Knowledge Strategies in Using Social Networks

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Abstract. *Knowledge strategy selection is a multiple criteria decision-making (MCDM) problem, and requires adequate methods to solve it appropriately. Knowledge strategies are also intrinsically linked to individuals and their ability to comprehend the world and leverage their intellectual assets to respond effectively to a fast changing environment. The essential features of social networking sites include but are not limited to: blogging, grouping, networking and instant messaging. Since the social networks facilitate communication and interaction among users, there is a continuous need of researches to examine what are the motives that affect the acceptance of usage of the social networks. This study aims at examining the role of the knowledge strategies that individuals employ in using social networks with respect to the overall objective of increasing the knowledge level. For this purpose we have used the Analytic Hierarchy Process (AHP) mathematical model since it allows us a structuring of the overall objective on the main components. For the present research we considered a structure composed of three levels: L1 – the purpose of networking, L2 – strategies used to achieve that purpose, and L3 – activities needed for strategies implementation. At the upper level (L1), the main objective of a person in using social networks is to increase its knowledge level. To obtain the aforementioned objective we considered for the second level (L2) the following strategies: S1 – to learn from other persons; S2 – to make new friends; S3 – to increase the personal experience and visibility. The implementation of these strategies is realized through the following activities considered at the third hierarchy level (L3): A1– joining general social networks (e.g. Facebook, Google+, MySpace, Hi5 etc.); A2– joining professional social networks (e.g. LinkedIn etc.); A3– creating a personal blog (e.g. Blogster, Wordpress etc.); A4– joining online communities of practice. The study focused on students, as they hold very important percentage of the total users of social networks. A total of 700 questionnaires were distributed to 18-25 years old students and the rate of response was 42%. Based on the theory of eigenvalues, the AHP mathematical model provides the priority vectors for both the strategies and the activities levels, thus, underlining the main knowledge strategies employed in using social networks.*

Introduction

The emerging use of social media such as social networking sites changes our lives fundamentally and influences our handling of knowledge and information. Surveys on the use of social networking sites report that their usage has become the dominant out of school, leisure time computer using activity among youngsters of various ages, ethnicities, and income levels (Rideout et al., 2010 cited in Greenhow, 2011).

Boyd and Ellison (2007, p. 211) define social networking sites as "*services based on internet that allow individuals to build a public or semi-public profile within a system, create a list of other users that share a connection, and see and navigate through their list of connections and of those created by others within the system.*" In other words, social networking sites (SNS) offer to people new ways to build and maintain social networks, create relationships, share information, generate and edit content and participate in social movements through the Internet. In today's economic environment, social networks represent a source of competitive advantage. SNS are considered of great importance both for individuals and businesses, since they support the maintenance of existing social ties and the formation of new connections between users through the Internet (Boyd & Ellison, 2007).

Since their creation, SNS have been a topic of interest and research. Users across the world have signed up for accounts on SNSs in order to discover other people with similar interests or experience, to share personal information with both friends and strangers, or to establish business contacts. Young people use social network sites for a wide-range of purposes; they cling on existing online socializing routines to co-opt SNSs as social learning resources in direct and indirect support of education-related tasks and values. The youngsters use their online social network to fulfill social learning functions within and across informal and formal learning spheres of activity. Among the social learning functions can be includes: (a) obtaining validation and appreciation of creative work through feedback on their profile pages; (b) peer/alumni support – reaching out to former classmates to give or receive help in managing the ups and downs of high school or college life; or (c) help with school-related tasks (Greenhow, 2011). Therefore, investment in social networking sites may benefit individuals through greater access to and use of information, influence, social credentials, and reinforcement of identity and

recognition. Social networking sites have contributed to increasing numbers of contacts between users sharing common interests and to the creation of online communities and digital social networks. Having one or multiple accounts in SNS has become one of the most popular and faster growing internet activities; SNS applications attracted already hundreds of millions of users and the numbers are growing fast (Lorenzo-Romero, Constantinides & Alarcon-del-Amo, 2011).

