these networks is when they confuse the purposes of individual improvement and group advancement. Often the research proposals and funding process requires support of the institution through reduction in indirect cost recovery or matching funds. When administrators have a process to do this (to facilitate a single faculty's grant) they are essentially making a decision about how to use grant funds. But when they make the decision to support a large grant project through additional university resources, they are making a decision that should be made by budgetary and governance processes. It is a mistake to use the internal processes of a network for group advancement for university level decisions. It is a mistake because these networks are based on a high amount of internal interactions and a limited amount of external production. Basing university decision on which grant gets funding, i.e. which proposal has the appropriate external production function, is

missing the entire value of the internal processes and warping the group development network processes. For example, if the university has already decided that they need a new computer lab then to solicit input from faculty user groups who could help find funds for this facility because they have a use for the computer lab is valid. But, to let a group of faculty who want the university to support a computer lab because they need that facility to get a particular grant is a form of governing and budgeting by "grantocracy".

University administration relies on the social capital and trust that has built up between faculty. Similarly they rely on the trust that they (administrators) have established with faculty. I think the university as a whole benefits if the transactions between faculty and administration can happen as smoothly and with as much good faith as possible. Especially during times of external threats or internal crisis, the university will rely on a few well-connected and respectable faculty to help them convince other faculty to help address whatever the problem may be. These situations are crucial, but when they occur there is no time to develop a network of trust, it has to already exist. The university as a whole could benefit from more extensive social networks. It would benefit both in the short term (**example**) and for handling longer term disturbances. Infrastructure and activities are important for establishing and maintaining these. The architectural layout of the campus that includes places for all size groups of faculty to meet is crucial. Just as the piazza is central to Italian social and business life in the cities, good university layout is crucial. There are so many reasons why building and nurturing social networks is important to university function even though these linkages are totally internal and can't be translated into dollar values of export products.

Conclusions

Effective operation of a university requires that the resources, under the control of the administration, be distributed to the faculty and their immediate groups. There are several established mechanisms for this distribution of power including the college and department hierarchical power structure and faculty governance through committees. The committees are established artificially to both gather talent from faculty and staff but also to approximate the network of users for the committee's work.

Networks form within the faculty, students and staff to address problems that are more effectively solved in a group rather than individually. In universities, there are four major categories of purposes for which networks are formed. The first and over-riding purpose is for self-preservation and protection of people's jobs and working conditions. This is just human nature. Purposes 2 through four are; 2) to work toward the advancement of your immediate group, 3) promote opportunities for self improvement including nurturing creativity and the spread of innovation, and finally 4) create trust by building social capital.

Understanding the structure of these self-formed and purposeful networks is key for effective faculty participation and administrative interaction. Networks that are used for the purposes of group advancement or protection can be formed almost on demand as needed. However, networks that build trust have to be built and maintained for other activities to be possible and networks that are used for spreading innovation and supporting individual creativity have to be built over a long time.

These networks support activities that are largely unmeasured in the university budget. The benefits of of these networks are they customize the internal work flow. Unfortunately this work doesn't show up as export products. It's not only that the work that is done in these networks is internal, but that building the networks and self-organizing processes don't

even show up as any sort of products. These four different networks contribute to the overall development of a sustainable university. Combinations of the four types of networks can work together to help support sub-portions of the university as they proceed through the resiliency cycle.