

Getting on board: A social network analysis of the transformation of new hires into full-time employees

Klarissa Chang¹, Kate Ehrlich², David Millen²

¹Carnegie Mellon University
changtt@cmu.edu

²IBM T. J. Watson Research
{david_r_millen, katee}@us.ibm.com

Abstract

In a time of rapid turnover in employment, companies must transform new hires into productive employees as quickly as possible. This process, known as on-boarding, usually focuses on providing new employees with the information they need to get their job done. But becoming an integral member of the group is much more complex. In this study, we adopted a social network approach to examine the relational aspects of on-boarding within a group of interns and their mentors at a large industrial lab. Social network analysis gave us the opportunity to study the on-boarding experience of several people at once and to examine the relationships within the group of interns as well as between the interns and other permanent employees. We used a combination of questions about egocentric networks and bounded networks as well as individual interviews to better understand the interns' pattern of information access and sharing. The results were revealing and delineated important implications of social network analysis as an investigative tool for critical organizational processes.

Background

The on-boarding process often takes a new hire through a whirlwind tour of new rules, processes, procedures, technologies, people, places and services. But once the basic ground rules and information have been presented, the new employees are usually left to fend for themselves. Most succeed in making the right connections to get the information and support they need to accomplish their tasks. But those new employees who don't make the right connections are at risk of leaving the company.

Research in naturally occurring social networks of new hires has yielded conflicting results that are generally attributed to possible differences in task environments. Earlier research has shown a relationship between various forms of structural centrality and role satisfaction in small groups (Brass 1981). Other studies that examined the causes of network variables often clashed with structuralism because they tend to explain the network in terms of actor personalities and latent propensities (e.g., Mehra et al. 2001). People may use complex and iterative behaviors to minimize the number of possible expertise sources, while providing a high possibility of garnering the necessary expertise (McDonald and Ackerman 1998). Chao et al. (1992) examined the long-term effects of mentoring and discovered that mentored individuals significantly differed from non-protégés in comparisons of job outcomes. These results indicated that positive effects of mentoring on organizational socialization and intrinsic job satisfaction are essentially a relationship based process.

To gain a better understanding of the relational aspects of on-boarding we used a Social Network Analysis (SNA) approach to study a group of student interns who had joined an industrial research lab for the summer and provided us with an excellent example of on-boarding. The interns were expected to produce an original project under the direction of a mentor who was a full-time employee and were therefore were under some pressure to be quickly integrated into the group. The program also gave us the opportunity to study the on-boarding experience of several people at once and to study the relationships within the group of interns as well as between the interns and the rest of the group. The study used a combination of questions about personal networks, bounded networks and individual interviews to address how interns use their relationships with other people in the group for informational purposes and the impact of these relationships on their interest in returning to the group in the future.

The Study

The industrial lab where the study took place has a well established internship program whose goal is to create a productive and fun working environment for the students during their summer tenure and promote long-term relationships with those students and their institutions. In consequence, a lot of planning and energy goes into recruiting and hiring the best and the brightest undergraduate and graduate students, and matching them to “mentors” who guide their research over the 13 weeks the interns are on-site.

New interns joining the group are given a presentation with a binder of information, a place to work, a networked computer, phone and other necessities of office work. They are also introduced to the other members of the group several times: to a few people on their first day, to the whole group at its weekly meetings, to anyone from the group who shows up at a weekly informal “tea” session. The names and background of each new intern is displayed on a large screen in a common area for the first couple of weeks when the intern joins the group.

The whole group - interns, mentors, other researchers and associated staff – are located together on the same floor over a relatively small area. All interns have cubicles near other interns and/or other members of the group. In addition there are several social activities set up for the interns over the summer involving trips, entertainment and other planned and unplanned activities.

The interns are supported by several full-time administrative, support and volunteer staff including a research coordinator who oversees many of their activities, even providing virtual introductions to the interns before they join the group. Once on site, interns rely primarily on their mentors for advice and direction on their project work, and on the coordinator and the support staff for all other information.

