

# An Innovative Way to Add Value to Organizations: People Relationship Modeling

Robert Waker, Mario Neto, Antonio Conceição

► **To cite this version:**

Robert Waker, Mario Neto, Antonio Conceição. An Innovative Way to Add Value to Organizations: People Relationship Modeling. Vittal Prabhu; Marco Taisch; Dimitris Kiritsis. 20th Advances in Production Management Systems (APMS), Sep 2013, State College, PA, United States. Springer, IFIP Advances in Information and Communication Technology, AICT-415 (Part II), pp.361-368, 2013, Advances in Production Management Systems. Sustainable Production and Service Supply Chains. <10.1007/978-3-642-41263-9\_45>. <hal-01451779>

**HAL Id: hal-01451779**

**<https://hal.inria.fr/hal-01451779>**

Submitted on 1 Feb 2017

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



# An innovative way to add value to organizations: people relationship modeling

Robert Ari Waker<sup>1</sup>, Mario Mollo Neto<sup>1</sup>, Antonio H. Q. Conceição<sup>1</sup>

<sup>1</sup> Paulista University-UNIP, Graduate Program in Production Engineering, São Paulo, Brazil  
bobwaker@gmail.com, mariomollo@gmail.com, henrique\_mao@hotmail.com

**Abstract.** Communications agencies are private organizations that have a fundamental role in marketing and communication markets. Following this perspective, this study, with the support of Social Network Analysis tools, the structure of an agency will be modeled with the purpose of identifying the most important actors and its relationships, and show its interdependence with the workflow of the production chain. To achieve compatible results with the organization goals, it is important that their areas or teams relate with one another so as to optimize their production processes. With support of the Ucinet<sup>®</sup> software and its integrated module NetDraw<sup>®</sup>, this paper describes through a case study, how to implement this innovative approach and follow the evolution of the network in order to improve their operational performance. The results pointed out an increase in productivity after the analysis and change in the organization's internal communication.

**Keywords:** Social network analysis, Process innovation, Organizational structure.

## 1 Introduction

According to the Brazilian Association of Advertising Agencies (ABAP), Brazil is the sixth advertising market worldwide [1]. According to data from the Brazilian Institute of Public Opinion and Statistics (IBOPE), the activities directly related to advertising in 2011 generated R\$ 88.32 billion in revenues and represented 2.13% of the Brazilian Gross Domestic Product (GDP) [2]. The Brazilian Geography and Statistics Institute (IBGE) disclosed that the Brazilian GDP in 2011 was R\$ 4.15 trillion [3]. The communication chain is basically made up of four groups of actors: the advertiser, the communication agency, the media vehicles and the market, which here includes the consumer public. According to Corrêa [4], each group has its share of responsibility and contribution toward making the communication process a success, as can be seen in figure 1.

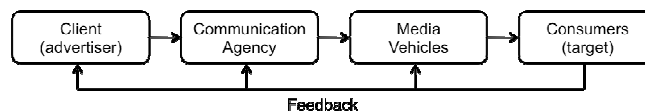


Fig. 1. Communication chain (Source: Adapted from Corrêa [4])

According to Corrêa [4], the communication chain is dynamic and has a direction of motion that represents a process aimed at reaching the market efficiently. This motion is also made up of a feedback, which has as result a cycle that keeps the chain always adjusted to the reality. The role of the communication agency is to develop communication campaigns, which can be in the form of: advertising; promotion; public relations; direct marketing and events. Its main objective is to take the client's message to the desired public [5].

The development of communication products/services, especially in scale, involves work teams with different professional profiles that work simultaneously and create mutual interferences during practically all stages of a job, which must be managed and coordinated over time. Formal tools and techniques are required to assure that the job will attain its objectives and is completed in time and within the budget. However, the network analysis approach can be applied to contribute toward management of the production chain of communication agencies to provide a more efficient environment for leaders to understand and add value to their companies [6].

According to Cross and Thomas [7], the social network analysis approach can drastically improve performance in the vital areas of an organization. This perspective allows leaders to identify key points of collaboration and weak points in their organizations so as to control critical points related to value creation. A network is made up of nodes and links interconnecting the nodes. The nodes can be called actors, who may represent individuals or organizations, while the links represent the relationships between them.

