Unlocking the full potential of the crowd – a government perspective

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Abstract

As a result of technological developments over the past two decades citizens have become increasingly connected, both socially and virtually. Now, more effective use of the collective knowledge and expertise of a group of citizens can be made in a way that improves knowledge and produces greater insight into information. This phenomenon is widely referred to as the 'wisdom of crowds'.

The experts interviewed in this study use 'wisdom of crowds' to refer to a range of phenomena, with differing degrees of social interaction and different numbers of decision makers. Their definitions do not necessarily, therefore, comply with the traditional definitions of 'wisdom' and 'crowds'.

We developed a framework to map these phenomena in terms of numbers of decision makers and amounts of knowledge. This involved identifying three stages of development, with interaction between governments and citizens increasing from Stage 1 to Stage 3. At the same time, decision-making processes are becoming more and more complex, and the traditional role of governments is in-creasingly being challenged.

More effective social interaction and greater involvement of citizens in decision-making processes are predicted to lead to more 'wisdom of crowds'. In order to unlock the full potential of this, more knowledge about social interactions in the 'crowd' is needed, as well as progress in the technological tools available to facilitate coordination and collaboration.

Introduction

The technological developments over the past two decades have changed the societal playing field dramatically. Computers have become connected worldwide, while much more information is now available to every citizen. At the same time citizens have become connected in new ways and now have the tools to produce, share and distribute their own information, knowledge and opinions. Citizens all around the world have embraced these new opportunities enthusiastically, as the explosive growth in personal websites, blogs, social networking sites, YouTube and Twitter demonstrates. The Web has become a social Web.

This fully networked and global structure, with its huge range of many-to-many communication opportunities, has created a completely new set of dynamics, where citizens can raise their voice and group and regroup themselves ad hoc around the issues that matter to them. In this way, bottom-up and lateral initiatives can arise and rapidly grow in popularity. Citizens have become less dependent on and, therefore, less bound by traditional organisations, institutions and states. Initiatives such as Wikipedia and Linux show some of

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the potential that citizens can create by working together enthusiastically, without the involvement of traditional organisations.

More and more organisations and governments have started to make use of these new opportunities in recent years. Companies such as Lego, Boeing and Dell have successfully involved their customers and harnessed their knowledge and expertise through online communities where consumers can send in and discuss ideas for new products and have the opportunity to influence the configuration of products being developed. Web 2.0 tools also played an important role in President Obama's election campaign. Indeed these tools are seen as the key to his success because they enabled him to engage citizens and mobilise them to play an active role in his campaign and fundraising (Harfoush, 2009). Growing numbers of organisations have recognised the potential for involving citizens in developing and marketing their products and policies. The Netherlands have seen the following examples of such co-creation or crowdsourcing initiatives:

- the Battle of Concepts, an online idea contest where companies can put questions to students and young professionals about innovation and marketing;
- Innovation 2.0, where companies can provide input for the Ministry of Economic Affairs' innovation policy;
- Wijbouweneenwijk.nl, an online community where citizens and experts can meet to co-create a new residential area in the municipality of Smallingerland.

New technologies, such as augmented reality , sensor networks, mobile devices and advancements in artificial intelligence (including semantics and swarm modelling), are being developed to provide greater insight into data and information and to improve interaction among people and between people and their surroundings. These technologies are expected to enable citizens to coordinate their efforts even better in the future and to collaborate more effectively than before. This will make citizens an even stronger force to be reckoned with.

These developments could fundamentally change our society and the way people coexist and collaborate (Shirky, 2008; Tapscott & Williams, 2007). They could provide new ways to tackle organisational, social and societal problems by actively involving citizens and providing them with the tools they need to attune their behaviour to each other and to their environment.

At the same time, existing organisations and institutions, such as governments, political organisations and businesses, are all having to face the challenge of how best to respond to these developments. They may need to adjust and possibly even redefine their positions on citizens so that citizens can play an active role and create solutions of their own. All in all, therefore, decision-making processes are set to become much more complex than before.

In this chapter we analyse some of the implications for society of this wide range of current developments in ICT technologies so as to identify the main challenges and opportunities faced by policymakers, politicians and governments.

