

# GROWTH OF COLLECTIVE INTELLIGENCE BY LINKING KNOWLEDGE WORKERS THROUGH SOCIAL MEDIA

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## Abstract

*Collective intelligence can be defined, very broadly, as groups of individuals that do things collectively, and that seem to be intelligent. Collective intelligence has existed for ages. Families, tribes, companies, countries, etc., are all groups of individuals doing things collectively, and that seem to be intelligent. However, over the past two decades, the rise of the Internet has given upturn to new types of collective intelligence. Companies can take advantage from the so-called Web-enabled collective intelligence. Web-enabled collective intelligence is based on linking knowledge workers through social media. That means that companies can hire geographically dispersed knowledge workers and create so-called virtual teams of these knowledge workers (members of the virtual teams are connected only via the Internet and do not meet face to face). By providing an online social network, the companies can achieve significant growth of collective intelligence. But to create and use an online social network within a company in a really efficient way, the managers need to have a deep understanding of how such a system works. Thus the purpose of this paper is to share the knowledge about effective use of social networks in companies. The main objectives of this paper are as follows: to introduce some good practices of the use of social media in companies, to analyze these practices and to generalize recommendations for a successful introduction and use of social media to increase collective intelligence of a company.*

**Keywords:** *collective intelligence, social media, knowledge, management, virtual team.*

## Introduction

This paper deals with collective intelligence in the era of Internet-based social media. This topic is worth our attention because if the company is able to use the potential of collective intelligence appropriately, it can achieve a strong competitive advantage. Collective intelligence can also be used for public benefit. In this paper we have tried to establish if there are some general rules how to use collective intelligence in favor of a certain project. The phenomenon of web-based collective intelligence is relatively new. The best theoretical background for this topic is created by the MIT Center for Collective Intelligence. The background publications on the subject of web-based collective intelligence are: *Inventing the Organizations of the 21st Century* by Thomas W. Malone, Robert Laubacher, and Michael S. Scott Morton,<sup>1</sup> *The Future of Work* by Thomas W. Malone,<sup>2</sup> *Democratizing Innovation* by Eric von Hippel,<sup>3</sup> or *Organizing Business Knowledge: The MIT*

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<sup>1</sup> Thomas W. Malone, Robert Laubacher, and Michael S. Scott Morton, *Inventing the Organizations of the 21st Century* (Cambridge, MA: MIT Press, 2003).

<sup>2</sup> Thomas W. Malone, *The future of work: how the new order of business will shape your organization, your management style and your life* (Boston: Harvard Business Press 2004).

<sup>3</sup> Eric von Hippel, *Democratizing Innovation* (Cambridge, MA: MIT Press, 2005).

*Process Handbook* by Thomas W. Malone, Kevin Crowston, and George A. Herman<sup>4</sup>. The MIT Center for Collective Intelligence publishes working papers presenting the results of its research. These working papers are available at the website of the MIT Center for Collective Intelligence.<sup>5</sup> Some papers are also published in scientific journals such as *MitSloan Management Review*. To achieve our aim, i.e. to find some general guideline how to create a successful web-based collective intelligence network, we have analyzed six successful cases of the growth of collective intelligence and compared the concrete characteristics of the project with some general recommendations of the MIT Center for Collective Intelligence.

Collective intelligence has existed for as long as humans have. However, this traditional phenomenon is nowadays occurring in entirely new forms. Thanks to modern information and communication technologies (ICTs), particularly the Internet and Internet-based social media, large numbers of people around the world can work together in ways that were never possible before.<sup>6</sup> This possibility is a great opportunity but also a great challenge for the companies. The opportunity is strengthened by the fact that we live in the knowledge society and knowledge economy. That means that a growing ratio of products is based on knowledge and knowledge workers and their human capital are the most valuable sources of the companies which employ them. Since knowledge is intangible, it can be, at least in its explicit form, shared through ICTs. The companies can gather virtual teams of workers without having to take into account their geographical location, because the team members can communicate and cooperate via ICTs. Moreover, present-day companies can use collective intelligence of the crowd and take advantage of its collective intelligence. The crowd can be composed of employees, customers, experts, by the general public, etc. Thus, it is very important for the management of the companies to profoundly understand collective intelligence so the company can create and take advantage of these new possibilities.