According to Granovetter [8], the concepts used in the intra-organizational networks are related directly with analysis of interpersonal networks, even because they were originally conceived in a context of how relations between people occur. Processes analysis in interpersonal networks provides the best view of how the relations between micro and macro interactions occur. One way or another, it is through these networks that the interaction in small scale is converted into large-scale standards, and these, in turn, feedback the small groups.

The networks help people to attain to an objective that they cannot attain alone. In this wise, all will benefit from the network. However, they must also collaborate to ensure it remains healthy and productive [10].

According to Cross and Thomas [7], leaders who notice how networks work will be able to increase the organization's competitive advantages, producing differentiated results like increase in income, efficacy, cost reduction and even innovative solutions. According to Cross *et al.* [10], it is important to find ways to help people become better connected, thus the organization will be able to obtain the real benefits of its expertise more efficiently.

According to Corrêa [4], the essential departments for an agency to exist and operate include: administrative; attendance; planning; media; creative and production. In this configuration, the administrative department covers the following areas: management, financial, accounting, legal, human resources, purchases, stock control, office services and information technology.

For agencies to obtain results compatible with their goals, it is important for their areas to relate with one another so as to optimize their production processes. On

understanding how knowledge flows through the various borders of an organization, it is possible to obtain an understanding of how the management should direct its efforts to promote collaboration, which will have a strategic return for the organization [10].

Currently, internal communication really appears as a function of the company at the same level as production, financial administration or personnel management [11]. According to Kotler [12], the management models adopted by organizations directly influences the communication model. The participative models are based on broad communications, aiming at sharing information and knowledge, while organizations based on a strong hierarchic structure of control tend to have little communication.

Communication is a “mean” and not an “end” activity, which provides service to other areas of the organization. Communication, both internal and external, gives the organization consistency and organicity. Internal communication integrates all communications that take place in the organizational system, giving support to decisions, grouping networks, objectives, norms, policies, programs, directives, among others. The primordial function of internal communication is to establish the official process through which the organization and its internal public communicate [12].

The communication flow in a business process model can be defined as the level in which the model clearly shows how the communication interactions (e.g., face to face, e-mail, internal memorandums, workflows) occur in a business process [13].

For an internal communication policy to be successful, it must be strategically aligned with the organization’s values and culture, as well as with its operational structure. According to Kotler [12], lack of communication alignment can have as result a drop in the productivity of employees due to the incoherence of messages and, on the other hand, in the external plane, the organization can also lose credibility before other stakeholders (clients, suppliers and investors). Thus reducing its profitability.

The objective of this research is to apply social networks analysis (SNA) to one of the actors responsible for the communication chain: the communication agency, where the network’s internal connectivity characteristics will be surveyed, relating the performance of three specific areas with the number of interactions among its actors.

## **2 Methodology**

The study was conducted in a small agency (under 20 employees). To evaluate the production process in a consistent way, one single type of material was used in the survey: the development of simple printed material. In order to align the production process with the workflow, data collection was performed surveying all interdepartmental interactions during the production of each job, recorded in their internal management system. To conduct the case study, the methodological research approach suggested by Miguel *et al.* [14] was used. Figure 2 shows the internal information flow of the communication agency, considering its departments.

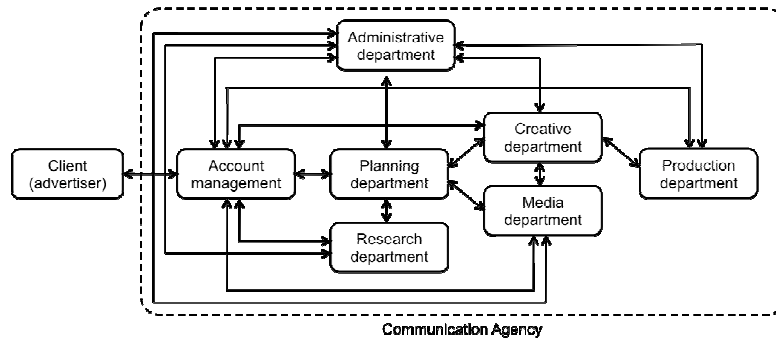


Fig. 2. Communication agency information flow

All jobs with the same technical description were raised, within the range of one month (month 1), totaling 19 jobs. Of all materials developed, 13 were delivered within the estimated time (68.42%) and 6 were delivered out of the estimated time (31.58%). In this analysis, was made an arithmetical mean of the number of interactions of each actor, for the two possible situations: jobs that were delivered on time and jobs that were not delivered on time.