In summary, the interns are physically and socially made to feel that they are part of the group right from the beginning. Even for these interns, however, there can be challenges in developing the right connections to become a productive member of the group in a short time.

Method

The study used a Social Network Analysis to examine how interns utilize the available human resources to get their work done. The network survey consisted of questions examining egocentric networks and bounded networks (Wellman 1982; Cross and Parker 2004). In the bounded networks, four questions were asked to elicit network patterns representing information seeking, awareness, social closeness, and information access within the group. For information seeking, the respondents were asked how often they sought information or advice on projects, work, or operations from each person in the group. For awareness, they were asked about the extent to which they understood the knowledge and skills of each person. For social closeness, they were asked how often they met with each person for non work-related (social) activities. For information access, they were asked about the extent to which each person was accessible within a sufficient time frame when they needed information or advice. In the egocentric networks, we were interested in descriptive information concerning the communication mode, type of advice sought, and source of information providers in personal networks. The interns were also asked how interested they were in returning to IBM either as an intern or a permanent employee. Respondents were not required to rate their relationships with people they did not know. Pairs of ratings that did not exist were coded with missing values.

All the interns, their mentors, associated support and administrative staff were included in the study. Participation in the study was voluntary. 32 out of 41 people responded to the online survey, representing a response rate of 78%. 59% of the respondents were males. 48% of the respondents were computer scientists, 10% were engineers, 15% were social scientists, 10% were designers, and the rest came from other disciplines. Each intern was allocated a mentor who had similar research interests as him/her. All except one of the interns joined the organization for less than 6 months, while most of the permanent employees had been working at IBM for more than 2 years.

An email was sent to the participants along with a cover letter from a manager of the group. Two follow-up emails were sent to encourage their response. The participants were asked to complete an online questionnaire asking for their perceptions of the work within and outside the group. The interns were administered the survey towards the completion of their internship, and therefore had some working experience with the group. The quantitative results were supplemented with qualitative data collected from

follow-up interviews with the respondents. Data about demography and reporting relationships were obtained from company records and the online survey. The online questionnaire included a network survey that was pilot tested with five members of the group. We conducted tests of reliability and validity, and followed Freeman et al.'s (1987) recommendations to enhance accuracy of recall so as to generate a more accurate representation of the social networks (Rogers and Kincaid 1981; Marsden 1990).

Results

Likelihood of returning

Simple regression analyses generating correlation statistics were run to examine the relationship between likelihood of returning and network positions. The results were revealing. When we looked at whether the interns were interested in returning either as an intern or a future hire, we found that two factors predominated: their awareness of the knowledge and skills of the other people in the group ($\beta=0.40$, $p<0.05$) and accessibility (whether people they sought information from were available in a timely fashion) ($\beta=0.55$, $p<0.01$). These two factors were more important than the interns' frequency of social interactions outside work ($\beta=0.08$, $p=0.51$). We also analyzed the correlations between likelihood of returning and centrality in information seeking. Interns who played a central role in information sharing and who other employees actively sought information from expressed more interests in returning to the company, as compared to their fellow interns who played a peripheral role in information sharing ($\beta=0.58$, $p<0.01$). Interns whose knowledge and skills were highly known to others also indicated that they were keen to return to the company ($\beta=0.38$, $p<0.05$). Despite the peripheral role played by interns, compared to their permanent counterparts in information seeking, retention of these interns was found to be strongly correlated with their role in information sharing and the awareness of their expertise within the network.

Information Seeking Behaviors of Interns and Mentors

Network correlation and regressions were used to test the model examining information seeking behaviors within the network. As network data observations were not independent and did not satisfy assumptions of statistical inference in traditional regression, special procedures were adopted. The Quadratic Assignment Procedure (QAP) and multiple regression quadratic assignment procedure (MRQAP) (Baker and Hubert 1981; Krackhardt 1988; Borgatti and Everett 1999) were used to run the correlations and multiple regressions. QAP analyses have been shown to remain unbiased as compared with ordinary least squares (e.g., Krackhardt 1988). Table 1 shows the results of QAP on information seeking within the network. Being aware of another person's knowledge and skills, having information access to that person, and being socially close were found to encourage one's propensity to seek information from another party in the company. In other words, information seeking was highly determined by awareness of one's expertise, whether one was readily accessible for information, and whether one had forged close social ties.