## Collective intelligence and Social Media

Not surprisingly, there are many definitions of collective intelligence. For the purposes of this paper we can use the definition by the MIT Center for collective intelligence. The experts from this center define collective intelligence as “Group(s) of individuals doing things collectively that seem intelligent.”<sup>7</sup> Collective intelligence refers to harnessing the power of a large number of people to deal with a problem as a group. The idea is that a group of people can solve problems more efficiently and offer greater insight and a better answer than any one individual could provide. As mentioned above, these people can now cooperate via Internet-based social media. Social media refers to the ICT platforms designed for real-time social interaction.<sup>8</sup> The examples are wikis, discussion forums or blogs. Many platforms are available on public websites and are very popular, e.g. Facebook or LinkedIn. The companies can use also private sites, e.g. Jive, Yammer, Socialcast. Some of the platforms enable creating information and interaction for general audience, e.g. Facebook, some are more specialized, e.g. LinkedIn enable professionals to create and share

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<sup>4</sup> Thomas W. Malone, Kevin Crowston, and George A. Herman, *Organizing Business Knowledge: The MIT Process Handbook* (Cambridge, MA: MIT Press, 2003).

<sup>5</sup> “MIT Centre for Collective Intelligence – Publications“, accessed November 19, 2011, <http://cci.mit.edu/publications/index.html>.

<sup>6</sup> Malone, *The future of work*.

<sup>7</sup> “Handbook of Collective Intelligence“, accessed January 10, 2012, [http://scripts.mit.edu/~cci/HCI/index.php?title=What\\_is\\_collective\\_intelligence%3F](http://scripts.mit.edu/~cci/HCI/index.php?title=What_is_collective_intelligence%3F).

<sup>8</sup> Rafiq Dossani, *Social Media and the Future of Business*, accessed October 5, 2011, <http://www.wipro.com/Documents/insights/SOCIAL-MEDIA.PDF>.

professional profiles and create professional networks. Enterprise social networks usually contain wikis, discussion forums, blogs, or enable sharing text and other files.

The managerial questions arise: Why should be the use of Internet-based social media efficient? Should the companies change the way of decision making and take into account the views of the crowd? And what are the key issues when designing collective intelligence platforms? Actually, these questions represent only a small part of the problems which the managers now have to solve. It is obvious, that current management models used in many organizations are obsolete, because they are based on bureaucratic hierarchies, on control and specialization and do not address the way knowledge workers work best. New innovative management practices must be implemented. Management innovation is the most challenging innovation which the organizations have to go through, but it is also the most enduring source of business innovation.<sup>9</sup>

While making decisions, current hypercompetitive and fast-paced business requires very broad exploration of potential opportunities, accurate responses and short response times – all that at once. Thanks to the Internet and other ICTs we have access to data, but we have to explore the data, find the opportunities and finally make decisions. Unfortunately, as individual decision makers, we have certain limitations. It seems that our brain is not well equipped to deal with so many business problems of this day in an effective way.<sup>10</sup> The solution can be to use collective intelligence of others. Thanks to currently available ICTs it is not a problem to involve a large group of people in the decision-making process. However, “the wisdom of crowds” in corporate decision making can only be used if the managers are able to assess whether in a given case the use of collective intelligence is appropriate, possible and under what conditions.

Decision making is the essence of management. To make a decision to solve a problem the managers actually have a two-level task. First, they have to generate different alternatives of problem solution and second, they have to evaluate these alternatives and chose the optimum one as a solution to the problem. During the decision making process the individual can fall into several traps.<sup>11</sup> The most common traps are

- Anchoring trap – the propensity to give a disproportionate weight to the first information the decision maker receives
- Status quo – the tendency to stick to the status quo
- Sunk costs – the predisposition to continue an endeavor once an investment in the form of money, effort, or time has been made
- Framing trap – the propensity to be influenced by different reference points
- False assumptions – the proclivity to assume something is true without evidence to support it
- Missed signals – the penchant to ignore warning signs
- Competition trap – the urge to win during a competitive challenge that blinds decision makers from seeing reality clearly

Collective intelligence can help mitigate the effects of these traps by bringing the diversity of viewpoints into the decision making process. Thanks to the use of the Internet and its specialized sites the companies can seek advice from the crowd.

