HOW TO CREATE A SMART MOB: UNDERSTANDING A SOCIAL NETWORK CAPITAL

Ashley Hubbard Harmon
Wellesley College
106 Central Street, Wellesley, MA 02481, USA

Panagiotis Takis Metaxas
Wellesley College
106 Central Street, Wellesley, MA 02481, USA

ABSTRACT

This paper explores the creation of smart mobs and their ability to gain knowledge, social capital, and expand individual authority through participation. The evolution of smart mobs through computer-mediated communications has extended and expanded the traditional realm of individual influence and authority. In the decade since Rheingold identified smart mobs, this type of behavior has continued to grow and expand, influencing social, political and economic domains. But what makes or breaks a smart mob? Researchers in the last decade have tried unsuccessfully to identify their key components. This paper offers a "recipe" for creating smart mobs, by discovering the must-have characteristics that are necessary for their success: *Desire for Communication; Affordable Communication Devices; Opportunities for Instantaneous Communication; Shared Goal; and Small Time Frame*. In conclusion we propose that the future of effective smart mobs can be based on a template that has been successfully implemented since 2008, and that as individuals gain authority through the vehicle of smart mobs, governments will have to re-define their role in response to the collective action facilitated by smart mobs.

KEYWORDS

Smart Mobs, Social Networks, Social Web, Reputation Systems.

1. INTRODUCTION

In 1989, when Tim Berners-Lee merged hypertext with the Internet to create the World Wide Web, he laid the foundation for open, technology-enabled collaboration. Aided by the decreasing manufacturing cost and increasing computing power of microprocessors, the Web can now be accessed via computers, mobile phones and personal digital assistants connected to the Internet,. These computer mediated communications are now empowering people in new ways and are changing the way individuals meet, mate, work, play, conduct business, govern and create. These technologies are also at the foundation for the creation of the smart mob. Smart mobs, first identified by Howard Rheingold [1], and highlighted in the New York Times 'Year in Ideas' in 2002 [9], are defined as *technologically-mediated self-structuring social organizations.* Since then we have seen the development of several high-profile smart mobs, including the ones that were created during the recent Iranian elections [16], etc. Smart mobs behave intelligently and effectively [2] because the exponential network links allow for social coordination on a vast, even global, stage.

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But what makes or breaks a smart mob? Researchers in the last decade have tried unsuccessfully to identify their key components [14]. This paper analyzes successful smart mobs, showing that smart mobs can only emerge when five key criteria are met.

The rest of the paper is organized as follows: In the next section 2 we describe the five key criteria for the creation and success of smart mobs. In section 3 we examine the effective use of recent smart mobs,

demonstrating that in every example, all five enabling points existed. In the same section we also explore the outcome when one of the five criteria of a smart mob is manipulated, leading to the creation of a darker, less socially acceptable, smart mob. Finally, in section 4 we propose that the future of effective smart mobs can be based on a template that has been successfully implemented since 2008, and that as individuals gain authority through the vehicle of smart mobs. The last section has our conclusions in which we observe that governments will have to re-define their role in response to the collective action facilitated by smart mobs.

2. FIVE KEY COMPONENTS FOR THE CREATION OF SMART MOBS

The creation and success of a smart mob is predicated on five key components presented here. The first three criteria serve as the foundation for the creation of any online social network. Smart mobs are distinguished by two additional criteria; unification around a shared cause or goal, and a finite time frame in which to accomplish the shared cause. As we will see in the following sections, it is only when all these conditions are in place that the potential for a smart mob is enabled.

2.1. *Desire for Communication*

Throughout civilization humans have demonstrated an *innate desire for communication*. As John Locke famously said, "Man is by nature a social animal." Historically, the desire to communicate gave rise to collective action: a group pursuit or set of goals. This idea of collective action, facilitated by communication, has been examined throughout numerous disciplines. Sociologists have explored social integration and conflict. Economists have analyzed the role of public goods in society and computer scientists have measured hypotheses and run large-scale social experiments. Communication tools of the Twenty-first Century allow for collective action in new, seemingly limitless, ways. Today the communication of many is occurring on a scale that has never before been possible. This inherent desire to communicate is the first component necessary for a successful smart mob.

