EXPLORING THE ROLE OF HOMOPHILY IN INNOVATION JAM: A CASE STUDY

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ABSTRACT

In this paper social networks analysis techniques and regression model are used to conduct an exploratory analysis on how homophily influences ideation activity in an organizational ideation jam. A business unit within a Sweden-based global company has been selected in order to investigate our research question. Our findings document that self-organized ideation networks exhibit a tendency towards collaborative homophily, expressed in terms of similarity in participants' attributes. Specifically, we found that most active people in posting ideas are also the most active in commenting on the ideas contributed by others. In addition, our results highlight that gender and belonging to the same organizational unit have an impact on the activity to post ideas and comments during the jam. Our results provide valuable input for innovation theory and for the management of ideation jams within organizations.

Keywords*: Innovation jam, homophily, idea generation, social networks.*

1. INTRODUCTION

The innovation management literature shows that employees represent one of the most important sources of innovation ideas within companies (Van Knippenberg et al., 2015; Dahlander & Piezunka, 2014; Reitzig & Sorenson, 2013). To leverage this innovation potential, organizations such as IBM, NASA, LG, VOLVO, MICROSOFT and many others recently moved on to use of web tools that stimulate the generation, development and selection of new innovation ideas from employees located all around the world (Bayus, 2013; Adamides & Karacapilidis, 2006).

A successful example is represented by innovation jam, which is a focused online collaboration sessions held around a specific topic designed to spark innovation. More specifically, it represents a virtual organizational space that provides to employees the possibility to post ideas and suggestions regarding ideas. Bjelland and Wood (2008) give particular emphasis to the advancement, refinement and support built around ideas in organization jams. It can be seen as an evolution of more classical forms of brainstorming, since it is supported electronically, focused on specific topics, time limited, and aimed to enlarge significantly the number of employees involved in the ideation process. Employees participate directly to idea generation and development through posting their own ideas or providing suggestions to the ideas of others. With the introduction of this new organizational tool for idea generation and management, however, radically new ideation approaches emerge and new challenges need to be managed and addressed within organizations.

Firstly, the jam allows individuals to engage in collective creative efforts, despite their geographical and cognitive distances (Kijkuit & van den Ende, 2010). This is an

advantage as long as innovation is to a large extent the result of social interaction and communication among employees (Leonard & Sensiper, 1998). The increased connectivity provided by ideation systems renders it possible to communicate, interact, provide and receive comments with more and more individuals, also geographically distant (Jeppesen & Lakhani, 2010). However, jams may represent an opportunities for individuals at the peripheries of organizations to show off, and these individuals may have more incentives to contribute with their ideas and comments, as this is a good opportunity for them to gain exposure in other parts of the organization (Bayus, 2013). Secondly, as it becomes easier to suggest an innovation idea, organizations can expect a substantial increase in the overall number of ideas presented, especially if there is active encouragement or any kind of rewards from management to propose new ideas. Whereas this normally is desired by organizations, this also means that more ideas will compete for a limited set of resources (Bjork et al., 2011). Thirdly, the possibility to see and comment on others' ideas changes the entire ideation process, as it does not only include merely the moment of idea creation, but also the subsequent commenting, adding of information, and refinement of them, in the end resulting in a more extended and collective process. However, the provision of suggestions requires from employees the selection of ideas (among the many) to which they want to contribute, signaling how they allocate and channel their attention to the different ideas inserted into the jam (Dahlander & Piezunka, 2014). The same works from managers and how they allocate attention in order to select the most innovative and useful ideas among the many presented (Van Knippenberg et al., 2015). Fourthly, by cleverly performing ideation jams, organizations can focus and direct the contributing individuals' attention and innovation efforts towards strategically important areas of their businesses, or to critical aspects of their products and services (Reitzig & Sorenson, 2013).

