

Arab Revolutions and "chaos theory"

Hamdallah Akvani¹ , Sayed Vali Moosavinezhad²

Received Date: September 5, 2012

Accepted Date: April 9, 2013

Abstract

Recent events happening in the Arab world shows the traditional model is not efficient for the analysis of political phenomena. On 17 December 2010, the self-immolation of Tunisian vegetable vendor Mohamed Bouazizi sparked the Arab Revolutions. Within a few months, a wave of protest had swept away the despots of Tunisia, Egypt and Libya. Since then protests have been keeping the region, which has until recently been viewed as having stable authoritarian regimes and as being largely resistant to democratization, on edge. This paper will examine what caused the emergence of a social movement in Arab world and how this can be explained through Chaos Theory. The paper will provide a brief overview of technical aspects of Chaos Theory and then use the Chaos Theory lens to explain why the Arabian movement emerged. Politics sphere exhibits many features of complex adaptive systems, being dynamical and unpredictable, non-linear systems operating in unpredictable and changing external environments.

Key words: Arab Revolutions, chaos theory, Egypt, Tunisia.

¹. Assistant Professor of Political Science, yasouj university, Iran.

E-mail: hamdallah.akvani@ gmail.com

². MA Student of Political science , Allame Tabatabaei University, Iran.

E-mail: valimoosavinejad@ yahoo.com

Introduction

No doubt, history will never forget the name of Mohamed Bouazizi. He was not a political leader; he was never religious, sporting, scientific, social, and artistic elite and so on. There were great men in Tunisia and Egypt who did not do anything. He did not know what will happen. When the self-immolation, he never knew what would happen after his death. But His death led to major political events in these countries. And he paved the way for creating new countries. But how could his self-immolation change the history? In the past two years many approaches were introduced for analyzing Arab Revolutions.

The “Arab Revolutions” seems to challenge a number of scholarly truisms prevalent in the Middle East studies community. A number of critical media commentaries put the scholarly expertise of area experts in doubt who apparently have not been able to predict the recent course of events. A wind of change has not only moved across the Middle East but also seized public debates and university lecture rooms, raising crucial questions for the scholarly establishment (JUNG . 2011:2).

The Arab Revolutions were not the first historical event making historians, social scientists, and other scholars of the humanities surprised. Previously in 1989 none of analysts predicted the fall of the Berlin Wall and the subsequent demise of the Soviet Union. Also no one could predict Iran's 1979 revolution, and again all the analysts were surprised.

We believe that chaos theory can provide accurate answers to some questions in political arena. Why did not someone predict revolutions in Egypt and Tunisia. Chaos theory provides a clear answer to this question. We have to answer these questions from the perspective of chaos and complexity theory to the study of Arab Revolutions in both Tunisia and Egypt.

The first question we raise is: How can chaos and complexity theory explain this movement? And why cannot the traditional view of political science provide a proper interpretation of this event?

Classical positivist model, which truly and largely permitted the advance of modern scientific knowledge, is somehow outdated. This deterministic-like paradigm which run during the 18th and 19th centuries, not only based on the work of Newton but also of other distinguished scientist such as Leibniz, Euler or Lagrange as well as on the philosophical inquiries by Descartes or Comte, strongly supports what

has been named as paradigm of order (Geyer,2003). For Newton, the universe was rationalistic, deterministic and of clockwork order; effects were functions of causes, small causes (minimal initial conditions) produced small effects (minimal and predictable) and large causes produced large effects.(Keith Morrison, 2008:29) Chaos Theory, in contrast to the classic Newtonian sciences, provides the capability of deriving patterns and predictability from seeming disorder (Dobson , 2008). It is founded on four main principles, as follows: order, reductionism, predictability and determinism. By order, one may understand that, the given causes will lead to the same known effects. Reductionism implies that the behavior of the system can be explained by the sum of the behaviors of the parts. On the other hand, this kind of system is predictable in the sense that, once its global behavior is defined, events in the future can be determined by introducing the correct inputs into the model. Finally, determinism implies that the process flows along orderly and predictable paths that have clear beginnings and rational ends (Régis and Joan i Font 2006).

Chaos Theory is a relatively new addition to the lexicon of the scientific community. It has the potential for developing detailed models for complex behavior. At the same time, it has significant capabilities to help describe extremely complex systems and allows for valuable insights without completing a single mathematical calculation. Despite its recent development as a theory, individuals and governments have intuitively applied its basic principles with significant success in the past (Dobson: 2008). According to this theory we propose these questions: What did cause the emergence of Arab Revolutions and how can this be explained through chaos theory? How can we use the chaos theory for explaining the emergence of Arab movements?

