Following Traces of Collective Intelligence in Social Networks: Case of Lithuania

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Abstract: One might argue that social technologies continue to grow in popularity driving economic and societal changes and thus gain potential to influence policies. "In the last few years groups of people, connected by the Internet, collectively creating a very large and high quality intellectual products with almost no centralized control, determined emergence of a new kind of intellectual capital - collective intelligence" (hereinafter CI) (Goyal, Akhilesh, 2007). Volumes of literature published exhibit the growing interest in the field of CI thereby justifying the relevance of the problem CI's emergence, development and employment. Despite some efforts (e.g. Luo et al. 2009, Gan et al. 2007, Malone et al. 2010), generally accepted frameworks for studying collective intelligence in human behaviour either does not exist or research is fragmented and lack of complex structure. Furthermore, due to the lack of a common framework, it is not possible to assess what is already known and to tie the efforts of different disciplines together (Salminen, 2012). The variety of mediums where products of CI could be introduced is extensive. Exploring the potential of CI could help communities become more productive and help societies solve their problems more effectively. The paper aims to investigate possibilities and barriers to employ social networks as participatory instruments in terms of introducing CI developed in these networks into public policy. An expansion of forms of public participation is extremely relevant for young democracies like Lithuania where the culture of participation in public policy is still ill developed. Therefore it is very important to stimulate and support the emergence of innovative participatory instruments that could foster public engagement in policy formation. In order to achieve the research goal, applying analytical and case study methods, following activities were undertaken. We analysed the phenomena of CI and its potential, benefits for tackling of societal changes as well as preconditions of co-creation of value in social networks. Theoretical analysis is followed with examination of the environment of public participation in Lithuanian policy formulation in and overview of social technology based Lithuanian networks (platforms) that are targeting to influence public policy. The preliminary research demonstrates that the number of social projects, funded by public organizations or private persons, is constantly growing in Lithuania. However other researches demonstrate that Lithuanian policy makers are conservative enough in selection of participatory instruments. Thus introduction of intellectual capital in form of CI developed in social networks in public policy remains fragmented in Lithuania and requires the shaping of new framework of participation.

Keywords: intellectual capital, social technologies, social network, collective intelligence, community management, public participation, virtual community project

1. Defining collective intelligence

"While some researchers argue that learning is essentially an individual activity, most theories of organizational learning stress the importance of collective knowledge or collective intelligence as a source of organizational capability" (Goyal, Akhilesh, 2007). Collective intelligence differs from individual intelligence because it encompasses a social dimension, groups and organizations develop collective mental models (Senge, 1990) and interpretive schemes which affect group decision-making and action. In recent years, there has been a surge of research activity into collective intelligence. Massachusetts Institute of Technology, one of the most reputed academic institutions of USA has established a centre called the "MIT Centre for Collective Intelligence" for understanding and taking advantage of the phenomenon of collective intelligence. Some of the most notable outputs of collective intelligence, according to them, include Google, Wikipedia, and InnoCentive. "Study of collective intelligence in humans is a relatively new field, for which huge expectations are set, for example through speculations on the emergence of the Global Brain (Heylighe,1999). The detailed overview on collective intelligence definition is given by J.Salminen (2012). Approaches to studying collective intelligence have been diverse, from the purely theoretical (Szuba, 2002) and conceptual (Luo et al. 2009) to simulations (Bosse et al. 2006), case studies (Gruber 2007), experiments (Woolley et al. 2010) and systems design (Vanderhaeghen and Fettke, 2010). It is the general ability of a group to perform a wide variety of tasks

(Woolley et al. 2010). The phenomenon is closely related to swarm intelligence, which means collective, largely self-organized behaviour emerging from swarms of social insects (Bonabeau and Meyer 2001).

New forms of collective intelligence emerge because of the Internet, web 2.0, 3.0 and social media tools, no wonder that interest in the field is rising (Salminen, 2012). A wide range of different aspects and components of "collective intelligence" which have been studied, at various levels, directly or indirectly, include the following according Goyal, Akhilesh (2007):