The actors involved in this study are respectively: attendance, creative, production and client (external). In figure 3 it is possible to visualize the production process workflow of printed materials. Based on this workflow is that all data were collected in the survey.

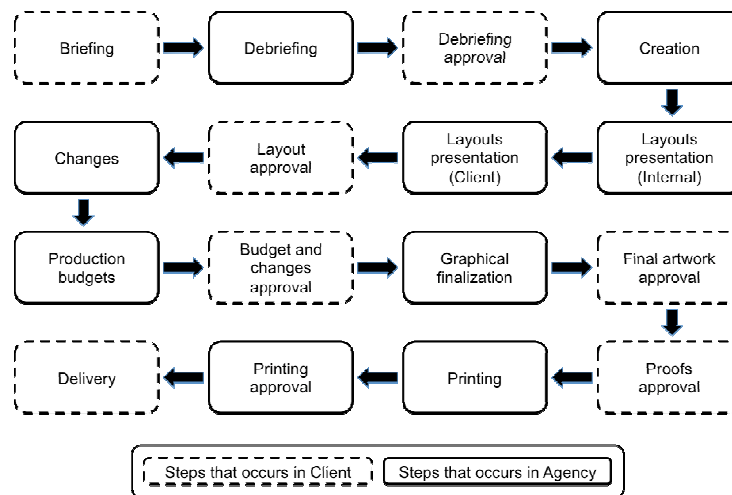


Fig. 3. Printed materials workflow of the communication agency

The aim was to inspect the interactions, identifying the actors and their respective relations. These relations among the actors allowed identification of the relationships weights, and are based on the number of interactions made between one department and another, during the production process. According to Lazzarini [15], to map out

the network analyzed, the concept of groups will be used, which is defined as a finite set of actors delimited by conceptual, theoretical or empirical criteria on which the network measurements are based. Understanding the relationship process of actors is crucial to understanding its dynamics and to obtain efficiency in its operational results.

Both the network structure and position of the actors can affect the organization's functioning and its abilities to create value for the company [15]. Connectivity, which is able to interconnect each one of the network's individuals, can be represented by the intensity and frequency of communication among the actors [16].

To evaluate the network studied, two structural indicators were chosen: overall density and Freeman's degree centrality measures [15]. In this research, the degree centrality and density indicators were established using the theory of graphs in the Ucinet<sup>®</sup> software and its integrated module NetDraw<sup>®</sup>, which allows the viewing of data in graphical format [17]. According to Coleman *apud* Lazzarini [15], dense networks allow maximum information flow among the actors. The value of the density measurement is obtained from the number of ties observed divided by the maximum number of ties the network can have. The degree centrality indicator evaluates the number of ties that an actor has with other actors of the network. The more centrally positioned in the network, the more capacity will this actor have to access other actors of the network [15].

Based on the obtained indices was possible to relate them with the performance of the evaluated network in order to give information to the management team, and therefore, generate corrective actions in the production chain. After analyzing the first month (month 1) some actions were taken, which generated an improvement in the delivery of the jobs in the following month (month 2).

### 3 Results and Discussion

The intra-organizational network graph of the agency, shown in Figure 4, was obtained from the data of the actors and their ties in module NetDraw<sup>®</sup> [17].