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Wisdom of crowds

Within the scope of these developments, the term 'wisdom of crowds' (Surowiecki, 2004) is often used to refer to the concept that the collective knowledge and expertise of a group of individuals, somehow connected through a network, can be larger than the sum of the individual contributions. Surowiecki argues that, under specific conditions, lay groups can take better decisions and make better assessments than experts. According to Surowiecki, wise crowds are characterised by diversity of opinion, independence from group thinking, the ability to preserve the richness of diversity, decentralised decision-making that allows for specialisation and local knowledge and by having a mechanism for aggregation that turns private views and judgements into a collective decision.

In this chapter we will discover that the term 'wisdom of crowds' is used as a metaphor to describe a series of current and future developments, ranging from identifying citizens' preferences and opinions to co-creating policy, actively involving citizens in policy decisions and the self-organizing of citizens. This extends Surowiecki's concept of crowds to areas in which diverse groups take decisions involving complex social interactions. But these groups do not automatically comply with Surowiecki's criteria for 'wise crowds' in that they do not always demonstrate independence of opinion and decentralised decision-making. The 'wisdom' of a crowd is the aggregation of individual contributions to information, experience and judgment that can lead to new or better knowledge and insight. Each contribution can be relevant and, thanks to ICT technologies, can be collected without citizens needing to be personally related or work together actively.

Mechanisms for aggregation can range from intelligent software (the Google search engine, for example, ranks web pages based on popularity, or book shopping suggestions on Amazon.com), wikis and economic markets to all sorts of internal coordination and collaboration between people, with and without the use of technology. ICT technologies can play a significant role in internal coordination within crowds, as in the case of peer-to-peer technology for free telephony (Skype) or the TomTom car navigation software, which calculates the fastest route home for each individual, based on the amount of traffic (in other words, the collective behaviour of the crowd) measured by the Vodafone telecommunications network. These are just the first, very simple examples of what is likely to come when the web evolves into the Web 3.0 and 4.0 environments, where technology will understand human language (referred to as the 'Semantic Web') and all objects will become connected to networks (referred to as the 'Internet of Things').

Although technologies to improve insight and facilitate coordination are available, we still have to deal with social interactions that remain highly complex. The recent financial crisis has shown that psychological and social factors are very hard to grasp and can dominate the behaviour of crowds. These factors can lead to mass hysteria and blindness to risks. The balance between 'wise' and 'unwise' crowds can be very delicate, as Surowiecki (2004) acknowledges. To sum up, the 'wisdom of crowds' can manifest itself in many different ways and has the potential to generate more and better ideas, increased commitment and involvement and the mobilising (or self-mobilising) of citizens into action. Technology has a

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major role to play in aggregating knowledge from crowds and facilitating coordination and collaboration.

Method

The aim of this study was to find out how the 'wisdom of crowds' currently manifests itself and what future developments are expected to increase the use of this wisdom, as well as to establish how this will affect organisations and society as a whole. In order to get differentiated and wide-ranging views, fifty experts from different fields, including social sciences, computation, ICT, mathematics, biology, psychology, economics, politics and policymaking, were interviewed about their views on the 'wisdom of crowds'. These experts came from both public sector organisations (such as government departments and universities) and the private sector (multinationals, SMEs and self-employed people), as well as from both executive and operational levels. Their expertise and positions meant they could be expected to have a good overview of current developments in this respect.

These experts were asked to define both the phenomenon of the 'wisdom of crowds' itself and the terms 'wisdom' and 'the crowd'. They were also asked to give current examples of organisations using the 'wisdom of crowds' and to explain their vision of the associated opportunities and challenges. We continued conducting new interviews adding new dimensions or details to the description of the phenomenon until, after forty interviews, we considered that the data had reached saturation point (Glaser & Strauss, 1967), with the results from the final ten interviews being consistent with the information from the previous interviews.

In this chapter we discuss the views and challenges that these experts identified for the public sector and political decision-making. In many cases these views were very similar to the opportunities and challenges identified in the private sector.

Results

After analysing the interviews we concluded that our experts did not define the 'wisdom of crowds' in a single, consistent way. So, too, did their definitions of 'wisdom' and 'the crowd' differ. Rather than coming up with a consistent definition, they referred to a range of phenomena that varied both in terms of the kind of social interaction and the extent of interdependence between the members of a group. What these phenomena have in common is that the amount of knowledge of the group as a whole is seen as larger than the total knowledge of the group's constituent parts. In almost all cases 'wisdom' was used to refer to 'knowledge' and 'insight' rather than to a higher form of contextualised knowledge. According to the experts, the complexity and challenges related to the phenomena are primarily determined by the number of members involved in decision-making. The trend seen

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is of growing numbers of decision makers over the next few years because of the growing involvement of 'the crowd' in innovation and policy-making processes.