> *"social networks of individual and organization, social interaction, familiarity and interpersonal trust" (Chang and Harrington, 2005; Akgun et al., 2005);*
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> *"group cohesion" (Wang et al., 2006);*
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> *"diversity, strength of relationship, position in the network, group identification" (Van der Vegt and Bunderson, 2005);*
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> *"strategic communities, self-organizing innovation networks, self-managing teams" (Rycroft and Kash, 2004);*
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> *"inter functional linkages, public institution and policy frameworks, characteristics of the entire sociotechnical network of which a firm is part, informal ties and incubators" (Smilor, 1987; Lumpkin and Ireland, 1988); and "between university and industry" (Rothschild and Darr, 2005; Kreiner and Schultz, 1993);*
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> *"shared governance, collaborative leadership or distributed leadership" (Bradford, Cohen, 1998; Spillane, 2007)*
>
> *"collective intelligence is a form of universal, distributed intelligence, which arises from the collaboration and competition of many individuals" (Levy, 2010).*
>
> *"collective intelligence could also be defined as a statistical phenomenon of the „wisdom of crowds" effect" (Lorenz et al. 2011). The term „wisdom of crowds" was coined by Surowiecki (2005) and it describes a phenomenon where, "under certain conditions, large groups can achieve better results than any single individual in the group. For example, the average of several individuals "estimates can be accurate even if individual estimations are not" (Surowiecki 2005).*

We define collective intelligence as groups of individuals acting collectively in ways that seem intelligent in this paper. The field is also multidisciplinary according Salminen (2012) as it is related to psychology (Woodley and Bell 2011), complexity sciences (Schut, 2010), cognitive studies (Trianni et al. 2011), biology (Bonabeau and Meyer 2001), computer sciences and semantics (Levy 2010) and social media (Shimazu and Koike, 2007). At the moment, there is no theory capable of explaining how collective intelligence actually works (Schut, 2010). It is challenging for researchers from different disciplines to be aware of advancements in other fields, possibly under differently named concepts" (Salminen, 2012).

Scientific observation and analysis of the social impact of technology on development of collective intelligence raises a lot of problems. Following scientific questions could be formulated: how different social projects could become a possibility to effect positive changes in communities and government, how to increase engagement of passive society into decision making process, what technologies would help to structure the information, purify the positions, reconcile different opinions and formulate the real society voice. "The explosion of user-generated content referred to as Web 2.0, including blogs, wikis, videoblogs, podcasts, social networking sites, streaming, and other forms of interactive, computer to computer communication sets up a new system of global, horizontal communication networks that, for the first time in history, allow people to communicate with each other without going through the channels set up by the institutions of society for socialized communication"(Barahona et all, 2012). Through our research, theoretical analysis and conversations with academics, we could define these areas for exploring collective intelligence in community management (Lesser at all, 2012):

- in generating new ideas for creating value using the experiences and insights of numbers of people around the world,
- in disaggregating and distributing work in new and innovative ways,
- in making better, more informed decisions about the future,

- in aggregating knowledge, insight and expertise of a diverse group
- in targeting and motivating the right participants etc.

2. Development of virtual community projects in Lithuania

"As people multiply their abilities to organize themselves through social technologies, there is the possibility to effect positive change in communities and governments. Social technologies could also help communities collaborate in political and non-political ways, such as voting, organizing disaster aid, decision making for community and government etc."(Malone,2010). This potential could be especially relevant in societies with relatively short extent of participation of society in public life and in public policy making process in particular.

Sad to say Lithuania is one of countries where civic engagement is poor. The researches that are being accomplished by Civil Society Institute since 2007 exhibit low level of the society's political self-awareness – in 2012 the civic engagement was rated in average 38,4 of possible 100 points (Civil Society Institute 2013). Since 2007 this rate is increasing very slightly. The positive shift is noticed because recently Lithuanian public more actively defends public and collective interest in governing institutions. However this form of activity remains vague as only 17 per cent of the people that addressed governing institutions were concerned of the public problems. Worth mentioning that civic engagement of young people (form 15 to 29 years old) is distinguished as being significantly low. The social environment for civic engagement in Lithuania is revealed to be enough adverse. It is evaluated only 22,2 of 100 points in 2012 and does not improve during the last several years. 6–7 of 10 individuals have negative opinion on participation environment. That could be one of the reasons why society's general interest in public issues remains only average (evaluated about 40 points of 100 during the last 3 years). The existing superposition between government and society could be one of the main obstacles to strengthen civil society in Lithuania (Ziliukaite et al. 2006). The research results prove the necessity to search for different tracks that could contribute to stimulation of civic engagement.

Civil society interacting with governments is able to improve their effectiveness and responsiveness (Croissant et al. 2000, Merkel and Lauth, 1998). Therefore socially active Lithuanian people are challenged to relieve the rest of society form suffer of the syndrome of impotence (Civil Society Institute 2013a). As progressive means to tackle this issue is employment of social media.