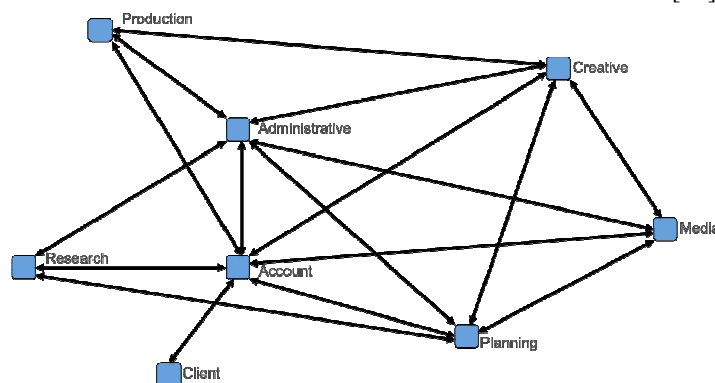


Fig. 4. Network graph obtained using the software Ucinet<sup>®</sup> and its module NetDraw<sup>®</sup>

After processing data with the NetDraw<sup>®</sup> module, two different networks were found: one related to jobs delivered on time and another related to jobs delivered after the deadline. Figure 5 shows the relationships identified according to the number of times that each actor enters in contact with other network actor. The properties of the actors were adjusted and arranged according to their geodesic structure and their links according to their strength. The construction of both networks was done identifying the interactions between the actors of the network in order to present a comparison of the operational response found in both situations.

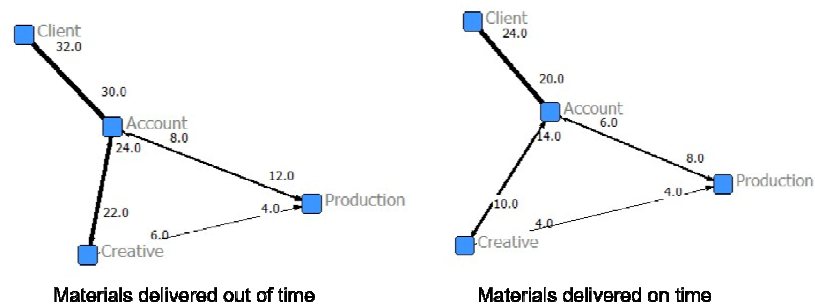


Fig. 5. Networks obtained using data collected in month 1

After processing the data with the module NetDraw<sup>®</sup>, the weights of relations between the participating actors were processed with the software Ucinet<sup>®</sup>, so the parameters that describe the networks analyzed were found. Table 1 presents the structural data (Freeman's Degree Centrality Measures and Overall Density) of the evaluated networks. In this way, the key player of this network, in terms of interactions (centrality), is the account management area. It has an input degree of 42.00 and a 40.00 degree output for materials delivered on time, and an input degree of 66.00 and a 62.00 degree output for assignments delivered after the deadline.

Table 1. Structural data of the evaluated networks

Network	Centrality (OutDegree)	Centrality (InDegree)	Density
Materials delivered on time			1.6071
Account	40.00	42.00	
Client	24.00	20.00	
Creative	14.00	18.00	
Production	12.00	10.00	
Materials delivered out of time			2.4643
Account	62.00	66.00	
Client	32.00	30.00	
Creative	28.00	28.00	
Production	16.00	14.00	

This study sought a better understanding of the relation between the actor's relationships and the performance of the production chain. For this purpose, have been found indicators that reflect the network with high density and degree centrality. The actual structure of the network provides a unique view of the client, by the attendance area (account management). Due to this view, which is not shared with other actors, the jobs end up having a high rate of rework and consequently are delivered out of the schedule. Analyzing the density indicator for materials that were delivered out of time is perceived an increase due to the various interdepartmental interactions generated from the rework process.

From the point of view of network resources, internal connectivity should be dense, but not redundant, within the limits of the organization, this analysis is consistent with the citation of Cross and Thomas [7] and Freeman *apud* Lazzarini [15]. This way, due to the optimization of the internal connectivity, organizations can achieve better results in their production processes.

Based on obtained results, the organization management team tried to bring the creation and production departments closer to the client, through face meetings, with the objective of minimize the high degree of centrality of the attendance department, and also reduce the network density index. After this directive, a new survey was made in the following month (month 2) in order to monitor the indexes of the developed jobs. All jobs with the same technical description were raised, totaling 18 jobs. Of all materials developed, 16 were delivered within the estimated time (88.89%) and 2 were delivered out of the estimated time (11.11%). Comparatively, there is a decrease of 64.82% in jobs delivered out of time during month 1 in relation to month 2, and an improvement of 29.92% in jobs delivered on time, which can be seen in Table 2.