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<sup>9</sup> Gary Hamel, “The Management 2.0 Challenge. How Will You Reinvent Management in Your Organization?” *Harvard Business Review*, July 28, 2011.

<sup>10</sup> Eric Bonabeau, “Decisions 2.0: The Power of Collective Intelligence,” *MIT Sloan Management Review*. (Winter 2009): 45-52.

<sup>11</sup> John S. Hammond, Ralph L. Keeney and Howard Raiffa, “The Hidden Traps in Decision-Making,” *Harvard Business Review* (January 2006): 118-126.

## Examples of successful growth of collective intelligence

In this part of the paper we have provide some examples of successful use of social media in favor of the growth of collective intelligence. Actually, it is a problem to claim that collective intelligence of a certain group of people is on a certain level or that it is increasing. Nevertheless, we can feel that if people create such a big thing such as e.g. Wikipedia, the new value or public knowledge arises. The MIT Center for Collective Intelligence examines the possibilities of measuring collective intelligence but there are no results yet.<sup>12</sup> However, if we extend the mentioned definition of collective intelligence we can assess if there is a growth of collective intelligence in the examples provided below. We have stated that collective intelligence can be defined as a group of individuals doing things collectively that seem intelligent. We can add that the group addresses new or trying situations and that the group applies knowledge to adapt to a changing environment.<sup>13</sup> Thus, if we can see that these assumptions are fulfilled successfully, we can conclude that collective intelligence is growing. The first three examples are focused on public networking, the other three examples are focused on private corporate networks.

### Wikipedia

The famous example of collective intelligence is Wikipedia ([www.wikipedia.org](http://www.wikipedia.org)). Wikipedia is a multilingual, web-based, free-content encyclopedia project based on an openly editable model. Wikipedia is written collaboratively by largely anonymous volunteers. Anyone with Internet access can write and make changes to Wikipedia articles. Since its creation in 2001, Wikipedia has grown rapidly into one of the largest reference websites, attracting 400 million unique visitors monthly. There are more than 82,000 active contributors working on more than 19,000,000 articles in more than 270 languages. Contributions cannot damage Wikipedia because the software allows easy reversal of mistakes and many experienced editors are watching to help and ensure that the edits are cumulative improvements.<sup>14</sup>

### Stack Exchange

Stack Exchange ([www.stackexchange.com](http://www.stackexchange.com)) is a very interesting example of collective intelligence. Stack Exchange is a fast-growing network of nearly 80 question and answer sites on diverse topics from software programming to cooking. It is an expert knowledge exchange site. After someone asks a question, members of the community propose answers. Others vote on those answers. Very quickly, the answers with the most votes rise to the top. The questions and answers on Stack Exchange can be edited by anyone. The site is free and open to everyone. Registration is not necessary; however, registered users can collect reputation points when people vote up his/her answers. It means that Stack Exchange focuses on solution proposals and also on solution evaluation. Everything is done publicly.

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<sup>12</sup> "Measuring collective intelligence" accessed January 12, 2012, <http://cci.mit.edu/research/measuring.html>.

<sup>13</sup> "Handbook of Collective Intelligence".

<sup>14</sup> "Wikipedia: About", accessed December 10, 2011, <http://en.wikipedia.org/wiki/Wikipedia:About>.

## InnoCentive

A more business-oriented but still public example is the web site InnoCentive, through which companies can post their problems (challenges) and solicit solutions. The winning solution receives a cash award.

