

# Building Educational and Marketing Models of Diffusion in Knowledge and Opinion Transmission

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**Abstract.** Group communication and diffusion of information and opinion are important but unresearched aspect of collective intelligence. In this paper a number of hypotheses are proposed in discussed. Each hypothesis proven would be a considerable step towards creating a complete and coherent model of group communication, that could be used both in computer and human sciences. This paper also discusses some methodology that may be used by researchers to determine the hypotheses.

## 1 Introduction

Communication processes are an important aspect of social groups dynamic. They also have a large impact on collective intelligence in human groups and thus influence the collective intelligence models in computer science. Information diffusion in social groups is an especially interesting area, as it may be used in global education, e-learning, business flow of information and more. Group communication is becoming a forecasting field of knowledge which is especially important in the case of unlimited abilities of information flow. Recognizing theoretical mechanisms of diffusion allows one to foresee the directions of spreading opinions, information about the products and purchasers. It also allows one to foresee some force structures after a political group disintegration.

In this paper we point out and discuss a series of open questions and hypotheses based on them. These question and hypotheses differ from basic ones (with time groups adopt similar language) to very practical ones (better communications reduces physical stress). Some of them were considered in other areas of research, but in this paper we point towards the need to observe the real communications in order to determine the real world characteristics of the process. Much of the paper may be understood as an outline of a large experiment, where computer scientists and sociologists would cooperate to determine the real world aspects of collective intelligence. Gathered data could then be used to create new

models of information diffusion in social groups – we outline possible approaches to creating such models. Finally, the models may be again tested in real world situations, by using them to improve the communication skills of educators and others.

This paper is organized as follows: Section 2 provides a short overview of relevant literature in human and computer science; Section 3 provides a group of open research questions and discusses them shortly; the last Section 4 provides a discussion of possible approaches to solving the problems with computer science tools.

## 2 Related Works

This paper is based in part on theoretical assumption of network communication made in [3,4,12], which also suggest this problem niche.

One of the basic social capital definition has been suggested in [10]. It states that social capital is formed by those social organization features such as networks (arrangements) of individuals or households, as well as related with them norms and values which create outside effects for the whole community [9]. The main advantage resulting from high social capital is reduction of transactional costs e.g. the costs connected with concluding contracts, court proceedings, and other formal actions. It concerns an economic sphere of life. High level of social capital is associated with sound civil state functioning, as well as with creating groups and associations being a fulfillment between the state and family. Lack of social capital causes social dysfunctions (corruption, terrorism etc.) and may lead to an economic shortage or decrease. The crucial element of social capital is trust.

Voluntary cooperation is also dependent on the social capital. Norms of generalized reciprocation and social involvement networks are favorable to social trust and cooperation because they decrease the advantages connected with breaking off. They also reduce uncertainty and provide future cooperation patterns. The trust itself is a newly formed social systems property and in the same degree a personal quality. Individuals are able to trust (its not only naivety) thanks to social norms and interdependence networks covered by their actions. The social capitals components are: communication and participation network, trust, divisible norms and values [11].

Through social phenomena examination, both in a real world and in virtual space, social groups features can be observed, as well as the relations between them. The group should be consider in categories of relations between individuals features and between the individuals (attributes themselves are not enough). Social research requires taking into account the two of possible attitudes- individuals attributes, and the context they exist [1].

Relations in the Internet space may be examined by social networks analysis, using the method set created to test formed in the Net structures, including persons or objects which are related [5,12].

The theory of consensus which some of proposed research is based on was developed based on sociological sciences and is based in Consensus Theory [8].