2.2. *Affordable Communication Devices*

Technological innovations since the late 1990's have created *affordable communication devices*. The extended success of "Moore's law" [3] demonstrated an exponential growth in computing hardware and processing speed. This growth has allowed for a dramatic increase in processing power and decrease in the size of electronic devices. Lower prices of portable and mobile devices are now at a price point that is accessible to many on a global scale. The prevalence of affordable communication devices is the second key component in the creation of a smart mob.

2.3. *Opportunities for Instantaneous Communication*

From cellular phones to PDA's, to real time chat networks, the explosion of social media and social networks creates new *opportunities for constant and immediate communication*. Within online social networks individuals can be thought of as nodes, linked to others through many possible paths and channels to distribute and receive information. The interactions are generally based on cooperation, reciprocity, self-interest and reputation. Through instantaneous communication the possibilities for spreading and disseminating knowledge is dramatically altered. "When the network enables transactions between the individual nodes, the value is squared. When the same network includes ways for the individual to form groups, the value is exponential" as "Reed's law" suggested [1]. Therefore, a new infrastructure exists through which instantaneous communication can occur. This real time, global, mass network communication, is the third element needed for the implementation of a smart mob.

We should note at this point that the first three criteria are essential for the creation of all online social networks. One can readily verify that well-known online social networks such as Facebook, Myspace and Twitter all share these characteristics. But they do not automatically lead to the creation of smart mobs. To get there, we need two additional criteria, presented next.

2.4. *Shared Goal*

The unification around a specific cause or *shared goal* from which individuals stand to benefit is an important component of a smart mob. The existence of a common aim differentiates a smart mob from a social network. Traditionally successful actions towards a cause have often been limited to well-funded, organized groups. For example, collective action has shown many times that small, powerful groups had the ability to shape public decisions. The previous three smart mob components, the desire to spread a message, lower costs, and real-time communication, can all be channeled through the vehicle of a common cause. With digital technology altering both organizational costs and structures, unification in support of a goal can occur through new channels. The necessity of support for a common cause is the fourth element required for the existence of a smart mob.

2.5. *Small Time Frame*

Collective action, in the name of a cause, aided by communication and social media, will only have the potential of becoming a smart mob if there exists a limited time frame in which the outcome of the cause can occur. The final key component for the creation of a smart mob is a *finite time frame*, usually in a matter of hours to days. Longer periods of time will not provide the focus or urgency necessary for the rise of a smart mob.

2.1 Examples of The Five Criteria in Successful Smart Mobs

Together these five enabling components create the potential for the emergence of a smart mob.
Let's look at how these criteria have demonstrated themselves in several well-known smart mobs. We expand below on several smart mobs.

Table 1. Application of the five criteria in a few well-known smart mobs

Smart mob	**Manilla e-Revolution [1]**	**Balloon spotting [6]**	**Ushahidi [7]**
Desire for Communication	Seeking political justness	Seeking success in research goal	Eagerness to help earthquake victims
Affordable communication devices	cellphones	Cellphones; Web servers	GPS-enabled cellphones
Opportunities for instantaneous communication	Texting network	DARPA's challenge	Ushahidi network
Shared goal	Ending President Estrada's regime	Financial gain; bragging rights; research	Rescue earthquake victims
Small time frame	January 17 - 20, 2001	December 5, 2009	Jan.12 – Feb.20,2010

These three examples are described in detail in sections 3.1, 3.4 and 4. More examples of successful and unsuccessful smart mobs are described in the remaining subsections of section 3.

