MODERN SOCIAL MEDIA AND SOCIAL REVOLUTIONS

A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE
General Studies

by

BRIAN L. MAYER, MAJOR, USA
B.A., Methodist University, Fayetteville, North Carolina, 2005

Fort Leavenworth, Kansas
2011-02

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED** *(From - To)*
16-12-2011	Master's Thesis	FEB 2011 – DEC 2011

4. TITLE AND SUBTITLE

Modern Social Media and Social Revolutions

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

Major Brian L. Mayer

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

U.S. Army Command and General Staff College
ATTN: ATZL-SWD-GD
Fort Leavenworth, KS 66027-2301

8. PERFORMING ORG REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for Public Release; Distribution is Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

The emergence of social media platforms as a means of communication and information sharing marks a fundamental change to how societies interact. This new form of media played a formative role in the organization of mass uprisings and demonstrations known as the 'Arab Spring' that took place in the Middle East and North Africa in 2011. The study draws data from research in social revolution, social network theory, and mass communications to develop a new model to explain social media's function in the organization and execution of social revolutionary activities. The model integrates DeFronzo's five components of social revolution with Barabasi's social network theory. Shirky and Roy's social media engagement work to explain interaction between the separate groups. The study applies data from the 2011 Egyptian Revolution to test the model. Findings from this research show the model sufficiently identifies social media use across a wide range of groups within a society and maps their respective interaction between online social networks and the occurrence of physical events such as mass demonstrations and similar political unrest. Given limitations in respect to time and the complex variables associated with social problems within such a large scale, this study is unable to definitively predict the extent to which certain groups are likely to respond within the social domain as well as at the state level. This study provides an acceptable theoretical model to serve as the basis for future research in social revolutionary activities.

15. SUBJECT TERMS

Social Revolution, Social Media, Social Network Theory, Facebook, Twitter

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**			**19b. PHONE NUMBER** *(include area code)*
(U)	(U)	(U)	(U)	127	

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

MASTER OF MILITARY ART AND SCIENCE

THESIS APPROVAL PAGE

Name of Candidate: Major Brian L. Mayer

Thesis Title: Modern Social Media and Social Revolutions

Approved by:

_____, Thesis Committee Chair
Daniel A. Gilewitch, Ph.D.

_____, Member
Russell B. Crumrine, M.A.

_____, Member
Jeff Vordermark, M.S.

Accepted this 16th day of December 2011 by:

_____, Director, Graduate Degree Programs
Robert F. Baumann, Ph.D.

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

MODERN SOCIAL MEDIA AND SOCIAL REVOLUTIONS, by MAJ Brian L. Mayer, 127 pages.

The emergence of social media platforms as a means of communication and information sharing marks a fundamental change to how societies interact. This new form of media played a formative role in the organization of mass uprisings and demonstrations known as the “Arab Spring” that took place in the Middle East and North Africa in 2011. The study draws data from research in social revolution, social network theory, and mass communications to develop a new model to explain social media’s function in the organization and execution of social revolutionary activities. The model integrates DeFronzo’s five components of social revolution with Barabasi’s social network theory. Shirky and Roy’s social media engagement work to explain interaction between the separate groups. The study applies data from the 2011 Egyptian Revolution to test the model. Findings from this research show the model sufficiently identifies social media use across a wide range of groups within a society and maps their respective interaction between online social networks and the occurrence of physical events such as mass demonstrations and similar political unrest. Given limitations in respect to time and the complex variables associated with social problems within such a large scale, this study is unable to definitively predict the extent to which certain groups are likely to respond within the social domain as well as at the state level. This study provides an acceptable theoretical model to serve as the basis for future research in social revolutionary activities.

ACKNOWLEDGMENTS

I would like to express my deepest thanks to those that offered support and encouragement throughout this research project. First, to my wife, Alicia, for enduring the long hours of study that occupied countless hours of my time as well as her unfailing commitment to maintain balance in our home. Sacrifices made by the family exacted a high price to complete this study and it would not have been possible without a best friend by my side.

I would also like to thank my committee for their expert counsel and commitment to the project. As committee chair, Dr. Gilewitch kept the research project on track and served as a guide through the process from start to finish. Mr. Crumrine and Mr. Vordermark offered expert perspective and encouragement. I express my sincerest gratitude to the committee for being a part of the team.

To my seminar group leader, Mr. Cricks for his qualitative research direction, many thanks. I would also like to thank my oral comprehensive exam committee: LTC Corey, Dr. Beilakowski, Mr. Cricks, Mr. Salvatorelli, and Mr. Brown for their time and effort to include the focus of my research toward the context of the examination.

TABLE OF CONTENTS

Page

ILLUSTRATIONS

Page

TABLES

Page

CHAPTER 1

INTRODUCTION

Overview

The wave of revolutions in the Middle East and North Africa that began January 2011 raised questions concerning the role of modern social media in social revolutions. Evidence suggests a growing number of activists are using modern social media tools as a means to organize groups and conduct an information campaign aimed at promoting popular support for their objectives. During an interview with CBS News, Wael Ghonim, an Egyptian born regional marketing manager for Google in the Middle East, said, "If there [were] no social networks, it [the Arab Spring] would have never been sparked . . . without Facebook, without Twitter, without Google, without YouTube, this would have never happened" (Ghonim 2011). Reports labeled the two week event the "Facebook" Revolution (Smith 2011).

While many in the media as well a number of analysts and experts extol social media's role in this latest form of social revolution, limited study linking this new form of communication and social revolutions has been made. The purpose of this research is to examine the interaction between social revolution and modern social media to develop a theoretical model to explain this relationship. The study tests this model using events that took place in Egypt from 2010 to 2011 that ultimately led to the mass uprising resulting in the ouster of President Hosni Mubarak. The majority of previous studies in revolutions seek to explain the importance of "social structure, ideology, and culture in creating collective contentious action" (Poulson 2006, 21). The means by which communications

platforms are used in the formation of collective action, ultimately leading to social revolution, is rarely the focus of discussion. This research serves to fill that gap.

This study supports America's national security objectives by creating a tool that improves the identification and understanding of relationships between modern social media and social revolution. The model proposed in this study can be applied to regions vulnerable to instability and internal conflict that are of strategic importance to the security of the United States. It improves the body of knowledge central to further defining the operational environment that can impact America and its allies. This study brings to light a relationship that exists between modern social media and outbreak of social revolutionary activity, a relationship that has only recently gained attention at the national level.

Modern social media made its first appearance as an Internet based social networking tool in 1997 (Boyd and Ellison 2007). While these early social network platforms lacked the functionality found in modern sites such as Facebook and Twitter, they marked the first time users had the ability to create profiles, list friends, and search a database of other users for the purpose of interacting and sharing information. Face to face, off line networks began migrating to virtual, online networks. Within ten years, 37 major social networking sites existed (Boyd and Ellison 2007). Launched in 2003, MySpace was the first mainstream social networking platform to host more than one million participants (Boyd and Ellison 2007). Advances in technology led to smaller, user-friendlier devices that allowed people to access social media sites through mobile telecommunications and wireless platforms. Continued development in social media applications redesigned the way in which the world communicated, ushering in a new age

of the World Wide Web known as Web 2.0 (O'Reilly 2005). Barriers to communication quickly dissolved as increasingly larger numbers of users began migrating to a form of interaction that was inexpensive, accessible, and ubiquitous when compared to traditional forms of communication. The speed and nature associated with this new form of communication challenged traditional state mechanisms to control access in countries where media fell under the purview of the government. Through the democratization of information, countries operating as authoritarian states are finding it increasingly difficult to isolate their people from information about life outside their borders. (Friedman 1999).

This research explores the dynamics of this new form of social networking by conducting a detailed review of its role in the conduct of social revolutions. It contributes to emerging studies in modern social media technology by focusing on one aspect of its affect on social groups in an increasingly globally interconnected world. Findings from this study provide applicable information supporting Internet freedom policy development and could be used to identify conditions conducive to the formation of social revolutionary activities as an advance warning mechanism prior to the onset of violence. It improves the body of knowledge central to defining the operational environment that impacts civil-military objectives. This study serves as the basis for subsequent quantitative research within this field. The design for this project deconstructs the primary components within the proposed model to enable the researcher to isolate key areas of engagement necessary based off the following research questions.

Primary Research Question

How do modern social media influence social revolution?

Secondary Research Questions

What are the fundamental criteria common in social revolutions?

What is an acceptable theory supporting modern social media's influence on social revolution?

Can a model explain modern social media's influence on social revolutions?

Does that model clearly and sufficiently explain the influence of social media on the 2011 Egyptian revolution?

Limitations

This research draws data from previous work in the fields of social revolution, social network theory, social media engagement, and technological revolutions in communications. Supporting material comes from secondary sources from leading writers within each of the categories, primary and secondary online data and journals, and statistical data, to include primary content, drawn from social media groups active in the social revolution domain. Unfortunately, the nature of social media prevents determining the veracity of information posted. Additionally, content and users connected through social media networks maintain a level of anonymity.

The limited amount of time available to conduct this research precludes a detailed quantitative analysis of engagements between real time social networks and uploaded content. To overcome time constraints, survey data taken from social media group analysis reports provides statistical trends in lieu of user level information.

This research uses the 2011 Egyptian revolution to test the primary question. Information gathered in the course of this study comes from Arabic and English social media sites. Translation of social media content posted in Arabic relies on open source

software. Google translate provides machine translation based on statistical patterns and varies in accuracy (Aiken and Balen 2011).

Delimitations

This thesis explores specific categories in two main areas, social media and social revolution. Found within these categories are a range of varying subsets that are not covered in this study. In respect to social media, data gathered comes from two of the primary social media sites in use today, Facebook and Twitter. Other popular sites like QQ in China, reporting 200 million registered users, and Habbo in Finland, with 138 million registered users, are not included in the study (Mohsin 2009).

Like social media, social revolution comes in several forms. Variations including top-down seizure of power, military coups, cyclical political unrest, and civil war (Tilly 1995) fall outside the general classification of social revolution and are not included in this study. The study does not factor the review of state controlled media to include totalitarian government controls as found in China and Iran.

Assumptions

The following assumptions are believed to remain true, and add relevance to the research project. Technological advances in mobile communications will make access to social media tools cheaper and easier. High-speed data connectivity will further expand multi-media data sharing such as high definition video communications. Expanding global markets add additional force behind this technological diffusion through the support of development zones in remote locations. Larger sections within societies will continue to migrate to online social networks as a means to exchange information.

The debate over Internet freedom and unfettered access to social media will remain a global challenge as governments like Iran and China exercise strict control over such technology. Overt measures to control access to social media have the potential of increasing the level of frustration within a society. Despite the most extreme control measures, the ubiquitous nature of social media precludes the total obstruction of content flow.

Definitions

Active engagement: function connecting the social revolution domain to the event domain as a result of a conditional response by an individual to take action as a product of passive engagement or unifying catalyst that creates a new event within the event domain.

Aggression: "sequence of behavior, the goal response to which is the injury of the person toward whom it is directed" (Dollard et al. 1939, 9).

Blog: "a web site that contains an online personal journal with reflections, comments, and often connections to other social media users provided by the writer, blogger" (Merriam Webster Dictionary Online 2011).

Event domain: region within Mayer's Model on modern social media's relation to social revolution containing independent variables consisting of physical events that occur in society.

Frustration: "interference with the occurrence of an instigated goal response at its proper time in the behavior sequence" (Dollard et al. 1939, 9).

Mass uprising: large assembly of a citizenry, gathered under a common intent against a state institution or its policies, possessing sufficient strength and support to attempt to overthrow the authority of the state.

Modern Social Media: modern form of social communication using Internet capable technology devices to facilitate participatory information sharing, interoperability, user-centered design, and collaboration on the World Wide Web as a function of the second generation web or Web 2.0.

Passive engagement: the function through which events occurring in the event domain are observed by individuals in the social revolution domain.

Social media network: scale free network of users and groups connected through modern social media platforms for the purpose of communicating with other people and sharing information and resources.

Social Media: traditional method of communication within society operating independent of professional media producers. Social media uses privately owned print or broadcast technology to distribute information from one person to many. It is a precursor to modern social media.

Social revolution domain: region within Mayer's Model on modern social media's relation to social revolution based on Defronzo's five criteria of social revolution: mass frustration, elite dissidents, weakened state, permissive environment, and unifying catalysts.

Social Revolution: "a rapid, fundamental, and violent change in the dominant values and myths of a society, in its political institutions, social structure, leadership, and government activities and policies" (Huntington 1968, 264).

Tweet: “post made on Twitter online messaging service” (Merriam Webster Dictionary Online 2011). Messages are limited to 140 characters.

Conclusion

This study explores the influence that modern social media has on social revolutions. The literature review conducts a critical examination of major works in the field of social revolution, frustration aggression theory, social networking theory, and modern social media technology. Chapter 3 explains the methodology used in this research to develop a theory and build a new model that describes modern social media’s influence on social revolution. The research project then applies events that took place in Egypt from 2010 to 2011 that led to the 25 January Egyptian Revolution to test and analyze this model. The final chapter summarizes the findings by presenting the strengths and weaknesses of the model as well as provides recommendations for further research in this field of study.

CHAPTER 2

LITERATURE REVIEW

Overview

This chapter first traces the sources behind social revolutions and foundational approaches in the field of frustration aggression theory, then transitions to a detailed review of sociological studies in network theory in order to link human behavior in social revolutions with social media. The discussion then turns to the evolution of communications while tracing the influence of social media in modern social revolutions. This is necessary to demonstrate how advances in communications technology leads to greater diffusion of information sharing while fostering collective action (Shirky 2009). A gap exists in current research regarding the influence of social media and social revolutions. Information drawn from the literature review is used later in the thesis to develop a suitable model that explains the influence of modern social media on contemporary social revolutions.

Major revolutions in history such as the American, French, and Chinese revolution are rare compared to the large number of lesser revolutionary activities. These activities include social revolutions, coups, and mass uprisings that account for a large percentage of political violence in society (Zimmermann 1983). Ekkart Zimmerman, professor of sociology at Dresden University of Technology, specializes in the field of conflict research. In his book, *Political Violence, Crises, and Revolutions,* Zimmermann compares numerous empirically based studies in cross-national revolutions while integrating writings on “social psychological” and “social historical” research (Zimmermann 1983, 413). He argues that revolutionary activities do not emerge over

night, “they gradually build up through a number of less violent activities” (Zimmermann 1983, 413). This does not suppose such activities, in the form of political violence, are necessary precursors leading to revolutionary movements. Publishing works nearly a half-century before Zimmermann, Crane Brinton stands as one of the seminal figures in revolution studies (Duncan 1952). His approach to revolutionary research differs greatly from Zimmermann. Brinton believes that “historical, generally observable experiences are valid data for the scientific method” (Duncan 1952, 676). He regards less violent activities as equally effective in accomplishing the same results. Furthermore, be considers increased talk of revolution within a population, increased “consciousness of social tension,” and increased irritations shared within a society are sufficient to establish an “air” of discontent that ultimately leads to full mobilization in support of revolutionary activities (Brinton 1952, 66).

The establishment of a revolution does not occur within a solitary section of society. It requires the presence of friction and support from subsections within a population as detailed by James DeFronzo (DeFronzo 1991). Tilly supports this socially based view in his book, *European Revolutions: 1492-1992*.

> Social processes in a state’s environment profoundly affect the prospect and character of revolution by shaping the state’s structure and its relation to the subject population, by determining who are the major actors within any particular polity, and by affecting how much pressure bears upon the state and from which direction. (Tilly 1995, 6)

Foundations of Social Revolutions

James DeFronzo argues that there exist five factors common to all social revolutions regardless of their level or violence (DeFronzo 1991). The first factor requires a “tremendous increase in mass frustration” among urban or rural populations

(DeFronzo 1991, 10). To further describe how mass frustration develops, DeFronzo follows Ted Gurr's theory on relative deprivation to explain how frustration develops in groups as a result of gaps "between people's expectations and their ability to satisfy those expectations" (DeFronzo 1991, 11). Relative deprivation theory is one of several adaptations to the original frustration aggression hypothesis posited by a team of researchers known as "the Yale group" in 1939 (Berkowitz 1989, 59). Studies in mass frustration attempt to explain the relationship between the frustration and aggressive behavior within individuals and groups.

The second factor in social revolutions includes the "division of elite groups" (DeFronzo 1989, 14). Elites operate outside governmental institutions and possess a number of qualities that place them in positions of power within the population. These qualities may include: wealth, education, technical aptitude, or leadership characteristics. Division within this section of society supports the establishment of the revolutionary movement by creating discord within the upper echelons, subverting the power of government institutions, and fostering revolutionary ideologies within the population at large (DeFronzo 1989). Huntington notes that technological advances leading to increases in "literacy, education, and media exposure" improve political awareness in society, elevating their expectations, and encourage demand for participation in government (Huntington 1968, 47). Technological mobilization has the potential for creating new groups of elite actors. This increased level of activism challenges institutional behavior and may elicit the application of greater control measures from the government.

The third factor in social revolutions supports the "unifying motivations that bring together members of different social classes in support of revolution" (DeFronzo 1989, 16). Central to this point is Berkowitz's application of "aggression facilitating cues" to induce a motivating reaction within groups in response to an external event (Berkowitz 1989, 65). Alone, the unifying motivation brought about through the facilitating cue is insufficient to support revolutionary movements. The disaffected group must include a cross section of society as a whole to garner support from a relatively large percentage of the population (Brinton 1952).

The fourth criterion involves a crisis that "severely weakens government administrative and coercive capabilities in a society in which a revolutionary movement is developing" (DeFronzo 1989, 18). Events impacting a state's stability come from internal problems such as corruption, failed social programs, or unemployment. Problems can also impact the state from external forces such as global market changes, war, or regional competition with neighboring states. Responding to crisis situations increases the institutional vulnerability rendering the state susceptible to internal conflict. "All else equal, a weakened state is more liable to revolution than a strong one" (Tilly 1995, 6).

The final attribute found in all social revolutions considers the "choice on the part of other nations not to intervene or their inability to do so to prevent the success of a revolutionary movement" (DeFronzo 1989, 19). A number of reasons exist for foreign powers to elect not to intervene in a state's internal matters. Countries may desire to intervene, but doing so would damage their standing in world affairs, or they may not be economically or militarily equipped to effect any measurable prevention (DeFronzo 1989). Still another case for non-intervention occurs because a successful social

revolution may benefit the foreign power's position. As a final example, there may be occasions when foreign powers elect to stand by out of fear of retaliation from other nations sympathetic to the revolutionary cause or from the people conducting the revolution.

The presence of these five common criteria in social revolutions develops independently over time, culminating in mass mobilization. Mass frustration, dissident elites, unifying motivation, weak government, and a permissive environment factor in social revolutions in varying degrees dependent on the circumstances surrounding the movement. Social structures and ideologies within a population determine the level of relevance (DeFronzo 1989). The unifying component within each of these variables depends largely on a group's ability to share information and organize corporate action. Advances in communications facilitate this action by connecting previously disassociated individuals through social media, structured within the framework of network theory. Shared information increases the size of the social network along through perceived relative deprivation. Perceived relative deprivation then translates into a causal condition that supports social revolution.

Relative Deprivation

John Dollard, professor of human relations at Yale University, led a team, commonly referred to as the "Yale group," in the development of frustration aggression theory in 1939. The basic premise of the theory states, "the occurrence of aggressive behavior always presupposes the existence of frustration . . . the existence of frustration always leads to some form of aggression" (Dollard et al. 1939, 1). The team's research served as the foundation for Ted Robert Gurr and Leonard Berkowitz's frustration

aggression model in relative deprivation. Davies adapted Gurr's relative deprivation model; the J-Curve model, explains the potential for aggressive behavior to take form when there is a negative change in the general support for basic needs following a period of sustained growth (Zimmermann 1983). People take part in revolutionary movements out of a sense of deprivation or inequality either in their relation to others or in relation to their perceived expectations (Zimmermann 1983). Huntington recognized this during his work on mobilization theory and identified two intervening variables that explain this function; first, "opportunities for economic mobility" of the individual and second, the "adaptability of the institution" to meet perceived needs (Huntington 1968, 54). Within this context, a society is conditioned to expect fulfillment of generally accepted means by way of employment, political representation, and individual liberties. Likewise, state programs designed to support these conditions must continually adjust to external factors to provide opportunities within the society.

Gurr claimed different theories on human aggression identify three distinct psychological assumptions: (1) Aggression is solely instinctual; (2) Aggression is solely learned; and (3) Aggression is an innate response activated by frustration (Gurr 1968, 254). The first assumption regards aggression as being characterized by outbreaks of violence due to internal conditions as a result our nature. The second assumption places aggressive tendencies to conditions present during childhood or within a culture that supports aggression as an accepted form of response. The third assumption categorizing aggression as a response to frustration attributes aggression as a directed response due to the "interference with a goal-directed behavior" (Gurr 1968, 246). The natural condition within this response assumes the frustrated individuals direct aggression toward the cause

of the frustration. At the point of frustration, the individuals measure their response based on their situation. The perception of frustration depends on whether the interference is justified or unjustified (Berkowitz 1989). The nature of aggressive response depends on violent or non-violent action, regression, fixation, resignation, and aggression all fall within this area (Berkowitz 1989).

Gurr recognized a limiting variable in Berkowitz's unjustified response factor in that an individual could misplace the source of the frustration and respond toward a bystander who was not the true instigator (Gurr 1968). Each of these conditions is based on social learning and the environment in which the individual lives. "The implication of frustration-aggression theory is that civil violence almost always has a strong desire to satisfy bodily need . . . the magnitude of its effects on the social system is substantially dependent on how widespread and intense anger is among those it mobilizes" (Gurr 1968, 250).

Gurr's framework for frustration aggression theory depends on two propositions. First, the operation of instigating variables determines the magnitude of anger and second, the propositions of mediating variables determine the likelihood and magnitude of aggression as a response. "Value expectations are the goods and conditions of life to which people believe they are entitled" (Gurr 1968, 251). Gurr regards Yates' position on expectations to mean, "the actor can be said to be frustrated only when he or she is aware of the interference" (Gurr 1968, 251). Awareness in this theory is equivalent to relative deprivation.

Within the context of this study, relative deprivation theory establishes a general understanding of the likelihood and magnitude of an aggressive response to an individual

or group's perceived frustration. This theory helps to explain how and why groups respond to cues that previously did not elicit collective activism, while examination of those conditions and processes that lead from frustration to social movement supports observable evidence of groups engaging in non-governmental confrontation directed toward people, property, or institutions (Gurr 1968). Relative deprivation theory does not attempt to describe the revolutionary process or determine the probability of success in social revolutions (Gurr 1968) but stands as an instigating condition which drives the formation of revolutionary action.

Social Network Theory

Society is a complex social network that operates within a set of defined rules (Barabasi 2002). Albert Laszlo Barabasi, a professor of physics at Notre Dame, is one of the foremost writers in complex network theory. In his book, *Linked*, Barabasi uncovers the structure and behavior of complex networks found in the World Wide Web (Barabasi 2002). He takes the same approach to explain the dynamics within human networks. This work improves upon earlier research in random network theory and cluster theory originally published in 1959 by Erdos and Renyi. Paul Erdos and Alfred Renyi, each accomplished and highly respected mathematicians, are credited for creating a branch of mathematics known as random graph theory that served as the foundation for future study in the growth and distribution of naturally occurring networks (Barabasi and Albert, 1999). Their research findings proposed networks, "too complex to be captured in simple terms were described as random" (Barabasi 2002, 23). Within their model, all nodes within a network were assigned the same level of importance. Real networks were not static, they are "self organized" (Barabasi 2002, 221). While groundbreaking at the time

of publication, their model failed to explain the disparate distribution of nodes within a complex network.

Barabasi designed a new approach to complex network theory known as 'power law distribution' or 'scale free' networks (Barabasi 2002, 70). According to Barabasi, the organization of all networks, biological or technical, "was the complete absence of democracy, fairness, and egalitarian, values" previously supported by Erdos and Renyi's work in random networks (Barabasi 2002, 70). As his work progressed he discovered there were "organizing principles that govern the complex webs" in society (Barabasi 2002, 219).

First published in the 1998 journal, *Nature*, Duncan Watts introduced the concept known as "clustering coefficient" (Watts and Stogatz 1998, 440). This factor determines the strength of the bond within a group measured by the ratio between the number of nodes within a small group and the number of possible links between the nodes. A group with a clustering coefficient of one is said to be a strong group. A coefficient closer to zero represents a weak group. Watts modified Renyi's random network theory to include this coefficient. The product that emerged closely resembled social networks in human group behavior.

While Watts was conducting his research, Barabasi's own work led him to believe, "humans have an inborn desire to form cliques and clusters that offer familiarity, safety, and, intimacy" (Barabasi 2002, 50). Social networks, like computer networks, consist of strong and weak ties. Strong ties exist between close friends and relatives. They are formations of close-knit groups of first-degree relationships. Weak ties linking two or more strongly connected groups are more important to social network than strong

ties because they increase the diameter of the network (Barabasi 2002). The nodes in a network that tie groups together are called hubs. Hubs appear naturally in complex networks. They are identified by the exceptionally high number of connections in comparison to other nodes within the same network. Barabasi confirmed the existence of hubs during his research project to map a sample of the Internet consisting of 325,000 pages (Barabasi 2002). Rather than finding a generally equal distribution of connections between nodes, he discovered 82 percent of pages had three or fewer links (Barabasi 2002). Ravi Kumar, Jasmine Noval, and Andrew Tomkins found similar results in their study of "Flickr" and "Yahoo! 360" (Kumar, Novak, and Tomkins 2006). Clay Shirky reports the majority of MySpace users maintain two connections. Yet, "dozens of weblogs have an audience of a million or more, and millions have an audience of a dozen or less" (Shirky 2009a, 84).