Moreover, social networks are intangible resources. If we are to look at the intellectual capital at individual level and its components we could easily link social networks with social capital, or in a broader perspective to relational capital. The concept of "social capital" describes *"features of social life-networks, norms, and trust, that enable participants to act together more effectively to pursue shared objectives"* (Putnam, 1994 cited in Webb, 2008, p. 68); or *"the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition"* (Bourdieu, 1985, p. 243 cited in Ordóñez de Pablos, 2005). Therefore, social capital comprises both the network and the assets that may be mobilized through that network (Ellison, Steinfield & Lampe, 2007; Adler & Kwon, 2002). As human capital is embedded in people's heads, so social capital is embedded in the nature of personal relationships, and to possess it one must relate to others. Within this context, social networks are considered as means to foster the transfer, diffusion of information and knowledge, lower uncertainty and, dependent on the level of trust within networks, enhance economic development (Webb, 2008).

Within the current economic development, knowledge is considered one of the most important strategic resource, and the ability to acquire, integrate, store, share, and apply it the most important capability for building and sustaining competitive advantage both at individual level as well as organizational level. Penrose (1959) underlined that the capability to create value depends on one's ability to implement strategies that respond to market opportunities by exploiting internal resources and capabilities. Therefore an effective management starts with a proper strategy. The same holds truth in the case of knowledge management. In order to implement knowledge management successfully, one must first select a favorable knowledge strategy. Knowledge strategy selection usually involves subjective and qualitative judgment. More exactly, choosing knowledge strategies is a strategic issue, which is conditioned by resource needs, realistic support, time requirements, and conformity with expected outcomes, motivation among others. Thus, the knowledge strategy

selection is a multiple criteria decision-making (MCDM) problem, and requires adequate methods to solve it appropriately. Knowledge strategies are also intrinsically linked to individuals and their ability to comprehend the world and leverage their intellectual assets to respond effectively to a fast changing environment.

The rapid adoption and usage of SNS by many different users globally has raised important questions regarding these social platforms, such as how, why, where, and by whom they are used (Haythornthwaite, 2005). Some of the aspects of SNSs covered by research include social relationships, the nature of connecting with friends, identity creation and management, gender, employment, learning among others. Even though many aspects have been covered, many questions still remain regarding the usage of SNSs. The main purpose of this paper is to examine the role of the knowledge strategies that individuals employ in using social networking sites with respect to the overall objective of increasing the knowledge level.

Knowledge strategy selection

The research model

Knowledge strategy selection is a MCDM problem, and requires adequate methods to solve it appropriately. One of the methods that can be employed to solve a MCDM problem is the known Saaty's Analytic Hierarchy Processes (AHP) method. The AHP, developed by Saaty (1994, 2009) is designed to solve complex multi-criteria decision problems. It is a flexible and powerful tool for handling both qualitative and quantitative multi-criteria problems. The AHP is aimed at integrating different measures into a single overall score for ranking decision alternatives. The main characteristic of this method is the structuring of the main decision problem into a hierarchy where at the top is the goal of the decision, then the objectives from a broad perspective, through the intermediate levels (criteria on which subsequent elements depend) to the lowest level (which usually is a set of the alternatives), as depicted from figure 1, and afterwards construct the pairwise comparison matrices. In the pairwise comparison matrices each element in an upper level is used to compare the elements in the level immediately below with respect to it. The priorities obtained from the comparisons are used to weigh the priorities in the level immediately below. Then, for each element in the level below it is added its weight value and the global priority is obtained.
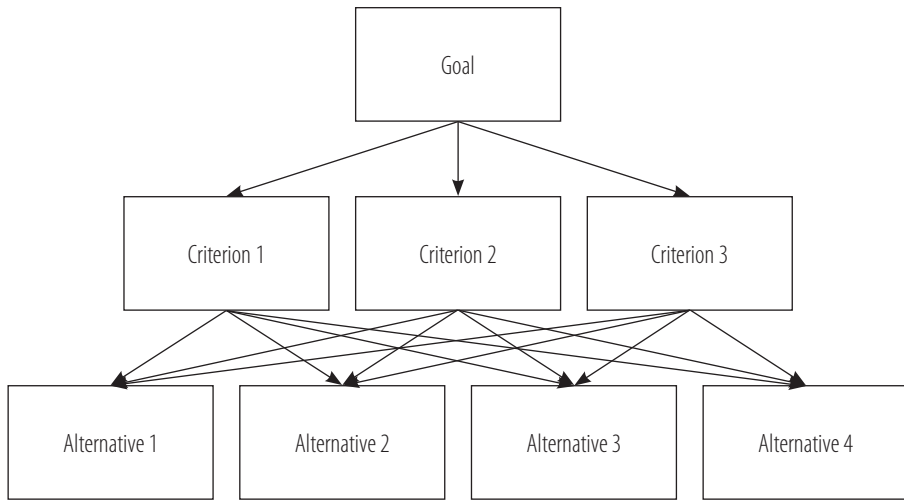
Figure 1: The generic structure of the AHP method