"Technology does not determine society it expresses it. But society does not determine technological innovation: it uses it" (Castells, 2000). Information and communication technologies support effective and sustainable development because they create conditions for the emergence of a new form of social organisations based on networking. The Lithuanian strategy on the public sector development emphasizes the extensive amplification of electronic services and wider use of them, but not a simple transfer into electronic environment. Rural Internet Access Points (RIAPs) are one of the most important sources of access to the global information society in Lithuania. Owing to RAIN I and RAIN II projects carried out by absorbing EU structural support funds, the fast and high-quality internet became accessible not only in cities but also to rural areas public sector, business organizations and residents. It is planned that by the end of 2013 broadband internet will reach 98.7 percent of rural areas. There is no doubt that the widespread and availability of the internet in Lithuania is one of the prerequisites for the formation of networked societies. Such outbreak of social technologies conditioned possibilities to interconnect the public for social projects.

The number of socially oriented network platforms, funded by public organizations or private entities, is constantly growing in Lithuania. Among them are such projects as *manobalsas.lt* (*My Voice Lt*, www.manobalsas.lt), Transparency International administrated project *manoseimas.lt* (*My Parliament*, www.manoseimas.lt), eVoting testing system *ivote.lt* (www.ivote.lt), Lithuanian civic initiative think tank *Aš Lietuvai.lt* (*I for Lithuania*, www.aslietuvai.org) and the platform of e-democracy *Lietuva2.0.lt* (*Lithuania 2.0*, www.lietuva2.lt).

According to the project developers *My Voice LT* is a rational voting system on the internet that uses questionnaire on public issues. People are invited to make a short test to find out which politicians and political parties are closest to their political views. In questionnaire is given questions based on public interest issues from a variety of areas - education, health, economy, foreign policy and culture. It is believed that people, knowing politicians position toward issues that concern them, can make a rational decision what politician will represent their interests the best. At the same time the project contributes to the strengthening

of democracy in the country, civil society development, populism reduction, encourages people to vote responsibly and activates interest in politicians' attitudes and political parties programs.

Another project implemented by Transparency International Lithuanian Division and a group of active citizens of Lithuania *My Parliament LT* is dedicated for those, who care about the work of MPs and parties what are their positions on important state issues. Test basis - 10 themes, which has been voted at the Parliament during the last 2008-2012 years term.

Both *My Voice LT* and *My Parliament LT* apply the same questionnaire. However there is significant distinction between them. The results of peoples' voting in *My Voice LT* are compared with those of the candidates for MPs whereas *My Parliament LT* voting is based on standpoints of actual MPs. Thus even *My Parliament LT* displays actual positions of MPs, *My Voice LT* allows to reveal voices not only of the parliamentary parties but also of the others.

The project *iVote.lt* is aiming to introduce citizens to new internet voting method and to allow them experience the method themselves. *iVote.lt* game model is based on online voting mode used in Estonia and adopted with attitude towards specifics of Lithuania. When designing voting game global online voting practice was studied and consultations with experts in fields of law, information technologies and elections were conducted.

Based on groups in Google and Facebook new virtual community *Aš Lietuvai.lt* (*I for Lithuania*, www.aslietuvai.org) was created. This project strives to find original ways to tackle national problems and it is organized in the way that people propose ideas and solving of problems, participate in leading these ideas to practical application. At the moment this community is implementing public Senate idea. Another notable idea in process is creation of positive internet TV (equivalent to www.tvrain.ru). Many other ideas will be studied in the next chapter.

In January of 2011, virtual community project *Lietuva 2.0.lt (Lithuania 2.0,* www.lietuva2.lt) was launched. It is identified as a social network of e-democracy, a platform for socially active individuals aiming to contribute to the development of Lithuania. *Lithuania 2.0.lt* provides means for society to get involved in public life of the country by presenting ideas, voting, discussing and compromising proposals for Lithuanian legislation.

We performed initial analysis of features of the Virtual community projects. They are presented above within Lesser's et al. (2012) areas for exploring CI in community management (Table 1). This analysis allowed us to define which projects serve as the best platforms for the development of CI.

Table 1: Analysis of Lithuanian virtual community projects as platforms for CI

Virtual community project / Areas for CI	***My Voice*** LT	***My Parliament LT***	***iVote.lt***	I for Lithuania	Lithuania 2.0
Generation of new ideas for value creation	No	No	No	Yes	Yes
Innovative distribution of work	No	No	No	Yes	Yes
Contribution to decisions about the future	Yes	Yes	Yes	Yes	Yes
Aggregation of knowledge	No	No	No	Yes	Yes
Targeting and motivating participants	Yes	Yes	Yes	Yes	Yes

The rough analysis demonstrates that some of the Virtual community projects are more sophisticated as platforms for CI than the others. *My Voice LT*, *My Parliament LT* and *iVote.lt* contribute to recognition of public perceptions on social problems, foster civic engagement and educate people about Lithuanian political life. However these projects are lacking such important attributes as possibilities to concentrate new ideas, attract and share knowledge, and distribute work in new and innovative ways. Meanwhile *I for Lithuania* and *Lithuania 2.0* contain all the features for the development of CI. Therefore these virtual community projects are selected for more detailed analysis.