What are Chaos Theory and Sciences of Complexity?

Chaos theory which is the study of nonlinear dynamic systems, promises to be a useful conceptual framework that reconciles the essential unpredictability of industries with the emergence of distinctive patterns (Cartwright 1991). Although chaos theory was originally developed in the context of the physical sciences, Radzicki (1990) and Butler (1990) amongst others have noted that social, ecological, and economic systems also tend to be characterized by nonlinear relationships and complex interactions that evolve dynamically over time. This

recognition has led to a surge of interest in applying chaos theory to a number of fields, including ecology (Kauffman, 1991), medicine (Goldberger, Rigney and West, 1990) international relations (Mayer-Kress and Grossman, 1989), and economics (Baumol and Benhabib, 1989; Kelsey, 1988). Despite the apparent applicability of chaos theory to the field of business strategy, there has been surprisingly little work in this area.

Chaos theory is the study of complex, nonlinear, dynamic systems. The field was pioneered by Lorenz (1963), who was studying the dynamics of turbulent flow in fluids. Although we all recognize the swirls and vortices that characterize turbulent flow, the complexities of turbulent flow have confounded mathematicians for years (Levy,1994). This sensitivity dependence on initial conditions is common to chaos theory. Some of the key features and concepts of chaos theory and the sciences of complexity are Sensitivity to Initial Conditions, fractals, strange attractors, self-organization, and dynamic complexity. Each of these is briefly discussed later and then applied them on current Arab movements.

Arab Revolutions

The Arab Revolutions was ignited in Tunisia in late 2010 after a local street vendor set himself on fire in protest against his government, an act that led to a wave of protests and revolutions across Libya, Syria, Bahrain, Algeria, Egypt, Yemen, and Jordan (Arab Revolutions; Op-Ed). In January 2011, President Zine El Abidine Ben Ali fled from Tunisia to Saudi Arabia, and in February President Hosni Mubarak of Egypt resigned, thus ending his 30-year rule. Muammar Gaddafi of Libya was deposed in August 2011 and killed in October of that same year. Provincial governmental bodies have assumed control in the wake of these revolutions, promising the electorate democratic elections and reforms. Regional unrest erupted in the surrounding countries as the people became inspired by their neighbors to revolt against the status quo (Basselgia 2012:4).

The Outbreak of the Arab Revolutions

The Arab Revolutions actually began in the middle of winter. On 17 December 2010 a municipal inspector in the provincial Tunisian city of Sidi Bouzid confiscated vegetable seller Mohammed Bouazizi's cart

because he did not have a vending license. The inspector followed the typical routine, meaning that the young merchant probably needed either stronger connections to an influential person or enough money for a bribe more than he needed a license. His appeals to the powers that be were denied. This mixture of humiliation and powerlessness was apparently what drove him to the desperate act of publicly self-immolating in front of the local government building. In the following hours and days, spontaneous solidarity rallies cropped up, during which protestors were killed by security forces and thus became “martyrs” to be mourned at later rallies. Arab news channel Al-Jazeera, which eventually developed into the most important emotion provoking and mobilizing medium of the Arab Revolutions, showed clips of the self-immolation and of the related demonstrations that were filmed using cell phone cameras. The protests quickly reached the capital city of Tunisia and spread to neighboring countries. They expanded not only regionally but also in terms of social composition within individual countries. Soon, the protests included people from all walks of life: while the participants were mostly youth, protestors also included children, adults, the elderly, women and men, Muslims and Christians, the religious and the secular. In less than two months, the two supposedly most stable autocrats in the Middle East were overthrown: Tunisia’s Zine el-Abidin Ben Ali on 14 January 2011, and Egypt’s Hosni Mubarak on 11 February 2011. At the beginning of 2011, protests and unrest broke out in almost every Arab country. The only countries that have thus far managed to avoid such problems are the Gulf monarchies of Qatar and, experiencing only marginal protests, the U.A.E., both of which guarantee their populations a worry-free life bankrolled by oil income (Stephan Rosiny, 2012:2).

The Arab Revolutions began, for much of the news media, as an optimistic, enlightened turn of events in the midst of totalitarian regimes. The New York Times romanticized the Arab Revolutions, describing it as the dawn of a period of new hope for the nations that had erupted into revolution over the past year. Many hoped expectantly that economies would improve in the region, thus opening opportunities for foreign investment (Basselgia, 2012). Understanding this phenomenon is that a large part of the world is essential.

