

An Empirical Analysis on Social Capital and Enterprise 2.0 Participation in a Research Institute

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Abstract —Social capital broadly refers to the opportunities an individual has by being part of a network of relationships. Recently organizations started deploying internal Enterprise 2.0 platforms and Social Network Sites (SNS) to improve how employees collaborate and work. In this paper we report our analysis of the relationships between social capital and the use of a SNS in a research institute. Data collected through a survey from 54% of its 670 employees have been investigated with factor and regression analysis. We found users enabled to use the system, currently one third of all employees, have significantly higher social capital. Moreover social capital correlates with self-reported intensity of SNS usage, while we did not find statistically significant correlation with real usage extracted from system logs but for the unexpected fact that heavy users exhibit a smaller knowledge of their colleagues. We also find significant relationships between social capital and different demographic features such as seniority, job role, age, gender. There are few studies analyzing the real impact of SNSs on employees ability to collaborate. We believe further work is needed in this area so we released the SNS we developed as open source software, aiming at promoting its adoption by other organizations. We also released the dataset we collected in this analysis for comparative purposes.

Recently organizations started deploying advanced Web portals on their intranets, sometimes called Enterprise 2.0 [1]. Similar in inspiration to Web2.0 and social network sites such as Facebook, Flickr or Youtube, their goal is to improve collaboration among employees by letting them elicit and organize knowledge relevant for their daily job needs.

In this paper, we report an analysis of the relationships between Social Capital and usage of an Enterprise2.0 system deployed in Fondazione Bruno Kessler (FBK), a research institute in Italy. Social capital [2] broadly refers to the set of resources embedded in a social network. In particular, individual social capital is used to frame the opportunities a specific individual may have simply by being part of a web of social ties. We collected empirical data of individual social capital, through a survey sent to the 670 employees of FBK in December 2009: researchers, interns, technicians and administrative staff. We received 362 answers (54%).

We also released the Enterprise2.0 system [3], named Taolin, as open source at <http://taolin.fbk.eu> so that other organizations could reuse it and possibly replicate our study. We have also released the dataset we collected at <http://sonetlab.fbk.eu/datasets/>

Our work aims to validate and replicate the seminal paper by Steinfield et al. [4]. The main difference is that we analyze patterns both for users of the Enterprise2.0 systems and for

non-users, i.e. employees who were not enabled to use the platform, in order to explore differences in social capital between users and non-users. In December 2009, 200 employees were enabled to use the system and 119 of them replied to our survey.

Participants to the survey were asked to express their agreement on different statements: 14 statements, referring to the social capital dimensions, were administered to all participants, while 10 additional statements, concerning aspects of the platform usage, were administered only to enabled users. The statements are slightly adapted from [4] so that our results can be compared. We also collected demographic data such as age, gender, number of years in FBK, etc. We also collected, only for users, additional data about platform usage, such as number of logins in the 30 days preceding the survey administration, use of features such as chat messages or profile views of colleagues.

In order to find common patterns among the 14 statements, we used exploratory factor analysis and factor them into five different dimensions of social capital (see Table 1). *Bonding social capital* refers to the perceived availability of strong ties within the organization, represented by agreement with statements such as “If I need an emergency loan of 300 Euros there is someone at FBK I could ask to loan it to me”). The other dimensions refer to *bridging social capital*, i.e. existence of many weak ties spanning also research groups different from your own. Following [4], we named two of these dimensions as *access to new people* and *citizenship*. We also find dimensions not present in [4]: *desire of networking*, representing the willingness to develop new ties and discover other people's interests and *knowledge of colleagues*, referring to the self-reported assessment about the amount and quality of personal current ties. These five factors explain more than 50% of the cumulative variance. The 10 additional statements, asked only to users about their platform usage, were grouped into three dimensions: *intensity of site use*, *use site for new contacts* and *use site for existing contacts*.

In order to investigate if there is a correlation between social capital of FBK employees and their use of the Enterprise2.0 platform, we used regression analysis selecting as dependent variables the 5 factors of social capital (see Table 1). As independent variables we used three different sets of measures: measures about site usage as coming from the survey, measures about site usage as coming from logs of real usage of the system and demographic information about FBK employees such as age, years as employee in FBK, gender, job role. The first two set of measures were available only for enabled users.