3. Tracing collective intelligence in virtual community projects *I for Lithuania* and *Lithuania 2.0*

We analysed *I for Lithuania* and *Lithuania 2.0* according aspects and components of CI which were listed in academic literature (see the chapter "Defining Collective intelligence"). In total we identified 11 components according which qualitative analyses of the virtual community projects were accomplished (see Table 2).

Table 2: The components of collective intelligence in *I for Lithuania* and *Lithuania 2.0*

Component of CI	*I for Lithuania*	*Lithuania 2.0*
Social network of individuals and organizations	Any individual or organization can join the project. Currently more than 10 NGOs and other public institutions are connected to the project. Acceptance of the unique code of ethics is required.	Any individual or organization can join the project. Currently more than 10 NGOs are connected to the project. Acceptance of the rules of privacy and directions for use is required.
Strategic community	This virtual community identifies itself and sets the mission – to collect wisdom of crowds for tackling ultimate social issues in Lithuania.	Identifies itself as a network that strives to find solutions for social problems in Lithuania.
Policy frameworks	*I for Lithuania* strive to influence policies via collecting, analyzing and implementing ideas. Ideas are allocated to several levels: global value level, national (state) value level, organization or community value level, and individual value level.	*Lithuania 2.0* strives to influence policies via collecting, analyzing and implementing ideas.
Sociotechnical network	*I for Lithuania* – virtual community project consisting of people that communicate using social technologies. For participation in the project hardware, software and internet connection are required. Google sites, Facebook, Google docs, Twitter etc. are employed to facilitate the project activities.	*Lithuania 2.0* – virtual community project consisting of people that communicate using social technologies. For participation in the project hardware, software and internet connection are required.
Self-organizing innovation network	Open innovations are the essence of *I for Lithuania*. Up to date about 5000 ideas including innovative ones were proposed, voted and discussed. Working groups focusing on specific ideas are being composed of these ideas joining people.	Innovative ideas are expected to arise within conceptions proposed for discussions at *Lithuania 2.0*. However the main focus is not on innovation but on relevance to Lithuanian society. People are free to join any conception that is developed within the network.
Social interaction, familiarity and interpersonal trust	People interact while discussing issues, voting and commenting on ideas. The registered Facebook users participate in the network. People recognize each other via profiles. Trust is built on believe that users follow the code of ethics that is accepted during the enrolment to the network.	People interact while discussing issues, voting and commenting on ideas. The registered users participate in the network. Applicants are asked to motivate the striving to participate in *Lithuania 2.0* and describe their competences. Users can remain anonymous, but the network leaders publish their CV. Trust is built on believe that users follow the manifest, users' requirements and privacy guidelines that are accepted during the enrolment to the network.
Group cohesion, strength of relationship	Virtual community project gains attributes of civic movement. A number of users connect to some idea and work for it's development.	*Lithuania 2.0* unifies socially active people for common goals. A number of users connect to some idea and work for it's development.

Component of CI	*I for Lithuania*	*Lithuania 2.0*
		Devotion to the ideas is expected and it is set in the manifest.
Diversity	Vast of micro projects. I.e. some of the ideas that are being developed by *I for Lithuania* include: strategies for Lithuania; crisis mapping; 9 Lithuanian principles; matters of survival; untouchable priority; the Solidarity Charter; success factor; Lithuanian equation; reverse creation; successful nation; open television etc.	Various ideas, diverse voting. I.e. some of the current problems that are being solved by *Lithuania 2.0* are: alcoholism reduction; waste management; improvement of election system; contract on candidate's political responsibility; implementation of national e-learning system for schools etc.
Self-managing teams, collaborative leadership or distributed leadership, and shared governance	People join into the group elaborating some specific idea in informal, non-hierarchical manner. The moderator is selected to lead the group. However during the idea development process leaders could change.	The platform is filled up with contents by registered *Lithuania 2.0* users. Those are considered to be both managers and leaders as well. The more active some user is the more rights in the network he gains.
Inter functional linkages	One of the basic projects of *I for Lithuania* is creation and employment of public Senate. House of Lords and House of Commons are established for laws making. Several actions are linked until ideas become an Act: work in groups on some idea, preparation of documents, formal presentations, readings and debates, consideration in committees, reporting, and assent.	Processes of presentation of ideas (or conceptions), explanation of problems, introduction of solutions, discussions, evaluation and voting for or against ideas and solutions are interlinked.
Collaboration and competition of many individuals	Are counted several hundred of *I for Lithuania* participants residing in different countries. They compete when present ideas and collaborate when elaborate alternatives for problem solving.	Currently *Lithuania 2.0* is joined by about a hundred participants competing in introduction of ideas and collaborating in searching the ways to tackle social problems.