Based on this analysis, we devised a framework to map the different concepts of the 'wisdom of crowds' with respect to decision-making processes, as shown in Figure 1. The x axis shows the number of decision makers, while the y axis shows the amount of knowledge generated by the group, reflecting the concept of wisdom. Firstly, three traditional types of decision-making were defined: decision-making by one individual person or organisation, decision-making involving multiple stakeholders such as in representative democracies and decision-making in large social groups such as societies and masses. These three types are shown in the lower half of Figure 1.

For each type, the group's total amount of knowledge can be increased by making more effective use of the information and knowledge of all the individual group members. This translates on the y axis into three types of 'wisdom of crowds', which are described and analysed in more detail below. All the phenomena mentioned by the experts can be classified as belonging to one of these three types.

In this framework these types are considered to be three stages of 'wisdom of crowds', with rising numbers of decision makers and more social interactions within the group. According to the experts, social interactions between group members are essential for the creation of 'wisdom'. Greater social interaction is seen as having the potential to create more 'wisdom of crowds' than groups of unrelated individuals, which seems to contradict the original concept of the 'wisdom of crowds' introduced by Surowiecki. According to the respondents, the greater the number of social interactions between members of a group, the greater the challenges involved in using the available knowledge and interactions effectively and in unlocking the full potential of the 'wisdom of crowds'.

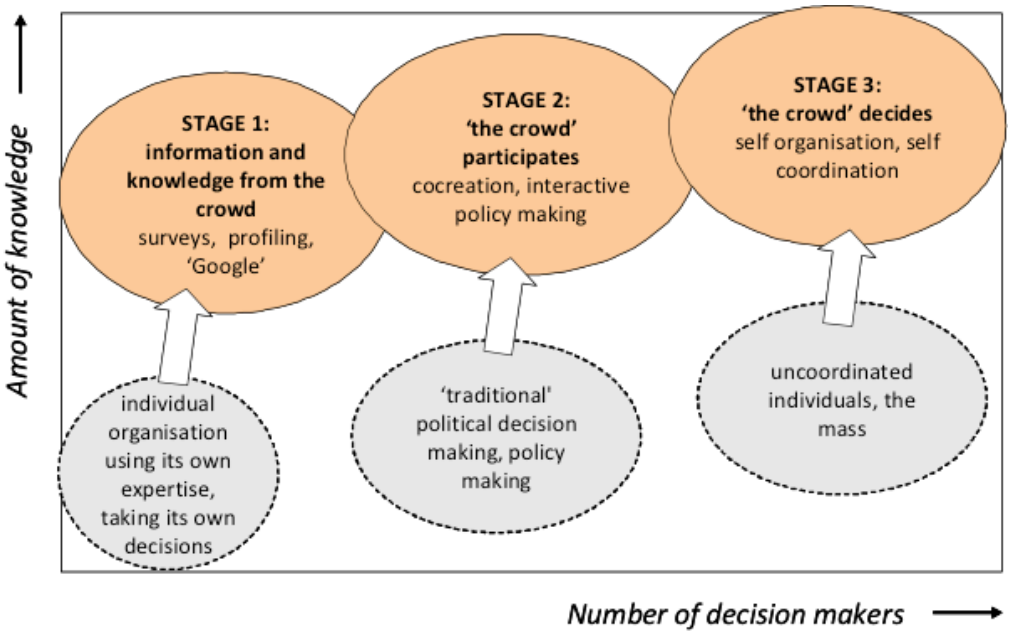

Fig. 1. Three stages of the 'wisdom of crowds'.

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Stage 1: Using knowledge and information from the crowd

The first stage represents the original concept of 'wisdom of crowds' as used by Surowiecki (2004). In this stage, individuals and organisations tap into the knowledge of a large group of people consisting of independent members making decentralised, individual decisions. These organisations use the crowd to get extra information ('information intelligence') and new ideas. Organisations use the crowd to help them, for instance, to resolve difficult issues that require knowledge, insight and expertise. In this way, organisations gain access to the diversity of opinion among crowd members.