## Social networking in NASA

NASA is the first example from the corporate segment. They started social networking in 2008 claiming that new ideas and new solutions for their complex missions require input from a geographically dispersed community of knowledge workers. By providing an on-line social network, NASA created a collective intelligence and learning community for its knowledge workers.<sup>15</sup> According to NASA on-line networking accelerates communication and problem solving, captures an individual knowledge worker's know-how for reuse by many, creates peer-to-peer communication in context and deepens the understanding for decision making. Currently NASA is still developing its social media-based networking. For internal communication, NASA uses Yammer and some of the employees use ExplorerNet – an internal social networking tool.<sup>16</sup> Each user of ExplorerNet has an individual profile with contact information, they can add information about their expertise, past and current project, etc. Each user is also given his/her own blog, wiki and discussion space. Communities are another component of ExplorerNet. The communities have wikis, discussion forums, community blog, polling and some project management functionality. Anyone can create a community at any time for any purpose. The communities can easily cooperate as virtual teams. The employees state that thanks to ExplorerNet they are able to cooperate at a much higher level than before.

## Mutual Fun in Rite-Solutions

Rite-Solutions ([www.ritesolutions.com](http://www.ritesolutions.com)) created a state-of-the-art “innovation engine” designed to provoke and align individual brilliance toward collective genius. The goal of the company was to connect people on an emotional level where all employees are entrusted with the future direction of the company, asked for their opinions, listened to, and rewarded for successful ideas. Rite-Solutions is a software/system engineering company. It is built on two fundamental beliefs:

- Nobody is as smart as everybody (good ideas are not bounded by an organizational structure, but can come from anyone, in any place, at any time)
- The hierarchical pyramid as a relevance structure is a relic of command and control conventional wisdom, more suited to controlling information flow than fostering innovation

In 2005 Rite-Solutions launched a collaborative stock market-based game with the aim of making the employee feel relevant to the success of the business in the most tangible way, and tapping their amazing intellectual bandwidth far beyond assigned job tasks. The name of the

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<sup>15</sup> Celeste Merryman, *Findings from the NASAsphere Pilot*, accessed December 12, 2011, <http://socialcast.s3.amazonaws.com/corporate/downloads/NASAsphereReportPublic.pdf>.

<sup>16</sup> *In Talk. Social Media in NASA*. May/June 2011, accessed January 15, 2012 [http://www.nasa.gov/pdf/542302main\\_ITTalk\\_May2011.pdf](http://www.nasa.gov/pdf/542302main_ITTalk_May2011.pdf).

application is Mutual Fun.<sup>17</sup> The first step of the user is to complete a profile that details his/her work experience, expertise and capabilities, interests and curiosities. This is how users establish what they bring to the game table and ultimately allows other players to search for people who might be able to assist them in various areas of their innovative ideas based on profile information. Every person in the company gets an initial \$10,000 to invest in their peers' "idea stocks." Players can float, advance and develop portfolios of ideas. Colleagues can make dollar investments in stocks, volunteer time or express interest. An algorithm dynamically derives individual stock values and a player's place on the leader board (from an individual's own idea stock values and activity in assisting, investing, and discussing their co-workers ideas). Inevitably, volunteer teams spring up around initiatives on Mutual Fun. The best ideas are realized by the company.

Some of the most valuable ideas come from the most unexpected places. A company administrator with no technical experience came up with an idea for using a bingo algorithm which Rite-Solutions had created for their casino clients to create a web-based educational tool. The inspiration came when this employee helped her daughter with a school project. That idea, "Win/Play/Learn" immediately caught the attention of some engineers, who developed her idea into a successful product. By 2011 Mutual Fun innovation game generated more than 50 innovative products, service and process ideas, 15 of which have been successfully launched and account for 20 % of the company's total revenue.

## My Customer in Best Buy

Our last example is from the company Best Buy ([www.bestbuy.com](http://www.bestbuy.com)). Best Buy is an innovative consumer electronics retailer with over 1,500 retail locations across North America, Europe and Asia. The Company prides itself on the knowledge of its employees and unleashing the power of its people as part of its core philosophy and values.<sup>18</sup> Best Buy created the software platform "My Customer" to unleash the voice of its more than 100,000 frontline employees to share what they heard or learned from daily interactions with customers. The thought was that Best Buy can solve real problems that employees report in as close to real-time as possible. By processing data in the analytics, Best Buy can acquire early indicators of potential opportunities or issues that can be addressed by various business units throughout the company. The fact that any employee could participate in helping drive change was powerful in itself. The managers are still listening to the employees. My Customer is ingrained in normal business rhythms. Employee satisfaction directionally increased in correlation with the submissions provided. If leaders listen to what employees share, employees in turn feel good about their work and feel valued.