The preceding cases demonstrate the growth of CI by linking socially active people through social media. Both *I for Lithuania* and *Lithuania 2.0* contain all the most important features for CI building such as self organization, shared management, innovations, social interaction, collaboration etc. Furthermore, if we screened these virtual communities from the point of genome of CI (Malone, Laubacher, and Dellarocas, 2009), we could state that:

- both networks have set a very clear missions and goals, that answers the question "*What* is being done?" is explicitly answered;
- neither *I for Lithuania* nor *Lithuania 2.0* limit who can participate in activities ("*Who* is doing it?"). As the general public is invited, there is possibility to engage people with diverse knowledge and skills;
- contributors take part in the activities because of the opportunity to socialize, they can feel motivation to contribute to large goals, people can also be inspired by possibility to be appreciated ("*Why* are they doing it?");
- participants know the way CI will be used ("*How* it is being done?"). Both networks strive to reach some positive result in social problem solving. To find possible solutions different group decision making methods are applied such as voting, contest, averaging, and consensus or team decides on solution. Thus contributors know that their efforts will not be lost.

As *I for Lithuania* is compared to *Lithuania 2.0* it is obvious that the first one is much more complex in its contents as well as in its extent in terms of the number of participants. On one hand, expansive characteristics of *I for Lithuania* exhibit its popularity, recognition and believe that this virtual community could stimulate positive social changes. On the other hand, such complexity aggravates operation of the network, requires from new participants lots of time and efforts to understand the processes within the network, a number of promising ideas could be lost in vast of information. Whereas *Lithuania 2.0* is simpler, easier to understand and find information, follow ideas. However *Lithuania 2.0* is very new platform and it holds potential of expansion.

This research could be valued as an introductory phase into subject because it reveals the facts of growth of CI in social networks. However there is no clarity yet how institutions of government could use collective intelligence to solve public problems. Researchers' on stakeholders' involvement in policy making in Lithuania demonstrate failings in application even of the "classical" participatory instruments like formal participatory decision and/or problem solving groups, committees and commissions etc. (i.e. Pitrenaite-Zileniene and Mikulskiene 2012, Mikulskiene and Pitrenaite 2012). Both Lithuanian policy makers and participatory policy processes hardly are ready to employ ideas developed in social networks. Therefore the question of introduction of CI results to public policy making remains to be answered by further research.

4. Conclusions

In this paper, we define collective intelligence as groups of individuals acting collectively in ways that seem intelligent. The field is multidisciplinary and there is challenge for researchers from different disciplines to understand how collective intelligence actually works.

New forms of collective intelligence emerge because of the Internet, web 2.0, 3.0 and social media tools. Scientific observation and analysis of the social impact of technology on development of collective intelligence raises a lot of problems. The variety of mediums where products of CI could be introduced is extensive. Exploring the potential of CI could help communities become more productive and help societies solve their problems more effectively.

Lithuanian society suffers lack of civic engagement. But the fact that country recently has burst with internet accessibility and application of electronic services, wide opportunities to foster public involvement through social media emerged. Socially active communities recognizing these opportunities have launched diverse virtual community projects that stimulate the society's civic and political self-awareness.

The variety of virtual community projects testify the growing involvement of society members into public life and at the same time the rising assumptions and possibilities for the development of CI. For exploration of collective intelligence phenomenon in Lithuania such platforms as *I for Lithuania* and *Lithuania 2.0* could be explored because they are built from the main components of creative CI network.

The composition of *I for Lithuania* and *Lithuania 2.0* clearly demonstrates to all the participants *What, Who, Why* and *How* is operating in these virtual communities. Therefore people know the goals, are welcomed to act, recognize possible benefits, and understand rules of contribution. Such medium is favourable for the growth of CI. However, even *I for Lithuania* and *Lithuania 2.0* produces lots of intellectual output, there is no framework that could help to convert this output to actual policies.

Following scientific questions could be formulated: how different social projects could become a possibility to effect positive changes in communities and government, how to increase engagement of passive society into decision making process, what technologies would help to structure the information, purify the positions, reconcile different opinions and formulate the real society voice.

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