As previously discussed the first step in the AHP method is to develop the hierarchical structure, to define the predefined goal, the decision criteria supporting the goal and the sub-criteria supporting each criterion. Thus it is formulated the AHP method. Within this model all criteria and sub-criteria contribute to the goal. As the main aim of this paper is to examine the role of the knowledge strategies that individuals employ in using social networking sites in order to increase the knowledge level we have constructed a three level hierarchy: L1 – the purpose of networking, L2 – strategies used to achieve that purpose, and L3 – activities needed for strategies implementation, as shown in figure 2. Having in mind the overall objective of our research, but also, based on the frequency of usability of the SNSs, we have extracted the strategies and the activities necessary to construct the three level hierarchy from the literature available on the subject (Boyd & Ellison, 2007; Dickson & Holley, 2010; Dunne, Lawlor & Rowley, 2010; Ellison, Steinfield & Lampe, 2007; Haythornthwaite, 2005; Kayode, Zamzami & Olowolayemo, 2012; Li, 2011; Matthews & Stephens, 2010; Steiner, 2009; Webb, 2008).

Therefore, at the upper level (L1), the main objective of a person in using social networks is to increase its knowledge level. To obtain the aforementioned objective we considered for the second level (L2) the following strategies: *S1 – to learn from other persons; S2 – to make new friends; S3 – to increase the personal experience and visibility*. The implementation of these strategies is realized through the following activities considered at the third hierarchy

level (L3): *A1 – joining general social networks (e.g. Facebook, Google+, MySpace, Hi5 etc.); A2 – joining professional social networks (e.g. LinkedIn etc.); A3 – creating a personal blog (e.g. Blogster, Wordpress etc.); A4 – joining online communities of practice (CoPs)*. General networks, such as Twitter, allow users to "follow" selected users and receive their message updates, as well as promote themselves or their business to their own followers. The Twitter service allows people to keep abreast of trends and stay in touch with their contacts with a level of immediacy, regularity and intimacy that would be hard to replicate in the offline world. Professional networks, such as LinkedIn, allow members among other things to: work collaboratively by sharing files with their network through private workspaces or share information and keep up to date with their network. The choice of the professional social networks as strategy for increasing the knowledge level was made bearing in mind the characteristics of the target group of our study, the 18-25 years old students of Faculty of Business Administration. Due to the field of study, business administration, a high percentage of the students attending this specialization have part time jobs within the business environment, thus having an interest in the professional social networks or online communities of practice. Blogs enable a personal brand to be enhanced by articulating knowledge on specialist matters pertaining to the industry concerned, and provide opportunities for the individual's "story" to be told in a compelling and innovative way (Harris & Rae, 2011).
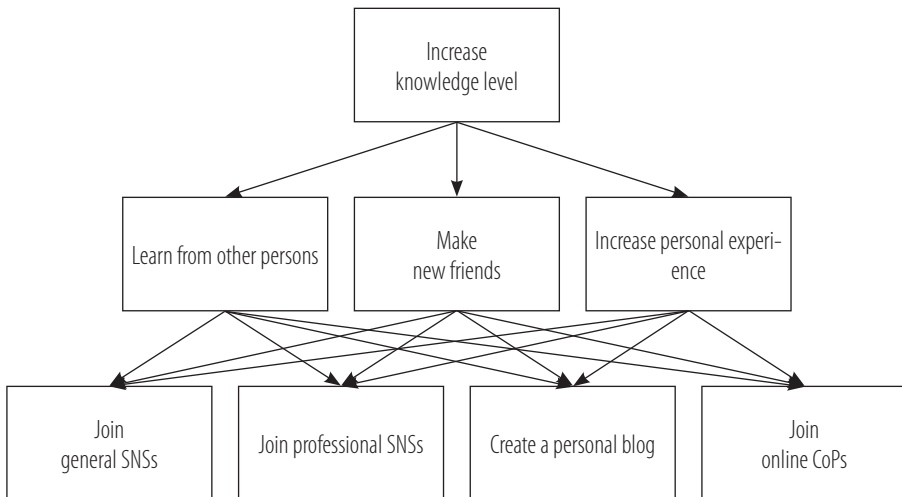

