EXPLORING INTELLECTUAL CAPITAL THROUGH SOCIAL NETWORK ANALYSIS: A CONCEPTUAL FRAMEWORK

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Abstract

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The purpose of this paper is to develop a framework to assess intellectual capital. Intellectual capital is a key element in an organization's future earning potential. Theoretical and empirical studies show that it is the unique combination of the different elements of intellectual capital and tangible investments that determines an enterprise´s competitive advantage. Intellectual capital has been defined as the combination of an organization´s human, organizational and relational resources and activities. It includes the knowledge, skills, experience and abilities of the employees, its R&D activities, organizational, routines, procedures, systems, databases and its Intellectual Property Rights, as well as all the resources linked to its external relationships, such as with its customers, suppliers, R&D partners, etc. This paper focuses on the relational capital and attempts to suggest a conceptual framework to assess this part of intellectual capital applying social network analysis approach. The SNA approach allows for mapping and measuring of relationships and flows between, people, groups, organizations, computers, URLs, and other connected information/knowledge entities. The conceptual framework is developed for the assessment of collaborative networks in the Czech higher education sector as the representation of its relational capital. It also builds on the previous work aiming at proposal of methodology guiding efforts to report intellectual capital at the Czech public universities.

intellectual capital, relational capital, social network analysis, collaborative networks, higher education

Rising importance of knowledge in a business and its competitive standing stemming from the resource-based view of a firm has led to a focus on human capital. Human Capital is viewed as a unique, hard to imitate resource providing for a sustainable competitive advantage (see among others work of Hitt *et al.*, 2001, Wright *et al.*, 1994). Some other authors (Melbourne, T. M., Pardo del Val, M., 2008) however argue, that it is not the human capital that is most important to success because it is not the human, per se, that is the real asset but the relationships those humans have that are the most inimitable and important capital. The relationships people within organizations have developed are the focus of this paper. The aim of the paper is to develop a framework to assess relational capital of higher education institutions with the application of social network analysis and thus builds on key concepts that have emerged from research that illustrate the potential for using network theory to guide knowledge exchange and higher education sector development.

MATERIAL AND METHODS

The paper builds on theoretical background of two key concepts: intellectual capital and social network analysis and by combining these two concepts attempts to develop a conceptual framework for an assessment of relational capital.

Intellectual capital and relational capital – theoretical background

There is no consensual view about what intellectual capital is. A plethora of intellectual capital terminologies are used in various disciplines, yet no broadly accepted definition of intellectual capital exists.

According to guidelines produced by researchers from universities across Europe, (Canibano, L. *et al.,* 2002), human capital is defined as the knowledge, skills and experience that employees take with them when they leave. Some of this knowledge is unique to the individual; some may be generic. Examples are innovation capacity, creativity, know-how and previous experience, teamwork capacity, employee flexibility, tolerance for ambiguity, motivation, satisfaction, learning capacity, loyalty, formal training and education. Relational capital is defined as all resources linked to the external relationships of the firm – with customers, suppliers or partners in research and development. It comprises that part of human and structural capital involved with the company's relations with stakeholders (investors, creditors, customers, suppliers), plus the perceptions that they hold about the company. As organizations move towards becoming extended enterprises, the relationships in the emerging network will enable the trust and communication necessary for any effective strategy and action. Relationship capital is also essential for an enterprise to co-create its products and services – with its customers, as they provide continuous, rapid feedback to the enterprise as to what will satisfy their needs. Examples of this are image, customer loyalty, customer satisfaction, links with suppliers, commercial power, negotiating capacity with financial entities and environmental activities. Structural capital is defined as the knowledge that stays within the firm. It comprises organisational routines, procedures, systems, cultures and databases. Examples are organisational flexibility, a documentation service, the existence of a knowledge centre, the general use of information technologies and organisational learning capacity. Some of them may be legally protected and become intellectual property rights, legally owned by the firm under separate title.

Human, Structural and Relational Capital often work together in judicious combinations to give rise to core competencies that assume strategic significance.

Social network analysis

There has been a considerable growth of interest in the potential offered by the relatively new techniques of social network analysis. Social network analysis emerged as a set of methods for the analysis of social structures, methods that specifically allow an investigation of relational aspects of these social structures. The network perspective emphasizes structural relations as its key orienting principle, where social structure consists of "regularities in the patterns of relations among concrete entities: it is not a harmony among abstract norms and values or a classification of concrete entities by their attributes". (White, Boorman, Brieger, 1976, pp. 733–734) Entities may be individual persons, small groups, organizations, or even states. The regular patterns of relations connecting a set of entities comprise macrosocial contexts, or overall structure, that influences their perception, beliefs, decisions, and actions.