All the above-mentioned companies take advantage from the Web-enabled collective intelligence. All of them link knowledge workers or volunteers with certain knowledge through social media. In all examples groups of individuals do things collectively in a way which seem intelligent. We can state this because all the groups achieve useful results. Wikipedia is a broadly used encyclopedia, Stack Exchange helps people solve problems and achieve professional reputation; InnoCentive is a platform for gathering innovative problem solution, where people can meet

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<sup>17</sup> Jim Lavoie, *Nobody's as Smart as Everybody - Unleashing Individual Brilliance and Aligning Collective Genius*, accessed October 10, 2011, <http://www.managementexchange.com/story/nobody%E2%80%99s-smart-everybody-unleashing-quiet-genius-inside-organization>.

<sup>18</sup> Steve Wallin, *My Customer: One Voice is Noise, Many is a Chorus – Voice of the Customer through the Employee*, accessed October 14, 2011, <http://www.managementexchange.com/story/my-customer-one-voice>.

companies and vice versa. NASA shifted the level of cooperation to a higher level, Rite-Solutions creates innovative products and Best Buy can immediately respond to customer needs. In these cases we can speak about collective intelligence without hesitation.

Another question is, if the groups of people in our examples address new or trying situations and if their knowledge is used to adapt to a changing environment. In Wikipedia new articles are written every day and many articles are reworked and updated. The content of the articles mirrors the changing environment. In Stack Exchange the experts answer the questions and the knowledge is captured in the application for future needs. The knowledge is used by the people to solve their job tasks or private issues. In any case, the knowledge is used to address a new or trying situation. In InnoCentive the companies directly go public with their problems (trying situations) and thanks to the knowledge of other people their problems are solved. NASA reported that thanks to social networking the communication and problem solving accelerates and the understanding for decision making is deeper than before. If we understand a problem and are able to find a solution, it means that we have adapted to a new situation. Rite-Solutions uses collective intelligence of its workers to create new business ideas and develop new products. If the new product is successful, it means that the company is able to react to the changing needs of its customers. The main idea of My Customer application in Best Buy is to solve the problems of the customers in real time. It means that Best Buy, thanks to My Customer, can address new or trying situations. In all these examples the characteristics of the growth of collective intelligence are fulfilled, and Web-based social networking triggers the growth of social intelligence.

## General rules for successful social networking

The preceding examples are concrete cases of the growth of collective intelligence by linking people through social media. But another question arises: Are there any general rules for successful social networking in order to increase collective intelligence? Apparently, to many problems that the companies face, there is potentially a solution out there, however, far outside of the traditional places where management usually search for it. Why don't more businesses use collective intelligence to solve their problems? It seems that they do not know how. Practice is still far ahead of theory in the field of collective intelligence and managers are not always willing to use the trial-and-error method. In this paper some successful projects are presented, but numerous projects have failed. The MIT Center for Collective Intelligence identified a relatively small set of attributes which are present in successful collective intelligence systems.<sup>19</sup> Let's introduce these attributes and examine if there are present in our examples.

To build the kind of collective intelligence system suitable for the desired goal, managers have to ask four main questions:

*What* is being done?

*Who* is doing it?

*Why* are they doing it?

*How* it is being done?

In general, these questions have to be answered for any business activity. What often differs in case of the web-based collective intelligence are the answers.

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<sup>19</sup> Thomas W Malone, Robert Laubacher, Chrysanthos Dellarocas, "The Collective Intelligence Genome," *MitSloan Management Review*, (Spring 2010, Vol. 51, No.3): 21 – 31.