Figure 2: The structure of the AHP model used in research

The survey

The three level structure and the AHP methodology was transposed into a two parts questionnaire. In the following it will be presented the general form of the questionnaire. The first part of the questionnaire contained questions aimed at determining general information about the respondent and whether of not he or she is a user of SNSs and if so what are the SNSs that the respondent is a member of. The second part of the questionnaire was devoted to the determination of the priority vectors of the chosen strategies and criteria with respect to the overall goal of the study to increase the knowledge level. The scale considered for the research was from 1 (equally important) to 9 (extremely important). Questions were formulated in comparative terms, as shown below:

1.
    a. Given the goal, which of the two strategies do you consider to be more important: S1- to learn from others or S2 - to make new friends?
    b. How much more important is the previously chosen strategy with regard to the other strategy, on a scale from 1 to 9?
2.
    a. Given the goal, which of the two strategies do you consider to be more important: S1- to learn from others or S3 - to increase the personal experience and visibility?
    b. How much more important is the previously chosen strategy with regard to the other strategy, on a scale from 1 to 9?
3.
    a. Given the goal, which of the two strategies do you consider to be more important: S2 - to make new friends or S3 - to increase the personal experience and visibility?
    b. How much more important is the previously chosen strategy with regard to the other strategy, on a scale from 1 to 9?

When the priority of each criterion and sub-criterion is developed in the hierarchy, the actual evaluation of alternatives takes place. This involves yet another set of pairwise comparisons, this time between each alternative, evaluated against each criterion and sub-criterion. The determination of the priority vectors of the alternatives (A1– joining general social networks; A2– joining professional social networks; A3– creating a personal blog; A4–

joining online communities of practice) took into consideration the criteria in the above level of hierarchy. For example, for the first strategy, to learn from other people (S1), the questions were formulated as follows:

4.
   a. Given the strategy (S1), what do you think is more important: joining general social networks (A1) or joining professional social networks (A2)?
   b. Please indicate, on a scale from 1 to 9 to what extent you consider your previous choice is more important than the other one.
5.
   a. Given the strategy (S1), what do you think is more important: joining general social networks (A1) or creating a personal blog (A3)?
   b. Please indicate, on a scale from 1 to 9 to what extent you consider your previous choice is more important than the other one.
6.
   a. Given the strategy (S1), what do you think is more important: joining general social networks (A1) or joining online communities of practice (A4)?
   b. Please indicate, on a scale from 1 to 9 to what extent you consider your previous choice is more important than the other one.
7.
   a. Given the strategy (S1), what do you think is more important: joining professional social networks (A2) or creating a personal blog (A3)?
   b. Please indicate, on a scale from 1 to 9 to what extent you consider your previous choice is more important than the other one.
8.
   a. Given the strategy (S1), what do you think is more important: joining professional social networks (A2) or joining online communities of practice (A4)?
   b. Please indicate, on a scale from 1 to 9 to what extent you consider your previous choice is more important than the other one.
9.
   a. Given the strategy (S1), what do you think is more important: creating a personal blog (A3) or joining online communities of practice (A4)?
   b. Please indicate, on a scale from 1 to 9 to what extent you consider your previous choice is more important than the other one.

Similar questions to those from 4 to 9 established comparisons among alternatives A1 to A4 with respect to the next two strategies, S2 and S3, so that

a total of 21 questions are used as a base for establishing decision matrices associated with one respondent.