Working from the position that networks are dynamic organizations, Barabasi identified growth and preferential attachment as two laws that govern network behavior (Barabasi 2002). These laws state that as a network grows, each newly added node is more likely to connect to a node that maintains a proportionately higher number of connections (Barabasi 2002). This approach was Barabasi's attempt at explaining the creation of hubs that he recognized during his survey of the Web. He suggests there is a strong "correlation between population density and the density of Internet preferential attachments" (Barabasi 2002, 152). Preferential attachment is a condition found in network growth that determines which preexisting nodes are more likely to connect to newly introduced nodes (Barabasi 2002).

Kumar, Noval, and Tomkins (2006) provide additional information on networks and social media in their paper, *Structure and Evolution of Online Social Networks*, sponsored by Yahoo Research in 2006. Their research categorizes social network groups into three regions: singletons, degree-zero nodes who have joined the social network but have never made a connection with another user; middle region communities consisting of "various isolated communities that interact with one another but not with the network at large;" and giant core regions represent, "large groups of people who are connected to one another through paths in the social network" (Kumar, Noval, and Tomkins 2006, 5). Users in this group connect either directly or indirectly to a large part of the entire network. In the same manner as the networks, they place users into three separate categories: passive users who join networks out of curiosity or at the insistence of a friend; inviters who are interested in migrating off-line social groups into online forums; and linkers who are full participants in the growth of online social networks and actively connect to other groups (Kumar, Noval, and Tomkins 2006).

The study's findings state that online social networks often contain more than half their mass outside the giant component and the structure outside the giant component is largely made of hubs that maintain links to other groups (Kumar, Noval, and Tomkins 2006). The largest segment of social network growth is made up of hubs inviting people into social networks. The isolated communities typically host the existence of a hub. Barabasi associates this type of user as a hub with weak connections to other communities (Barabasi 2002).

Users join social networks through two ways; they actively seek out the network or are invited into the network. Offline social networks typically motivate users to seek

out online connections. This study modifies the "preferential attachment" from Barabasi's work to introduce a user's bias to that attachment. This bias is formed through the "multivariate connections exhibited by the user" (Kumar, Noval, and Tomkins 2006, 2). The study used observations by Faloutsos et al., "On Power Law Relationship of the Internet Topology" (Michalis 1999) to support the claim that real networks were not static, rather scale free as proposed by Barabasi (Kumar, Noval, and Tomkins 2006). They indicate the diameter of the Web is "quite small" when using the measurement of the shortest path between two random nodes (Kumar, Noval, and Tomkins 2006, 5). This demonstrates the high degree of inter-connection present in all networks. The size of the network is equal to the square of the number of participants. The study also measured the reciprocity index of each of the sites. Reciprocity in this context measures the likelihood that a user will reply to an invitation to join a group based off a received invitation. "The reciprocity of Flickr is around 70.2% and Yahoo is around 84%" (Kumar, Noval, and Tomkins 2006, 3).

Further study in properties associated with human networks examines Clay Shirky's book, *Here Comes Everybody*. "Human beings are social creatures" forming a hierarchy of complex connections from the individual level, group level, and network level (Shirky 2009a, 14). Shirky states technology drives the way people interact. "We now have communications tools that are flexible enough to match our social capabilities, and we are witnessing the rise of new ways of coordinating action that take advantage of that change" (Shirky 2009a, 20). Social media tools create "alternative strategies" to how we address complex problems. Shirky suggests, to accurately study social networks, requires the researcher to consider the aggregate of the group rather than the behaviors of

the individual. “Our electronic networks are enabling novel forms of collective action, enabling creation of collaborative groups that are larger and more distributed than at any other time in history” (Shirky 2009a, 48). Group dynamics involves awareness of the group and sharing of information; cooperation synchronizes behavior to create a shared creative capacity; and collective action promotes shared responsibility (Shirky 2009a).

The exploration of social network dynamics provides an explanation to how individuals organize into groups to address complex problems associated with mass frustration. Individuals or small networks connected through strong links lack the ability to generate sufficient support needed to affect a positive response to address the cause of their frustration. Theda Skocpal (1994) illustrates this in *Social Revolutions of the Modern World* by explaining the coalescing of disparate groups into collective action during the 1978 Iranian Revolution. She states, “The networks and symbols of communication among clerics and between clerics and lay people became crucial for orchestrating and sustaining widespread popular resistance to the state” (Skocpal 1994, 249). The following section presents advances in communications as an integral component in the development and organization of social networks.

Evolution of Social Media

> The 21st century communications revolution may turn out to be every bit as dramatic, and entail similarly revolutionary contradictory consequences, as the 15th century revolution. Some of these consequences may be just a beneficial, some just as unintended, and some just as socially damaging. Most will be well upon us before they are fully appreciated. (Kovarik, 2011, 14)

The advent of the printing press, telegraph and telephone, recordable media other than print, wireless broadcast medium such as radio and television mark the four major revolutions in communications technology over the past 500 years (Shirky 2009b). With

each passing phase, access to information through communications became more "global, social, ubiquitous, and cheap" (Shirky 2009b). Shirky categorizes this medium into two groups; broadcast media providing one to many communications and conversational media providing one to one communications (Shirky 2009b). He suggests, "media that is good at creating conversations is no good at creating groups and the media that is good at creating groups is not good for conversation" (Shirky 2009a, 106). Daniel Papp, David Albert, and Alissa Tuyahov (1997), view the revolutions in communications differently in their publication, "The Information Age: An Anthology on its Impact and Consequences." They approach each medium on the impact it has in relation to "distance, time, and location" (Papp, Albert, and Tuyahov 1997, 13).

The first step in understanding the development of communications medium considers broadcast media. Bill Kovarik, professor of communications at Radford University asserts in his book, *Revolutions in Communication: Media History from Gutenberg to the Digital* Age, "printing allowed the spread of knowledge and challenges to authority by enabling mass communication among people who had previously been linked only by personal and small group communication" (Kovarik 2011, 13). Most historians agree that the printing press was the first true one-to-many communications medium. Widely available during the American and French Revolution, the moveable type press made mass distribution of personal works possible (Kovarik 2011). Providing one example of works produced during the American Revolution, Jane Chapman lists Thomas Paine's publication of *The Rights of Man* as one of the most widely influential works of their time, selling "more than one and a half million copies over Europe" by 1809 (Chapman 2005, 14). Michael Kazanjian, member of the Emory University project

to digitize and record the French Revolutionary Pamphlet Collection, provides additional reference stating, “The pamphlet is a genre of literary engagement . . . most readily adopted by partisans complicit in a political or social crisis” (Kazanjian, Emory University Online, 2003). One historian commented that 1789 and the years that followed cannot be understood without an examination of the role played by print media for they had the “vocation of measuring the new era and defining its rhythm” (Papp, Albert, and Tuyahov 1997, 20). Marshall McLuhan (1967), professor of communications and culture at Toronto University underscores this point in his work *The Medium is the Message: Inventory Effects*. He asserts the medium, the technology through which information is presented, is of greater importance than the content it produces. It shapes human interaction. This defining effect stands true with technological advances as with print media on civilization. McLuhan asserts, “Printing was the first mechanization of an ancient handicraft and led easily to further mechanization of all handicraft” (McLuhan 1962, 44).

Despite advances in technology, broadcast media remained confined to creating one message and sending it out to select groups in society (McLuhan 1962). The invention of wireless radio and television marked the first major advance in mass communications since the printing press (Shirky 2009b). The radio succeeded in removing barriers of location in communications medium by enabling communications to take place apart from fixed devices and locations (Papp, Albert, and Tuyahov 1997). Time and distance were no longer limiting factors. A single message could be sent across the globe to major population centers creating a broad reaching collective experience. Mass media coverage of the 1989 Tiananmen Square massacre and 1991 Soviet coup

linked the world to events taking place in regions formerly closed to outside media (Papp, Albert, and Tuyahov 1997).

Conversational media supports one-to-one communications. The telegraph initiated a wave of communications development throughout the world by giving rise to instant communications at greater distances (Papp, Albert, and Tuyahov 1997). The impact of telegraph quickly gained attention, by 1851 over 800 miles of wire extended across the United States. The Atlantic Telegraph Company completed the first trans-Atlantic cable linking The United States to Great Britain on 16 August 1858. Despite extensive access to this medium, the telegraph relied primarily on governments and corporations to transmit messages. The advent of the telephone in 1876 extended access to the general population (Papp, Albert, and Tuyahov 1997).

The integration of broadcast and conversational media was the turning point in the development of social media. Dewar writes in his RAND report, “As the first true many-to-many communications medium, the networking of computers is the defining characteristic of the information age” (Dewar 1998, 4). Shirky notes that integration of established communications depends “not on technical capital but social capital” (Shirky 2009b). Prior to the creation of the web, professionals produced most of the media that was available for consumption. A new form of media exists in cyberspace, a global all access culture defined by the ability to share information where individuals simultaneously create and consume news and information, blurring the distinction between publisher, reporter, and reader (Branwyn 1997). David Morgan captures this point noting, “the instantaneity of easily-available information” means that people can rival governments in their capacity to comprehend the facts of a policy” (Morgan 1998).

Jenkins describes three concepts that shape what he calls “convergence culture”; these include media convergence, participatory culture, and collective intelligence (Jenkins 2006, 2). Authors such as Qualmann, Jenkins, and Shirky agree the power of social media comes from interpersonal relationships over traditional conduits of access to information. They integrate communications technology into their behavioral lives.

The procedure for using modern social media as a linking agent between Barabasi’s social network structure and Shirky’s consumer/producer principle came about as an unanticipated product during a research project studying language development in children. Massachusetts Institute of Technology (MIT) professor and cofounder of Bluefin Labs, Deb Roy, undertook a series of research projects designed to study the influence of social environments on language acquisition (Roy 2009). He presented these findings during a March 2011 conference in Long Beach, California. The research matched conversations that took place through modern social media sites to mass media programming (Roy 2011). “A piece of content, an event, causes someone to talk. They talk to other people. That drives tune-in behavior back into mass media creating cycles that drive the overall behavior” (Roy 2011). Roy goes on to label certain features of this interaction dynamic. Social media content producers that have a large number of connections are called “pro-amateur” users while connections between the social media domain and events are “engagement properties” (Roy 2009b). His study found that human behavior is directly linked to conversations in modern social media.

Conclusion

Separate components exist within modern social revolutions. With the passage of time physical social networks transitioned to virtual social networks linked together in

greater numbers through the use of modern social media tools. Cross-sections within societies unite through shared frustration; organizing action, sharing information, and gathering support for their cause. Technological advances support the collective motivation for social revolutionary activities through ubiquitous, inexpensive, and real-time communications platforms. Engagements linking the modern social network domain to real-time events generate behavioral cycles sufficient to elicit physical response in the form of social revolution. Chapter 3 applies information presented in this literature review to outline the research method used to develop a theoretical model to explain modern social media's influence in social revolutions.

CHAPTER 3

METHODOLOGY

Overview

This chapter presents the method used to develop a suitable theory and create a theoretical model that answers the primary research question. Mayer's Model on Modern Social Media Influence on Social Revolutions, hereafter referred to as "Mayer's Model," was created to describe modern social media's influence on social revolutions. This study uses qualitative analysis to understand behaviors, attitudes, social, and cultural context of modern social media activity in relation to social revolutions. The goal is to integrate existing theories on social revolution and social networking along with the influence of modern social media. This chapter is divided into two parts. The first describes the framework upon which the model is built, and includes an analysis of existing models. The second part is a descriptive case study of events that took place in Egypt from June 2010 to February 2011 leading to the 25 January Egyptian Revolution.

Supporting Models

Existing models used as the basis in the construction of the Mayer's Model consist of DeFronzo's (1991) social revolution criteria, Barabasi's (2002) social network theory, and Roy's (2011) social media engagements. The social dynamic of groups, mainly how they interact and respond to external conditions, remains the central component throughout each of the theories. Development of Mayer's Model begins with DeFronzo's social revolution criteria. Barabasi's social network construct is then incorporated into the model to explain the group dynamics within the social domain.

When combined, they create the social revolution domain. The final component integrates Deb Roy's social media engagements to link the social revolution domain to the event domain consisting of mass communications and observable activities. This new model explains key aspects of social revolution through a pragmatic application of social networking theory, obviating the need for more complex behavioral explanations.

Social Revolution Model

DeFronzo's criteria for social revolution stand as an acceptable foundation to describe common factors present in the majority of social revolutions. Chapter 2 provided detailed accounts to support DeFronzo's research as ideally suited for this study. A general review of each criterion is as follows:

1. Mass Frustration: The growth of frustration among the majority of the population.

2. Dissident Elite: The existence of elite elements who are alienated from the current government and, more specifically, of elite members who support the concept of revolution. Within the context of this study, dissident elites include activists within the general population and sympathetic supporters present across the globe that leverage social media access to facilitate revolutionary activity.

3. Unifying Catalyst: The development of unifying motivations that brings together the members of different social classes in support of revolution. Such events occur through brief highly focused events or through prolonged activity that resonates throughout the group over time.

4. Weakened State: The occurrence of a crisis that severely weakens government administrative and coercive capabilities in a society experiencing the development of a revolutionary movement.

5. Permissive Environment: The choice on the part of other nations and states not to intervene or their inability to do so to prevent the success of a revolutionary movement in a particular society (DeFronzo 1991). In addition to state actors, this research considers international corporations and non-state organizations that work in support of the revolution.

These five revolutionary factors operate as interdependent variables in relation to each other. Their confluence generates the necessary conditions required in establishing social revolutionary movements. Within the context of this study, no one factor holds greater value than the others. Similarly, the removal of one or more of the factors eliminates the potential for the success of a social revolution. Figure 1 provides the author's interpretation of DeFronzo's social revolution criteria. Areas within the social revolution domain located toward the center, where two or more categories converge, are of particular relevance to this study. This focus accounts for the multivariate factors present in social groups and explains how nodes within social networks function in several areas simultaneously.

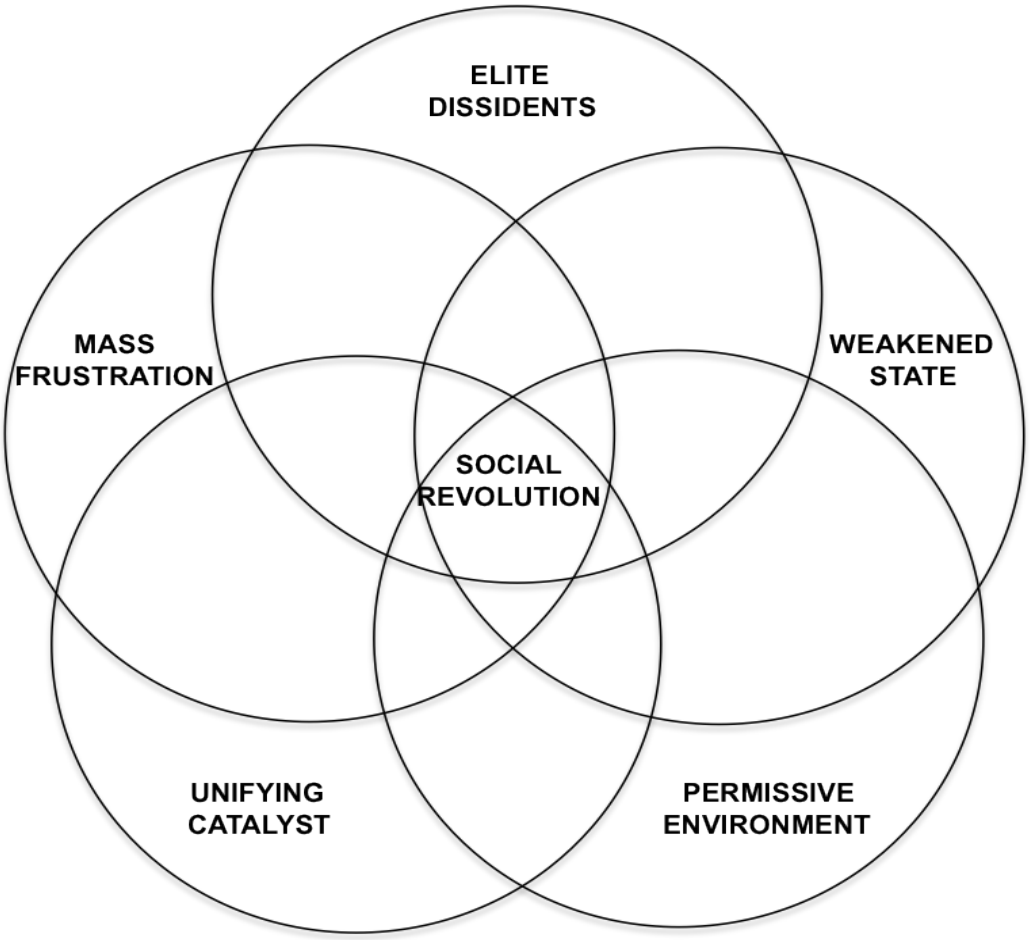

Figure 1. Graphic interpretation of DeFronzo's social revolution criteria
Source: Created by author.

Social Networking Model

The second component used in the construction of Mayer's Model applies Barabasi's scale free model to describe the growth and interaction of social networks. The scale free model functions according to Barabasi's real network theory. Supporting information presented in chapter 2 outlines the application of this theory to explain the growth of real social networks. This application of Barabasi's scale free model is suitable for explaining how and why the real social networks function. Figure 2 provides a

graphic depiction of Barabasi's scale free model. Barabasi's primary laws governing social networks as follows:

1. Growth: For each given period of time, a new node is added to the network. This step underscores the fact that networks are assembled one node at a time (Barabasi 2002).

2. Preferential attachment assumes that each new node connects to existing nodes with multiple links. The probability that the new node will choose a given node already present within the social network is proportional to the number of links maintained by the chosen existing node (Barabasi 2002).

> The scale free topology is a natural consequence of the ever-expanding nature of real networks. Starting from two connected dots, in each panel a new node (shown as an empty circle) is added to the network. When deciding where to link, a new node prefers to attach to the more connected nodes. Thanks to growth and preferential attachment, a few highly connected hubs emerge. (Barabasi 2002, 87)

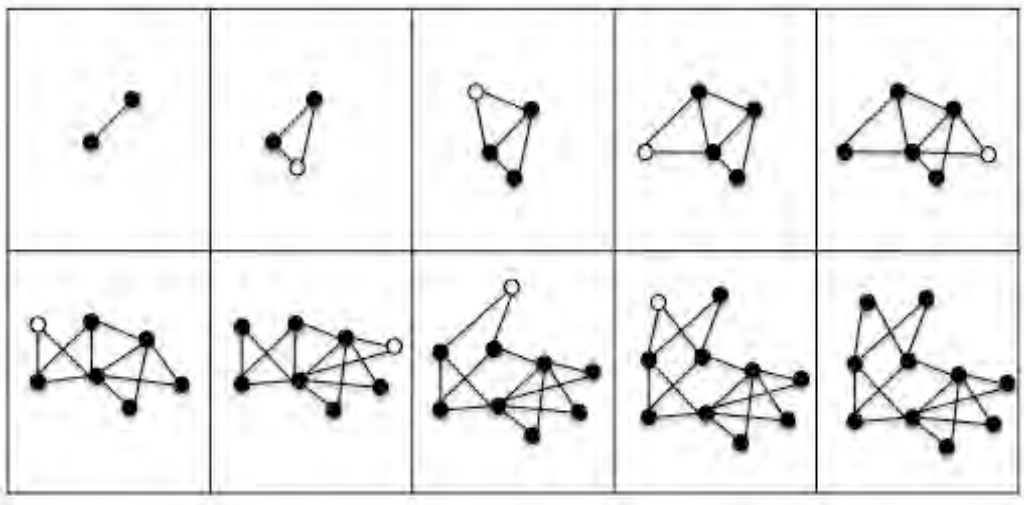

Figure 2. Scale free network theory
Source: Albert Barabasi, *Linked: The New Science of Networks* (Cambridge, MA: Perseus Publishing, 2002), 87.

Simply stated, nodes of multiple connections within a network are more likely to attract new connections. The resulting structure creates an accurate representation of complex social networks present in today's modern social media domain. Deb Roy's (2011) social network engagement presented during a TED conference provide additional support to Barabasi's real network rules. The speed at which the networks grow increases as greater numbers of individuals join the network.

Modern Social Media Engagement Model

Deb Roy's (2011) model of modern social media domains and their engagement in respect to events experienced through direct observation or passive exposure to mass communication broadcasts serves as a linking agent between DeFronzo's social revolution criteria and Barabasi's social network structure. This integrative approach is an acceptable means for providing a general explanatory method as to how groups operate in relation to external cues. A graphic representation of Roy's engagement is shown in figure 3. Social networks present within the social revolution domain function within one or more of the revolutionary criteria presented by DeFronzo. The observable action within the event domain generates dialogue within the social revolution domain that is then received and shared within the modern social media network. This shared information influences behavior in the social revolution domain that elicits an action that emerges as a new event in the event domain. This cycle of events is characteristic of a feedback loop. The use of this approach underscores the role mass media plays within the conduct of social revolution and serves as an acceptable function within Mayer's Model.

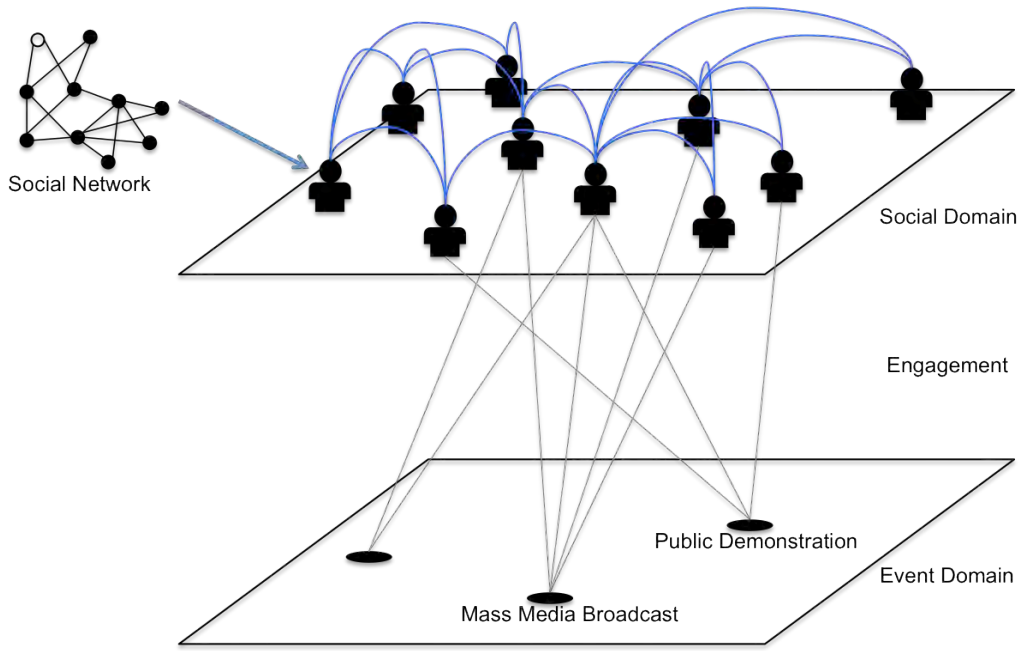

Figure 3. Graphic depiction of Roy's social media engagement
Source: Created by author based on research by Deb Roy, The Birth of a Word, TED Conference online, March, http://www.ted.com/talks/lang/eng/deb_roy_the_birth_of_a_word.html (accessed 23 April 2011).

Egyptian Revolution Case Study

The second part of the analysis conducts a descriptive case study focusing on key events that took place in Egypt from June 2010 to February 2011 leading to the 25 January Egyptian uprising that ultimately led to President Mubarak's ouster. This case study tests the validity of Mayer's Model. Statistical data drawn from Internet based analytical tools as well as primary source content posted to social media platforms serve as the foundation for this part of the study. Additional information taken from secondary sources including media publications and non-government organization reports concerning sociopolitical demography provide contextual background information. Focus areas within the case study include social, economic, and political factors. Throughout

the case study, analysis of events respective to their position within Mayer's Model describe the impact and influence present once the social media function is considered.

Conclusion

The purpose of this chapter is to establish the primary components within Mayer's Model and the means by which data is used to test the model. Through qualitative analysis, the new model integrates existing theories in social revolution, social networks, and communications. The next chapter provides an analysis of the new model's function and applies key data points from the 2011 Egyptian revolution to test the model's applicability. In summary, social groups are the principal element within the three supporting components of Mayer's Model. They organize, interact, and respond to internal and external cues that influence behavior within the collective organization. The descriptive case study is the basis for applying the function within those key events. Chapter 4 integrates the separate theories into a new comprehensive model (Mayer's Model) providing a sufficient construct to test the thesis. This analysis then supports the claim that a suitable theory can be developed to sufficiently describe modern social media's influence in organization and support of modern social revolutionary activities.

CHAPTER 4

ANALYSIS

Overview

The purpose of this chapter is to conduct a detailed analysis of Mayer's Model using the method outlined in the previous chapter. Integrating models from different fields of study discussed in the literature review provides a comprehensive tool suitable for tracing modern social media's influence through the social revolution domain. The interaction of the model's independent and dependent variables can be examined through an analysis of key events leading to the outbreak of social revolutionary activities in Egypt in 2011. This analysis explains how modern social media may influence social revolution. Analysis presented in this chapter addresses each of the subordinate questions:

1. What are the fundamental criteria common in social revolutions?

2. What is an acceptable theory supporting modern social media's influence on social revolution?

3. Can a model explain modern social media's influence on social revolutions?

4.Does that model clearly and sufficiently explain the influence of social media tools on the 2011 Egyptian revolution?

This chapter consists of two parts. The first part explains the individual components of the Mayer's Model and demonstrates how each function in respect to the entire model. The second part of the chapter tests the model using the Egyptian revolution of 2001. Figure 4 is a graphic depiction of Mayer's Model.