Despite the relevance of these issues, and the increasing number of global organizations that routinely adopt innovation jams in order to generate innovation and facilitating collective creativity, we found a dearth of study that seek to understand the behavioral and cognitive mechanisms underlying the interaction of people within a jam. Especially innovation managers within firms require to organizational and innovation management studies empirical evidence and theoretical explanations that help them to better manage and employ these useful tools for the generation and selection of ideas. In this study, we adopt social network analysis theories and techniques in combination with innovation management literature in order to shed light and help to create better understanding of the processes of generation of ideas within organizations. More specifically, we adopt the theoretical lens of homophily (McPherson et al, 2001) to study antecedents of interaction patterns among ideators at the early stage of innovation, when ideas are presented in the jam and discussed with other colleagues.

The occasion to bring these empirical and theoretical issues is provided by data that we have collected within the business unit of a Sweden-based global company who recently performed an innovation jam among all the employees of the different locations around the world. The selected unit is research-focused and plays a key role in the company's innovation, as it besides traditional research and development activities also supports the other business areas and units of the global company in innovation. Our argument proceeds as follows. The next section presents a literature review on homophily. The third section provides information on our research design, and discusses issues related to data and measurements. In the fourth section we report the results of our analysis. A final discussion section concludes the paper.

2. THEORETICAL BACKGROUND

Homophily represents the preference of individuals to choose others who are similar to themselves as partners (McPherson et al, 2001). Increasing interest in this topic is due to the growing relevance of interactions among individuals in sociological and organizational issues (Rivera et al, 2010). Different attributes have been identified as determinants of homophily, including race and ethnicity, sex and gender, age, religion, education, occupation and social class, network positions, behaviors, attitudes, abilities, beliefs, and aspirations (McPherson et al, 2001). Homophily has been studied in several settings, such as voluntary organizations (McPherson & Smith-Lovin, 1987), postgraduate educational programs, universities and schools (Mehra et al., 1998; Wimmer & Lewis, 2010), hospitals (Mascia et al., 2015), workplace organizations (Bacharach et al. 2005), and courthouses (Lazega et al., 2009).

Literature argues that homophily simplifies the process of communication, mitigates conflicts and relationship costs (McPherson et al., 2001) and produces relevant effects in terms of trust (Wimmer & Lewis, 2010). Excessively high levels of homophily, however, may be problematic especially when the expected and desired result is an output in terms of generation of ideas. Innovation management studies have underscored that idea generation to a large extent is the result of social interaction and communication (Leonard & Sensiper, 1998), and that conscious social interaction, rather than individual undertakings, is at the core of such kind of creative activity (Bjork et al., 2011). In this perspective, homophily can lead to links that favor the connections between persons similar in certain attributes, such as expertise, knowledge, or organizational role, and this process could have negative effects on the individuals' ability to generate innovative ideas.

In this study, we believe that the theoretical lens of homophily can shed light and help to create better understanding of the processes of generation of ideas within organizations. Since homophily usually arises from an individual's choice (i.e. preference of similar attributes), and this choice may be induced from the specific structure of the individual's social world (i.e. guided from the social context or by opportunities along an individual life) (McPherson & Smith-Lovin, 1987; Kossinets & Watts, 2009), a more in-depth analysis and the production of detailed evidence on how this phenomenon affects innovation jams can be very useful for managers and practitioners involved in innovation processes.

3. RESEARCH METHODS

3.1 SETTING AND DATA COLLECTION

A single explorative case study consisting of a business unit within a large global company based in Sweden has been selected in order to conduct our study. The selected business unit is a research-focused one that focus on innovation and support the other business units of the global company. One such activity is to run idea jams, which is a 48-hour IT-based creative session in which employees are invited to contribute with ideas and comments on ideas during the set time frame. The idea jam is preceded by a period of marketing initiatives in which the employees through e-mail get links to web pages on the intranet with inspiration and stimulation within the specific area of the idea jams. These inspiration sessions can for example present a specific type of customer and the need that they have today that are not fulfilled, or present a more general need in terms of new ideas that, for example, contribute to a better environment. The employees are invited to participate during the 48-hour idea jam session. They can contribute with