As previously mentioned one of the main characteristics of the AHP methodology is pairwise comparisons. The paired comparison judgments are applied to pairs of homogeneous elements and summarized in a matrix of judgments. Based on the aforementioned questionnaire four matrices of judgments were built: the first matrix, denoted with S, $S=(s_{ij})_{i,j=1,2,3}$, corresponds to the comparisons among the three strategies (*learn from others (S1), make new friends (S2), increase personal experience and visibility (S3)*), while the other three matrices, denoted $S_1^{A1,A2,A3,A4}$, $S_2^{A1,A2,A3,A4}$ and respectively $S_3^{A1,A2,A3,A4}$, correspond to the choices made among the alternatives *join general SNS (A1), join professional SNS (A2), create a personal blog (A3) and join online communities of practice (A4)* with respect to the three strategies. All of the four matrices are positive, reciprocal ($s_{ij}>0$, $s_{ij}=1/s_{ii}$, $i,j=1,2,3,4$ and $i\neq j$) and have one on the main diagonal ($s_{ii}=1$, $i=1,2,3,4$).

Data processing and discussion

The present study focused on students, as they hold very important percentage of the total users of social networking sites (Kayode, Zamzami & Olowolayemo, 2012; Dunne, Lawlor & Rowley, 2010). A total of 700 questionnaires were distributed to 18-25 years old students from the Faculty of Business Administration, and the rate of response was 42%. The priority vectors resulted from the four matrices associated to each respondent were calculated using the Gauss program, version 10.0.

Within the sample more that 50% of the respondents were female. The degree of usage of the social networking sites among the respondents is almost 95%, thus confirming the initial hypothesis that the youngsters hold a great majority of the SNSs users.

If we were to study the priority vectors of the matrixes associated with a random respondent we would have the following interpretation: The random individual considers that with respect to the overall objective of increasing the level of knowledge the most important strategy is strategy S2 – to make new friends, as it holds the highest weight of the elements of the priority vectors (Table 1). The second most important strategy is strategy S3 – to increase personal experience and visibility, with a weight of 0.18. The strategy with the

lowest weight of the three, 0.099, resulting in the least preferred strategy is strategy S1 – to learn from other persons.

Table 1. Priority vectors for matrix S

Respondent 91	S1	S2	S3
Priority values	0.099	0.719	0.180
A1	0.086	0.666	0.304
A2	0.684	0.069	0.359
A3	0.120	0.088	0.305
A4	0.108	0.175	0.029

For the selected respondent, with respect to strategy S2 – to make new friends, the most important alternative is alternative A1- joining general SNSs, as it holds the highest weight of the priority vector, 0.666 (Table 2). Ranking two in the order of most important alternatives with respect to strategy S2 – to make new friends is alternative A4 – joining online communities of practice, with a weight of 0.175. Among the least preferred alternative for the selected respondent are alternative A3 – creating a personal blog, with a weight of 0.088, and A2 – joining professional SNSs, with a weight of 0.069.

Table 2. Priority vectors for matrixes $S_1^{A1,A2,A3,A4}$, $S_2^{A1,A2,A3,A4}$ and $S_3^{A1,A2,A3,A4}$

	Priority vectors
S1	0.099
S2	0.719
S3	0.180

In order to establish the composite priorities of the alternatives considered we lay out in a matrix the local priorities of the alternatives with respect to each criterion and multiply each column of vectors by the priority of the corresponding criterion and add across each row, thus resulting in the composite priority vector of the alternatives. The corresponding results for the composite priorities of the alternatives for the selected respondent are presented in Table 3.

Table 3. Composite priority vectors of the alternatives

Respondent 91	Composite priorities
A1	0.307
A2	0.374
A3	0.266
A4	0.050

Therefore, for the selected respondent we can conclude that, with respect to the overall objective of increasing the level of knowledge the most preferred alternative is alternative A2 – joining professional SNSs, with the highest weight of the vector of priorities of 0.374. Alternative A1 – joining general SNSs, is the second most preferred activity when increasing the level of knowledge, with a weight of the priority vector of 0.307. With a weight sensitively smaller than alternative A1, alternative A3 – creating a personal blog is ranking third in the list of activities preferred when increasing the level of knowledge, whereas alternative A4 – joining online communities of practice is the least preferred activity, having the smallest weight of the vector of priorities, 0.0506.