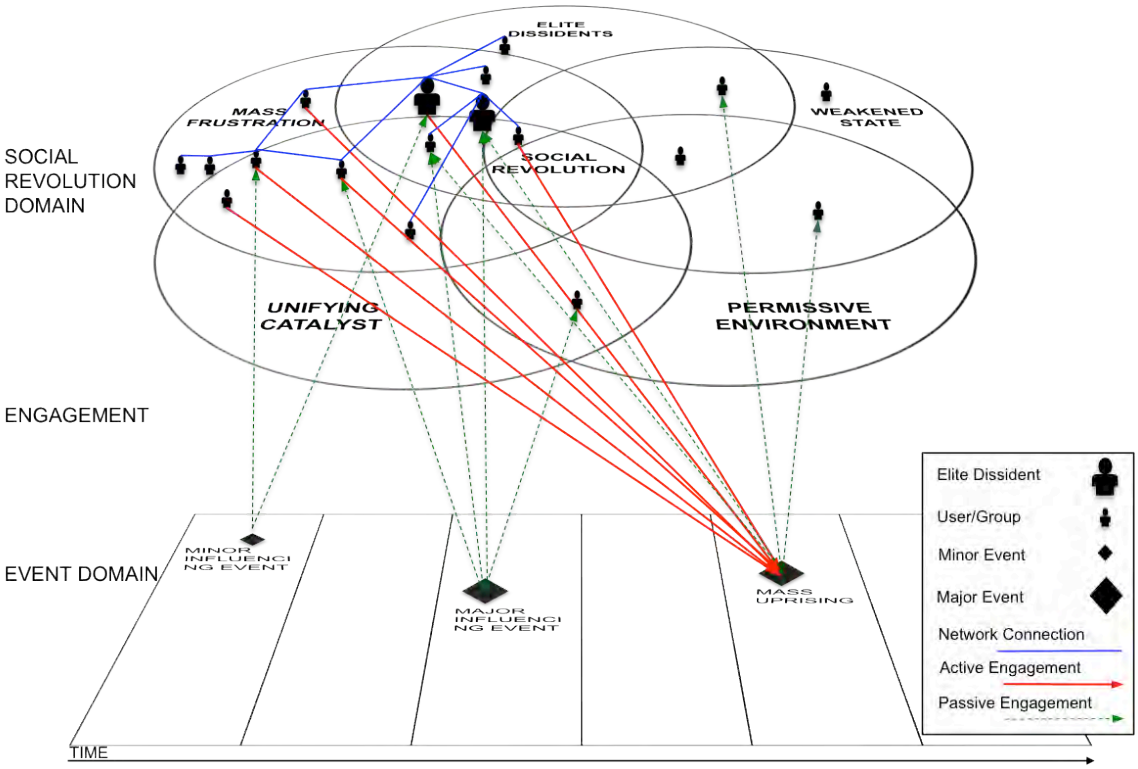

Figure 4. Mayer's Model

Source: Created by author.

Mayer's Model Analysis

The study of revolutionary movements requires a critical examination of the function and behavior of social groups within a society. Absent corporate social activity, social revolutions cannot exist. Groups of individuals create social networks; they share common experiences; they organize and interact as a function of daily life. Mayer's Model takes this social interaction into account and uses it as the structure driving social media activity. The model contains three primary components. The first component is the social revolution domain depicted as the top tier of the model (figure 4). It relates to the social networks present in all societies ranging from local groups to global social interaction. The social revolution domain includes the five primary criteria present in

social revolutionary activities according to Defronzo (1991), and is depicted here by the congruent interlocking circles placed at an oblique angle. Social revolution lies at the center of this domain. Areas where two or more circles overlap represent unique characteristics within that region. The human figures in the model represent individual actors who are motivated to act by social revolutionary activities described by Defronzo (1991). The connections between the human figures represent modern social media networks through which people communicate (Roy 2011).

The second component of this model is the event domain, which appears on the lower tier of Mayer's Model. The event domain consists of mass media broadcasts and physical events observed by individuals and groups within the social revolution domain and include events that have minor effects on the populace, major effects on the populace, and have the potential to generate a mass uprising. The event domain includes time progression (depicted by an arrow) as a means to capture developing events as they occur and the behavioral reaction of social groups in response to these events. Social media engagement links the event domain to the social revolution domain.

The third component of the model consists of engagement. Engagement operates as a dependent function between the social revolution domain to the event domain, a linkage that has received little attention in previous literature, but is fundamental to understanding the relationship between the two domains. This link between the social revolution domain and the event domain is the result of a social media user's exposure to observable events that take place in the event domain. Passive engagements, depicted in the model as dashed green lines originating from the event domain, occur when individuals in the social revolution domain witness an event either through direct

observation or broadcast via mass media. The arrows on the green lines indicate the operative direction of the information flow. No action, on the part of the observing individual in the social revolution domain, is required for passive engagement to occur. One example of passive engagement would be if an individual observes a protest, such as the recent "Occupy Wall Street" protests in New York City (Facebook 2011c), and takes no action to join the protest but witnesses it as an event that attracts their attention.

Conversely, active engagement, shown as solid red lines originating from the social revolution domain and extending to the event domain, represent a physical manifestation of action by those in the social revolution domain as a result of passive engagement. The product of the physical act emerges as a new event in the event domain. The arrows in the active engagement lines indicate the direction of that action. An example of active engagement would be the local demonstrations in the Philippines in 2011.

> During the impeachment trial of Philippine President Joseph Estrada, loyalists in the Philippine Congress voted to set aside key evidence against him. Less than two hours after the decision was announced, thousands of Filipinos, angry that their corrupt president might be let off the hook, converged on Epifanio de los Santos Avenue, a major crossroads in Manila. The protest was arranged, in part, by forwarded text messages. (Shirky 2011c)

In this example, the media announcement that the Philippine Congress set aside key evidence is the event that was engaged passively by the populace. The mobilization of Filipinos as a result of the announcement is the active engagement that created an event in the form of protests against the government.

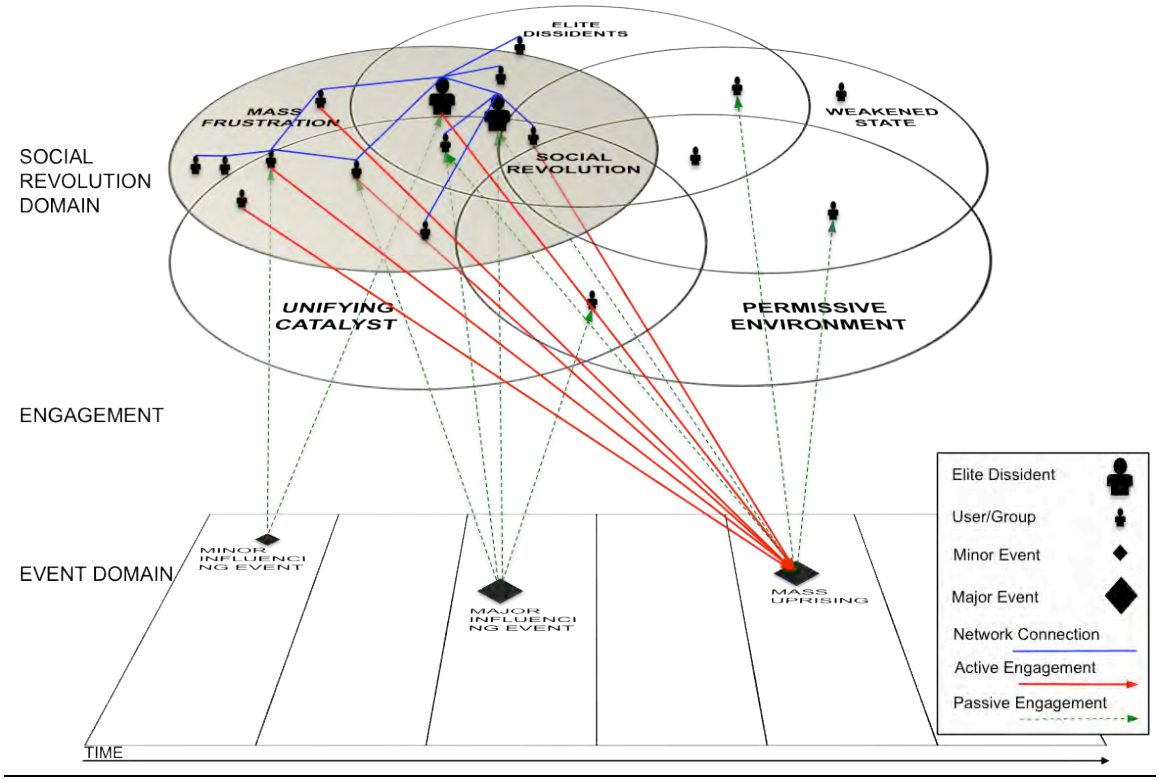

Figure 5. Mayer's Model (Mass Frustration)
Source: Created by author.

Mass Frustration

Mass frustration, depicted as the shaded circle in the social revolution domain (figure 5), is the driving force behind the growth of collective action. An example of this would be pulbic sentiment of the US Government following the 2008 housing crisis that negatively impacted home prices in "20 major US cities" (Mantell 2008). In this case, a significant portion of the population experienced frustration cased by the perceived relative deprivation created by the negative housing market. Mass frustration within a society creates a wide spread desire for people to take action in order to bring an end to the frustration. Within the context of this study, mass frustration occurs based on an

individual's perceived deprivation relative to those around them due to the failure of the state to provide for the basic needs of the population. Independent variables that affect the level of frustration include economic factors, individual liberties, and security. The human figures located within this section of the social revolution domain, represent those people that have connections by way of social media networks to people in other areas in the model. Hence, they represent the portion of a population that makes up the bulk of the modern social media networks in a society.

Areas in the social revolution domain where mass frustration overlaps with the weakened state signifies a government's inability to restrict access to social media. This creates an environment allowing people to openly to share grievances against the perceived source of the frustration. As mentioned before, the lines connecting human figures in the social revolution domain represent virtual networks that allow this communication to occur. Given the universally accessible nature of the Internet and modern social media, individuals experiencing mass frustration can extend their influence to others by posting personal commentary and information expressing their frustration. This contributes to a greater sense of frustration through shared deprivation or by increasing the virtual social network's awareness of privilege and opportunity held by external groups. Areas in the social revolution domain where mass frustration converges with elite dissidents and permissive environment represent the extended influence of mass frustration.

The existence of mass frustration alone is insufficient to generate the force necessary to bring about revolution. The section of the population experiencing mass frustration shares their plight with others through the social media network created,

organized, or administered by elite dissidents. Additionally, mass frustration requires unifying catalysts that possess sufficient attractive qualities to gain the attention of the population and create shared core grievances. Modern social media carries mass frustration beyond the traditional community and makes it available to the world. The active engagement, depicted by the red dashed lines in the model, show the resultant product of mass frustration as an event that occurs within the event domain. The international community, as members of the permissive environment, observes the event through passive engagement, in essence, creating a feedback loop that gets stronger with the passage of time. Given the instantaneity at which social media operates, users become content generators, sometimes referred to as citizen journalists, with the ability to foster feelings of mass frustration faster than local governments can react.

While mass frustration affects a large section of a population, the initial level of frustration varies within the social network. Individuals with secure jobs do not feel the same level of deprivation that the unemployed may feel. Despite differences between the individual impacts of the various frustrating conditions, modern social media creates a universal awareness within the social revolution domain. The lines between empathy and sympathy quickly become one common association. Conditions with a stronger potential for creating frustration are seen as unifying catalysts that overlap with mass frustration.

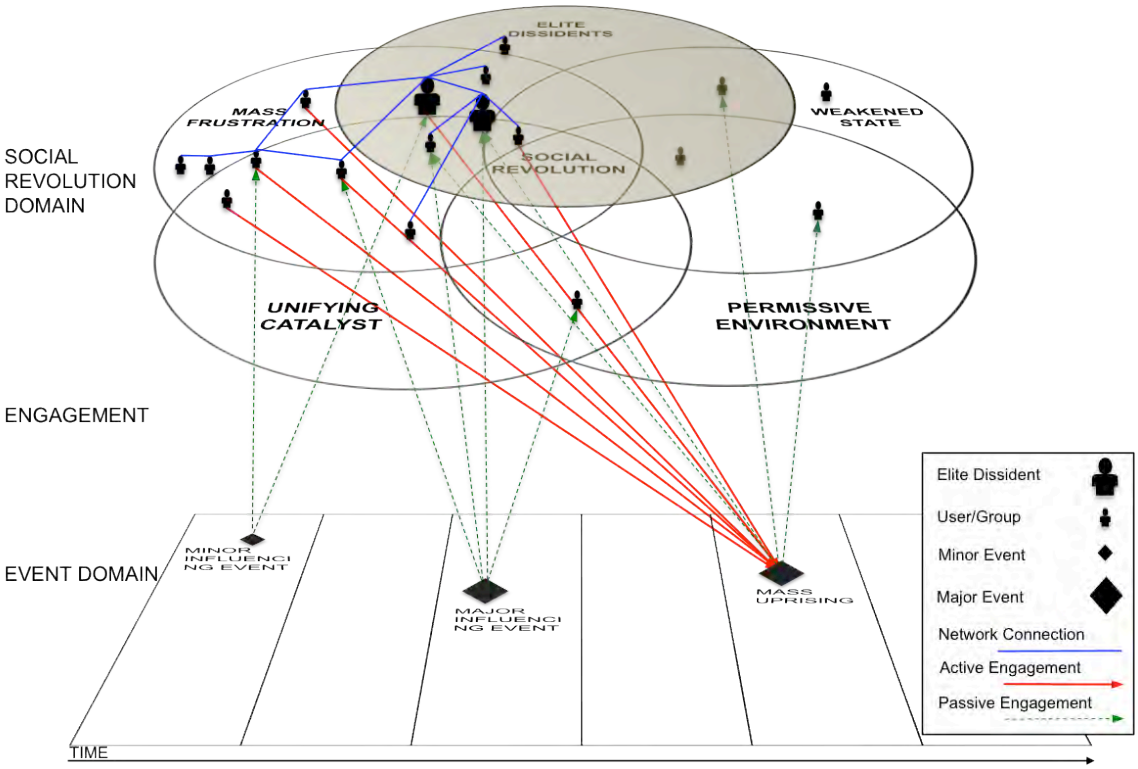

Figure 6. Mayer's Model (Elite Dissidents)

Source: Created by author.

Elite Dissidents

Elite dissidents, depicted in the shaded circle in the social revolution domain (figure 6), are responsible for the organization and strategy behind the creation of revolutionary activities. They are the influential actors within social networks that can easily shape popular consensus through the use of social media platforms. Elite dissidents have three main functions. First, they can experience mass frustration and work as activists within the population that shares their frustration. This condition is depicted in the model at the convergence between the circle of elite dissidents and that of mass frustration. Second, they can serve as technical experts or professionals that support the activities of the population, but do not take part in direct revolutionary action. This

condition appears in the model at the convergence of the elite dissidents circle with that of the permissive environment circle. The final type of elite dissident is one who operates from within the government apparatus and works to undermine efforts made by the state to control or eliminate the revolutionary movement. This condition occurs at the convergence of the weakened state circle and that of the elite dissident.

Before modern social media's impact, elite dissidents came from families of affluence and they generally attained university degrees. They were highly regarded in the community and possessed a certain charismatic appeal with the majority of the population (Brinton 1965). With the advent of modern social media, every user has the potential for becoming an elite dissident. Their physical presence within a society may serve to increase their local recognition, but it is not a requirement. Organizers can function as easily through virtual networks using modern social media platforms whether they are on the local street or on the other side of the world. The anonymity afforded to social media activists provides an increased level of security.

In the context of social media networks, the elite dissident serves as the hub that links multiple nodes according to Barabasi's (1999) real network theory. They create social media groups online and maintain a high number of followers within the social network as well as across other social network domains. Their attraction coefficient (Barabasi 1999; Roy 2011) to bring in new links to the social network is higher than that of the average individual.

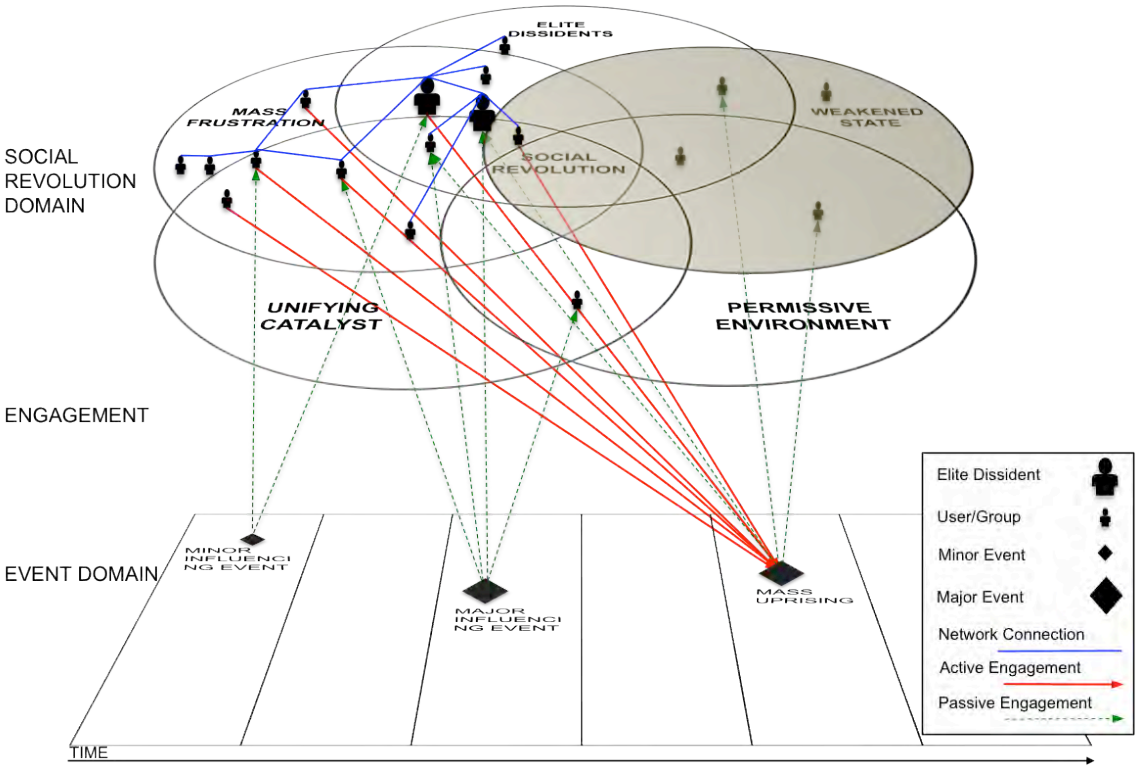

Figure 7. Mayer's Model (Weakened State)

Source: Created by author.

Weakened State

The weakened state, depicted as the shaded circle in the social revolution domain (figure 7), represents the inability of a state to react or control increased instability within its borders. It is often the result of an authoritarian system that engages in excessive restrictions limiting personal freedoms as a means to ensure their continued dominance. Social media undermines the efforts of a weakened state by providing an unchecked voice of dissent to the masses. The population under a weakened state government is no longer receptive to the state controlled media or its message. State actions are viewed as the source of frustration for many, depicted in the social revolution domain at the

convergence between mass frustration and weakened state; the population targets the weakened state to bring an end to the frustration.

The weakened state results from years of policies and regulations that create a division between the population and those in control. Government officials and institutions that make up the weakened state lose their standing with their citizens as well as foreign governments and institutions. The overlap of a weakened state and permissive environment is a negative relationship. The international community may criticize a state government threatened by revolution that resorts to oppressive measures to quell the uprising. Weak state governments are more likely to acquiesce to calls for restraint made by foreign powers.

The weakened state may attempt to regain control of the population by resorting to overt measures. This could take the form of restrictive legislation or security force action directed toward the population. This type of action is found in the social revolution domain where the weakened state circle overlaps with the unifying catalyst circle. The resulting sentiment of the population is seen at the convergence of three areas; weakened state, mass frustration, and unifying catalyst.

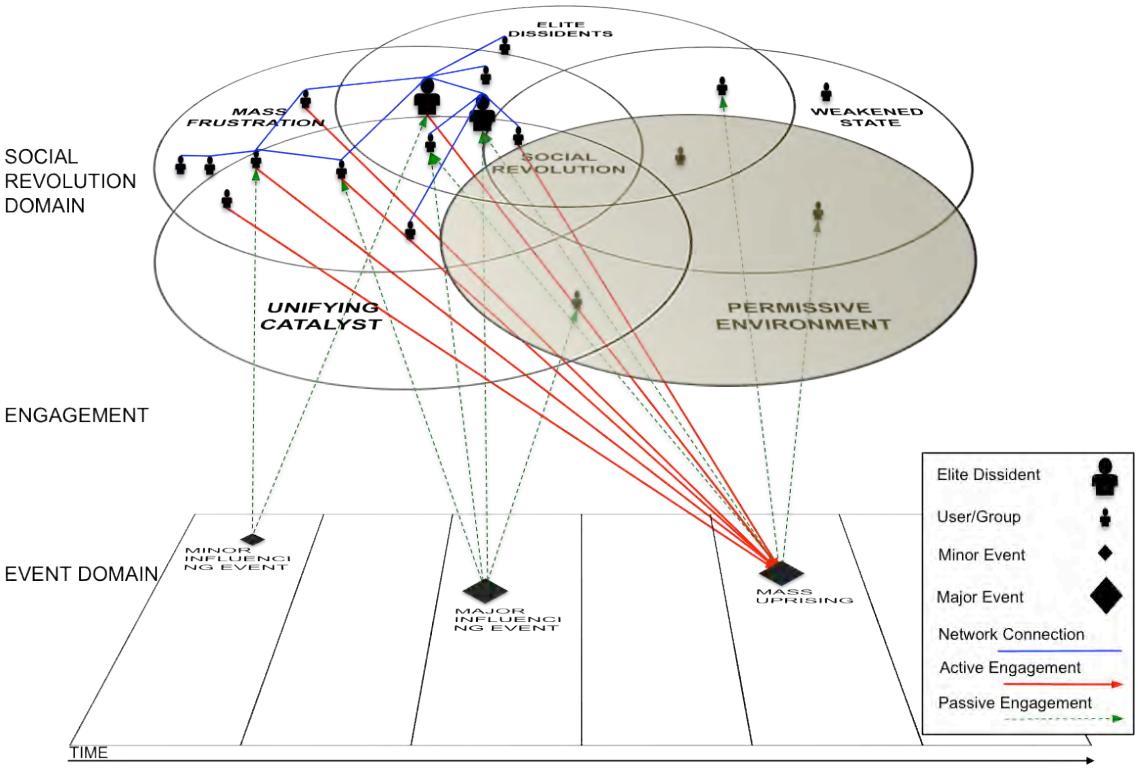

Figure 8. Mayer's Model (Permissive Environment)

Source: Created by author.

Permissive Environment

A permissive environment, depicted as shaded circle of the social revolution domain (figure 8), occurs when foreign nations or states elect not to intervene in the revolution, lack the ability to intervene, or side with the demonstrating populace. The human figures depicted in the permissive environment circle represent governments and state leaders that engage the weakened state through instruments of national power and strategic communications. An example of this would be President Obama's 18 March 2011 remarks regarding events in Libya stating, "The United States has worked with our allies and partners to shape a strong international response at the United Nations. Our focus has been clear: protecting innocent civilians within Libya, and holding the Qaddafi

regime accountable" (White House 2011). State leaders within the permissive environment are made aware of unifying catalysts and mass frustration within the disaffected population through passive engagement, represented by the green dashed lines connecting the event domain to the passive environment in the social revolution domain.

This category however, is not limited to state actors. A globally connected world brings greater influence from multi-national corporations and non-government entities. These groups and institutions help to shape the access and free flow of information that drives modern social media tools. Social networks, regardless of their position within the social media domain, are connected to the same global information grid that is often managed within a permissive environment. The model places groups of people connected by social networks in the social revolution domain where elite dissidents and the permissive environment converge. Whether the permissive environment consists of state powers or corporations, they possess the same level of access to content as those people on the street. They share common identities and ideals as those espoused by the people taking part in the revolution.

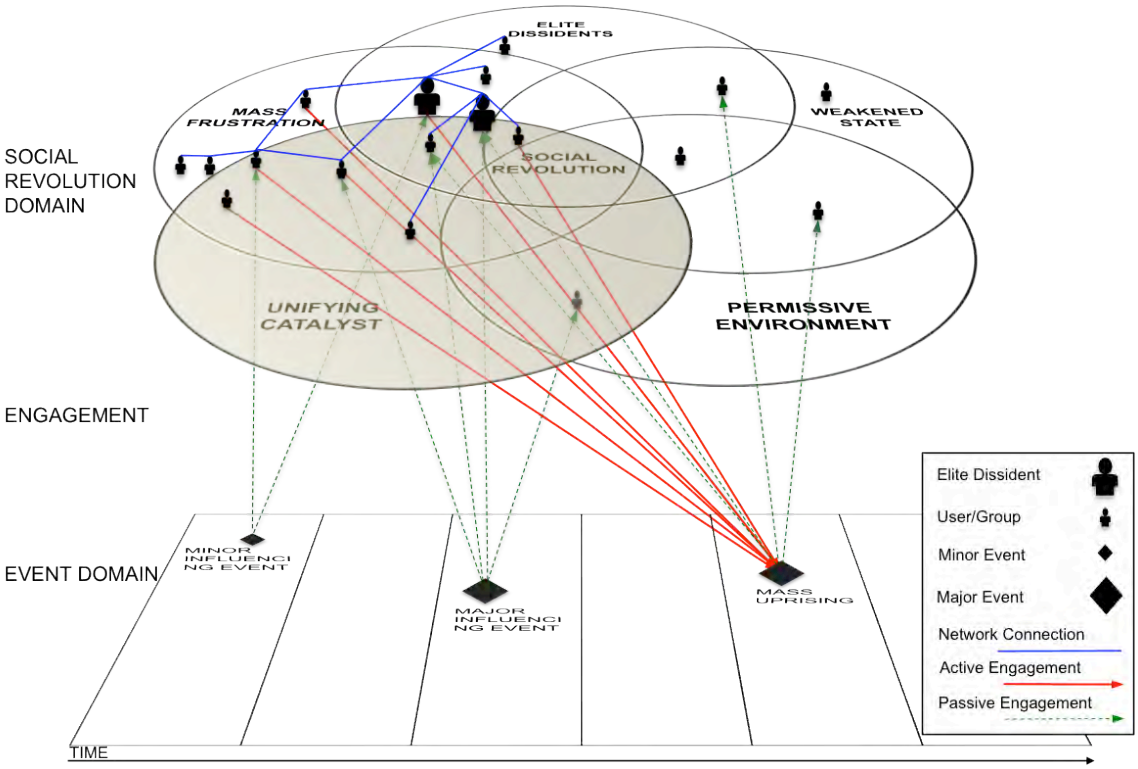

Figure 9. Mayer's Model (Unifying Catalyst)

Source: Created by author.