3. THE APPEAL OF SMART MOBS

Human beings' innate desire to learn, explore, institute change, ignite action and procure satisfaction can be linked to the evolution and growth of smart mobs in the last decade. The pursuit of human capital, social capital and knowledge capital have long motivated the actions of societies. Social networks are popular because, "people can put in a little of what they know and how they feel into the online network and draw out larger amounts of knowledge and opportunities for sociability that then put in"[1]. Indeed, the fact that the World Wide Web and the Internet have been public goods since their inception, and that they are saturated with knowledge, makes them an unusual and appealing combination.

An interesting way to highlight the differences between a social network and a smart mob is to explore networking situations that have morphed into smart mobs. In all the examples listed below the defining characteristics of the smart mob are the common cause and the finite time frame.

3.1 Manilla's e-Revolution

Howard Rheingold highlighted the successful smart mob that occurred in May 2001 in Manila. In the early part of the Twenty First Century teenagers in the Philippines were dubbed "Generation Text." [1] Texting was originally introduced in the Philippines in 1995 as a free advertising gimmick. Its inexpensive cost (compared with phone calls) enabled a high percentage of the population to be in touch via text messaging. In what has since been called the first "E-Revolution," seventy five minutes after the impeachment proceedings of President Estrada stopped, twenty thousand people gathered at the shrine of Our Lady of EDSA, a small church built in 1989 to commemorate the People Power Revolution that overthrew the dictatorship of Ferdinand Marcos. Within four days over one million people were part of a non-violent demonstration calling for the end of President Estrada's regime. In this one-week period in January 2001, over 70 million text messages were sent, and the ensuing peaceful behavior resulted in successful political change and a new Filipino president.

In this case the desire for communication was driven by a sense of political justness, and occurred on cellular phones via the texting network that had been in place in the Philippines since the mid 1990s. The common cause of ending President Estrada's regime resulted in over 70 million text messages being sent within a seven day period, and the non-violent protests of over one million people. The end result, a new Filipino President, can be seen as the positive outcome to an early smart mob.

The crowd that brought Estrada's regime to an end was the first clearly recognized smart mob. The continued appeal of the smart mob is due in large part to its potential to fundamentally alter the influence of an individual, and its ability to expand traditional roles of authority. As smart mobs have evolved, their outcomes have been concrete and tangible, thus reinforcing their validity and potential, and motivating the creation of further smart mobs. We will now examine several more recent occurrences of smart mobs, showing that in each example all five enabling points exist and were necessary for a positive result.

3.2. OXFAM's Haiti Initiative

During the Second World War OXFAM, The Oxford Committee for Famine Relief, was created to bring aide and food supplies into war torn Greece. In 1995 they merged with other non-government organizations to provide general emergency funds. This organization was not a smart mob; however, they have managed to create smart mobs based around specific crises. When the earthquake hit Haiti on January 12, 2010, OXFAM already possessed the first three components of a smart mob, their work represented a shared desire for communication and humanitarian actions and they had a website, an online network through which aid could be donated and dispersed.

Right from the first day of the earthquake, OXFAM mobilized a campaign to bring aid to the devastated country. This common cause, relief and help for Haiti, coupled with the need to bring immediate action, allowed for OXFAM to raise $100 million dollars within five weeks. On February 24, 2010 OXFAM closed their humanitarian Haiti fund because they had reached their goal [4]. The existing network which OXFAM used to raise money for Haiti included their own website, Google maps with current photos of the

devastation, you-tube videos of OXFAM workers on the ground installing fresh water receptacles and a Twitter network.

3.3. Kiva's Financing Model

Another example of a successful smart mob that has been created around philanthropic ideals is the organization Kiva [5]. Here the desire for communication is based on the idea of connecting people to create relationships. Through the medium of the web and cellular phones, Kiva has created a website where lenders can find field partners in developing countries to partner with and provide microfinance loans. Kiva's success as a smart mob is because all participants are united by a shared goal, connecting people to alleviate poverty, and the time frame is concrete. The average time for a Kiva loan to be funded is 96 hours and loans are paid back on either a monthly, quarterly or finite loan term cycle. Although Kiva is comprised of only 34 full-time staff members, on average in 2008 a loan was made every 31 seconds on kiva.org. Like OXFAM, Kiva is also an example of how successful smart mobs can be created on top of social networks once a common cause and finite time frame have been established.