Input from the crowd can be obtained by using intelligent search engines such as Google, data mining and the profiling software used by online book stores such as Amazon and Bol.com. The experts consulted claim that this input can also be obtained more actively by setting up online questionnaires such as 21minuten.nl, a Dutch initiative launched by McKinsey and De Publieke Zaak that asks people for their opinions on, for example, the economy, the environment and the European Union. The government can then use this information to improve its policy. Other examples include internet forums and idea contests, such as Showusabetterway.com in the United Kingdom, which asks citizens to help develop better ways of publishing the vast amounts of non-personal information that the government collects, such as the location of state schools.

According to the experts, organisations are in the lead in this stage, and decide for themselves how they use the information from the crowd. There are no social interactions among members of the crowd, and there is almost no social interaction between the crowd and the organisation. The organisational structures are unchanged.
The respondents saw the main challenges in this stage as being how to:

- gather, filter, synthesise and contextualise relevant information so as to obtain greater insight and more knowledge from multiple sources of information and the crowd;
- improve current market research techniques (which use panels of up to one thousand respondents) and voting systems (approval voting: yes or no?) so as to make better use of the 'wisdom of crowds' by obtaining better insight and higher-value information from the crowd;
- preserve the diversity of opinion while using statistical techniques that tend to reduce the amount of data.

Stage 2: Co-creation between citizens and organisations

In the second stage, citizens' involvement has grown: organisations and citizens collaborate to solve problems. In this stage, there is interaction between organisations and citizens. There is scope for the crowd to modify and configure a public policy or public service, and this process is often referred to as 'crowdsourcing'.

An example that was mentioned is the Ministry of Economic Affairs' Innovatie 2.0 community, where entrepreneurs can help shape subsidy schemes for innovation. Other

common examples can be found in the decision-making processes involved in infrastructural projects and spatial planning. These processes already have a lot of experience with citizen participation and representation, while Web 2.0 has made it easier to reach and interact with even larger groups. Another example is Wijbouweneenwijk.nl, set up by the municipality of Smallingerland.

In many cases, citizens collaborating with such initiatives not only have contacts with the organisation, but also with other citizens and so are used to discussing ideas and proposals and reacting to each other's wishes and demands. To a certain extent these social interactions make these citizens interdependent. Decision-making becomes a group process rather than an individual one, as in Surowiecki's original model of the 'wisdom of crowds'.

Although organisations may have actively involved citizens in this phase, our respondents still see them as having a high degree of control over the decision-making process and the public products and services that are offered. Organisations are largely able to define the margins of input by citizens, who present themselves as players representing even larger groups of citizens.

The social web means citizens are increasingly becoming connected and collectively organised, and these collectives can come and go. These days, for example, citizens are less and less represented by traditional labour or other unions and associations, but are instead opting for self-representation. They choose on an ad hoc basis how to organise themselves so as to best defend their interests. In other words, an 'adhocracy' (Mintzberg, 1983). This puts pressure on the amount of control that organisations can have. According to our experts, organisations wanting to make optimal use of the wisdom of these citizens need to evaluate their decision-making processes and develop more sophisticated decision-making tools.
The other main challenges facing organisations in stage 2, according to the experts, are:

- deciding the margins for input by citizens. Raising the margins could result in more innovative ideas, but also in less control for organisations;
- getting and maintaining citizens' commitment through the entire process of gathering ideas to taking decisions and action. Citizens who feel they are not being taken seriously may turn against the organisations;
- redesigning organisational structures and procedures. Working with groups of citizens requires openness, transparency and a more personal approach, which contrasts sharply with the way most bureaucracies operate.

Stage 3: Self-organisation

In stage 3, citizens have become even more self-aware and have taken the lead. Organisations have more or less dissolved into these groups of citizens. This stage can be described as a highly complex system, full of relationships and continual interaction between individual citizens or groups of them. It is characterised by self-organisation: initiatives are taken by citizens themselves, with no need for organisations to control them. One of the best examples

of this is the Linux software, which was developed by a team of collaborating experts who distributed tasks among the group and were completely self-organised.

The respondents also interpreted this concept of self-organisation as a sort of 'crowd', just like the other two forms. However, the high degree of social interaction in these groups means they cannot be seen as crowds consisting of citizens making independent decisions. In this phase, decisions are made by the group as a whole.

In this stage, wisdom is seen as a collective action of decision-making based on the collective awareness of the complex system. Instead of being able to control these citizens, organisations have now become part of the complex system in which both organisations and individuals can start initiatives and work together on a basis of greater equality. This seems to follow the trend, as predicted by our experts, of citizens becoming more empowered by social web tools and wanting being more involved, while also feeling more free to take action themselves (as a group) and to represent themselves rather than be represented by third parties.