Unifying Catalyst

A unifying catalyst, depicted as shaded circle of the social revolution domain (figure 9), represents unifying conditions in social revolutions. These catalysts can occur quickly, taking place with abrupt and dramatic focus that draws particular attention from social media users in the social revolution domain. Unifying catalysts can also take the form of interrelated lesser conditions that, over time, bring social groups together through shared experiences that generate a sense of mass frustration. Social media remove barriers that previously limited unifying catalysts to the local or regional level. This is depicted in the model through passive engagement that broadcast such events to the world via mass media broadcasts or social media platforms. Unifying catalysts taking

place in another part of the world support the growth of mass frustration and collective action within the affected population. The feedback loop in the model that builds over time includes unifying catalysts in the social revolution domain to link social networks under a shared feeling of mass frustration.

Elite dissidents, at the point of convergence with unifying catalysts, take advantage of social media's open access. They use unifying catalysts to support their objectives and feed into the mass frustration within the populace. State institutions may seek to minimize the impact of unifying catalysts while measuring their reaction against the permissive environment. Unifying catalysts in the social revolution domain therefore, differ from events that take place within the event domain. The unifying catalysts in the social revolution domain reside within the social network, as depicted by the connections between the human figures within the social revolution domain in the unifying catalyst circle. The focus therefore, is on the individuals as part of the social network. The individual then, is the dependent agent within a unifying catalyst circle. In contrast, the event domain features only physical events that are resultant products from the unifying catalysts in the social revolution domain, as shown in the model as the red solid lines between the event domain and the social revolution domain. An example of a unifying catalyst within the social revolution domain would be the video log posted to YouTube by Asmaa Mahfouz (2011) calling for others to join her in Tahrir Square to demonstrate against the Mubarak regime. This video post drew the attention of others in the social network and aided in the creation of the event in the event domain.

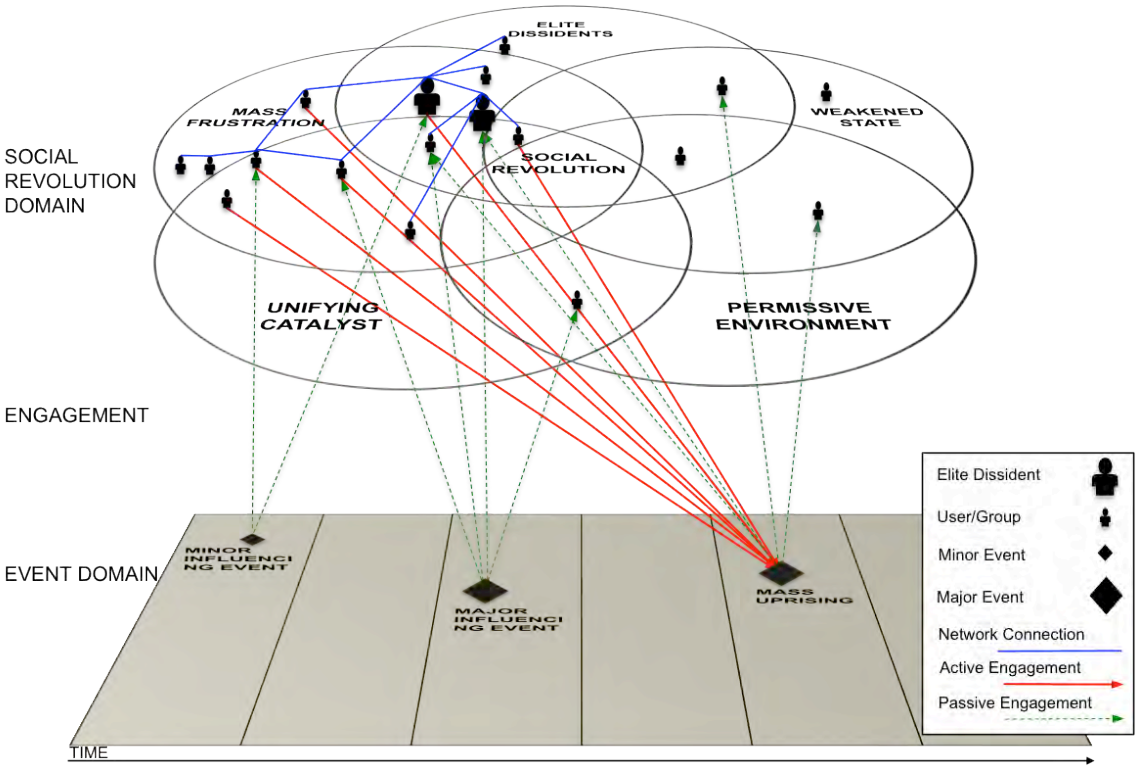

Figure 10. Mayer's Model (Event Domain)

Source: Created by author.

Event Domain

The event domain, depicted as the shaded plane in Mayer's Model (figure 10), consists of events present in real time as well as through mass media broadcasts. The event domain hosts a range of events that influence social media networks within the social revolution domain. The event domain can be viewed as an event timeline that progresses as events occur. The timeline is restricted to the event domain while the social revolution domain functions as a dependent component responding to individual events listed in the event domain. The model shows dividing lines along the event domain to represent time segments measuring any period of time as it relates to the progression of events. Events that occur within the event domain exhibit varying levels of influence

dependent on the size or impact of the event. For example, a mass demonstration has a greater attraction and impact than a local strike even though they both exist on the event domain. Traditioinal media networks are more likely to provide greater coverage, and subsequently more people will be exposed to the mass demonstration over the local protest that garner little outside attention. The ubiquitous nature of social media opens the event domain to observable events on a global scale. An event that occurs in another part of the world is equally presented on the event domain and observable by the social revolution domain.

Engagements

Engagements work as the linkage between social media users within the social revolution domain to physical events within the event domain. These events can take place within broadcast mass media or through physical events witnessed in real time. This is depicted in the Mayer's Model by two sets of lines. The green dashed lines originating from the event domain connect to individuals in social media networks present in any of the five categories in the social revolution domain. This type of engagement is considered passive engagement since it does not require any action on the part of those present in the social revolution domain. The other type of engagement is shown as a red solid line originating from the social revolution domain extending down to the event domain. This type of engagement is referred to as active engagement since it results from collective action on the part of individuals within the social revolution domain, and as a product of influencing behavior caused by any one of the five areas within the social revolution domain. The function of passive and active engagement

creates a feedback loop (figure 11) which is capable of generating greater influence within the social media network as it progresses.

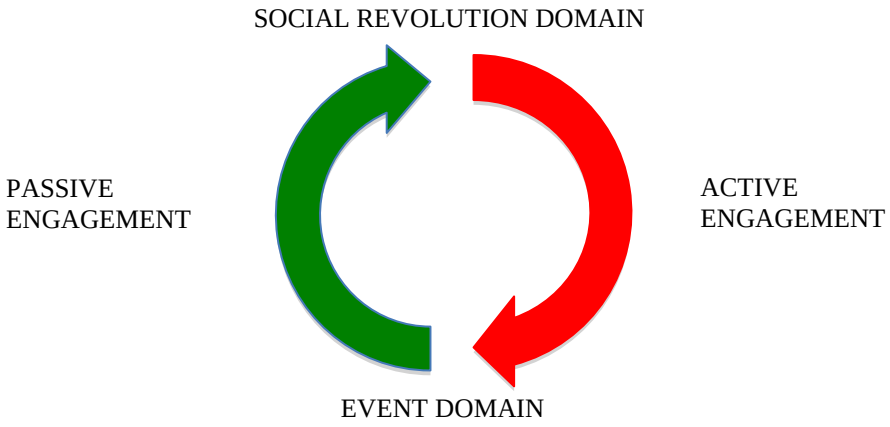

Figure 11. Engagement feedback loop
Source: Created by author.

Exposure to activities within the event domain, in accordance with the engagements, influences conversation and behavior that takes place within social networks in the social revolution domain. This action creates a cycle of behavior from exposure to the event domain through online conversation that may transition to physical actions that manifest themselves into new events within the event domain. This cycle of behavior is consistent with Deb Roy's (2011) findings on the impact events play with regard to social media dialogue when matched with Clay Shirky's research (2009b). Social media users are more likely to engage in physical activity as a result of shared solidarity through understanding online.

Social media exist in all areas within the model serving as tools that facilitate interaction within the population. Modern social media removes barriers to

communication that previously limited a society's ability to collect and share information. The impact of environmental themes that influence individual behavior is multiplied through the application of social media collaboration at a rate that surpasses authoritarian state controls. Mayer's Model enables the researcher to categorically position the various components within the social network and trace the engagement cycle. As an analytical tool, the model successfully demonstrates the relationship between action and reaction among the main components of the model.

Egyptian Revolution Case Study

The efficacy and usefulness of the Mayer's Model developed in this thesis cannot be determined until it is tested on an actual, contemporary social revolution. Such a test allows an evaluation of the model's strengths and weaknesses and ultimately determines if the model sufficiently explains the relationship between modern social media and social revolution. This test answers the subordinate research question; "Can a model explain modern social media's influence on social revolutions?"

The 2011 Egyptian Revolution provides an excellent case study for this test. It is the first example of a clear progression of the influence that modern social media has in a contemporary world event. The prolific use of modern social media during the Egyptian Revolution provides ample resources to apply to Mayer's Model. The duration of the Egyptian Revolution, when compared to other social revolutions, provides definitive limits to focus attention to within a prescribed timeline.

The method used to test the model using the 2011 Egyptian Revolution is to review key variables that contributed to the revolution and determine if and how well they are accounted for in the model. As each factor is introduced, it is explained in the

context of the revolution, then in the context of the model. Once the analysis is complete, an assessment is made on how well the model explains the reality of the interrelationships that resulted in the revolution.

Country Overview and Background

Information Technology Context

Egypt has invested considerable capital in developing their information technology and telecommunications infrastructure over the past decade. This effort coincided with a renewed focus on deregulating the telecommunications sector (Ministry of Communications and Information Technology 2011). These programs provided Egyptians living in urban areas greater access to the latest advances in communications technology. Mobile phone use and mobile Internet connectivity levels continued to grow reaching all time highs. Figure 12 shows the penetration of mobile communications in the Egypt in 2010 reaching over 90 percent of the total population.

Mobile Telephones

Indicator	Unit	January 2010	December 2010	January 2011	Monthly Growth Rates (٪)	Annual Growth Rates (٪)
Mobile Subscription	Million Subscription	55.85	70.66	71.46	1.13	27.95
Mobile Penetration *	%	72.66	90.44	91.32	0.88	18.66

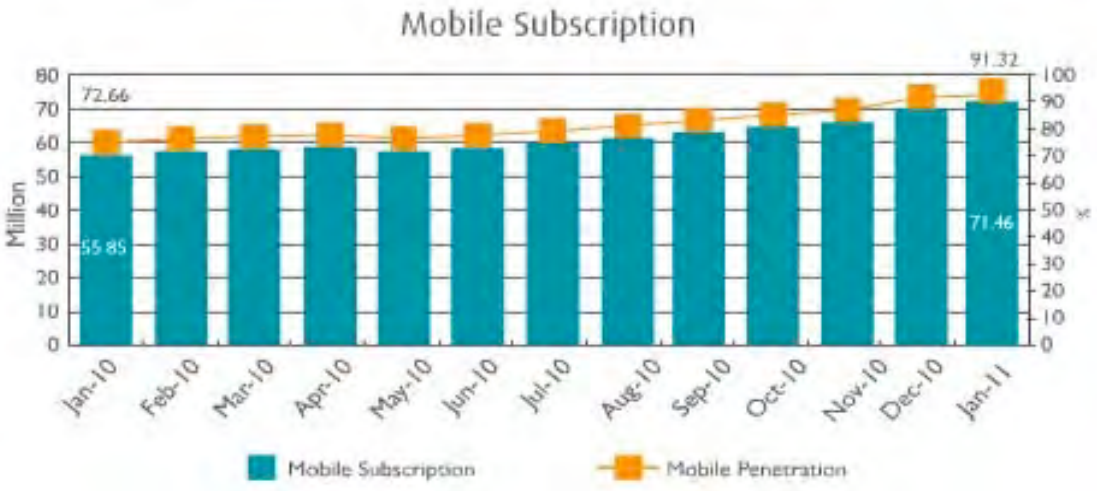

Figure 12. Mobile telephone use in Egypt
Source: Arab Republic of Egypt, Ministry of Communications and Information Technology, "ICT Indicators in Brief," February 2011, www.mcit.gov.eg/Upcont/Documents/ICTinBriefFeb2011-E.pdf (accessed 20 August 2011).

In addition to telecommunications infrastructure development, Egypt has worked to expand high speed Internet and broadband networking. Figure 13 shows the dramatic improvements Egypt has made over the past ten years in delivering the Internet to its population starting at less than 2 percent in 2000 to 20 percent in 2009 (Google Public Data Explorer 2011). According to the 2010 annual Information Technology Indicators Report, one of their principle aims was to continue to work on providing global access to its citizens.

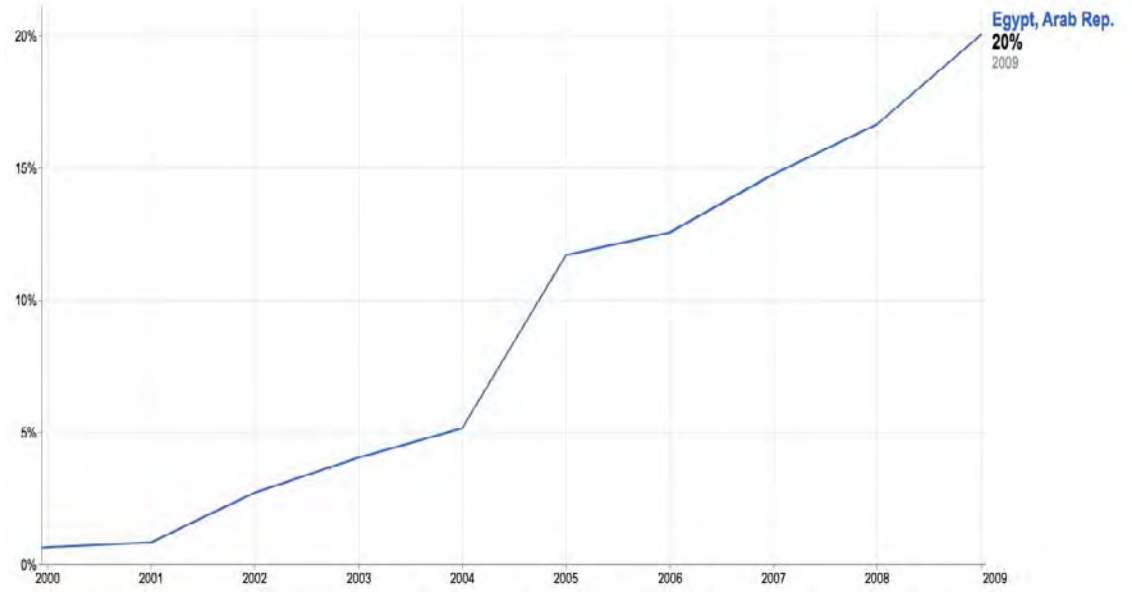

Figure 13. Egypt Internet users as percentage of population

Source: Google Public Data Explorer, Internet users as percentage of population, http://www.google.com/publicdata/overview?ds=d5bncppjof8f9 (accessed 25 October 2011).

Recent growth in Internet access in Egypt grew exponentially from December 2010 to March 2011 (Google Public Data Explorer 2011). The number of Egypt's Internet users increased by 18 million users reaching 24.5 percent of the population (Arab Republic of Egypt 2011). Popular social media platforms saw levels of growth proportionate to that of high-speed Internet services. As of February 2011, Facebook accounted for 8,929,740 active registered users in Egypt (Socialbakers 2011). It is the third most visited Internet site in Egypt behind Google and Yahoo! (Wolman 2011). Figure 14 provides a graphic representation of the breakdown of registered Facebook users in Egypt by age. The top two groups, users 18 to 34 years old, account for nearly 70 percent of the total users on the social media site. This data further supports other indicators that identify the same demographic experiencing unemployment as a part of

the youth bulge in Egypt. Mayer's Model (Illustration 1) explains this condition by the existence social networks actively present in areas of mass frustration and elite dissidents connecting millions of users. Unifying catalysts influenced social media activity centered on failures of the weakened state.

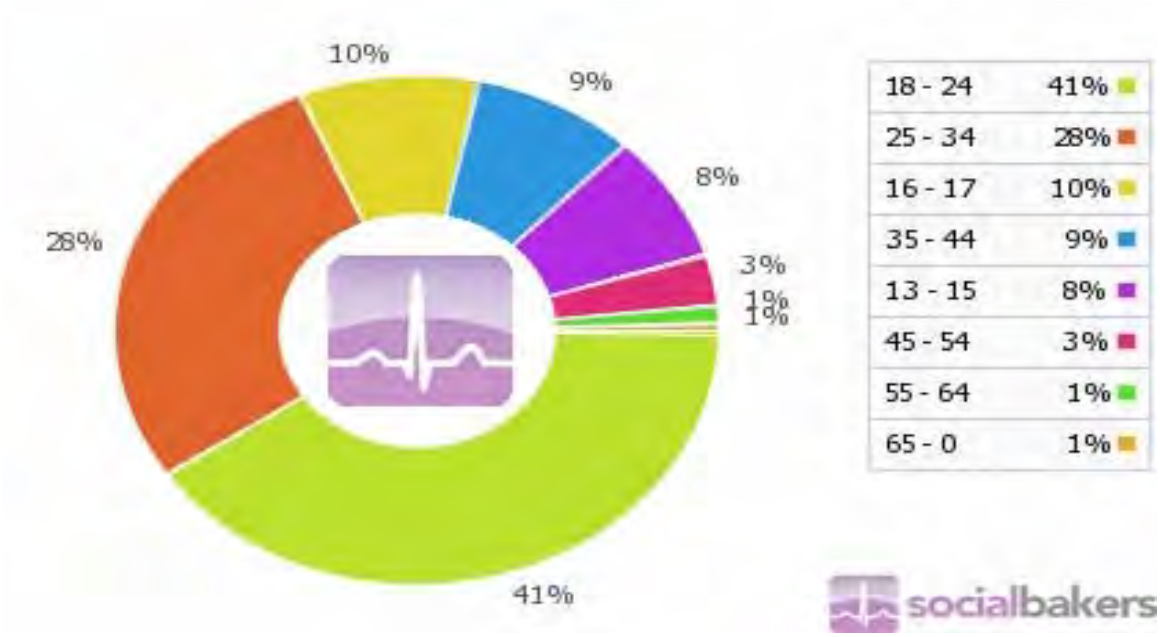

Figure 14. Egypt Facebook user demographics by age
Source: Socialbakers, Facebook Page Statistics, http://www.socialbakers.com/facebook-pages/ (accessed 21 October 2011).

Despite communications infrastructure development and reform programs, the Egyptian government maintained significant control over traditional media channels. Egyptian Radio and Television Union managed the operation and content generated by the country's major television and radio networks. Only three private satellite television stations have been operating in Egypt since 2001 (State 2010). Access to unrestricted information through global Internet connection via high speed data networks, in contrast

to state controlled media sources, created an oversight gap in the Mubarak administration's ability to regulate the flow of information at the lowest level and control the state's message to the people. This is further evidence to support the actions of a weakened state (Illustration 1).

Economic Context

Mass frustration in modern Egypt is a result of numerous issues, many of them economically based. Egypt is a country with 82 million people living mostly in urban areas and cities located along the Nile River valley (figure 15). Over 43 percent of the population lives in the cities of Cairo, Alexandria, Al Jizah, and Port Said (CIA World Factbook 2010). Negative economic conditions impacted the populace in Egypt's major cities with greater concentration than in lesser-populated regions. Major protest sites during the revolution appeared in these cities as millions of Egyptians took part in the demonstrations.

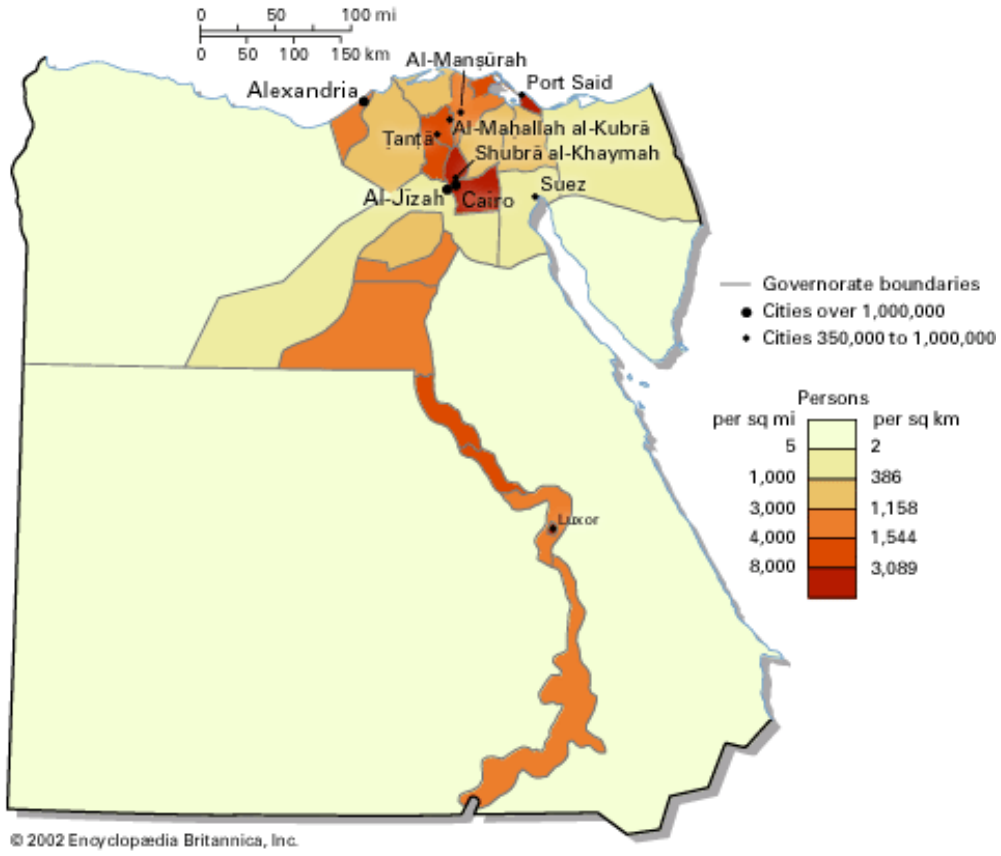

Figure 15. Population density map of Egypt
Source: Encyclopedia Britannica Online, http://www.britannica.com/EBchecked/media/94685/Population-density-of-Egypt (accessed 15 November 2011).

Another economic factor that supports mass frustration is the disproportionate number of youth among Egypt's population. Making up nearly one half of the total population, this condition has been termed the "youth bulge" (US Census Bureau 2011). Figure 16 provides a graphic break down of Egypt's population by age.

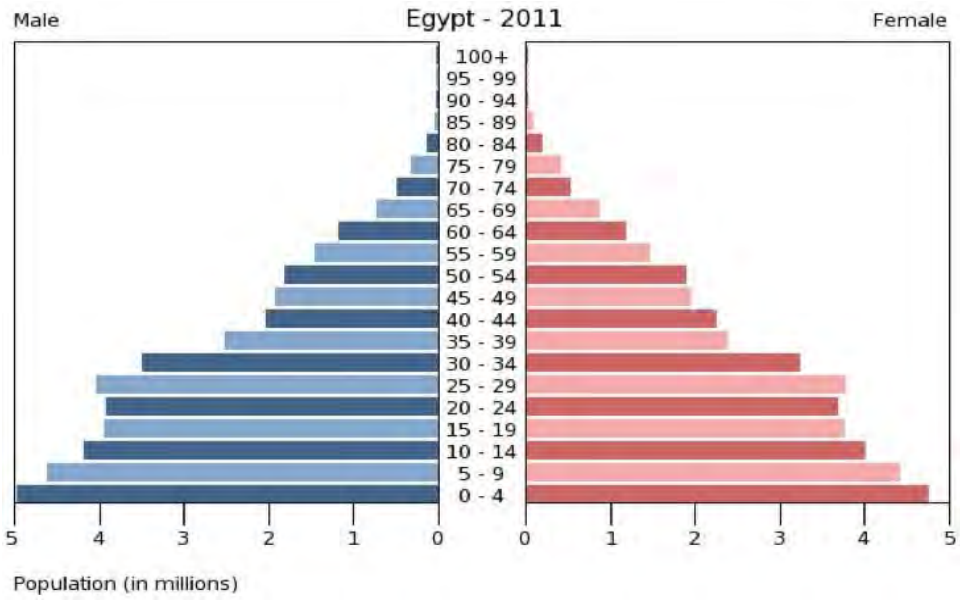

Figure 16. Egyptian population pyramid

Source: US Census Bureau, *International Database*, http://www.census.gov/population/international/data/idb/country.php (accessed 23 April 2011).