TABLE I. REGRESSION ANALYSIS

Independent variables	Dependent variables				
	Bonding social capital	Bridging social capital			
		Access to new people	Citizenship	Desire of networking	Knowledge of colleagues
Enabled as user	0.29 *	0.37 ***	0.27 *	0.36 ***	0
Site Measures From Survey					
Intensity of site use	0.23 *	0.18 *	0.22 *	0.34 ***	0.17 *
Use of site for existing contacts	0.02	0.17 *	0.10	0.34 ***	0.11
Use of site for new contacts	0.06	0.17 *	0.21 *	0.46 ****	0.23 **
Site Measures From Logs					
Days in desktop.fbk.eu	-0.12	-0.08	-0.04	-0.14	-0.07
Logins in last 30 days	-0.23	-0.2	-0.07	-0.04	-0.33 **
Profile views	-0.12	-0.06	-0.11	0.06	-0.09
Sent chat msgs	-0.04	-0.21	-0.35	0.18	-0.22
Sent feedbacks	-0.02	-0.14	-0.11	-0.13	-0.33
Demographic indicators					
Years at FBK	0	-0.07	0	-0.31 ****	-0.08
Age	-0.01	0	0.06	-0.21 ****	0.04
Short term contract	-0.19	-0.03	-0.14	0.48 ****	-0.01
Administrative (non-researcher)	0.12	0.22 *	0.42 ****	-0.07	0.15
Language of survey English	-0.03	-0.03	-0.13	0.23 **	0
Female	0.06	0.04	0.07	0.05	0.21 *

[* p < .05, ** p < .01, *** p < .001, **** p < .0001]

Table 1 shows the correlation coefficients resulting from the regression analysis. Here we comment the cells who report coefficients that are statistically significant.

First, being enabled as user of the system is positively correlated with four social capital dimensions. This analysis was not present in [4] because the survey was sent only to users who were using the system. Precisely, being enabled as user correlates positively with desire of networking and access to new people (significant at a p<.001 level). A possible explanation is people who enrolled for using the system desire to get in contact with other colleagues and also have the perception of getting to know many new colleagues. It is also

correlated (at a p<.05 level) with bonding social capital and citizenship. In fact, one of the main goal of Taolin is to “give a face” to colleagues and one of the most prominent features is the possibility of viewing the profile of colleagues [3].

Our other results tend to confirm [4]: intensity of site use correlates positively with all social capital measures. The use of site for new and existing contacts also have similar patterns of positive correlation with social capital dimensions.

All the indicators of usage, as extracted from server logs, are not significantly correlated with social capital measures. Surprisingly, amount of logins is negatively correlated with one dimension of social capital, knowledge of colleagues: the more logins a user made in the last 30 days, the smaller is knowledge of other colleagues. A possible explanation is the fact users who log in the system frequently get a real picture of how many colleagues and different research areas there are in FBK and how many new people join weekly and so a frequent user may possibly have a greater awareness of how difficult it is to have a large knowledge of other colleagues.

About demographic measures, age, years at FBK and having a long term contract correlate negatively with desire of networking. The possible explanation is that young people, new employees and employees with short-term contracts have more incentives in networking and looking for developing new ties with many new people. Similar point can be made for people replying to the survey in English. Being part of the administrative staff correlates positively with citizenship. One possible explanation is that a substantial part of the duties of administrative staff is to mentor new employees and to assist other colleagues in technical matters and in several bureaucratic procedures, thus resulting in a greater self-perception of organizational citizenship. Being female correlates positively with knowledge of colleagues. This slightly confirms findings by [4], who found that being female correlates positively with interest in global connection and ability to access expertise.

Summarizing, our empirical analysis confirm findings by [4]. Results not present in [4] are about users of the systems having higher social capital than non-users and heavy users exhibiting a lower knowledge of colleagues. This might indicate an Enterprise 2.0 platform is successful in letting employees developing a more real picture of the organization and in unveiling the amount of ties each employee can tap into in order to be more productive and in general to work better.

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