3.4. MIT's Balloon Spotting Project

As people continue to explore smart mobs and understand how they are created, it could be helpful to highlight a case in which a smart mob was created by design. In December 2009 The Defense Advanced Research Projects Agency (DARPA) commenced a contest to see how social networks could team together to locate 10 red balloons at unknown points across the Unite States. Over 4,300 people registered to take part in the competition in hopes of winning the $40,000 prize.

The winning team was from the Massachusetts Institute of Technology (MIT) and found all 10 balloons in less than 9 hours. How the competition was won is an example of a smart mob, seemingly created at the same time a social network was built. The MIT team was intrigued with the role of social networks in the spreading of information, but they did not have one available. Through this desire to understand communication they established a website through which people all across the US could join their team to help search for the balloons. Team members could use cell phones, pda's and the web to update balloon spottings. The situation turned into a smart mob once the MIT team created a financial compensation structure for those people who found, or helped look for, the balloons. The shared goal of finding the balloons and winning money, $2000 for the correct coordinates of a balloon, $1000 to the person who invited the winner to join the team, $500 to the person who invited that person, and so on, was the shared goal [6]. The finite time frame was driven by the fact that individuals all across the country were also competing.

The MIT team was able to establish the correct coordinates for all ten balloons in less than nine hours. The creation of this smart mob relied on all five enabling points. Although the MIT team was not trying to create explicitly a smart mob, the formula that they stumbled upon, has been purposely used to create successful smart mobs.

3.5. Manipulations of Smart Mobs

Although we have highlighted so far smart mobs with philanthropic and positive social implications, it would be remiss to not examine the existence of smart mobs with negative social implications. An interesting side effect of the Internet and mobile communication is that it creates room for anonymity and allows individuals to dehumanize possible receipts. Existing social barriers have been broken down by the prevalence of the Internet and mobile technology in most people's daily lives. In the late 1980s the term 'troll' was given to someone who intentionally disrupts an online community. In 2008 a New York Times reporter suggested that, "trolling has evolved from ironic solo skit to vicious group hunt" [8]. Indeed, the Internet "is now capacious enough to host an entire subculture of users who enjoy undermining its founding values." One of the ways in which smart mobs have been manipulated, is the website '4chan'. Founded in 2003 by a fifteen year old student, 4chan is an image board website where people can post and discuss Japanese comics and

television shows anonymously. The website contains six broad categories and a "/b/" boards dedicated to random images and topics. It is on this /b/ board where users, knows as "/b/tards/" have extended the role of smart mobs to the questionable, dangerous and possibly deadly[11]. Although 4chan has been called an Internet home for people who lack a social conscious, it has unquestionable become a cultural website powerhouse. In a 2008 television interview, a representative of 4chan claimed that the website has over 15 million users quarterly and that 4chan is larger than 99% of other sites on the web [12]. The site estimates that they have over 450,000 posts daily and proudly takes credit for a recent raid on Twitter, You Tube Porn Day and for hacking into the Time Magazine's voting system for the worlds most Influential Person to make 4chan's creator, 'moot,' the winner [17].

In this smart mob, the desire for communication is predicated on anonymity. Lack of identification allows social norms to disappear and the result is a subculture, built on deception, which appears to take great pleasure in toying with the media. This group of like-minded individuals uses the web through the network of 4chan.org. Their causes vary, but often seem to be grounded in malicious, pornographic, racist or misogynist purposes. For individual campaigns there is a finite time frame in which to act. Examples of 'successful' smart mobs instigated by 4chan trolls include installing flashing images and links to animated color fields on the National Epilepsy web site, hacking into Sarah Palin's Yahoo email account in 2008, and replacing the content of the hip hop website SOHH.com with racist photos and slurs. [12] In 2005, a bomb threat to football stadiums made by a troll resulted in his subsequent arrest, six-month jail sentence, and $26,750 fine. In response to these actions, 4chan has been dubbed an Internet hate machine, one which breeds and fosters domestic terrorists, and an example of how trolls now practice a new social behavior, "Internet Eugenics."