It is important to note the majority of the population was born after Hosni Mubarak assumed the presidency in 1981. Because young people make up the largest percentage of the Egyptian population, when they become frustrated, they blame their situation on the Mubarak administration, the only government they have ever known.

Policies enacted under the Mubarak regime that failed to satisfy the youth bulge demographic can be viewed as unifying catalysts within the social revolution domain that increase the level of mass frustration. Mayer's Model (Illustration 1) explains the impact these policies had on the population by their position in relation to the social media network in the unifying catalyst circle convergence with the mass frustration circle.

Over 70 percent of youth in Egypt hold a secondary level of education or higher (Dhillon and Yousef 2007). The same social demographic places a "higher value on mobility and social media" and is more likely to utilize social media platforms than other

age groups (Mobiledia.com 2011). Representing such a large percentage of the population, young educated Egyptians actively engaged in social media extend their position in the model from mass frustration to overlap with other areas to include unifying catalysts and elite dissidents (Illustration 1).

Egypt's educated youth assumed roles as elite dissidents within the social network. Mayer's Model (Illustration 1) explains this condition through their placement within the elite dissident circle. They, in turn, extend their influence on the social media network possessing a high attraction coefficient within the social media network that work to bring together individuals. These figures include bloggers, Facebook group administrators, and widely followed Twitter users. Access to information posted by these activists is available to anyone with an Internet connection. They represent all classes of users from the wealthy highly educated upper class to the middle or lower class.

Individual users are brought into social media networks through weak ties (Barabasi 2002) and connect to elite dissidents serving as hubs within the social network. The blue lines connecting the figures represent the connections made through social media tools. The largest portion of the population making up the social media network resides in the overlap between unifying catalyst and mass frustration. The failed polices enacted under the Mubarak regime serve as unifying catalysts to members of the social networks through shared frustration. Mayer's Model (Illustration 1) takes in account those individuals not connected to the social media network representing them as human figures within the mass frustration circle unconnected to the others through social media. Individuals in the social revolution domain not connected to the social media network interact with active social media users through traditional means.

It should be noted that the Mubarak regime increased their authority through state run social programs. This method of governance limited the administration's ability to meet the demands of its young citizens through economic downturns that adversely impacted the state and its population. The administration's failure to meet demands explains their role as the weakened state attributed for creating mass frustration. This represents a dangerous situation for the government.

Unemployment in Egypt was one of the driving forces behind mass frustration among the populace. Averaging 10 percent the decade preceding the revolution, unemployment negatively impacted population in Egypt's major cities. Table 1 provides a breakdown of unemployment from 2001 to 2010.

Table 1. Egypt unemployment rate 2001 to 2010

2001	8.8%
2002	10.1%
2003	11.28%
2004	10.53%
2005	11.47%
2006	10.91%
2007	9.21%
2008	8.78%
2009	9.52%
2010	8.99%

Source: International Monetary Fund: Central Agency for Public Mobilization and Statistics, September 2011, http://www.imf.org/external/pubs/ft/weo/2011/02/weodata/weoseladv.aspx?a=&c=469&s=LUR (accessed 10 September 2011).

When measured against the high number of youth graduating from university, the unemployment rate of youth in Egypt tells a different story. Youth unemployment for

Egyptians between 16 and 25 years of age is greater than twice the national average (Dhillon and Yousef 2007). Figure 17 graphically supports this data representing Egypt as well as other countries in the region. “Gains in educational attainment [had] not been met with quality jobs” (Dhillon and Yousef 2007). A report on Egypt’s unemployment published by Economy Watch in October 2010 shows that a majority of Egyptians graduating from universities waited on average 33 months before finding employment through the Labor Force Administration (Economy Watch 2010). The Labor Force Administration, operating under the Mubarak government, is another example of the weakened state failing to meet the needs of the population. This failure translates to increased frustration that grew as more Egyptians tried to enter the labor force. Young Egyptians enrolled in state run schools shared little hope of finding employment once they graduated.

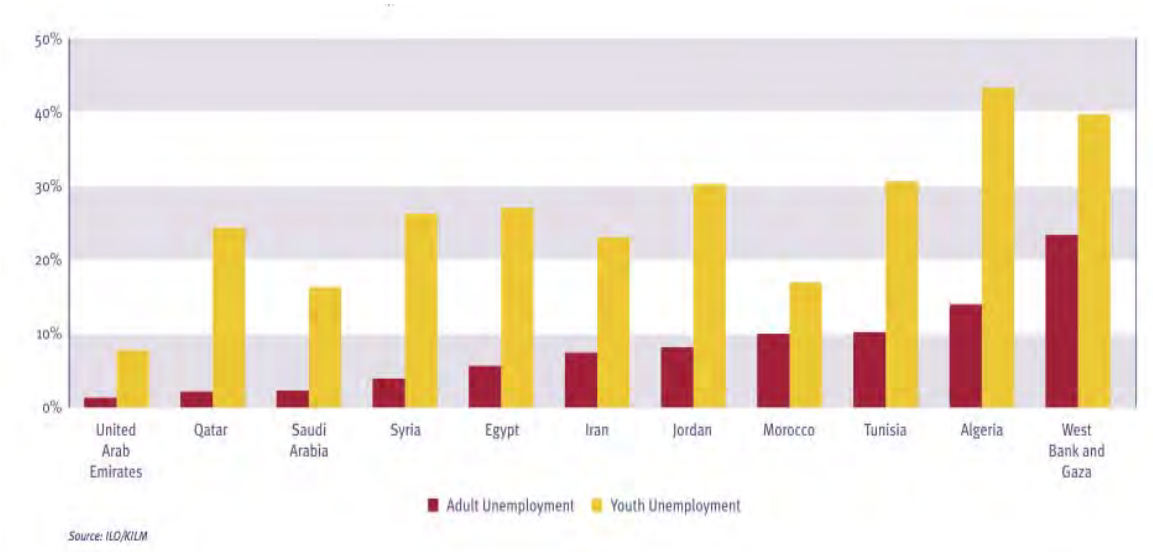

Figure 17. Egypt youth unemployment comparison
Source: Navtej Dhillon and Tarik Yousef, *Middle East Your Initiative*, 12 December 2007, http://www.shababinclusion.org/content/document/detail/623/ (accessed 25 October 2011).

This disaffected sector of the population grew increasingly frustrated with their situation over the decades; experiencing negative impacts and cultural stigma of losing respect and dignity within their community. Growing up under a highly controlled state economic complex, Egypt's youth looked to the government to provide assistance only to receive little reassurance from the Mubarak regime.

High inflation is another economic indicator attributed for creating an atmosphere of mass frustration. Despite relative growth in Egypt's markets over the past decade, inflation remained high from 2007 to 2010. This condition placed additional strain on the lowest wage earning section of the population as the poverty rate remained steady at 20 percent of the national average (CIA World Fact Book 2011). A World Bank data source, as seen in figure 18, shows the country's inflation rate averaged 11 percent over the preceding three years prior to the revolution. The basic cost of goods and services continued to negatively impact a large percentage of the population already struggling with depressed unemployment factors.

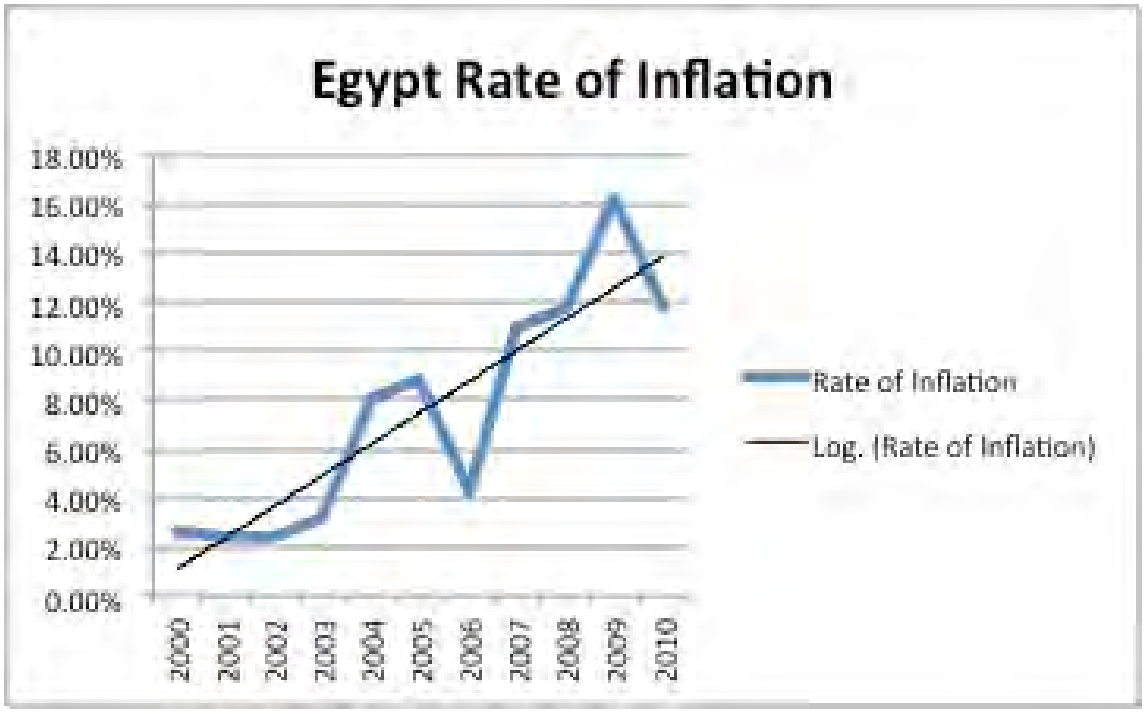

Figure 18. Rate of inflation in Egypt 2000-2010.
Source: Created by author using data from World Bank Development Indicators, "Inflation, consumer prices (annual %)," http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG (accessed 1 November 2011).

Austere economic conditions within Egypt, felt by a disproportionate percentage of the population is further evidence of the growing mass frustration. Failed state programs represent the weakened state's ability to improve these conditions. Mayer's Model (Illustration 1) accounts for the negative effects of unemployment, inflation, and failed policies by their proximity to the social network experiencing mass frustration and unifying catalysts. When exposed the such conditions over time the resultant behavior of individuals within the social media network creates heightened frustration in the populace.

The combination of a large section of the total population of young educated men and women, experiencing disproportionate levels of unemployment while facing rising

prices in food and cost of living created challenges the Mubarak administration was ill prepared to address. Egyptian youth adversely impacted by economic conditions turned to social media forums to voice their dissent regarding the source of their frustration with calls for lasting reform that had long been promised but not delivered. Adding to an already tenuous environment many Egyptians, adept at using social media technology, had access to information and resources from around the world thanks to the Egyptian government's communications development initiatives. All that remained was for a unifying event possessing sufficient force to embolden the masses to action.

30 Years under Mubarak

President Hosni Mubarak assumed the head of the Egyptian government by way of a national referendum following the assassination of President Anwar Sadat in 1981. Despite repeated assurances to rescind the emergency powers that automatically took affect prior to his election as president, the government voted to keep them in place through regular provisional votes. Articles within the emergency powers suspended individual constitutional rights, prohibited non-government demonstrations, authorized censorship of the media and increased the power of the state security forces (BBC 2008). "Mubarak constructed a legal framework that has been invoked to constrain the activities of opposition groups. Under his leadership, the government repeatedly renewed and extended the emergency law and initiated waves of constitutional and legal reforms in 2005 and again in 2007 that further consolidated the regime's power." (Carnegie Endowment for International Peace 2011). Many Egyptians felt Hosni Mubarak led the country through coercion and intimidation. They had lost their faith in the regime to make good on its promises in the face of rampant corruption within the government. The

level of control and intimidation Mubarak exercised could only be maintained through ever increasing limits on Egyptian personal freedoms.

At 81 years of age and in declining health, many believed that he was shaping the political landscape for his son, Gamal Mubarak. President Mubarak had appointed Gamal to a prominent position within the National Democratic Party and asked parliament to rewrite the constitution such that "criteria for subsequent elections were so stringent that no other party other than the National Democratic Party would be able to meet them in the next election" (Dunne 2007, 3). Opposition groups to the National Democratic Party were largely marginalized with complete exclusion of Islamist groups like the Muslim Brotherhood. While disassociated from the political process, these groups operated as elite dissidents that sought governmental reform. Mayer's Model (Illustration 2) underscores the division between the Mubarak administration and the opposition groups through their position at oppostite sides of the social revolution domain. This positioning in relation to the social media network in the mass frustration circle indicates the degree of influence the administration had in relation to opposing elite dissidents.

Cases of coercion and corruption were not reserved for the senior elected officials. Many in the city streets lived in fear of the security police and there were numerous cases of abuses of power through bribery, extortion, and torture (Al Jazeera 2011). Local citizens reported allegations of abuse to the government and the media but received little attention and were often subjected to personal harassment for their efforts to expose the abuse of power (Al Jazeera 2010). The security police, depicted as a human figure on the weakened state circle of the model, were viewed more as protectors of the state more than guardians of the people.

Frustrated and afraid, a growing number of Egyptian men and women began making their voice heard through citizen reporting in an effort to cope with their situation. Egyptian security forces, as members of the weakened state, had a negative effect on the populace further increasing the level of mass frustration. Corruption within the weakened state and abuse of powers at the hands of security forces served as unifying catalysts as experienced by those in the social revolution domain.

The Mubarak administration paid little attention to the growing "blogosphere" developing in Egypt. The government may not have viewed blog writers or social media activists as credible threats. Wael Abbas (Illustration 2) is a blogger activist that operates the blog site "Egypt Awareness." He posts information in Arabic, English, and German and began operating his blog in April 2008. He is represented in the model as another elite dissident human figure within the mass frustration circle. Bloggers like Wael Abbas factor into the Mayer's Model as elite dissidents targeting the Mubarak administration as the cause of the frustration. They used commentary critical of the Mubarak regime as unifying catalysts drawing others in that share the same level of mass frustration. Mayer's Model (Illustration 2) explains the connection elite dissidents such as Abbas have within the popluce and the inability of the administration to prevent his blog from influencing behavior in the street.

> A wide spread call went out for a general strike over corruption, rising prices, stagnant salaries, and unprecedented gap between the rich and poor in Egypt. As a result, thousands of demonstrators in the northern industrial town of Mahalla el-Kubra torched the largest textile factory in Egypt, looted shops, and hurled bricks at police . . . .[This] was to become the first virtual strike mobilized and organized by the new media exemplified by Facebook and Egyptian blogs. (Mohamed 2011, 42)

In April 2008, elite dissidents used social media platforms (e.g. Twitter, Facebook, etc.) to create a general strike (Illustration 2) as a physical event in the event domain. This event was met with force by Egyptian security forces. The international community became aware of the incident through passive engagement and raised their concerns over the event with the Egyptian government. The Egyptian population also observed the event that served to heightened the strike's effects. This event created a feedback loop beginning with the social revolution domain voicing their frustration through social networks then turning their frustration into action in the form of protest. The subsequent response by police compounded their frustration increased in the social revolution domain. Social media activists used this cycle of events to bolster their cause.

Bloggers and social media activists are young educated Egyptians frustrated with corrupt conditions, and that turn to social media to express their views. Abbas claimed government officials harass bloggers through threats and intimidation by the security forces (Frontline 2011). Many of the blogs covered issues relating to police brutality (Frontline 2011), a product of the weakened state. Abbas posted videos of abuse and solicited videos and pictures from friends and fellow activists. This interaction is depicted in Mayer's Model (Illustration 2) through the connections linking numerous figures in the social revolution domain. The issue of torture in police stations had been known for a long time. People in the street were aware of ordinary Egyptian citizens being interrogated and beaten by the police; the victims were not criminals or enemies of the government. This action by the Egyptian security forces placed the government in the weakened state category while drawing criticism from the international community in the form of a permissive environment. Like most Egyptians, Abbas was concerned and felt

that the Egyptian people should be treated with more respect and deserved dignity from their government. He was clearly an elite dissident with the power to create unifying catalysts within the social revolution domain.

State controlled media became the target of ridicule by Egyptians as daily broadcasts and newspaper articles failed to capture the frustration of those in the street. This lack of representation encouraged the use of citizen journalism through online bloggers and social media activism. “The number of blogs in Egypt [rose] from just 40 in 2004 to an estimated 160,000 in July 2008. More than three fourths of Egyptian bloggers write in Arabic only, 20 percent write in both Arabic and English, and nearly 10 percent write in English only. More than 30 percent of Arabic-language blogs are Egyptian” (Open Net Initiative 2009). Figure 19 provides a graphic depiction of Egyptian blogs in the social revolution domain in 2004. The limited number of connections explain the scarcity of this form of modern social media. Respresting such a small percentage of the information produced state controlled media had a greater level of influence among the general population. Figure 20 graphically depicts the growth of Egyptian blogs in 2008. The number of connected human figures in the social revolution domain increased dramatically thus providing an alternative source for information sharing outside state media control. The emergence of elite dissidents in the social network explains the number of bloggers posting content in English, a result likely to come from educated Egyptians from the “youth bulge.”

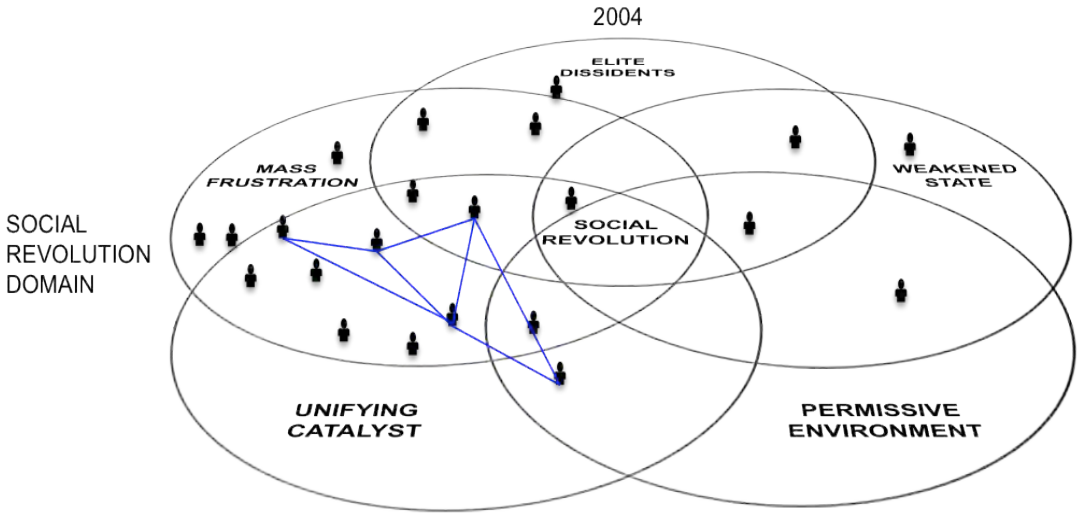

Figure 19. Number of Egypt blogs 2004

Source: Created by author.

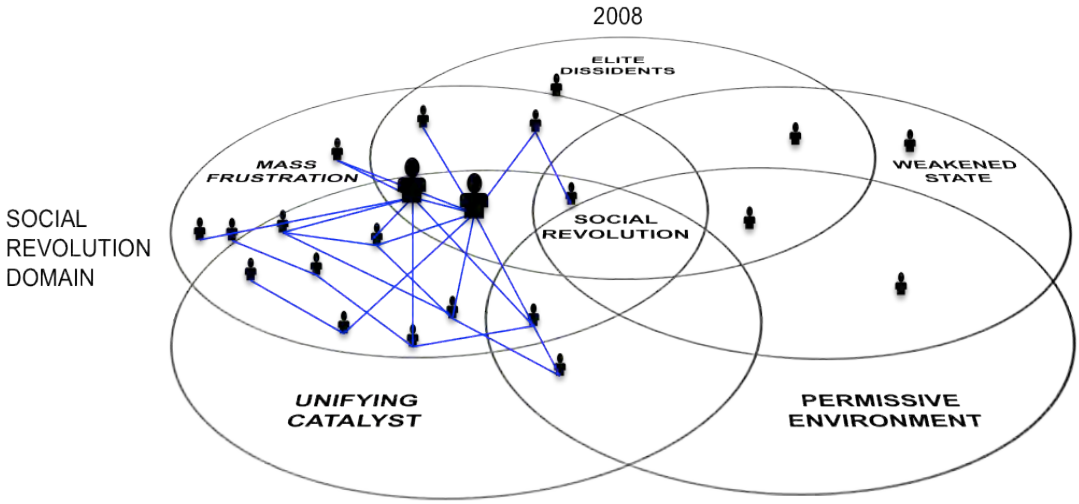

Figure 20. Number of Egypt blogs 2008

Source: Created by author.

The government, as a weakened state unable to control online social media conversation or provide an effective state message to counter it, accused bloggers of fabricating the reports and spreading lies about the government. The interior minister, as an function of the weakened state circle, warned activists of the penalties for using the

Internet as a tool against the government. According to Abbas, blogging was seen as the last free voice in Egypt. It is not only the effect of having Internet access that makes blogs so important to Egyptians. Social media activists used this form of media to bridge the gap between the Internet and the street. The Egyptian government programs to expand Internet access in the country further supported this bridge. The target audience of many of the bloggers are young Egyptians with the aim to get them involved in political events. The language, images, and opinions resonated with the target audience, serving as unifying catalysts, adding to a sense of mutual feelings of frustration within the social network.

The "long repression had bequeathed such a legacy of cowardice and submission that Egyptians would not rise up, whatever happened" (Aswany 2011, vii). By December 2010, the level of frustration directed toward Hosni Mubarak's administration had reached an all time high. The only thing that had yet to occur was an event that carried enough attractive power to break the fear of the Egyptian people. That event happened on January 14, 2011 when Ben Ali of Tunisia was driven from office.

The Beginning of the Revolution

Mayer's Model (Illustration 3) explains the linkages between discrete events that occurred during the Egyptian Revolution and the interaction between the revolution itself and the considerable influence of modern social media. The major event that initiated the revolution occurred on 17 December 2010 when Mohammed Bouazizi, an unemployed street vendor, lit himself on fire in front of the Tunisian parliament building to protest economic hardship and humiliation at the hand of the Tunisian government. This event exists in the event domain, and is observed by the individuals in the social media domain

through passive engagement (Illustration 3). Social media conversation created as a result of the passive engagement, elicited a unifying catalyst resulting in increased awareness across the social revolution domain, both within Egypt and around the world. Video files of the ensuing protests in Tunisia caught the world's attention when Al Jazeera began broadcasting reports on their satellite news network. The continued cycle of protests and real-time reports created a feedback loop spawning solidarity within elite dissidents among the social revolution domain in Egypt. In addition to televised broadcasts, Al Jazeera media teams posted the video to their Facebook group (Ryan 2010). The widespread coverage created a sizable permissive environment in support of individual rights of citizens in the social revolution domain. Egyptians could relate to what was taking place in Tunisia as signs of support began emerging in social media sites.

This single act prompted a string of self-immolations in Algeria and Egypt demonstrating the effects of the feedback loop between the event domain, through the social revolution domain, and back to the event domain in the form of a new event. In protest over poor living standards, Abdu Gaafar, set him self on fire in front of Egypt's parliament building. Following the incident, Gaafar claimed he did it after government officials refused to provide him with subsidized bread rations. Unwilling to accept their role in this act of protest, Egyptian authorities claimed outside groups were behind the event (Jones 2011). This was a failed attempt to absolve the government of any responsibility for the actions. The proliferation of social media networks as previously shown in figure 20 explains the negligible impact the state media's message had on the population.

After three similar acts occurred, Asmaa Mahfouz, an activist member of the April 6 Youth Movement and elite dissident within the model, created a video blog urging all young men and women to leave their computer screens and converge on the streets of Cairo to protest the brutal and corrupt regime (Mahfouz 2011). She appealed to the honor and dignity of Egypt's youth that had been stolen by a corrupt government. She professed that she would no longer live in fear and called on everyone to share the message with in their social networks and forward it on mobile phones to ten people (Mahfouz 2011). Mayer's Model (Illustration 3) recognizes Mahfouz as an elite dissident that observed, through passive engagement, the self-immolations of her fellow Egyptians. Her video blog is a powerfully effective unifying catalyst that possessed the necessary attractive qualities to connect multiple social networks in the social revolution domain. Social media sites made similar content instantaneously available to the entire world gaining international support in a matter of days. The connection between the passive engagement of the series of self-immolations in Egypt to Mahfouz which then extended through the entirety of the social media network explains the influencing potential held by social media elite dissidents.

On the morning of 25 January, the first groups of protesters began marching through Cairo to the heart of the city. This act was a violation of the emergency laws but the protesters continued undeterred. An estimated 20,000 to 30,000 protesters were involved in the demonstration. Riot police met the protest in an attempt to break it up before it reached Tahrir Square (Al Jazeera 2011). "The government quick to seize political capital, accused their long-time enemy, the Muslim Brotherhood, of inciting unrest" (Al Jazeera 2011). Despite government allegations, no evidence suggested the

Muslim Brotherhood was involved in the demonstration (Al Jazeera 2011). Shortly after midnight, security forces began using increased levels of violence that served only to attract greater attention from the Egyptian population.