	Standardized Coefficient	Significance	R-Square
Information Seeking			
Awareness	.33	.005	.78
Access	.25	.025	
Social	.34	.019	

Table 1. Predictors of Information Seeking

To understand information seeking behaviors between interns and permanent employees, we used UCINET (Borgatti et al 2002) to generate a density table (see Table 2) that examined the link between interns, mentors and other employees (managers and administrative staff). The density statistic reflects the percentage of actual ties over the total number of possible ties. Overall, interns were less likely to seek information from other people than were the permanent employees. And when they did seek information they were slightly more likely to approach the administrative and support staff than other interns or mentors although they sought out other interns more often than either of the other groups sought information from the interns. The lack of awareness and perhaps comfort in going to other people was especially pronounced in comparison with the mentors who sought out other mentors at more than twice the frequency.

Role (no. people)	INTERNS (16)	MENTORS (16)	OTHERS (9)
INTERNS (16)	20.4%	20.3%	34.0%
MENTORS (16)	11.3%	55.0%	63.9%
OTHERS (9)	15.3%	39.6%	34.7%

Table 2. Frequency of seeking information

Discussion

How long does it take a new hire to become a productive employee? Most new employees are performing at a functional level quite quickly. By the end of 3 months, a new employee who has become a central resource and who has developed good awareness and access to others in the group is probably beginning to work independently. But 3 months may not be long enough for new junior employees to be functioning, depending on broad connections to function independently and completely.

In the on-boarding process, the new employee comes to understand the rules, regulations, process, governance and other explicit information needed to perform their work. But he or she must also establish the personal connections that provide intellectual and social support for continued productive work. Establishing these connections can take many months and even years. Social Network Analysis is a useful tool for understanding how these connections develop over time and the impact of these connections on employee productivity and job satisfaction.

References

- Baker, F. and L., Hubert. "The analysis of social interaction data". *Sociological Methods & Research*, 9 (1981): 339-361.
- Borgatti, S. and M. Everett. "Models of core/periphery structures". *Social Networks*, 21 (1999): 375-395.
- Borgatti, S.P., M. Everett and L.C. Freeman. "UCINET 6 for Windows: Software for Social Network Analysis". Harvard: Analytic Technologies (2002).
- Cross, R. and A. Parker. "The Hidden Power of Social Networks: Understanding How Work Really Gets Done in Organizations". HBS Press (2004).
- Brass, D.J. "Structural Relationships, Job Characteristics, and Worker Satisfaction and Performance". *Administrative Science Quarterly*, 26 (1981): 331-348.
- Chao, G., P.M. Walz and P.R. Gardner. "Formal and Informal Mentorships: A Comparison on Mentoring Functions and Contrast with Non-Mentored Counterparts". *Personnel Psychology*, 45 (1992): 619-636.
- Freeman, L., A. Romney and S. Freeman. "Cognitive Structure and Informant Accuracy". *American Anthropologist*, 89 (1987): 310-325.
- Krackhardt, D. "Predicting with social networks: Nonparametric multiple regression analysis of dyadic data". *Social Networks*, 10 (1988): 359-382.
- Marsden, P. "Network Data and Measurement". *Annual Review of Sociology*, 16 (1990): 435-463.
- Mehra, A., M. Kilduff and D. J. Brass. "The Social Networks of High and Low Self-Monitors: Implications for Workplace Performance". *Administrative Science Quarterly*, 46 (2001): 121-146.
- McDonald, D. and M. S. Ackerman. "Just Talk to Me: A Field Study of Expertise Location". In the *Proceedings of the ACM Conference on Computer Supported Cooperative Work* (1998): 315-324.
- Rogers, E. & D. Kincaid. "Communication Networks". New York: Free Press (1981).