3.6. Destroying a Smart Mob

So far we have demonstrated the necessity to have all five enabling points to create a smart mob. If a single one of these points is removed, the smart mob will not occur. Although smart mobs can be manipulated by users to impact their outcome, they can also be manipulated or altered by a government to abort the smart mob.

A clear example of a budding smart mob that was destroyed by outside intervention occurred in Burma in August 2007. Students and political activists starting protesting the soaring cost of petrol after the government removed subsidies for fuel prices. The military led government cracked down on the protests using force and violence. In this evolving smart mob the protesters were driven by a desire for justice, they were able to use cellular phones and the web to spread their cause and attract attention on a global scale. The shared goal was protesting the Junta and the time frame was limited as people tried to adjust to soaring costs of fuel. In September thousands of Burmese monks joined the protestors and global coverage of bloodied monks dominated the press. By the end of September, in a severe government crackdown, the top diplomat from the United Nations was removed from Burma and for two weeks the government blocked all access to the Internet, including the shut down of all Internet cafes. Although the government claimed that they were doing maintenance work on the Internet, they managed to successfully eliminate the third component necessary for a smart mob, the network for communication. The protestors were left with limited ways to promote their cause and the rioting was effectively stopped. The government remained in power and no significant change was made. [15] The situation in Burma demonstrates that smart mobs can be stunted and artificially kept from developing.

Another way that governments have tried to control the power of emerging smart mobs is by confusing the common goal, as in the case of the aftermath of Iranian elections in 2009 [10]. It has been reported that by inserting spinners in the smart mob network who try to steer the forming group towards violent goals and thus reducing its legitimacy, governments can deny the power of the fourth criterion disabling the smart mob.

4. USHAHIDI: A MODEL FOR SMART MOB CREATION

The five criteria we have described in this paper have been implemented in a model that, we believe, will have continuous success in the future of smart mobs. This is the a model created in 2008 by Ushahidi [7] and it has been used since routinely in creating successful smart mobs [13]. This open-source project serves as a platform that allows individuals to gather and distribute data via email, SMS, and the web, allowing people to

see the results on either a map or a timeline. The goal of the project is to create a simple way of aggregating information from the public during a crisis. In 2008 Ushahidi was developed in Kenya by a group of citizen journalists after the post-election fallout. Individuals' submitted via their cellular phones and the web where acts of violence and peaceful efforts were occurring. After its initial success Ushahidi, which means 'testimony' in Swahili, transitioned from an ad-hoc group to a focused organization. Today there are over 45,000 users in Kenya and other communities of users have developed in Europe, Africa, Asia and the United States.

The list of successful smart mobs created, all focused around a common goal or crisis in a finite time period, is vast, providing strong evidence of the validity of the recipe we analyze in this paper. Successes include, monitoring crime in Atlanta, understanding stocks of medical supplies at pharmacies in Kenya, Uganda and Zambia in real time, monitoring the federal elections in Mexico in July 2009, tracking of swine flu, monitoring the vote report in India, tracking unfolding violence in and around the Gaza Strip and monitoring and organizing snow clean up after the 'Snowmageddon' in Washington, D.C. winter of 2010.

Modeled on open-source communication, Ushahidi has created a template for a smart mob. The first three components are in place, and when a cause that must be addressed immediately occurs, Ushahidi can create a smart mob within minutes.