Mayer's Model clearly illustrates that this protest is the product of a cycle of events. The converging circles in the social revolution domain demonstrate how mass frustration, elite dissidents, and unifying catalysts converged when social networks in the social revolution domain observed, through passive engagement, Tunisia's President step down. Elite dissidents used this combination of factors to increase the level of awareness and frustration within the population. The resultant behavior, as explained in the model, came about through active engagement, led by social media activists, to form a highly attractive event in the event domain that further exposed the weakened state's inability to support and defend Egyptians.

The following two weeks brought more people to the streets. The initial calls made by the demonstrators for an end to corruption and improved economic conditions changed; Hosni Mubarak's removal was now the main objective. The government warned of harsh response to anyone taking to the streets and imposed a strict ban on all public gatherings. Reports of violence began to circulate while video footage taken by those in the street showed armored police trucks trying to run protesters over as well as detaining people and beating women and children (Al Jazeera 2011). Online activism in the social revolution domain turned from organizing events to reporting human rights violations committed by security forces. Media images posted to social media sites showed a dozens of people taking pictures throughout the demonstrations (Al Jazeera 2011). Amateur video of protests from around the country was uploaded to YouTube and

Facebook. This method of broadcasting what was taking place in Tahrir Square and elsewhere in Egypt made individuals, groups, and governments around the world, directly aware of what was occurring through passive engagement. The action of posting content to social media sites as events took place is indicative of the growth potential found in the feedback loop as events progressed. Mayer's Model (Illustration 3) accurately captures this proliferation of social media content sharing through the connecting lines between the social media network in the mass frustration circle to other groups in the permissive environment circle. This connection explains the social media's global connection and influence.

Government attempts at silencing the protestors by shutting down the Internet and mobile communications failed to achieve the desired effect. The number of protesters continued to grow, reaching tens of thousands from Cairo to Luxor. By the evening of 1 February, the number of people in Tahrir Square exceeded one million (Al Jazeera 2011). Pro-Mubarak groups arrived to challenge the protesters. Largely disengaged to this point, the army stepped in to bring the clashes to an end. Mayer's Model (Illustration 3) recognizes the Egyptian Army as a member organization under the weakened state, however their refusal to engage the protestors equates their actions to that of elite dissidents. This served to further isolate the Mubarak regime and focus the mass frustration toward Mubarak himself.

Wael Ghonim, operating as an elite dissident arrested by Egyptian security forces, was released from prison eight days after being detained during the protest. That evening he conducted an interview on Dream TV, one of Egypt's three private news organizations. This broadcast brought newfound strength to the demonstrators. His tearful

pleas to the people resonated with those in Tahrir Square and elsewhere throughout Egypt. The following day Ghonim arrived at the center of the demonstration and addressed the growing crowd directly. Two weeks into the revolution, the mass of protesters grew to its largest size to date with over one million assembled in Tahrir Square alone (Al Jazeera 2011). No longer afraid of the security police, factory and business workers went on strike. Despite repeated attempts to appeal to the demands of the street the Mubarak regime was resigned to submit to the protestors' demands and stepped down from office.

The international community watched the revolution unfold. Their collective response demonstrated a permissive international environment that was unwilling to step in to assist the regime in bringing an end to the protests. On 28 January President Obama publicly stated America's support for the rights and liberties of all individuals while saying "all nations must maintain power through consent not coercion" (White House Blog 2011). Several days later British Prime Minister David Cameron released a statement saying, "We need to see a clear roadmap for that political reform, so that people in Egypt can have confidence that their aspirations for a more democratic, a future with greater rights, is met" (Cameron 2011). At the height of the protests, UN Secretary General Ban Ki-Moon urged authorities to refrain from violence against demonstrators and called for a peaceful resolution.

Former director general of the United Nations International Atomic Energy Agency and Nobel Prize winner Mohammed El Baradei openly called for reform and presented a clear challenge to the Mubarak administration. His position as an elite dissident provided a recognizable leader that could challenge Hosni Mubarak. While

Mohammed El Baradei was not a social media activist he is a notable figure in Egyptian society and his political activity during the 2005 parliamentary elections following his departure from the Atomic Energy Agency earned him considerable notoriety with the Egyptian street. He represented a promise for change long hoped for by many. He engaged in social media dialogue on a regular basis from outside Egypt offering support for reform and an end to Mubarak's regime.

El Baradei called on Egyptians to follow Tunisia's lead and joined them in Tahrir Square seeking Mubarak's resignation. Before returning to Egypt, El Baradei followed the uprising via international news broadcasts as well as Twitter and Facebook. At the time of the revolution, he had 286,099 followers on Twitter (@ElBaradei 2011). On 1 January 2011 he tweeted "Tragic events of 2 Saints church: symptomatic of an impotent regime unable 2 protect its people & a disintegrating society 2 implode." (@ElBaradei 2011). This post was reposted by 73 other users following him through social media (@ElBaradei 2011). On 13 January 2011, El Baradei posted "Tunisia :repression + absence of social justice + denial of channels for peaceful change = a ticking bomb" (@ElBaradei 2011). Aware of the calls for similar demonstrations in Egypt, he offered his support for "peaceful demonstrations vs. repression & corruption. When our demands for change fall on deaf ears what options remain" (@ElBaradei 2011). These comments made by El Baradei are examples of his support for the demonstrations.

El Baradei is an elite dissident within the social media domain as well as a member of the opposition group that presented a formidable challenge to the weakened state (Illustration 3). His appearance in Tahrir Square on 28 January shows the product of the feedback loop (Illustration 3). Following events that were taking place in Cairo

through social media, he decided to return to Egypt and join the call for Mubarak's resignation in person. His arrival was captured by journalists covering the protest, continuing the feedback loop and further galvanizing the movement. Following El Baradei's position in the social revolution domain while factoring in his modern social media interaction demonstrates Mayer's Model (Illustration 3) accurately tracked this particular elite dissidents through the course of his interaction between modern social media and social revolutions.

April 6 Youth Movement

One of the elite dissident groups that took part in organizing the 25 January protest was the April 6 Youth Movement. Asmaa Mahfouz, creator of the video blog calling for the demonstration, is a member of this group (Illustration 3). Created on 23 March 2008 by 27 year old Esraa Abdel Fattah Ahmed Rashid and 27 year old Ahmed Maher, the April 6 Youth Movement sought to challenge the government through organized strikes and whistle blowing efforts (Frontline 2011a). As of November 2011, the site ranked 10 of 798 political organization sites monitored by the online social media analytical database, Socialbakers (Socialbakers 2011). The site maintains 266,796 followers (Socialbakers 2011). Prior to the 2011 revolution, they studied nonviolent tactics from previous youth movements from around the world. Group members attended a US State Department sponsored "Alliance of Youth Movements Summit" in December 2008 (Frontline 2011a). There, they learned the power of socially centric communications to empower larger groups of disaffected youth (Frontline 2011a). This organization operated entirely through online social media groups to include Facebook and Twitter accounts. The April 6 Youth Movement operates as a collective of elite

dissidents comprised of educated and frustrated Egyptian youth. They are organized and proficient at spreading news of unifying catalysts such as police corruption and unfair elections (Illustration 3). Their message resonates with the mainstream Egyptian population.

Within 24 hours of opening the account, the group had over 3,000 registered followers (Wolman 2008). Maher used the web to spread anti-government messages to anyone who would listen. He was plugged into a network of activists encouraging others to create subgroups in order to spread the message. By the end of March, the site had over 40,000 members (Wolman 2008). They recognized the power video files and graphic pictures had on the population and employed them whenever they could. Events occurring in the event domain, similar to the protest in April 2008 (Illustration 2), provided graphic evidence of brutality and corruption by the weakened state (Illustration 3). Their function as elite dissidents connected to a large social network spread such unifying catalysts.

While the group's operation initially enjoyed mixed results, April 6 members featured prominently in the 25 January demonstration. They "distributed 20,000 leaflets late on Thursday outlining a basic blueprint of where to go and what supplies to take" (Naib 2011). Their actions attracted the attention of security forces leading police on a mission to isolate and detain key members of the organization. Leaders in the movement went to great efforts to remain largely underground and employed security measures to safeguard administrator passwords should one of them be interrogated by government agencies. The group's position outside the weakened state circle demonstrates the state's failed attempts to stop the April 6 Youth Movement (Illustration 3).

We are all Khaled Said

One of the most prominent social media sites used as a source for organization of the 25 January uprising was created in June 2010. Wael Ghonim, marketing director for Google in the Middle East, created the Facebook group "We are all Khaled Said" under an anonymous name with the intent of exposing violations committed under the emergency powers act held by the Mubarak administration (CBS News 2011). At the time of the Egyptian revolution, Wael Ghonim lived with his family in Dubai (Shah 2011). Mayer's Model places Ghonim in the category of elite dissident for his social media activism and permissive environment for his residence outside Egypt. His role in the model explains the shared information of unifying catalysts, organizing behavior that results in active engagement, and connection to other social networks in the permissive environment.

The death of an Egyptian businessman at the hands of police was the unifying catalyst that led Ghonim to create the page after he obtained photos of Said's body taken with a mobile phone in the morgue (Crovitz 2011). Khaled Said's face became the image of a new movement against the administration. Many Egyptians experiencing mass frustration caught news of the Facebook page and used it as a venue for expressing their own grievances against the government. In this way, the mass frustration felt by the people served as the unifying catalyst to others in the social media network. Elite dissidents in other social networks groups tagged "We are all Khaled Said" in their sites, which serve to connect their social network hubs to the 'We are all Khaled Said' social network hub (Twitter 2011).

The page received over 1 million registered followers as of December 2010 (Facebook 2011). Figure 21 shows the user growth of the site over the first six months after its creation. Data as of June 2011 from online social media analytical websites indicates that the Facebook page listed 68 of 93,805 monitored sites with a total of 1,711,323 active users averaging 2,000 new followers joining the site daily (Socialbakers 2011). Mayer's Model explains the large subscriber base of online followers to the group by the number of social network connections maintained by the elite dissident figure in the social revolution domain. When compared to regular users or groups, "We are all Khaled Said" is able to share information a significant percentage of the social network.

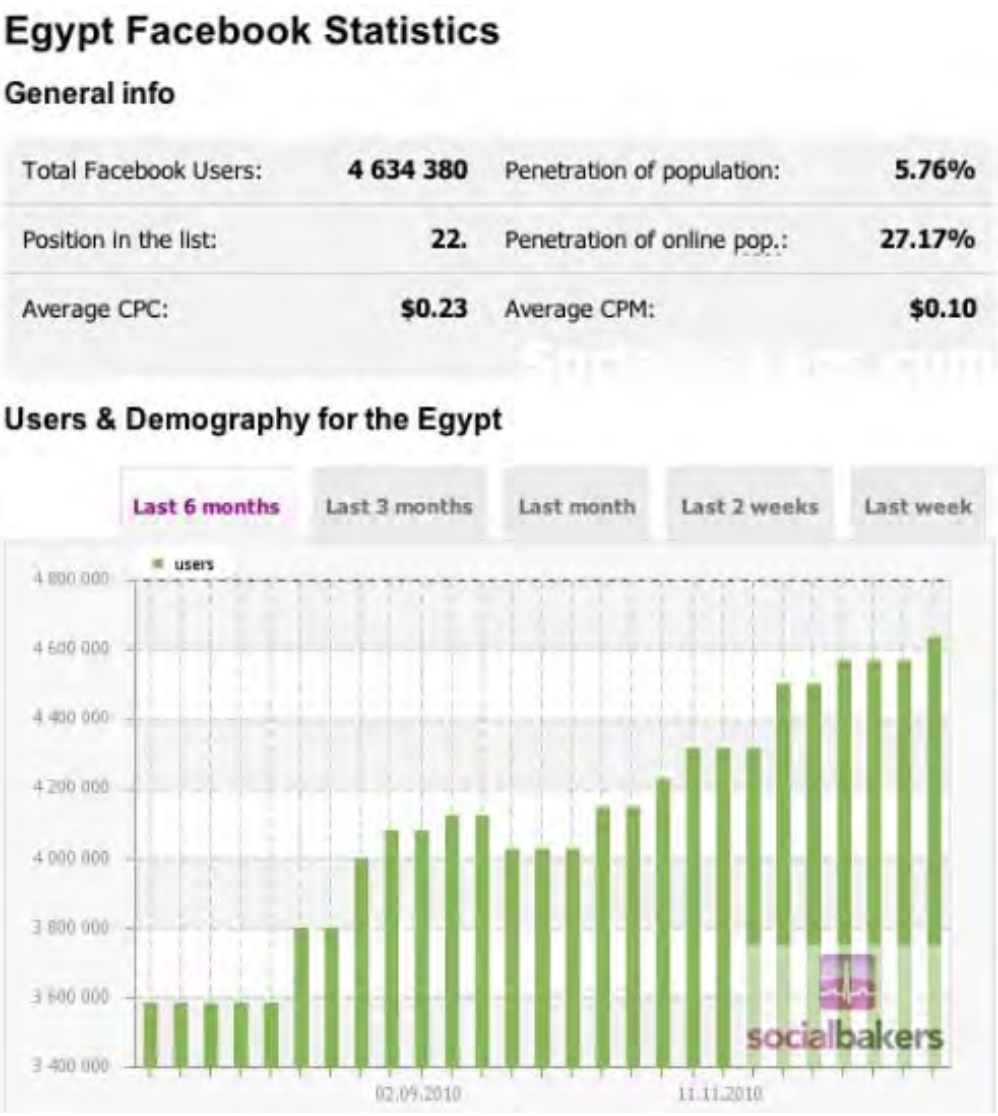

Figure 21. We are all Khaled Said (كلنا خالد سعيد) Facebook user growth
Source: Facebook, "We are All Khaled Said," http://www.facebook.com/ElShaheeed (accessed 23 April 2011).

Figure 22 depicts social media group insights and interactions. This information was controlled by the Wael Ghonim as the site administrator and was posted to "We are all Khaled Said" (Facebook 2011a) in January 2011 to inform the active followers of the volume of activity that was taking place through the virtual network (Facebook 2011a). It

shows the online user activity for “We are all Khaled Said” from its initial creation to December 2010; particular attention should be given to the marked increases in activity in June and again leading into December. The presence of a double spike in activity indicates the initial online communication following a unifying catalyst generates responsive conversations through a second string of activity. The feedback loop in Mayer’s Model explains the pattern of user activity when compared to events that took place in Egypt. Additionally, the volume of activity, as indicated by peaks in the data line, explains the differentiation between major events and minor events in the model’s event domain. The first spike represents the resultant social network activity from passive engagement while the second spike shows the social network activity following the resultant event in the event domain.

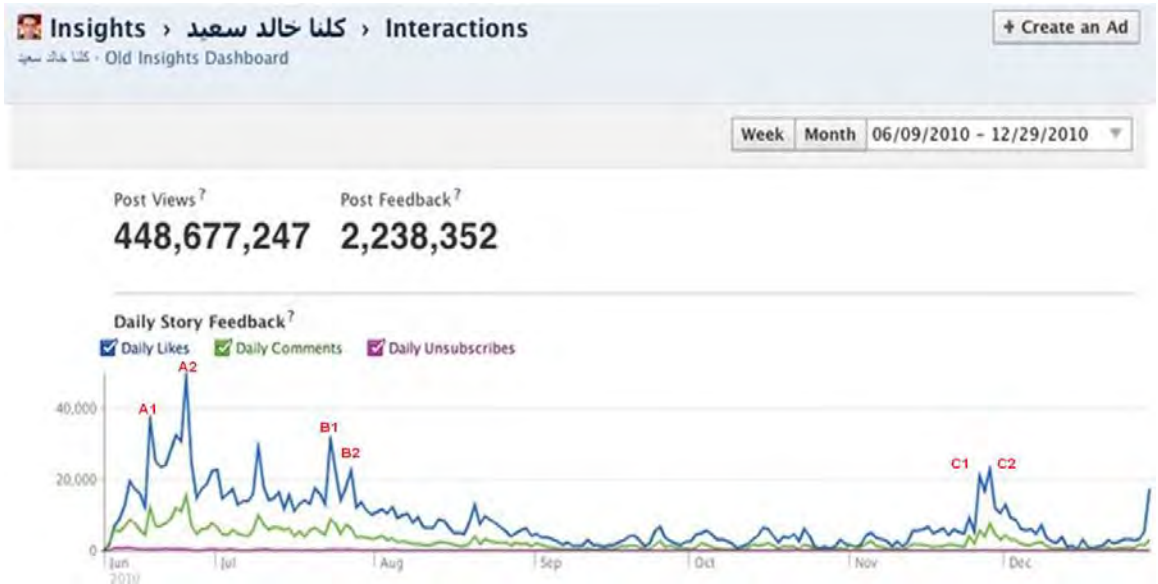

Figure 22. We are all Khaled Said (دي عس دل اخ انلك) Facebook group activity 10 June to 31 December 2010.

Source: Facebook, “We are All Khaled Said,” http://www.facebook.com/ElShaheeed (accessed 23 April 2011).

Data point (A1) in figure 22 shows the increased level of online activity following the release of photographs of Khaled Said's body following his death at the hands of Egyptian security police. This translates to a unifying catalyst that further supported calls for justice leading to an organized day of silent protest and worker strikes to bring attention to continued accusations of police corruption and brutality. Data point (A2) marks the level of comments posted on the day of silence that occurred within the event domain. This spike in user activity demonstrates the feedback loop as a result of passive engagement following the event. Data point (B1) shows increased activity during calls for a new series of protests to be held on the anniversary of the 23 July 1952 revolution. The model explains this increase in online activity as a result of catalyzing effect generated from the 1952 revolution's anniversary. The model's feedback loop results in data point (B2) showing the subsequent activity from that day's demonstrations as hundreds of Egyptians showed their support for increased freedoms. The next increase in activity corresponds with the fall parliamentary election at the end of November (C1, C2) where President Mubarak's National Democratic Party won in the face of reports of corruption and election law violations. Mayer's Model (Illustration 4) explains election law violations and exclusion of opposition groups as unifying catalysts in the social revolution domain. "We are all Khaled Said" created a forum for dissent among the frustrated population culminating in physical events as demonstrations against the election.

Figure 23 takes a closer look at the site activity beginning 1 January through the day President Mubarak announced his resignation. The two lines represent the daily total for comments posted to the site and the number of time users visiting the site selected the

"like" button to the individual posts. The spikes represent increased levels of activity ranging from 2,000 posts in early January to over 300,000 posts on the day Mubarak announced is resignation. This data shows a correlation between physical activities that occurred in the Egypt and the level of activity taking place online during the same time period.

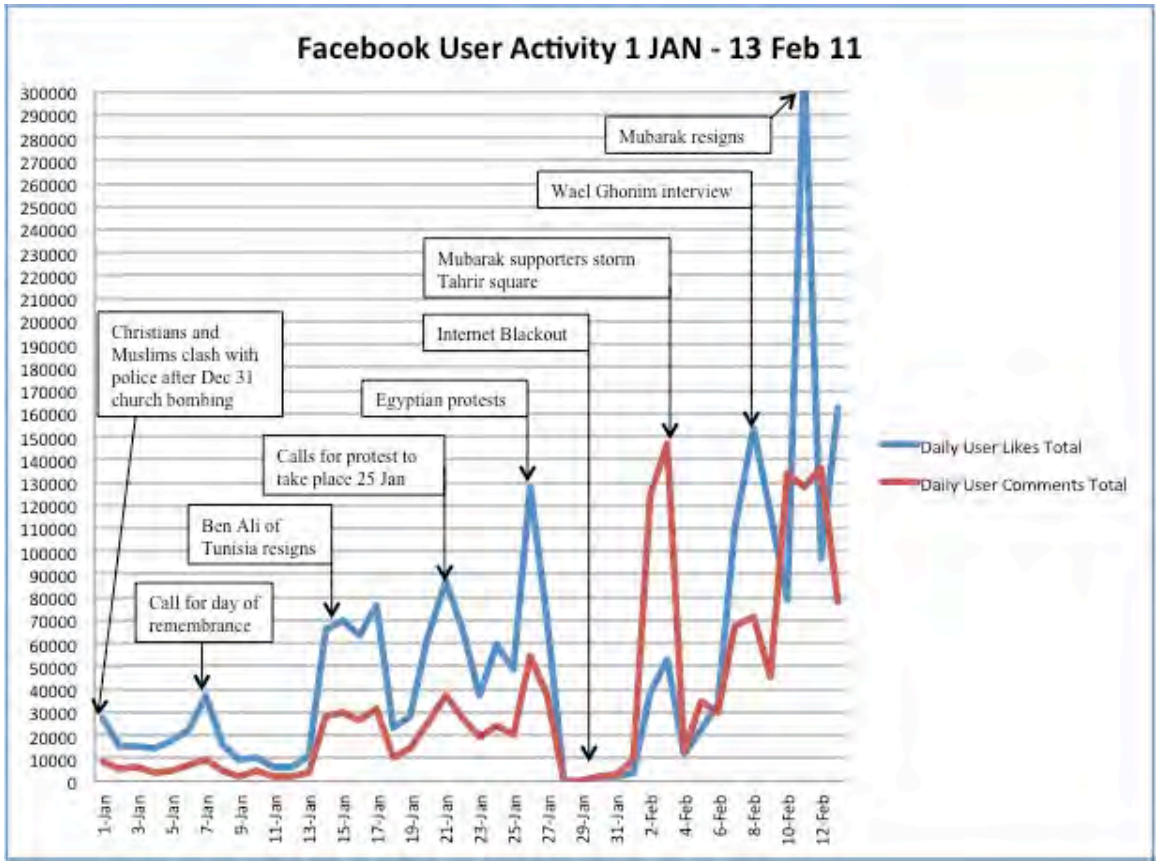

Figure 23. We are All Khaled Said (كلنا خالد سعيد) Facebook group activity 1 January to 11 February

Source: Created by author compiled from data posted to Facebook, "We are All Khaled Said," http://www.facebook.com/ElShaheeed (accessed 23 April 2011).

Posted on13 January 2011 an online poll uploaded to the Facebook group called for a demonstration of solidarity for those in Tunisia (Facebook 2011). Understanding the

function of the feedback loop and the influence presented by unifying catalysts, Mayer's Model explains the logical progression of events leading to the outbreak of demonstrations in Egypt. Passive engagements observed by social networks in the social revolution domain came in the form of YouTube video and mass media broadcasts. The following day President Ben Ali announced his resignation. Three days following Ali's removal from power, increased activity on Facebook began directing attention from Tunisia to Cairo. The model accounts for this change in focus as a characteristic of the social revolution domain whereas frustration aggression directs action toward the perceived source of the frustration. The increase in activity is a product of the feedback loop generated from increased awareness of frustration within Egypt. The renewed fervor for action against Mubarak, instigated by Ben Ali's ouster, demonstrates the potential growth from the feedback loop in the model.

An Egyptian businessman in Alexandria set himself on fire citing economic hardship on 18 January. An image of this incident was captured by a registered member of the "We are all Khaled Said" and uploaded to the page. Self-immolation, as an extreme form of protest, equates to a major event in the event domain. This translates to passive engagement by way of the observer that captured the incident on video. Once the video was posted to Facebook, it then became a unifying catalyst further magnifying the economic hardships that brought the Egyptian to such a radical method of protest. Rather than being viewed as a copy of the Buoazizi self-immolation in Tunisia, the string of comments posted regarding focused anger and frustration toward Hosni Mubarak alone.

On 20 January 2011 notices for a call demonstrate in Tahrir square began circulating through the modern social media network, the extent to which can be

explained in Mayer's Model by connections linking elite dissidents such as "We are all Khaled Said" and the "April 6 Youth Movement." A web link posted on "We are all Khaled Said" to the video by Asmaa Mahfouz, a member of the "April 6 Youth Movement" on 18 January is an example of this type of connection. Individual members shared information by posting links to map locations, phone numbers to call as a security measure, instructions for protestors on how to deal with security police, and directions for inviting more people to join the group. These organization efforts served as unifying catalysts within the social media network and worked to bring still others into the group through invitation. Figure 24 is an extract taken from the site. It shows active users step-by-step instructions to invite new members to the social network. In each example, social network activity occurs on the opposite side of the model as the weakened state. This graphically reinforces the inability for the weakened state to prevent this form of coordinated effort against the state. Mayer's Model explains the growth of the social network in the social revolution domain through application of social network theory, specifically through inviters that migrate off-line social groups into online forums (Kumar, Noval, and Tomkins 2006). The resultant growth of active users translates to increased potential of active participants depicted in the model as multiple active engagement connections between the social revolution domain and the major event in the event domain.

Figure 24. Facebook instructions for inviting users
Source: Facebook, "We are All Khaled Said," http://www.facebook.com/ElShaheeed (accessed 23 April 2011).

The Regime Responds

In an attempt to destabilize the revolution, President Mubarak ordered all Internet services terminated in response to the growing strength behind the protest. This drastic measure was meant to disrupt the demonstration's organization and restore the state's ability to control the message This act was a clear indicator that the Mubarak

administration, as depicted as the weakened state in the model, was resorting to desperate measures to restore control over the country using the long held tactic of censorship and intimidation. The Internet blackout had the opposite effect. It created a unifying catalyst among the Egyptian populace and attracted greater attention from the permissive environment.

Mayer's Model (Illustration 3) delineates the role of the permissive environment by connecting the figures between the social network in the mass frustration circle and the figure in the permissive environment circle. In this example, the permissive environment did not act against the Mubarak administration directly; rather they enabled communications within the social revolution domain outside state control.

In response to the government shut down of Internet and mobile communication access through international transmission circuits, Google offered a work around software known as 'Speak2Tweet' (Crovitz 2011). This action by a non-state actor shows the permissive environment in the social revolution domain is not reserved solely for traditional state actors. Egyptians were able to leave voice messages on a computer server that were then translated into text feeds and posted to Twitter in effect bypassing the blackout. Table 2 shows the increase in data posted to @Tweet2Speak during the Internet blackout. The restoration of Internet services on 2 February explains the rapid decline in message posting as word spread of restored network services (Twitter 2011).