**Table 2.** Indexes of developed jobs

Developed jobs	Month 1	Month 2	Difference
Materials delivered on time	68.42%	88.89%	↑29.92%
Materials delivered out of time	31.58%	11.11%	↓64.82%

The authors Cross *et al.* [10] affirm that social networks, apparently invisible, are fundamental to the performance and execution of business strategy. Thus, the results confirm that, with an appropriate connectivity within the organizations, we can have a significant impact on efficiency and innovation.

## 7 Conclusions

Through social network analysis techniques it was possible to evaluate how the production chain of a communication agency behaves through its network structure. The results show the necessity of identifying points of knowledge sharing within the organization that have strategic importance. The organization management can better



understand how their daily tasks behave, and from that moment, seek better ways to use their social capital to leverage an increase in operational efficiency [7].

To improve individual performance indicators it is necessary to seek, within the network, knowledge of the best techniques and procedures, and through a more efficient internal communication, distribute it to all employees. In this context, it may be more effective to engage in processes that help promote lateral connectivity, so the group can leverage their collective intelligence [6].

So, for this organization to obtain a competitive gain it will be indispensable to improve its internal structures to increase collaboration between actors, reducing borders and bringing people closer together to generate a better knowledge flow.

## References

1. ABAP. A indústria da comunicação no Brasil, <http://webserver.4me.com.br/wwwroot/abap/publicacoes.html>
2. IBOPE. Meios de comunicação 2012, [http://www.almanaqueibope.com.br/asp/busca\\_docInfo.asp](http://www.almanaqueibope.com.br/asp/busca_docInfo.asp)
3. IBGE. Indicadores econômicos. <http://www.ibge.gov.br/home/estatistica/indicadores/pib/defaultt.shtm>
4. Corrêa, R.: Planejamento de propaganda. Global, São Paulo (2004)
5. Sant'Anna, A.: Propaganda: teoria, técnica e prática. Pioneira, São Paulo (2000)
6. Quirke, B.: Making the connections: using internal communication to turn strategy into action. Gower Publishing Limited, Hampshire (2008)
7. Cross, R., Thomas, R. J.: Driving results through social networks: how top organizations leverage networks for performance and growth. John Wiley & Sons, San Francisco (2009)
8. Granovetter, M.: The strength of weak ties. *American Journal of Sociology*. 78, 1360-1380 (1973)
9. Christakis, N. A., Fowler, J.: Connected: the surprising power of our social networks and how they shape our lives. Little, Brown and Company, New York (2009)
10. Cross, R., Parker, A., Prusak, L., Borgatti, S. P.: Knowing what we know: Supporting knowledge creation and sharing in social networks. *Organizational Dynamics*. 30, 100-120 (2001)
11. Angeloni, M. T.: Comunicação nas organizações da era do conhecimento. Atlas, São Paulo (2010)
12. Kotler, P., Kartajaya, H., Setiawan, I.: Marketing 3.0: from products to customers to the human spirit. John Wiley & Sons, Hoboken (2010)
13. Kock, N., Verville, J., Danesh-Pajou, A., Deluca, D.: Communication flow orientation in business process modeling and its effect on redesign success: Results from a field study. *Decision Support Systems*. 46, 562-575 (2009)
14. Miguel, P. A. C., Fleury, A., Mello, C. H. P., Nakano, D. N., Turrioni, J. B., Ho, L. L., Morabito, R., Martins, R. A., Pureza, V.: Metodologia de pesquisa em engenharia de produção e gestão de operações. Elsevier, Rio de Janeiro (2010)
15. Lazzarini, S.G.: Empresas em rede. Cengage Learning, São Paulo (2008)
16. Cross, R., Cummings, J. N.: Tie and network correlates of individual performance in knowledge intensive work. *Academy of Management Journal*. 47, 928-937 (2004)
17. Borgatti, S., Everett, M., Freeman, L.: UCINET for Windows: Software for social network analysis. Analytic Technologies, Harvard (2002)