The answer to *What* is the *mission, goal* or at a lower level *task*. As mentioned above, management as a decision making body consists of two steps: it is necessary to create possible solutions and to decide which of them will be realized.

The answers to *Who* are very interesting in case of collective intelligence. Traditionally the answer is the experts or managers inside the company. But in web-based collective intelligence systems activities can be taken by anyone in a large group. The group can be unlimited (like in case of Wikipedia, Stack Exchange or InnoCentive) or limited, e.g. to employees (like in NASA, Rite-Solutions or Best Buy).

*Why* is the question of motivation. Why do people take part in the activity? Examining the motivation of the contributors is a big and also interesting task. However, we can find three main incentives which make people participate in social networks. It can be money, love and glory.<sup>20</sup> Money is a traditional source of motivation. Love is a motivator which works well in social networks. People are motivated by their enjoyment of an activity or by the opportunity to socialize with others and by the feeling that they contribute to some large cause. Glory can also be an important motivator. People want to be recognized and appreciated by peers, experts or managers.

*How* refers to the procedure how to chose the best idea proposed by the contributors. (We do not deal with the technical solutions of web-based collective intelligence applications.) Usual group decision making methods such as voting, consensus, and averaging can be used there, sometimes contest is possible and also final individual decision can be made by the responsible person.

In table 1 the attributes *What, Who, Why* and *How* for the above mentioned examples are identified.

Table 1: The *What, Who, Why* and *How* of the successful collective intelligence networks

Example	<i>What</i>	<i>Who</i>	<i>Why</i>	<i>How</i>
Wikipedia	Freely available full sum of human knowledge to all people in their own language <sup>21</sup>	Anyone	Love Glory	There is no need to make decisions. Public and editors can influence the content of the articles.
Stack Exchange	An expert knowledge exchange, network on diverse topics <sup>22</sup>	Anyone	Love Glory	Voting. The best answers are voted by the users.
InnoCentive	The world's largest problem solving marketplace, the open innovation and crowdsourcing pioneer that enables organizations to solve their key problems by connecting them to diverse sources of innovation <sup>23</sup>	Anyone	Love Glory Money	Individual decision. The company chooses the best solution and the author receives a financial award.

<sup>20</sup> "The Collective Intelligence Genome", 27.

<sup>21</sup> "Wikipedia: About", accessed December 10, 2011 <http://en.wikipedia.org/wiki/Wikipedia:About>.

<sup>22</sup> "Stack Exchange", accessed January 12, 2012, <http://stackexchange.com/about>.

<sup>23</sup> "InnoCentive", accessed January 13, 2012, <http://www.innocentive.com/about-innocentive>.



NASA	To foster an environment of creativity and innovative thinking <sup>24</sup>	The employees	Love Glory Efficient teamwork	Team decision making
Rite-Solutions	Create internal markets for ideas, cash & talent, depoliticize decision-making <sup>25</sup>	The employees	Love Glory Money	Voting. Some of the best ideas are founded by the company management – final managerial decision based on employee recommendation.
Best Buy	Create a democracy of information, enable communities of passion, expand the scope of employee autonomy <sup>26</sup>	The employees	Love Glory	Employees' immediate managers response to employee submissions, in more general topics top management is engaged.

As we can see all the networks have a very clear goal, the answer *What* is explicitly answered. Also the answer *Who* is clearly answered. It is necessary to give considerable thought to whether it is appropriate to ask the public to participate or to limit the network only to the employees or chosen experts. If a company invites the public, they can meet the people with knowledge and skills which they would not otherwise meet. But they also have to count on bigger danger of misuse or sabotage of the network. To cooperate with the people the company knows is better for the corporate security; however achievable knowledge and skills are smaller.

Before the company launches a collective intelligence network, they have to be sure as to the motivation of the participants to cooperate inside this network: *Why* should they participate? If there is no clear motivation, the project will sooner or later fail. In our examples the participants are highly motivated. It is surprising how many people love to contribute to Wikipedia or Stack Exchange. They do it for free, for their enjoyment or maybe for glory. If your answers in Stock Exchange are often voted for by other users, you start to be so-called guru and the employers can ask you for paid cooperation. But it seems that the main reason why people participate in Stack Exchange is the support and help to people who ask questions.