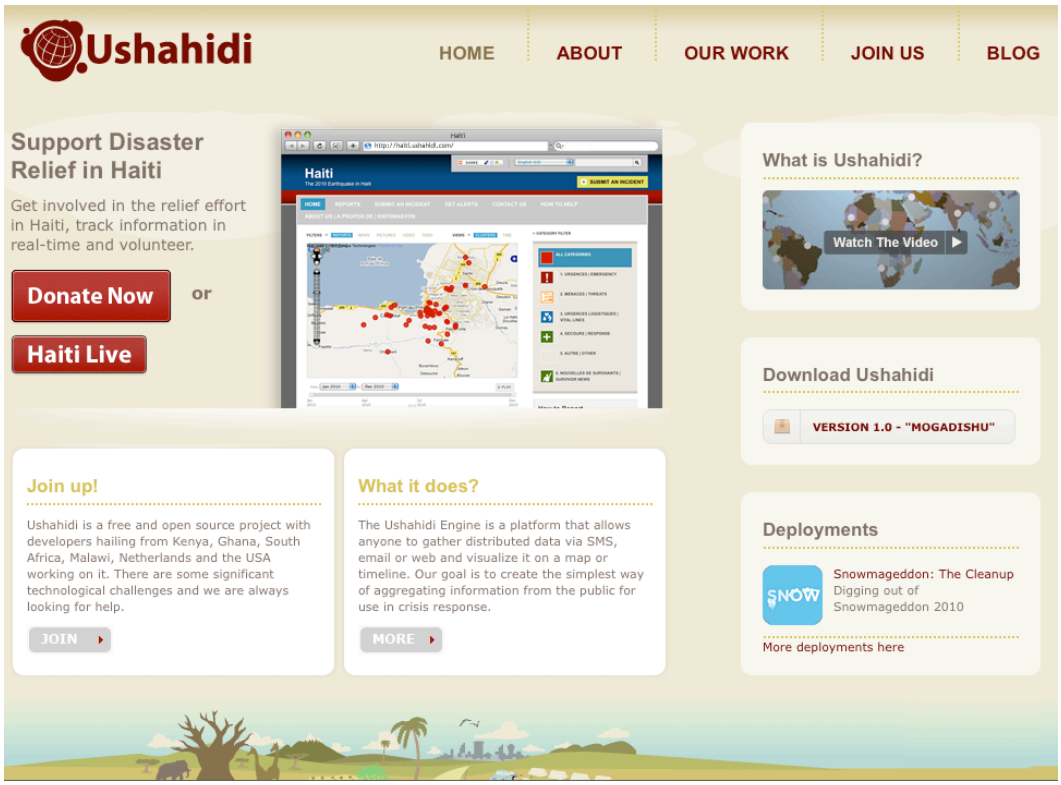

Figure: Ushahidi provides complete, reproducible support for all five criteria necessary for the creation of smart mobs.

5. CONCLUSIONS

In this paper we first presented five criteria that are necessary for the creation of smart mobs: *Desire for Communication; Affordable Communication Devices; Opportunities for Instantaneous Communication; Shared Goal; and Small Time Frame*. The question of why some social networks succeed while other fold had not been answered satisfactorily, partially because it was examined as a topological problem [14], not a

social one. In this paper we argue that a smart mob, the more powerful version of social networks, need to fulfill five criteria in order to succeed. We then proceed in analyzing several successful smart mobs.

One of the natural questions that arise is: While the five criteria for forming a smart mob are necessary are they also sufficient? While we cannot argue for what smart mobs that did materialize did not have, we can see examples that were destroyed after they were formed because one of the conditions failed or was attacked by those opposing them.

We should highlight that many smart mob behaviors happen so frequently that the next generation of adults will accept these patterns of behavior and their resulting repercussions as normal and expected. Rheingold predicted in 2002 that smart mobs would become the underpinnings of a new economic order. While this has not happened, governments will have to re-define their roles in response to collective actions facilitated by smart mobs. The combination of technology and human beings innate desires, through the vehicle of the smart mob, will allow for future innovation and action in the 21st century and beyond, and governments will have to adjust accordingly to the continued development and power of smart mobs.

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