The importance of social network analysis rests on three underlying assumptions about patterned relations and their effects. First, structural relations are
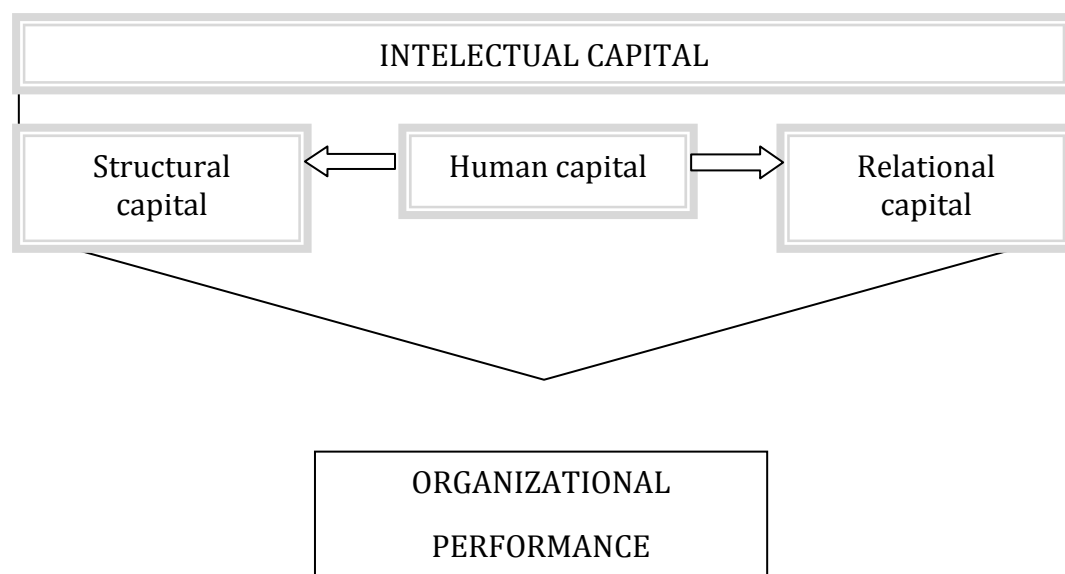
1: *Intellectual capital – theoretical model*

often more important for understanding observed behaviour than the attributes characterizing the entity. Many attributes remain unaltered across the various social contexts in which entities participate, while structural relations exist only in time-and-place specific locales and either disappear or are suspended when participants are elsewhere. Second, social networks affect perceptions, beliefs, and actions through a variety of structural mechanisms that are socially constructed by relations among entities. Direct contacts and more intensive interactions dispose entities to better information, greater awareness and higher susceptibility to influencing or being influenced by the others. Indirect relations through intermediaries also bring exposure to new ideas and potential access to useful resources that may be acquired through transactions with others. By channeling information and resources to particular structural locations, network help to create interests and shared identities and to promote shared norms and values. A third underlying assumption of network analysis is that structural relations should be viewed as dynamic processes. This principle recognizes that networks are not static structures, but are continually changing among their constituent people, groups, or organizations. In applying their knowledge about networks to leverage advantages, these entities also transform the relational structures within which they are embedded, both intentionally and unintentionally. The core issue is how large-scale systemic transformation emerges out of the combined preferences and purposive actions of individuals. Because network analysis simultaneously encompasses both structures and entities, it provides conceptual and methodological tools for linking changes in micro-level choices to macro-level structural alterations.

RESULTS AND DISCUSSION

Essential to the network approach is an understanding that behaviour is embedded in social relationships. This section provides a synthesis of the key networks concepts describing relations capital of the higher education institutions.

Selection of relational data. As relevant boundaries can be identified (the higher education sector), the framework adopts the positional approach to define target population for study. This approach uses the attributes of actors, their membership in a formal organization, or their occupancy of a well-defined position for inclusion in a network

Actors and relations – the two indispensable elements of any social network. While the actors of the network are the academic employees of the higher education sector, the relations include both directed and undirected connections. The following relations are subject to assessment:

R1: number of academic exchanges (Erasmus, Ceepus, Fulbright, etc.)
R2: number of incoming research visits
R3: number of outgoing research visits
R4: co-tutorship PhDs
R5: external partnerships (other universities and business environment).

Pattern of connections. The concepts of graph theory are used to describe the pattern of connection among points. The simplest of graph theoretical concepts refer to the properties of the individual points and lines from which a graph is constructed, and these are the building blocks for more complex structural ideas. As the intensity of relations is an important consideration and can be represented by a numerical value, the valued graph is constructed in which numerical values are attached to each of the lines.

CONCLUSIONS

The paper provides a brief overview of the two concepts frequently worked with in recent management literature: intellectual capital and social network analysis. Relational capital as part of the intangible assets of organizations is modified for the purpose of the use of the concept in the specific sector of higher education. The five types of academic relations are proposed to be assessed with the use of social network analysis.

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