both ideas and comments and when the jam is over ideas are selected to move further to innovation projects or not.
For this study, one specific jam was selected. The selected idea jam focused on five different areas and was active during 48 hours. During this session, ideas were created and developed by a large number of employees, something which can be regarded as a live experiment emulating what normally occurs in organizations, though in a much more compressed timeframe and IT-supported. This also meant that employees all over the world could contribute. Real data on all ideas, comments and contributing employees during this idea jam have been extracted from the company's internal data system. In addition to this data, three interviews have been performed with two persons responsible for the idea jam in order to get an understanding of how the jam was carried out and how the evaluation and selection processes were performed. In addition, the researchers have continuous interaction with the selected company and thereby have had many opportunities to ask clarifying questions of how the idea jam has been carried out.
Each of the five different areas had a number of moderators to help coaching the idea jam. The moderators of each area were also in charge of specifying a top ten list of the most promising ideas and in the cases they needed, they could also use experts who worked specifically with the different areas. The final evaluation of all the selected ideas from each area was done with the experts of innovation within the research unit focused on innovation. Some of the ideas were finally grouped together as they were regarded as similar and/or complemented each other in an innovation project.

3.2 VARIABLES

Social network analysis was employed to prepare the collected relational data. It is a method of collecting and analyzing data from multiple actors (or nodes) interacting through ties (or edges) with one another (Wasserman & Faust, 1994). Table 1 shows descriptives and correlations between dependent and independent variables employed in the study.
The dependent variable of this study (*Ideator X Ideator*) is computed as a relational matrix (161 X 161, as the number of actors involved in the jam who participated posting comments) where each person represented a node, and each edge represented the employees' interaction (collaboration or discussion) during the jam. The matrix is valued and asymmetric, as it reports in the intersection cells the number of comments provided by couples of participants.

	Variable	Mean	St.Dev.	Min.	Max.	1	2	3	4	5	6
1	Ideator X Ideator	0.188	1.060	0	49	-					
2	Identity	0.768	0.224	0.219	1	0.044	-				
3	Country	0.343	0.475	0	1	-0.016	0.006	-			
4	Area	0.227	0.419	0	1	0.024	0.077	0.058	-		
5	Gender	0.751	0.432	0	1	0.028	-0.005	-0.051	-0.019	-	
6	Manager	0.498	0.500	0	1	-0.005	-0.007	-0.005	-0.009	0.019	-

Table 1. Descriptive statistics and pairwise correlations

We computed also the following independent variables.
Identity. We inspect the degree of similarity of participants' in interaction activities during the jam. Specifically, this explanatory variable is related to the similarity that participants exhibit with respect to the number of ideas posted during the jam, and was

computed with the aid of UCINET software (for the math formula see Borgatti et al., 2002). This coefficient ranges between 0 and 1 with close values expressing the same level of activation and participation in the jam.
Country. As the jam has involved employees in the various countries in which the company has the seats (specifically: Asia, Australia, Europe, Middle East, South Africa, South America, Sweden, USA) we computed a binary matrix assuming 1 if couples of actors interacting are employed in the same country, 0 otherwise.
Area. Location-specific factors as well as membership in a specific business area may also affect interaction among actors on ideas (Reitzig & Sorenson, 2013). Five different areas were involved in the study, specifically: Emerging Markets, Fuel economy, ITS and Future Transport Solutions, New and Improved Business, Uptime. People in certain parts of the organization might be more familiar with the go/no go decision process, and therefore better equipped to present ideas. For example, one might expect that a lot of ideas would be more likely generated from people affiliated to certain business areas (e.g. "New and Improved Business"), in light of the specific objectives they pursue in the organization. This variable has been operationalized assigned individuals who generated ideas to their reference business area. We computed a binary matrix assuming 1 if couple of actors interacting are employed in the same business Area, 0 otherwise.
Gender. A dummy variable (1 for male, and 0 for female).
Manager. Holding a managerial position in the organization implies the possibility to direct and receive comments, as well as to influence indirectly the likelihood of the idea to be selected (Van Knippenberg et al., 2015). A dummy variable was used to capture this, taking on 1 when actors have managerial responsibilities and 0 for otherwise.
These last two attributive variables, collected as a vector, have been converted with the software UCINET (Borgatti, 2002) into a 161x161 matrix according to the criterion of the absolute difference, and then the data string-out performed with the same software permitted to build a new vector of observations related to each dyads simply putting in sequence all the columns of the matrix. The dependent variable and the first three independent variables were built directly as matrices, therefore only the string-out from matrix to vector related to each couple of dyads was performed.