Decision-making processes will consequently become much more complex and unpredictable, involving many players with no hierarchical structure and no-one in overall control. The experts predict that governments will also be less able to control and manipulate citizens and so may need to redefine their role, focusing on enabling citizens rather than controlling them. New organisational structures may also be needed.

Examples of self-organisation can already be seen in society. But, according to our experts, there do not yet seem to be many online examples other than Linux. More effective self-organisation may require more technological tools to support internal coordination and decision-making. The technological tools in use today, such as car navigation software, have been developed on the basis of the swarm models of ants and bees. We can certainly learn a lot from 'swarms' of insects or the like seen among birds and fish. Indeed these swarms can achieve amazing things that go far beyond what one individual can achieve. Even simple rules of self-organisation and self-coordination can generate complex organisational structures (Kauffmann 1995). However, although swarm models may provide a strong image for self-organisation, we also need to take account of the complexity of social interactions between humans.

The respondents see this final stage as involving the challenges of:

- unravelling animals' mechanisms for self-organisation and seeing whether they can also be applied to humans, as well as enabling self-coordination by using technologies to improve interactions and decision-making processes in large groups of citizens;
- redefining the role of traditional decision-making organisations and structures, such as parliaments, that will tend to be bypassed by groups of citizens acting and deciding collectively;
- predicting or detecting changes in sentiment at an early stage that might turn wise groups into unwise groups and trigger mass hysteria.

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Conclusion

As a result of technological developments over the past two decades citizens have become increasingly connected, both socially and virtually. This provides opportunities to make more effective use of the collective knowledge and expertise of groups of people and to build public support for and public involvement in change. Citizens and organisations have taken the first steps to profit from what Surowiecki refers to as the 'wisdom of crowds'. At the same time this increases the complexity of decision-making processes and challenges the role of governments and politicians.

Our study involved asking experts from business, government institutions and universities to give their views on the 'wisdom of crowds'. This term was found to be used to describe three different phenomena, which do not always comply with the original concept of the 'wisdom of crowds' introduced by Surowiecki. We built a framework to map these phenomena with respect to increases in knowledge and numbers of decision makers. This resulted in our identifying three stages of 'wisdom of crowds', with increasing degrees of social interactions in a group resulting in increasing complexity.

The experts referred to in this chapter see an evolution from stage 1 towards stage 2 and then on to stage 3. While the interaction between organisations and citizens increases towards the third phase, groups of citizens in this stage are also likely to demand greater accountability and more involvement in the decision-making process. In increasing numbers of cases citizens will self-organise and even bypass current organisational structures in order to achieve their own goals and ambitions. In this way, existing organisations may completely lose the control they currently enjoy. In response they may need to redefine their role and facilitate citizens instead of trying to control them, while new organisational structures may also need to be developed.

The first stage of the process can be seen as the 'wisdom of crowds' as described by Surowiecki. In other words, organisations and individuals using information from the crowd. These crowds consist of independent members making individual, decentralised decisions. In the second stage, citizens participate in the decisions taken by organisations, while in stage 3 citizens organise themselves into complex systems that take the decisions themselves. Social interactions within these groups mean, however, that these groups do not automatically meet Surowiecki's criteria for a 'wise crowd', characterised by independence and decentralised decision-making. The recent financial crisis has shown that social interactions can lead to mass hysteria and blindness to risks among large groups of people. If social interactions and individual contributions are not used effectively, the total amount of knowledge of 'the crowd' may easily reduce. The balance between 'wise' and 'unwise' crowds can be very delicate, especially in stages 2 and 3, as Surowiecki recognises.

Interestingly, the experts we interviewed saw social interactions as crucial for creating knowledge and wisdom in stages 2 and 3. Indeed these interactions may provide even better ideas and more commitment for implementing these ideas, thus resulting in more 'wisdom of crowds'. In order, however, for these complex interacting groups to become 'wise', the social interactions need somehow to be coordinated and to improve collaboration. This demands the development of more technological tools to enhance coordination and interaction among

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citizens. New technologies that are currently being developed are expected to stimulate this trend, while combining these new technologies with a better understanding of the social interactions and mechanisms could help us to progress to unlocking the full potential of the 'wisdom of crowds'.

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