The individual vectors of priorities for the pairwise comparison matrices were averaged over all the respondents in order to obtain the global values of the vectors of priorities as can be seen from table 6. Thus, at global level the respondents of the survey prefer with respect to the objective of increasing the level of knowledge strategy S3 – to increase personal experience and visibility, as it holds the highest weight of the three proposed strategies, 0.52. Strategy S1 – to learn from others is ranking second out of the three proposed strategies with the weight of 0.27. And the least preferred strategy is strategy S2- to make new friends, as it has the lowest weight out of the elements of the vector of priority for the strategies matrix.

Table 4. The global priority vectors for the four matrices resulted from the questionnaire

TOTAL	S1	S2	S3
Priority values	0.278	0.196	0.525
A1	0.228	0.475	0.236
A2	0.360	0.185	0.323
A3	0.106	0.103	0.157
A4	0.303	0.235	0.281

The aggregation of the global vector of priorities for the alternatives was done using the same logic as in the case of the aggregation of the composite vector of priorities for the alternatives at individual level. The results of the aggregation of the global vector of priorities for the alternatives are presented in table 5.

Table 5. The global vector of priorities for the alternatives

TOTAL	Global priority vector for the alternatives
A1	0.281
A2	0.307
A3	0.132
A4	0.278

According to the results presented in table 5, at global level the respondents considered that alternative A2 – joining professional SNSs is the most important for increasing the level of knowledge, closely followed by alternative A1 – joining general SNSs, with a weight of 0.28. This result can be connected with the fact that more than 80% of the respondents are members of at least one general social networking site, such as Facebook, Google +, Twitter. Another alternative preferred that can be used with respect to the overall objective of increasing the level of knowledge is alternative A4 – joining online communities of practice. Out of the four alternatives, the least preferred, with a weight of 0.13, is alternative A3 – creating a personal blog.

Conclusions

The main purpose of this paper was to examine the role of the knowledge strategies that individuals employ in using social networking sites with respect to the overall objective of increasing the knowledge level. As the choice of knowledge strategies is conditioned by resource needs, time requirements, motivation and the individual ability to comprehend the world, the selection of knowledge strategies is, therefore, a multiple criteria decision making problem, that requires adequate methods to solve it appropriately. As the main aim of this paper is to examine the role of the knowledge strategies that individuals employ in using social networking sites in order to increase the knowledge level we have chosen to investigate the problem by using the Analytic Hierarchy Process (AHP) method, developed by Saaty. For that reason we have constructed a three level hierarchy: L1 – the purpose of networking, L2 – strategies used to achieve that purpose, and L3 – activities needed for strategies implementation, as shown in figure 2. At the upper level (L1), the main objective of a person in using social networks is to increase its knowledge level. To obtain the aforementioned objective we considered for the second level (L2) the following strategies: *S1 – to learn from other persons; S2 – to make new friends; S3 – to increase the personal experience and visibility*. The implementation of these strategies is realized through the following activities considered at the third hierarchy level (L3): *A1 – joining general social networks (e.g. Facebook, Google+, MySpace, Hi5 etc.); A2 – joining professional social networks (e.g. LinkedIn etc.); A3 – creating a personal blog (e.g. Blogster, Wordpress etc.); A4 – joining online communities of practice (CoPs).* A total of 700 questionnaires were distributed to 18-25 years old students and the rate of response was 42%. The present study focused on students, as they hold very important percentage of the total users of social

networks. The priority vectors associated to each respondent were calculated using the Gauss program, version 10.0.

The results of the study reveal that the respondents prefer in order to increase the level of knowledge the strategies to increase personal experience and visibility and to learn from others and with respect to alternatives to join professional and general social networking sites. The results can be connected with the fact that more than 80% of the respondents are members of at least one general social networking site, such as Facebook, Google+, Twitter, validating thus the method chosen.

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