InnoCentive is an interesting corporate – public network. The participants can simply have fun when they suggest problem solutions, or they hope they will be recognized as experts and will be invited to some form of paid cooperation or they can even win the money promised by the company for the best problem solver.

NASA tried to create some up-to-dated communication tool for knowledge workers. The employees may like this tool, they can be recognized as experts but the main reason why to participate in the network is better, easier and faster cooperation inside the company. The networks used in NASA are efficient tools of knowledge management and help people work. In Rite-Solutions all the three motivators are interconnected. It is fun for the employees to participate, they can profile themselves as active experts and they can earn money because the system works as a stock market of ideas. If the idea is chosen for realization, it is fanatically supported by the management. Money is not the subject in Best Buy. The motivation for the employees is their engagement which is taken seriously by the managers. Employees feel that they are being listened to and that there is a response to their ideas which motivates them to continue to submit their ideas. The best of them are also

<sup>24</sup> James **McClellan**, *Beyond 140 Characters: Social Media@JSC* accessed January 14, 2012, [http://www.nasa.gov/offices/ocio/ittalk/5-2011\\_SocialMediaAtJSC.html](http://www.nasa.gov/offices/ocio/ittalk/5-2011_SocialMediaAtJSC.html).

<sup>25</sup> Lavoie, *Nobody's as Smart as Everybody*.

<sup>26</sup> Wallin, *My Customer*.

recognized as high performers. As the network was created as a form of customer support, the increased satisfaction of customers makes the work more pleasant.

*How* represents the way collective intelligence will be used. *How* must be also clear, otherwise all the effort of the participants can be lost. In Wikipedia there is no need to decide a certain problem. In this case the participants cooperate in a surprisingly efficient way when creating and updating the articles. Also at Stack Exchange there is no need to decide which answer or question is the best one. However, the users can mark their favorite answers. Every user can decide which proposed solution is the best for his/her purpose. InnoCentive is a case of individual decision-making. Somebody in the company which posted the problem (challenge), has to choose a solution. In NASA the application serves for communication and for team work. Thus the decision is a matter of a team. In Rite-Solutions the management asks the employee to vote and they trust collective intelligence of their employees. In Best Buy the employees only post their experience, problems or ideas and managers decide how to solve the situation.

We can conclude that in all the examples the answers to *What*, *Who*, *Why* and *How* are clear and known to all the participants. If people know, what is being done, that they are welcomed to participate, what the benefits they can achieve are, and how their contribution is used as a part of a bigger project, they are highly motivated. They are willing to share knowledge and become a part of a creative collective intelligence network.

## Conclusion

The current management models inhibit the success of many companies. The companies which are able and willing to innovate their managerial methods achieve a strong competitive advantage. One of the big opportunities is the use of collective intelligence in decision making. Attainable collective intelligence is nowadays almost unlimited thanks to the Internet-based social networks. The use of collective intelligence can help companies solve their problems, to mitigate the effects of decision making traps, to overcome the individual brain limitations, etc.

We have introduced six examples of successfully growing collective intelligence, which is used in favor of the public or in favor of the companies. In many companies the use of collective intelligence is not yet on the agenda. The reason is that there are no general rules or guidelines how to build an efficient social network and how to take advantage of collective intelligence of the participants. There is always the danger, that instead of collective intelligence the company can tap into a collective madness. A lot of research has to be done before some general recommendation for building collective intelligence-based networks can be articulated. Moreover, it is very likely that the development of ICTs will be faster than research. So, what else can managers do than just look at examples and hope for inspiration and success? In this paper we have proved that well prepared answers to the common business questions *What*, *Who*, *Why* and *How* can support the success of a social network and to stimulate the growth of collective intelligence. There may be many combinations of *What*, *Who*, *Why* and *How*, but they always have to be carefully specified. Then the chance the project will be successful in the long-term increases. The use of social networking and collective intelligence is a big opportunity, it brings some risk but in any case it is an adventure.

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