Using social network analysis to improve enterprise communication

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Abstract. The fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point. [13].

Keywords: First keyword · Second keyword · Another keyword.

1 Introduction

1.1 Knowledge transfer models

The mathematical modeling of knowledge and information transfer processes has been addressed by several authors, among which we highligt the contributions of [15,13,12,14,6] also applied in solving selection problems such as [9,10,8,3]. A previous review on knowledge transfer can be found at [5,7,2]

Shannon-Weaver approach In 1949, Claude Shannon and Warren Weaver developed the first template to explain the entire process in which the signal is transmitted from one hand to the other. The model is named after the two thinkers as the Shannon-Weaver Model. In this model, the signal finally arrives at the destination from the source of the information, via the transmitter, under the disturbances of the noise. The above model can be regarded as the earliest

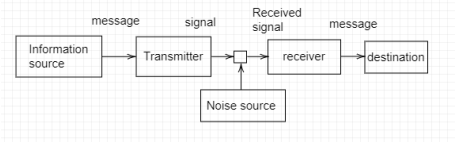

Fig. 1: Shannon and Weaver KT model

and simplest KT model. According to many scholars, the The design above can be called the earliest and easiest version of KT. The focus here is on the transmission and receipt of knowledge, according to many scholars. The design

is clearly linear, apart from its apparent technical bias. The signal is on a one-way street. It is not possible to reverse the transfer direction and there is no information feedback either.But in the design, we can see a clear breakthrough because it used the ”noise” function, which indicates that information is often transmitted under some poor conditions. We can see the invention brings insight on the following authors in the next item of this article.

Szulanki approach The model above can be considered to be the earliest and simplest model of KT. The emphasis here is on the transmission and reception of information, according to many scholars. The design is clearly linear, apart from its apparent technical bias. The signal is on a one-way street. The direction of the transfer can not be reversed and there is no feedback of information either. But in the model we can find a noticeable innovation because it used the ”noise” factor, which shows that knowledge is often transferred under some bad factors. We can see the innovation provides enlightenment on the following researchers in the forthcoming paragraph of this paper.

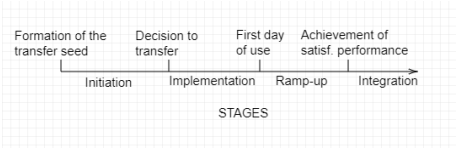

Fig. 2: Szulanki KT Model

Nonaka-Takeuchi approach The model above can be considered to be the earliest and simplest model of KT. The focus here is on the transmission and receipt of knowledge, according to many scholars. Besides its apparent technical bias, we can see that the design is clearly linear. The signal is on a one-way street. It is not possible to reverse the transition path and there is no data input either. But in the model we will find a noticeable invention because it used the ”noise” factor, which shows that knowledge is often transferred under some bad factors. We can see the innovation brings insight on the following authors in the upcoming item of this article.

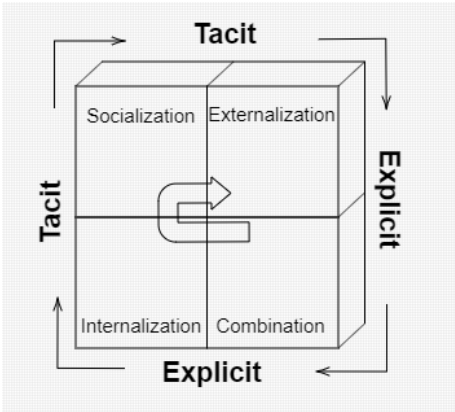

Fig. 3: Szulanki KT Model

Boisot approach Since all knowledge has different degrees of codification, abstractness and diffusibility, knowledge is dispersed in the Boisot-built I-Space at different points. Simultaneously, Boisot claimed that knowledge usually tends to be coded from uncoded, abstract from concrete, and diffused from undiffused if there is no resistance force. Boisot referred to the opposition as "Data Friction," and the inclination is to transfer point A to A as follows:

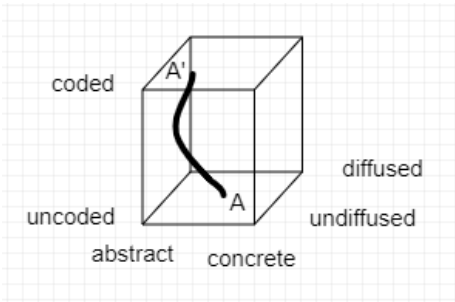

Fig. 4: Boisot KT Model

1.2 Social Network Analysis

According to [1] social network analysis is a collection of techniques under a methodology that allows us to create social structures by using graph theory and network analysis. Social structures can represent several kinds of different relationships between actors and assign weight to those relationships. It can represent the spread of disease or virus, interpersonal relationships, trust, influence, among many others. According to [4] SNA practice, it implies following an

analysis structure that suggests the following steps (adapted for our context in decision making by the authors):

- **Identification:** In this paragraph we notice the advice from [1] and define relational states as "relational cognition" in perceptual aspects. (Influence among them)
- **Analysis:** Measure the level of proximity for every actor in the network, to assign them different levels of importance.
- **interpretation of information:** Assign weights for every actor to use their influence in a dynamic group and improve Knowledge transfer process.

There are many proximity measures, in this work we use the measure [11]. The proximity can be compute as follows:

$$C_c^{'}(n_i) = \frac{g-1}{\sum_{j=1}^{g} d(n_i, n_j)} \tag{1}$$

Where: $d(n_i, n_j)$ is the distance between the actor n_i and the actor n_j, g is the sum of actors present in the network. The proximity measure proposed by Sabidussi can be seen as the average inverse distance between the actor (interested party in our problem) and all other actors. Proximity is the inverse measure of centrality because large values indicate that a node has high peripheral value, and small values indicate greater centrality in a node. A higher proximity index indicates less importance for each actor.

2 Case-study and methodology implementation

Avanza Colombia SAS, is a multinational dedicated to outsourcing services, among which are: industry, back office, advanced training and uniglobal, located in 6 countries and with headquarters of Colombia in the city of Bogotá, Avanza Colombia SAS, always in search of continuous improvement as well as being one of the companies with more commercial force in the country. The main focus of the following article focuses on the study of communication networks and how effective they are in a workgroup, these networks are characterized by having nodes, which represent the main actors participating in the system, these nodes they can connect with each other because they have similar characteristics or behaviors and thus obtain the final network. What you want to do with the study of networks, is to identify the quality of communication present in the area of quality and continuous improvement in the company Avanza Colombia SAS, this will help us understand how effective are the messages that are told to employees and therefore determine which are the main nodes of the network and which are the most isolated, this will help us understand how effective is the message that is being delivered to employees depending on whether you want the message to be Transfer by each of the employers, the same also identifies that staff can be told more secrets since it does not have a centrality that depends on other people. To achieve the aforementioned, a survey was conducted in the

area of quality with a series of questions that lead to identify the nodes with the level of importance of each one, this study can determine how the quality supervisor can do to speak strategically with a person and that this message can be expanded with total security, in the same way, it is possible to show that people can talk without risking that it can be shared with more staff.

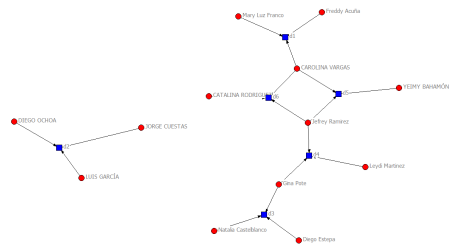

Fig. 5: Ucinet network

		1	2	3	4	5	6
		d	d	d	d	d	d
		-	-	-	-	-	-
1	LUIS GARC◆A	0	3	0	0	0	0
2	Diego Estepa	0	0	3	0	0	0
3	Gina Pote	0	0	1	3	0	0
4	CAROLINA VARGAS	3	0	0	0	3	3
5	Freddy Acu◆a	2	0	0	0	0	0
6	JORGE CUESTAS	0	2	0	0	0	0
7	Natalia Castelblanco	0	0	2	0	0	0
8	Leydi Martinez	0	0	0	2	0	0
9	YEIMY BAHAM◆N	0	0	0	0	2	0
10	CATALINA RODRIGUEZ	0	0	0	0	0	2
11	Mary Luz Franco	1	0	0	0	0	0
12	DIEGO OCHOA	0	1	0	0	0	0
13	Jefrey Ramirez	0	0	0	1	1	1

Matrix has 13 rows, 6 columns, and 1 levels.

Fig. 6: Ucinet network

3 conclusions

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