Table 2. Tweet2Speak Twitter posts					
Date	30 January	31 January	1 February	2 February	3 February
Posts	61	217	828	320	165

Source: Created by author from data on @Tweet2Speak.

Recording voice messages and reposting them to Twitter was one way in which permissive environment support for the movement further hindered Egyptian state attempts to disrupt the uprising. Figure 25 shows a depiction of this through an infographic featured in the August 2011 National Geographic online. The visible increase of Twitter posts outside Egypt, shown in blue, explains Speak2Tweet's effectiveness in bridging the gap created by the media blackout. The area in the social revolution domain at the point of convergence between the permissive environment, unifying event, and mass frustration is where Twitter's Speak2Tweet operates.

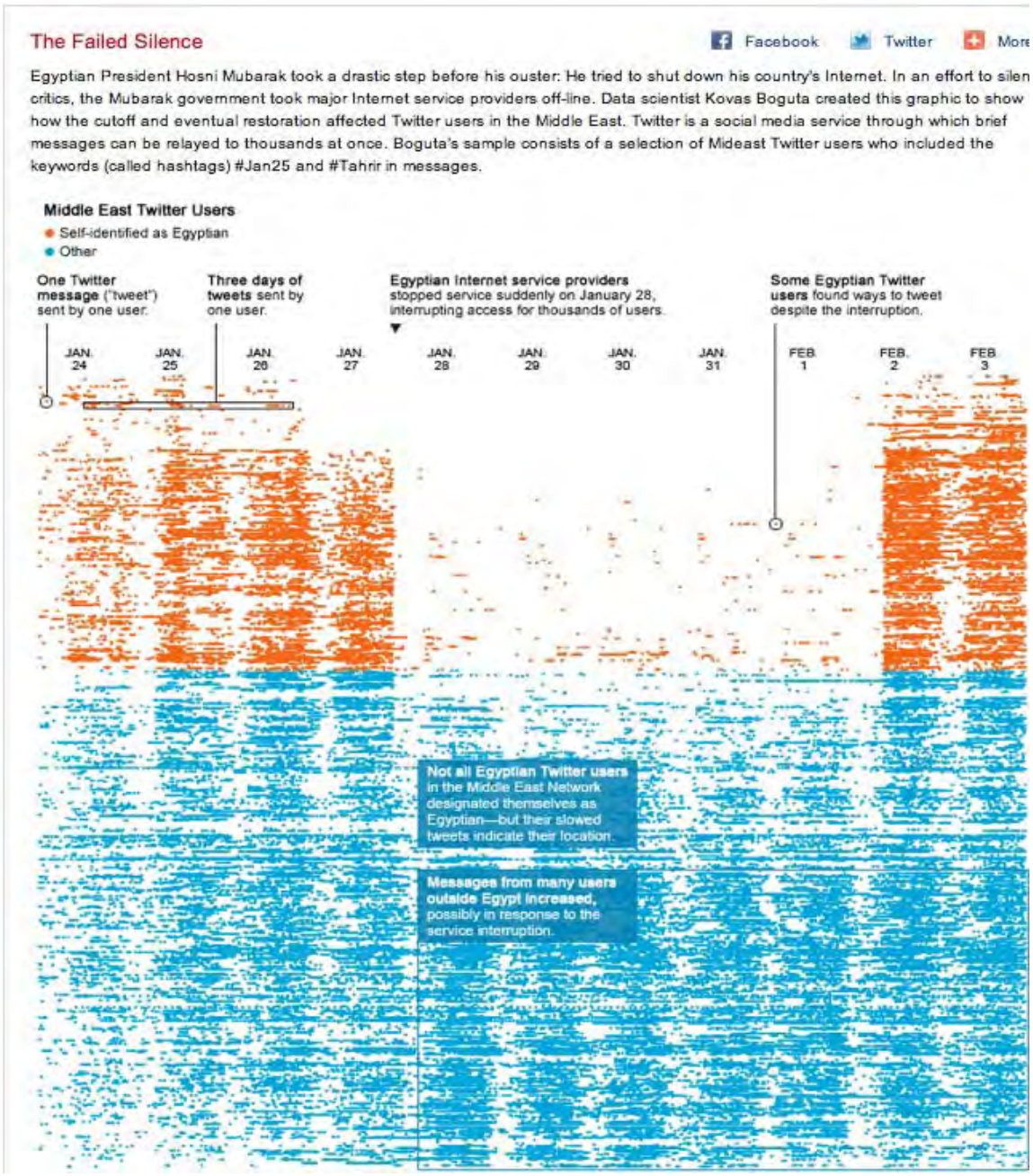

Figure 25. The Failed Science

Source: National Geographic Online, The failed science, http://ngm.national geographic.com/2011/07/middle-east-youth/twitter-graphic (accessed 15 November 2011).

Ishmail Marmoush, social media activist operating as an elite dissident, posted instructional steps on how to bypass the Internet outage by using mobile cell services and Egypt's 3G network (Marmoush 2011). While Internet and mobile communication services were severely restricted, some protestors and journalists covering the revolution were able to get through the blackout. Two key facts stand out in figure 25. First, the weakened state was unsuccessful in blocking all traffic as can be seen by the data points marking activity during the black out. Second, the surge in Twitter activity that took place once services were reestablished demonstrates the ubiquitous and real time capability social networks possess in terms of disseminating information. This finding is further supported in the level of social media activity when services were restored.

Writing on a blog posted 16 February to the social media site Hope140.org, a user credited with first using the #jan25 hash tag recalled how the events that began in Tunisia led to the Egyptian demonstrations. "The Tunisian revolution was barely covered by traditional media until Ben Ali fled, both the #Tunisia and #sidibouzid hash tags allowed us to follow the events for the whole month beforehand. I think that further convinced us of the power each of us has to effect change" (Hope140 2011). Registered under the username of @alya1989262, she is a graduate of Cairo University residing in New York (Hope140 2011). This user is therefore an elite dissident that has a virtual network with those people living in Egypt. Mayer's Model describes actions by elite dissidents in the permissive environment as being equally effective at shaping social media dialogue regardless of their physical position.

Mubarak Resigns

Receiving no international support and failing to bring an end to the mass protests despite repeated attempts, Hosni Mubarak made a final plea to Egypt declaring his enduring service to the nation. The United States and several other global leaders began pressuring Mubarak to conduct a peaceful transition of power. Every attempt made by Egypt's government to bring an end to the protests failed. Violence, placing blame, changes in government positions were all met with distrust and anger. Vice President Suleiman gave a televised address following evening prayers on 11 February. He announced that Hosni Mubarak decided to step down as president and appointed the military high council to assume the duties of leading the nation. Social media activity exploded on 11 February following the announcement.

Conclusion

This chapter conducted a systematic analysis of Mayer's Model, taking into account its major components and their respective function concerning primary social revolution criteria, social network theory, and modern social media principles. It then used the 2011 Egyptian Revolution to determine if the model sufficiently explains the relationship between modern social media and social revolution. Findings suggest the model is an acceptable tool to explain the relationship between modern social media and social revolutions. The association between discrete variables identified in the revolution and explained by the model coincide with quantitative data drawn from online social media plaforms. The following chapter completes the assessment by identifying the strengths and weaknesses of the model identified during the analysis then provides recommendations for future research.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Mayer's Model sufficiently explains modern social media's influence on social revolutions. This study identified the fundamental criteria in social revolutions as defined by Defonso (1991) and proposed an acceptable theory of the relationship as expressed by Mayer's Model. The model adequately explains the influence of modern social media on social revolutions and was successfully tested on the 2011 Egyptian Revolution.

A summary of the findings according the secondary research questions identified in the introduction to this study are provided to further explain the results of the analysis.

1. What are the fundamental criteria common in social revolutions?

The study found the five criteria presented by DeFronzo (1991) to be an acceptable framework to create the social revolution domain in the Mayer's Model. Defronzo identified mass frustration, elite dissident, weakened state, permissive environment, and unifying catalysts as essential elements of social revolution. These five criteria are underlying themes supported in publications by leading authors in social revolution theory such as Brinton (1965), Skocpal (1994), and Tilley (1995). Defronzo's criteria for social revolution provides the social framework against which modern social media networks operate in contemporary societies. Applying these criteria to social networks assists in explaining the unique roles of individuals within the context of social revolutions.

2. What is an acceptable theory supporting modern social media's influence on social revolution?

Social media is a ubiquitous form of communication that transforms individuals into producers of information. It heightens awareness of events occurring at real time across the globe while operating at a base level virtually unnoticed and unregulated by authoritarian controls. Contemporary events around the globe demonstrate the power that modern social media has and a theory regarding modern social media's effects on social revolution is appropriate and needed. Mayer's Model theoretically links the social revolution domain with discrete events, and explains how the effects of those events can be unifyied and their impact multiplied by the rapid and widespread communication that modern social media provides. The model explains this using social network connections linking elite dissidents, mass frustration, unifying catalysts, and permissive environment. The model also accounts for the potential that modern social media has for creating feedback loops that gain in strength over time and that can be fundamental to the success of a social revolution. This feedback loop is the result of interaction between the active and passive engagements linking the social media domain to the event domain and its function is explained well by the model.

3. Can a model explain modern social media's influence on social revolutions?

The answer to this question is clearly yes. Mayer's Model applied the basic criteria found in social revolutions and successfully integrated social network theory principles as a function within the criteria. It sufficiently mapped the cycle of events that occurred through the use of social media. Incorporating unifying catalysts within the social media domain provided an impetus for action by individuals in social networks. Quantitative data analyzed from active social media platforms, specifically Facebook and Twitter accounts, preceding and during the revolution provide sufficient evidence to

support the assumption that social media content is capable of creating a physical response in the event domain through organization and information sharing. This cycle of behavior uses engagement associated with events occurring in the event domain. It takes into account the role played by mass media broadcast as a means to shape content dialogue within the social network in the social revolution domain. Elite dissidents operate as hubs linking social networks together creating a collective of users capable of wide spread information sharing. In short, Mayer's Model accounts for much of the complex interactions that occur between modern social media and social revolutions.

4. Does that model sufficiently explain the presence of social media tools in the course of the 2011 Egyptian revolution?

The model provided a sufficient framework to map the relationship between the social media activity conducted by the members of the virtual social network and the opposing response taken by the government. All five of Defronzo's criteria must be present for any revolution to be successful. First, mass frustration within the Egyptian population developed over an extended period of time. Second, the country's youth, who represent a disproportionate size of the population, is comprised of individuals likely to engage in online activity and also are the group of people that are most impacted by negative socioeconomic trends. These conditions present an ideal situation for collective action directed toward the perceived source of their frustration. Third, information technology development in Egypt provided nearly 25 percent of the population readily available access to social media platforms. Finally, the Mubarak regime was ill prepared and unable to retain control of the message in the face of social media conversation.

When applied to conditions in Egypt, the model demonstrates that social media networks function in response to social revolution criteria within the social revolution domain, and account for the elite dissidents operating as hubs within the social media network. In this capacity, modern social media is the enabling force driving communications and behavior within the populace. Mass frustration shared by individuals accounts for the social networks position within that circle of the social revolution domain. Actions by the weakened state accurately depict unifying catalysts that influenced user-generated content present in the social media network. The role of the permissive environment explains the negative relationship between the permissive environment and the weakened state.

The relationship between the event domain and the social revolution domain by means of active and passive engagement underscores the presence of a feedback loop. The cycle of events generated by the feedback loop explains the emergence of new events in the event domain. The operative connection shows how events in Tunisia, for example were passively observed by the social media network in Egypt, resulting in active engagement through demonstrations in Cairo.

Strengths and Weaknesses

Using Mayer's Model on Modern Social Media's Relationship to Social Revolution as a lens to examine the Egyptian Revolution presents a number of strengths and weaknesses. As a strength, Mayer's Model enables a researcher to trace the path of social interaction between the event domain and the social revolution domain through the application of passive and active engagement. The model clearly demonstrates the

correlation between real time events such as demonstrations, and social media dialogue present in social media networks.

Organization of the five social revolution components in the social revolution domain is another strength. The converging areas account for distinct qualifying criteria where two or more social revolution components overlap. This enables a user to isolate a particular function or behavior of a group within a particular component based on its position in society or in the social media network. One example of this is the difference between an elite dissident operating as a member of the social network experiencing mass frustration and that of an elite dissident operating from the permissive environment. While operating from different areas within the social revolution domain, modern social media connects the networked individuals. Their function in social revolution is dictated by their position that in turns affects the network as a whole.

The model sufficiently accounts for other events in the region and can explain why Syria, as recently as November 2011, has not yet experienced a successful revolution. Despite the presence of mass frustration shared by the population, the absence of elite dissidents within the populace explains the lack of organization between the various groups opposing and the subsequent inability to effectively challenge the Assad administration. Additionally, violent methods to suppress the protesters indicate Syria's government cannot qualify as a weakened state. Government forces conduct raids on suspected social media activists and their families (Frontline 2011b). While passive engagement connects the world to events in Syria, the permissive environment has yet to play a formative role in the revolution.

Mayer's Model sufficiently explains social media's role during the 2011 Egyptian Revolution in addition to providing a justification to the course of Syria's revolution. The model accounts for the lack of control these governments exercise over social media networks in their respective countries. Given the influence social media has as an enabling tool with respect to information sharing and organizing, the model does not however, take into account government control over social media access as a function of the weakened state. This is seen as a weakness in the model's ability to explain the function of social revolution in technologically developed regions such as China or Iran.

Finally, it should be noted that the model is too basic to account for the myriad of complex variables and their interactions that are invariably present in social conflict situations. Mayer's Model is limited to supporting a general understanding of the principles associated with the various factors in the social revolution. Quantitative analysis of distinct fields cannot be achieved through the use of this model, but that is not the goal of this research effort. The model is designed to demonstrate the relation between social media activity and the presence of physical events associated with such activity and pave the way for research that could develop this line of reasoning further.

Applications and Recommendations for Future Research

Through application of concepts illustrated by the model, future research should be directed towards gaining a better understanding of events involving modern social media and social revolutionary activities. The model can be used to identify regions susceptible to mass uprising by analyzing social network activity in relation to socio-economic conditions within the social revolution domain. The democratization of modern social media into disaffected regions reinforces the need for greater understanding of the

conditions within the particular society and the applicability of the model presented in this study.

Mayer's Model provided several examples of how Al Jazeera, operating as a mass media source, broadcast events in the event domain with reports from Tunisia and Tahrir Sqaure. The role played by Al Jazeera and similar international news corporations may constitute actions as elite dissidents in the social revolution domain. They continue to exercise power to shape popular views in contemporary issues. A closer look at news agencies functioning as journalists while simultaneously operating in the social media network could further define their position in the model. To this end, the model could better explain the synergy between the professional news broadcast and the citizen reporter to better understand this new mode of journalism to control the state message.

Within the context of this study, the model traced the social media activity of Egypt's youth bulge. Future research in the demographic composition of social media networks operating within the social revolution domain should include the level of influence social media has on other groups actively engaged in social media to include military personnel, women, and terrorist organizations. Recognizing that modern social media access extends through all levels of society, this focus allows the researcher to identify which groups possess greater influence within the populace. This data could then be used in a cross comparison analysis between this particular demographic and regions with access to modern social media infrastructure.

This study mapped social media activity in the model using two popular social media platforms. While research indicates Facebook and Twitter are the most commonly used social media platforms present in Egypt, the existence of a host of other social

media sites are widely used in other parts of the world. Future research linking additional social media sites to the model, as it relates to social revolutionary activity in other countries, will test social media's cross interaction among multiple social media platforms.

Conclusions

Social media will continue to shape human interaction and societies. Technology influences the means as well as the ways in which we share and collect information. Globalization continues to push access to communications platforms to regions that are struggling to compete in the digital economy. Social media has gained considerable attention over the past few years as it continues to shape the way in which societies interact. Modern social media is ubiquitous and has tremendous influence on all societies, particularly those that are using the technology in juxtaposition with the level of development they have achieved in other areas of civilization (figure 26). The power to connect to anyone in real time regardless of where they are is the signature quality of social media platforms. Social media is a key component in the United States' push for global Internet freedom. It is one of the pillars of the US State Department's 21st Century Statecraft initiative. How social media networks communicate is fundamentally significant to the organization and motivation behind such activity. The medium that carries the message shapes and defines the message itself.

This study supports America's national security objectives by creating a tool that improves the identification and understanding of relationships between modern social media and social revolution. The model proposed in this study can be applied to regions vulnerable to instability and internal conflict that are of strategic importance to the

security of the United States. It improves the body of knowledge central to further defining the operational environment that can impact America and our allies. This study brings to light a relationship that exists between modern social media and instruments of national power, a relationship that has only recently gained attention at the national level.

Figure 26. Spread of modern social media
Source: Shanta, More cell phones than toilets, World Bank, 12 April 2010, http://blogs.worldbank.org/africacan/more-cell-phones-than-toilets (accessed 17 November 2011).

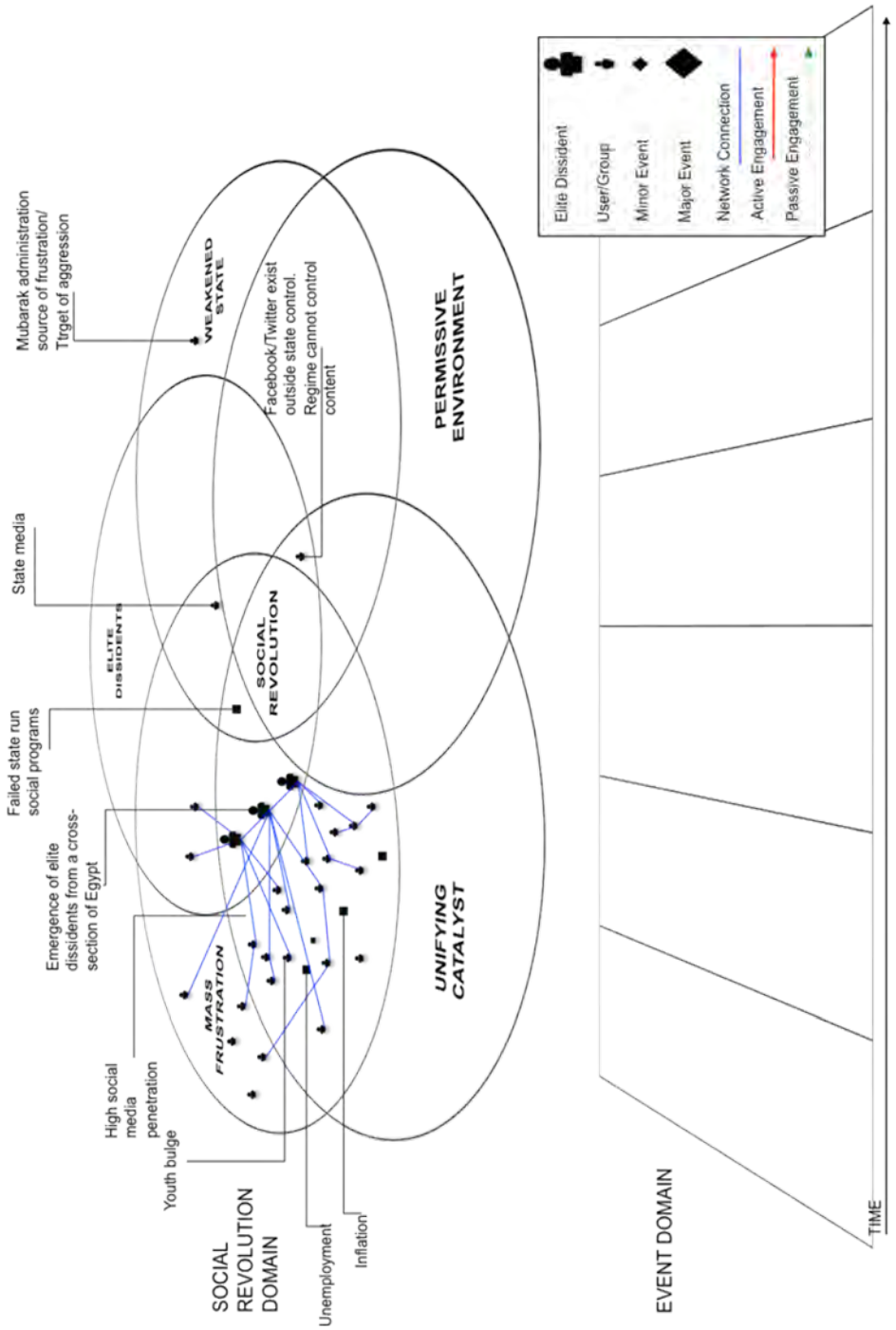

Illustration 1: Mayer's Model Applied to Egypt (Social Revolution Domain)
Source: Created by author.

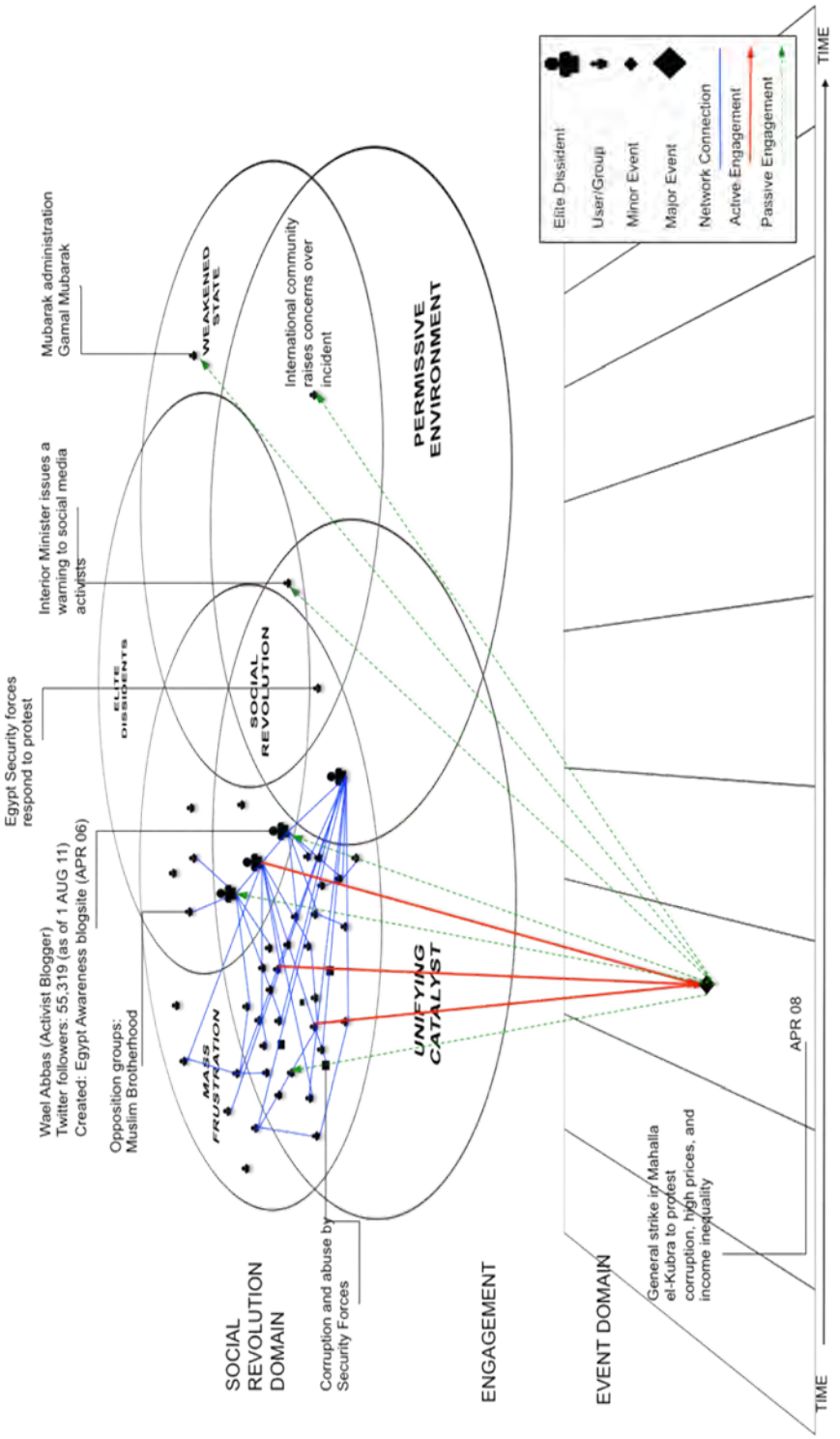

Illustration 2: Mayer's Model Applied to Egypt (April 2008 Protests)
Source: Created by author.