4. STATISTICAL ANALYSIS AND RESULTS

We performed a negative binomial regression to test whether independent variables are significant predictors of the dependent variables. Specifically, Model 1 tested the association between the relational variable that measures connectivity expressed as activity of commenting ideas posted by other actors and the *Identity* measure of similarity in participation to the jam. Model 2 is the full model, including all the independent variables. The software Stata version 10 was used for analysis.
The results displayed in Table 2 show that the coefficient for the variable *Identity* similarity is positively and significantly associated with the dependent variable. This shows that the most active people in posting ideas are also the most active in commenting on the ideas contributed by other inside the jam.
Amongst the others variables included, those considering *Area* and *Gender* were significantly associated with the dependent variable. This first evidence overall seems to suggest that that people tend to comment on the ideas very close to them, i.e. close to their sphere of competence and organizational area. The second evidence that emerges is the fact that men are more active than women in commenting on the ideas posted in the jam. Negative coefficients referring to people geographical location and managerial role, instead, are not significant.

Robust standard error in parentheses; ** p <0.01; * p <0.05

Variable	Model M1	Model M2
Identity	1.191** (0.226)	0.867** (0.197)
Country		-0.168 (0.114)
Area		0.250* (0.100)
Gender		0.349* (0.174)
Manager		-0.038 (0.078)
N. observations	25122	25122
Log-pseudolikelihood	-9674.705	-9628.774
Wald χ^2	27.86	34.36
P > χ^2	0.000	0.000

Table 2. Negative binomial regression

5. DISCUSSION AND IMPLICATIONS

The evidence produced by the case study of a multinational company offer new insights for improving both innovation theory and ideation management practices within firms. Previous studies on heterogeneity in social networks for innovation have mainly focused on group or team level, and have mainly addressed individual characteristics such as gender, age, formal education, and organizational belonging (Bjork & Magnusson, 2009; Kijkuit & van den Ende, 2010). This study provides new empirical evidence at a network level and captures actual behavioural patterns. Overall, the need for inducing interaction with individuals that are not similar is observed.

We found that self-organized ideation networks exhibit a tendency towards collaborative homophily, expressed in terms of similarity in participants' attributes. More specifically, we found that the most active people in posting ideas are also the most active in commenting on the ideas contributed by other inside the jam. Innovation managers within companies have the opportunity to identify people having ideas and innovative capabilities, but must also seek to ensure that the jam does not become a tool used by a few (very active) and many (not very active), monitoring and encouraging the widest possible participation by all.

We also found that people tend to comment on the ideas very close to them and to their area of knowledge and expertise. Each area of expertise can be viewed as a distinct pool of knowledge possessed by individuals affiliated with the various areas within the organization. If from one side this is desirable, as it allows focused discussions and greater mutual understanding, on the other side there is a risk of loosing potential benefits arising from discussion with members who have a different background. At the early stage of innovation, i.e. ideation, the latter may enhance an individual's capabilities to interpret ideas from people with different knowledge in a way that suits his or her knowledge and experiences. Through a "different point of view", individuals are capable of transferring what they know to others with different backgrounds in an easier manner. The ability to transfer knowledge effectively leads to higher exposure to a broader set of perspectives and cross-fertilization of ideas, and thus to variation in knowledge and problem-solving approaches which can help ideators to identify and use

multiple knowledge components in their activities. In a few words, innovation managers are asked to make sure that discussions during the jam are more boundary-spanning. Finally, we found that men are more active than women in commenting on the ideas posted in the jam. The jam can only benefit from greater involvement of the latter.

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