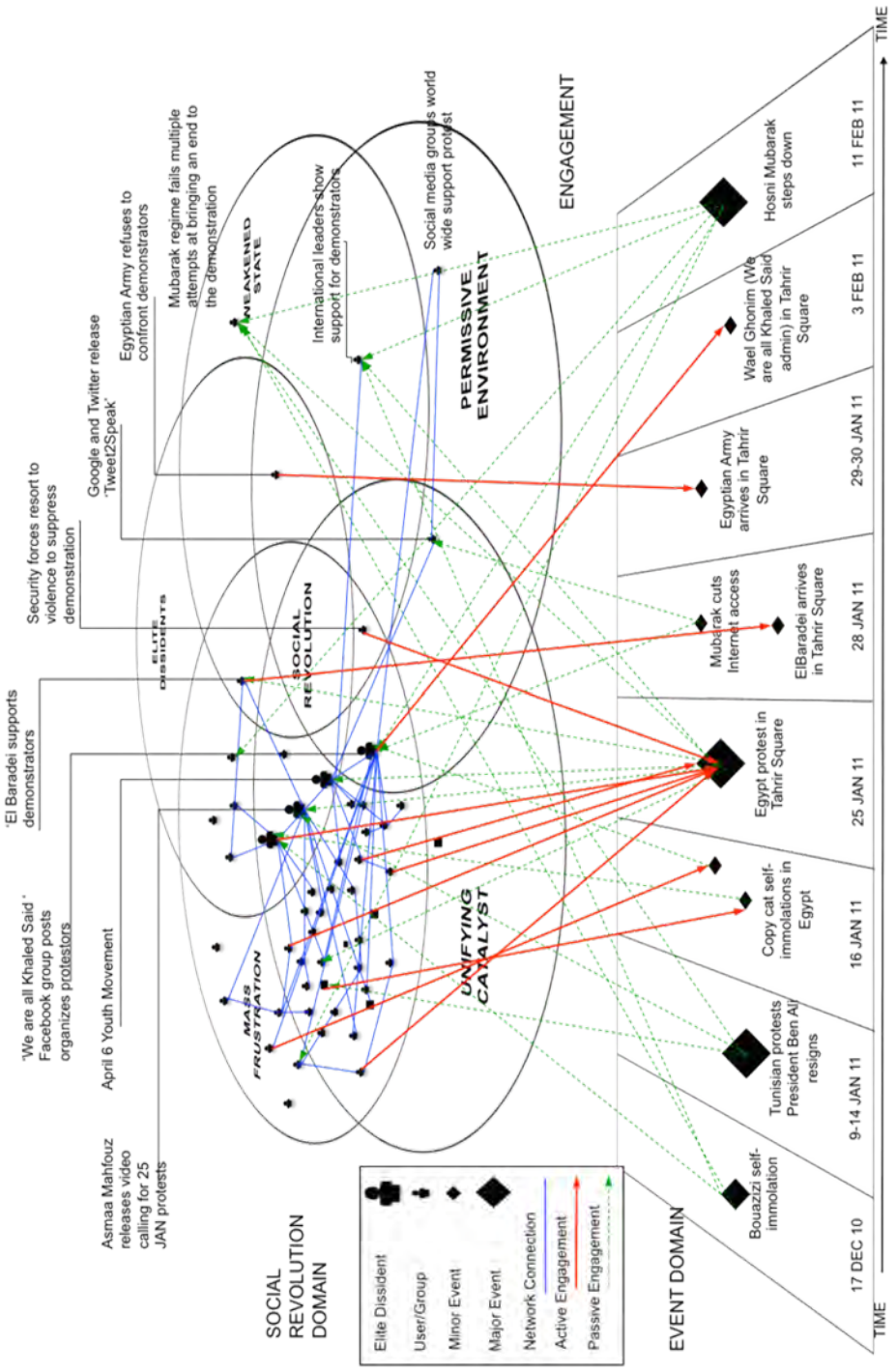

Illustration 3: Mayer's Model Applied to Egypt (25 January Revolution)
Source: Created by author.

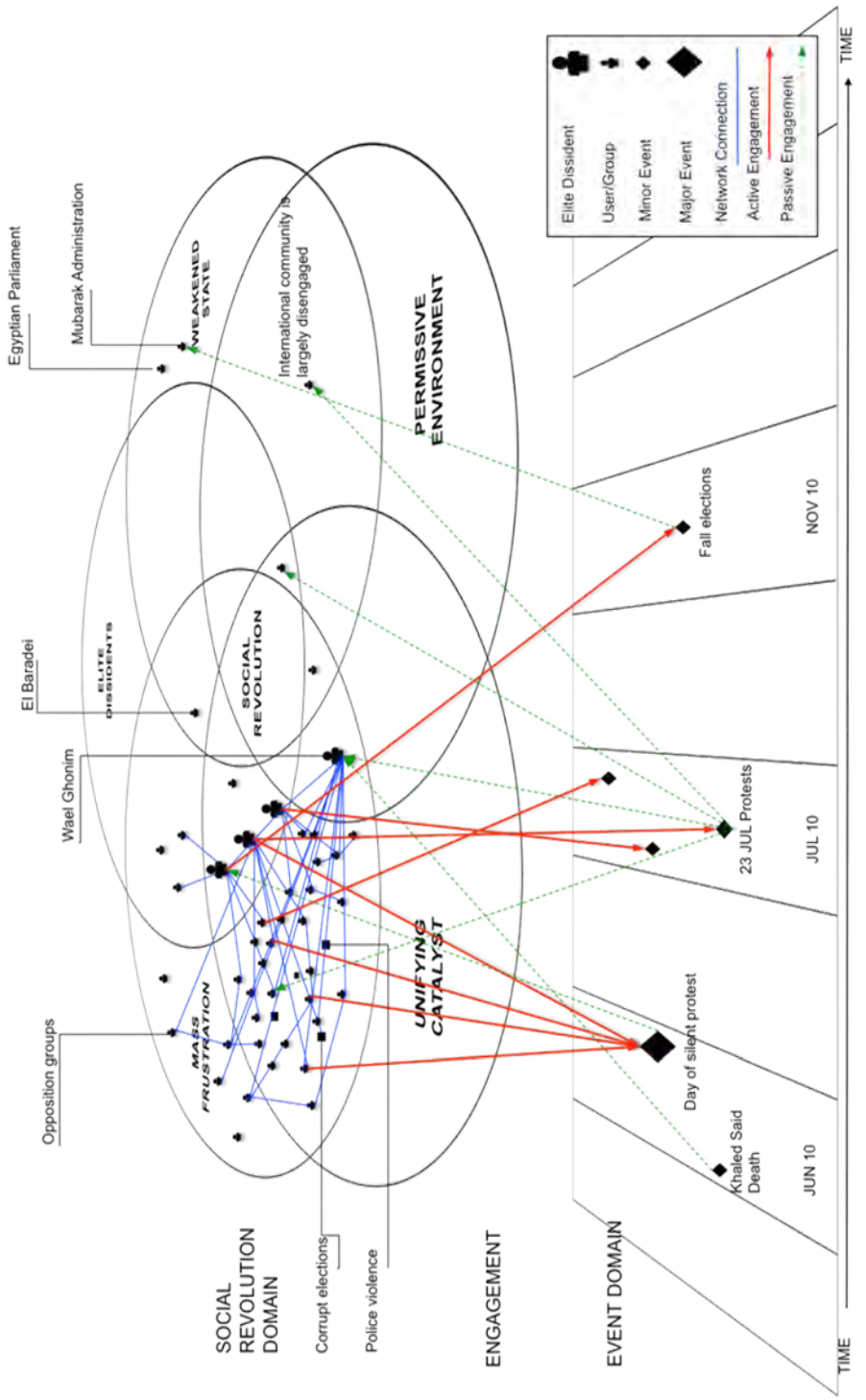

Illustration 4: Mayer's Model Applied to Egypt (We are all Khaled Said)
Source: Created by author.

APPENDIX A

2011 Egyptian Revolution Timeline

- June 2008 – The Facebook group 'April 6 Youth Movement' is created as the means for activists to operate without drawing the attention of security forces.
- July – Wael Ghonim creates anonymously creates the Facebook group 'We are all Khaled Said' in response to police alleged corruption and abuse that led to Said's death. Within a month over 30,000 social media users begin following the site. It will later be used as a primary source for organizing and sharing information during the revolution.
- 17 December – Mohammad Bouazizi sets himself on fire in Tunisia citing economic oppression and humiliation at the hand of Tunisian security forces. This event leads to protests in the streets that are captured via cell phones and uploaded on social media sites. Within 24 hours, Tunisian online activists send video files and pictures to Al Jazeera. Al Jazeera posts content to its website and airs the news in satellite news programming.
- 31 December – A bombing at Coptic Church in Cairo kills 21 people. Egyptians fault security forces for not preventing the attack. Online social media posts on Twitter and Facebook post images of solidarity among Christians and Muslims.
- 4 January – People take to the streets of Cairo and Alexandria in a silent demonstration in memory of those killed in the Coptic Church bombing.
- 9 January – Mohamed Bouazizi dies in the hospital.
- 14 January – Tunisian President Ben Ali steps down in response to the ongoing protests and calls for an end of his regime.
- 18 January – Egyptian activists announce a call for protests similar to those in Tunisia. The Twitter tag '#Jan25' is first used. YouTube post by Amsaa Mafouz spreads news of the planned demonstration rapidly throughout social networks.
- 25 January – Egyptians assemble in Tahrir Square en masse calling for Hosni Mubarak's resignation. The uprising is labeled 'The Day of Rage'. Government officials try to place blame for the uprising on Islamist groups.
- 27 January – El Baradei returns to Egypt and joins protesters in Tahrir square. El Baradei is seen as the most likely challenger to Hosni Mubarak. Wael Ghonim, founder and administrator of a highly influential Facebook group, announces his intent to join protesters in Tahrir Square.
- 28 January – Mubarak makes his first televised appearance promising reforms while firing his government. State controlled media shuts down Internet access and disables mobile phone communications. Wael Ghonim is arrested by security forces and interrogated. He is released 12 days later.
- 30 January – Google releases 'Speak2Tweet' service and advertises it online. Protesters now have the ability to phone in to toll free international numbers and leave voice message reports on what is taking place in Tahrir Square. These messages are then uploaded on Twitter to #Jan25 and #Egypt.
- 31 January – The United States, Great Britain, and the European Union press

Mubarak to recognize the fundamental rights of the protestors and comply with the demands of the people.

- 2 February – Mubarak supporters assault Tahrir square in an attempt to destabilize the area and cause wide spread violence.
- 3 February – Egyptian security forces begin using live ammunition against protestors. Reports of increased violence by security forces are reported from around the country.
- 4 February – The largest protest of the revolution takes place spreading throughout the city. The protest is labeled 'The day of departure'.
- 8 February – Ghonim conducts an interview on Egypt's Dream network, one of the few privately owned media channels operating in the country. During the interview he reveals the reasons behind creating the popular Facebook group citing a desire to expose the corrupt practices and threat Egyptian security forces posed to Egyptian people.
- 10 February – Hosni Mubarak makes a final plea to the demonstrators to return to their homes and allow the government to address their demands peacefully.
- 11 February – Egyptian Vice President Suleiman announces that Mubarak is leaving office after 30 years as president of Egypt. [1]

[1]Information used in the creation of the 2011 Egyptian Revolution Timeline draws from the following sources presented throughout the research project. "The Path of Protest," *UK Guardian*, http://www.guardian.co.uk/world/interactive/2011/mar/22/middle-east-protest-interactive-timeline (accessed 2 November 2011); "Egypt Burning," *Al Jazeera English*, http://english.aljazeera.net/programmes/2011/02/201121310411102992.html (accessed 2 November 2011); "Arab Awakening," *PBS News Hour*, http://www.pbs.org/newshour/timeline/uprising/.. (accessed 2 November 2011), 329-330.

REFERENCE LIST

Aiken, Milam, and Shilpa Balan. 2011. An analysis of google translate accuracy. *Translation Journal*. http://translationjournal.net/journal/56google.htm (accessed 1 November 2011).

Al Jazeera. 2011. Egypt burning. 24 February. http://www.aljazeera.com/programmes /2011/02/201121310411102992.html (accessed 15 November 2011)

Arab Republic of Egypt, Ministry of Communications and Information Technology. 2011a. The future of internet economy in Egypt: Statistical profile. http://www.mcit.gov.eg/Upcont/Documents/The_Future_of_Internet_Economy-_March09200932915544620095249540.pdf (accessed 5 May 2011).

——— 2011b. ICT indicators in brief, February 2011. http://www.mcit.gov.eg/ Upcont/Documents/ICTinBriefFeb2011-E.pdf (accessed 20 August 2011).

Aswany, Alaa A. 2011. *On the state of Egypt: What made the revolution inevitable*. New York: Vintage Books.

Barabasi, Albert. 2002. *Linked: The new science of networks*. Cambridge, MA: Perseus Publishing.

Barabasi, Albert, and Reka Albert. 1999. Emergence of scaling in random networks. *Science* 286, no. 5439: 509-512. http://www.sciencemag.org/content/ 286/5439/509.abstract (accessed 5 May 2011).

BBC Mobile. Egypt renews emergency law powers. http://news.bbc.co.uk/2/ hi/7420133.stm (accessed 20 October 2011).

Berkowitz, Leonard. 1989. Frustration-aggression hypothesis: Examination and reformulation. *The American Psychological Association Inc*. 106, no.1: 59-73. http://robertmijas.com/blog/wp-content/uploads/2011/03/frustration-aggression.pdf (accessed 5 May 2011).

Boyd, Dana, and Nicole B. Ellison. Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communications* 13, no.1. http://jcmc.indiana.edu13/issue1/boyd.ellison.html (accessed 25 July 2011).

Branwyn, Gareth. 1997. *Jamming the media*. Vancouver, British Colombia: Raincoast Books.

Brinton, Crane. 1965. *The anatomy of revolution*. New York: Vintage Books.

Carnegie Endowment for International Peace. Egypt's election primer. http://egyptelections.carnegieendowment.org/2010/09/10/egypt%E2%80%99s-elections-primer (accessed 20 October 2011).

———. Hosni Mubarak. http://egyptelections.carnegieendowment.org/2010/09/09/profile-of-hosni-mubarak (accessed 27 October 2011).

CBS News. 2011. Wael Ghonim and Egypt's new age revolution. *60 Minutes*. http://www.cbsnews.com/stories/2011/02/13/60minutes/main20031701_page2.shtml?Tag=contentmain;contentbody (accessed 2 November 2011).

Chapman, Jane. 2005. *Comparative media history: An introduction*. Cambridge, MA: Cambridge Polity Press.

CIA World Factbook. 2011. Egypt. https://www.cia.gov/library/publications/the-world-factbook/geos/eg.html (accessed 2 November 2011).

Crovitz, Gordon L. 2011. Egypt's revolution by social media. *Wall Street Journal* - Eastern Edition, 257.36. http://www.aucegypt.edu/SiteCollectionDocuments/WSJ.pdf (accessed 11 October 2011).

DeFronzo, James. 1991. *Revolutions and revolutionary movements*. Denver, CO: Westview Press.

Dewar, James. 1998. The information age and the printing press: Looking backward to see ahead. RAND Corporation. http://rand.org/pubs/papers/P8014 (accessed 25 July 2011).

Dhillon, Navtej, and Tarik Yousef. 2007. Middle East youth initiative, inclusion: Meeting the 100 million youth challenge. http://www.shababinclusion.org/content/document/detail/623/ (accessed 10 September 2011).

Dollard, John, Leonard William Dobb, Neal Elgar Miller, Orval Hobart Mowere, and Robert Richard Sears. 1939. *Frustration and aggression*. New Haven, CT: Yale University Press.

Duncan, John Paul. 1952. Book reviews: The anatomy of revolution by Crane Brinton. *Political Science Quarterly* 5, no. 4: 262. http://prq.sagepub.com/content/5/4/676.extract (accessed 5 May 2011).

Economy Watch. 2011. Egypt unemployment. http://www.economywatch.com/unemployment/countries/egypt.html (accessed 18 October 2011).

Encyclopedia Britannica. Egyptian population density. http://www.britannica.com/EBchecked/media/94685/Population-density-of-Egypt (accessed 15 November 2011).

Facebook. 2011a. We are all Khaled Said. http://www.facebook.com/ElShaheeed (accessed 2 March 2011).

———. Facebook. 2011b. April 6 youth movement. http://www.facebook.com /april6movement?sk=info (accessed 2 March 2011).

———. 2011c. Occupy Wall Street. http://www.facebook.com/OccupyWallSt (accessed 7 November 2011).

Faloutsos, Michalis, Petros Faloutsos, and Christos Faloutsos. 1999. On power-law relationships of the internet topology. *ACM SIGCOMM Computer Communication Review* 29, no. 4: 251-262. http://www.cs.ucr.edu/~michalis/ PAPERS/FFF.pdf (accessed 23 April 2011).

Foreign and Commonwealth Office. 2011. Prime Minister condemns violence in Egypt foreign and common wealth office. http://www.fco.gov.uk/en/news/latest-news/?view=News&id=543389682 (accessed 22 October 2011).

Friedman, Thomas L. 1999. *The lexus and the olive tree*. New York: Farrar, Straus, Giroux.

Frontline. 2011a. April 6 youth movement: How it all started. *Public Broadcast Station*. http://www.pbs.org/wgbh/pages/frontline/revolution-in-cairo/inside-april6-movement/ (accessed 15 August 2011).

———. 2001b. Syria undercover. *Public Broadcast Stattion*. http://www.pbs.org/ wgbh/pages/frontline/syria-undercover/ (accessed 20 November 2011).

Google Public Data Explorer. 2011. Egypt internet penetration by population percentage. http://www.google.com/publicdata/explore?ds=d5bncppjof8f9_&ctype=l&strail=false&bcs=d&nselm=h&met_y=it_net_user_p2#ctype=l&strail=false&bcs=d&nselm=h&met_y=it_net_user_p2&scale_y=lin&ind_y=false&rdim=country&idim=country:EGY&ifdim=country&tstart=973400400000&tend=1288933200000&hl=en&dl=en (accessed 25 October 2011).

Gurr, Tedd Robert. 1968. Psychological factors in civil violence. *World Politics* 20, no. 2: 245-278. http://www.millersville.edu/~schaffer/courses/s2003/soc656/ readings/gurr-psych-factors.pdf (accessed 23 April 2011).

Herrera, Linda. 2011. Jadaliya, Egypt's revolution 2.0, The Facebook factor. http://www.jadaliyya.com/pages/index/612/egypts-revolution-2.0_the-facebook-factor (accessed 17 August 2011).

Hope140.org. Twitter. http://hope140.org/blog/ (accessed 15 October 2011).

Huntington, Samuel. 1968. *Political order in changing societies*. New Haven, CT: Yale University Press.

International Labour Organization. 2010. Global employment trends for youth. United Nations. http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_elm/---trends/documents/publication/wcms_143349.pdf (accessed 10 October 2011).

———. 2011. Youth unemployment in the arab world is a major cause for rebellion. http://www.ilo.org/global/about-the-ilo/press-and-media centre/insight/WCMS_154078/lang--en/index.htm (accessed 9 September 2011).

International Monetary Fund. 2011. World economic outlook database. http://www.imf.org/external/pubs/ft/weo/2011/02/weodata/index.aspx (accessed 10 September 2011).

International Telecommunications Union. Internet world statistics: Usage and population statistics. http://www.internetworldstats.com/stats1.htm#africa (accessed 10 October 2011).

Jenkins, Henry. 2006. *Convergence culture: Where old and new media collide*. New York: New York University Press.

Jones, Sam. 2011. Man sets himself on fire near Egyptian Parliament. *Guardian*. http://www.guardian.co.uk/world/2011/jan/17/man-sets-himself-on-fire-egypt-protest (accessed 10 October 2011).

Kazanjian, Michael. 2003. Manuscript archives and rare books library. Emory University Online. http://beck.library.emory.edu/frenchrevolution/overview.php (accessed 25 July 2011).

Kovarik, Bill. 2011. *Revolutions in mass communications: Media history from Gutenberg to the digital age*. New York: The Continuum Publishing Company.

Kumar, Ravi, Jasmine Novak, and Andrew Tomkins. 2006. Structure and evolution of online social structures Yahoo! Research, 2006, KDD, August 20-23 2006, Philadelphia, PA.

Mantell, Ruth. 2008. Home prices off record 18 percent in the past year, Case-Shiller says. *Market Watch*. http://www.marketwatch.com/story/home-prices-off-record-18-in-past-year-case-shiller-says (accessed 7 November 2011).

Marmoush, Ishmail. 2011. How to log in to blocked twitter in Egypt. http://marmoush.com/2011/01/26/how-to-log-in-to-blocked-twitter-in-egypt/ (accessed 10 October 2011).

Mahfouz, Asmaa. 2011. Youtube. http://www.youtube.com/watch?v=SgjIgMdsEuk (accessed 21 October 2011).

Mobiledia.com. Youth values mobile media, social media. http://www.mobiledia.com/news/115297.html (accessed 4 November 2011).

McLuhan, Marshall. 1962. *Gutenberg's Galaxy: The making of typographic man*. Toronto: University of Toronto Press.

Mohamed, Ali Sayed. 2011. The political discourse of Egyptian blogs: A case study of Egyptian awareness. *Seachangejournal.ca*. 341-113. 17 May 2011. http://www.seachangejournal.ca/pdf/Political%20Discourse%20of%20Egyptian%20Blogs.pdf (accessed 10 November 2011).

Morgan, David. 1998. The information revolution and the Arab World, its impact on state and society. *The Emirates for Strategic Studies and Research*. Abu Dhabi, United Arab Emerites.

Mohsin, Saleha. 2009. Hey, America, we have our own Facebook. *Bloomberg Business Week*. http://www.businessweek.com/globalbiz/content/jul2009/gb20090715_921142.htm (accessed 9 September 2011).

Naib, Fatma. 2011. Online activism fuels Egypt protest. Al Jazeera English. http://english.aljazeera.net/news/middleeast/2011/01/2011128102253848730.html (accessed 15 May 2011).

O'Reilly, Tim, and John Battelle. 2011. Web squared: Web 2.0 five years on. Web 2.0 Summit. http://www.web2summit.com/web2009/public/schedule/detail/10194. (accessed 27 July 2011).

Open Net Initiative. 2009. Internet filtering in Egypt. http://opennet.net/sites/opennet.net/files/ONI_Egypt_2009.pdf (accessed 12 November 2011).

Poulson, Stephen. 2006. *Social movements in twentieth century Iran*. Baltimore, MD: Lexington Books.

Roy, Deb. 2009. New horizons in the study of child language acquisition. New Media Laboratory, Keynote address at MIT. http://media.mit.edu/cogmac/publications/Roy_interspeech_keynote.pdf (accessed 5 May 2011).

——— 2011. The Birth of a Word. TED Conference online. March. http://www.ted.com/talks/lang/eng/deb_roy_the_birth_of_a_word.html (accessed 23 April 2011).

Ryan, Yasmine, 2010. How Tunisia's revolution began. Al Jazeera. http://english.aljazeera.net/indepth/features/2011/01/201112612181598548 3.html (accessed 17 September 2011).

Shah, Angela. 2011. Egypt's new hero: Can geek-activist Wael Ghonim overthrow Mubarak? *Time World*. http://www.time.com/time/world/article/0,8599,2047006,00.html (accessed 3 November 2011).

Shirky, Clay. 2009a. *Here comes everybody*. New York: Penguin Press.

——— 2009b. How social media can make history. TED Conference online. June. http://www.ted.com/talks/lang/eng/clay_shirky_how_cellphones _twitter_facebook_can_make_history.html (accessed 23 April 2011).

——— 2011. The political power of social media. *Foreign Affairs* (January/February): 28-41.

Skocpol, Theda. 1994. *Social revolutions in the modern world*. New York: Cambridge University Press.

Socialbakers. 2011. Facebook page statistics. http://www.socialbakers.com/facebook-pages/ (accessed 21 October 2011).

Sreenivasan, Hari. 2011. Getting around Gadhafi: Rethinking revolution coverage of Libya. *PBS News Hour*. http://www.pbs.org/newshour/rundown/2011/02/getting-around-gadhafi-rethinking-revolution-coverage-from-libya.html (accessed 2 November 2011).

Talbot, David. 2011. Arab spring, inside Egypt's Facebook revolution. *Technology Review* MIT. http://www.technologyreview.com/blog/editors/26718/ (accessed 7 August 2011).

Tilly, Charles. 1995. *European revolutions, 1492-1992*. Cambridge, MA: Blackwell Publishing.

Twitter. 2011a. @Jan25. https://twitter.com/#!/jan25 (accessed 23 April 2011).

——— 2011b. @El Baradei. https://twitter.com/#!/ElBaradei (accessed 20 September 2011).

Wan, William. 2011. Egypt's Facebook revolution faces and identity crisis. *Washington Post Online.* http://www.washingtonpost.com/world/egypts-facebook-revolution-faces-identity-crisis/2011/03/08/ABA0qTLB_story.html (accessed 17 August 2011).

Watts, Duncan J., and Steven H. Stogatz. 1998. Collective dynamics of small world networks. *Nature* 393: 440-442. http://everythingisobvious.com/papers-publications/ (accessed 5 June 2011).

White House. 2011b. Remarks by the President on the situation in Libya. 18 March 2011. http://www.whitehouse.gov/the-press-office/2011/03/18/remarks-president-situation-libya (accessed 7 November 2011).

———. 2011b. President Obama on the situation in Egypt: All governments must maintain power through consent, not coercion. 28 January 2011. Posted by Jesse Lee. http://www.whitehouse.gov/blog/2011/01/28/president-obama-situation-

egypt-all-governments-must-maintain-power-through-consent (accessed 22 October 2011).

Wolman, David. 2008. Cairo activists use Facebook to rattle regime. Wired. http://www.wired.com/techbiz/startups/magazine/1611/ff_facebookegypt?currentPage=all (accessed 10 October 2011).

World Bank, Development indicators: inflation rates. http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG (accessed 18 September 2011).

Zimmermann, Ekkart, ed. 1983. *Political violence, crises, and revolutions: Theories and research*. Cambridge, MA: Cambridge University Press.

INITIAL DISTRIBUTION LIST

Combined Arms Research Library
U.S. Army Command and General Staff College
250 Gibbon Ave.
Fort Leavenworth, KS 66027-2314

Defense Technical Information Center/OCA
825 John J. Kingman Rd., Suite 944
Fort Belvoir, VA 22060-6218

Dr. Daniel A. Gilewitch
DJIMO
USACGSC
100 Stimson Avenue
Fort Leavenworth, KS 66027-2301

Mr. Russell B. Crumrine
DJIMO
USACGSC
100 Stimson Avenue
Fort Leavenworth, KS 66027-2301

Mr. Jeff Vordermark
DJIMO
USACGSC
100 Stimson Avenue
Fort Leavenworth, KS 66027-2301