Two Characteristics of Complex Systems

1- Sensitivity to Initial Conditions and Arab Revolutions: A chaotic behaviour is also characterized by its extreme sensitivity to initial conditions (Gleick, 1987). This sensitivity is somehow the most intuitive characteristic of chaotic systems too (Martín et al., 1995). This is the main reason why, even being a deterministic system, most of times there exist a lack of predictability in chaotic systems. Somehow they are determined but undeterminable; hence they are sensitive to extremely low perturbations (Herman, 1994). Moreover, as measurements are mainly imprecise in the social sciences, irregular periodicity may arise from a stochastic component or from a periodic behaviour where the signal-to-noise ratio is high (McBurnett, 1997).

Meteorologist Edward Lorenz, in an effort to increase the level of predictability of complex weather phenomena, initially described chaos as a property of systems. Lorenz (1963) found that a very minor modification in weather models led to unanticipated, wildly fluctuating, and seemingly contradictory outcomes. More recently, chaos theory (CT), along with related work in the complexity sciences, catastrophe theory, and non-linear dynamic system theory, is applied broadly to the social sciences, including psychology, economics, sociology, decision-making, political science, medicine, criticism, urban development, organizational studies, and crisis communication and management (Abraham & Gilgen, 1995; Butz, 1997; Guastello, Dooley, & Goldstein, 1995; Hayles, 1990; Matthews et al., 1999; Murphy, 1996; Robertson & Combs, 1995).

It is here that we can understand why Self-immolation Bouazizi could establish a chaos that continues. Chaos theory can explain this phenomenon. Non-linear systems, chaos and crisis situations, very sensitive to small changes and minor and the smallest fluctuations and disorder because they strengthen the entire system has intensified and can lead to big changes. This feature is known as the Butterfly Effect. In Chaotic space, structures and processes of politics into the realm is that no rule or no previous boundary. With getting sharper demands, exacerbated tensions, the transformation relations, policy paralysis, or more uncertain what that future results will be darker and anything may happen. In such a situation a small event like self-immolation of an ordinary citizen may become a massive movement. It would produce energy for their survival. The impact of self-immolation of Mohamed

Bouazizi on two revolutions in Egypt and Tunisia and the date is mentioned as follows.

Table1:Series events after self-immolation Mohammed Bouazizi in Tunisia

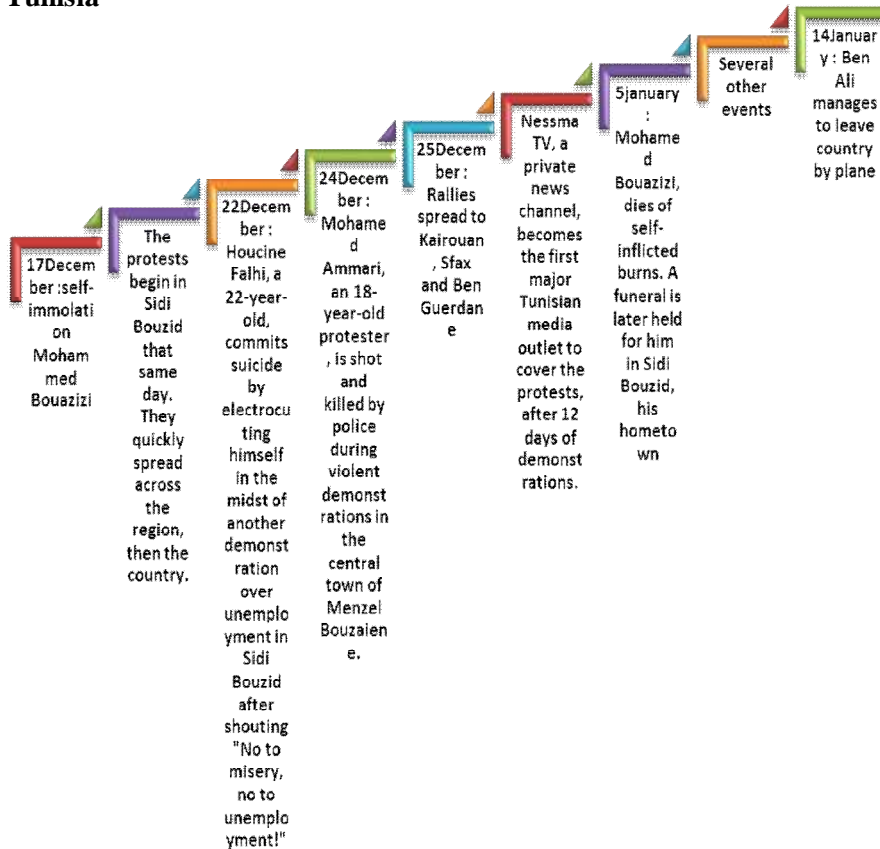
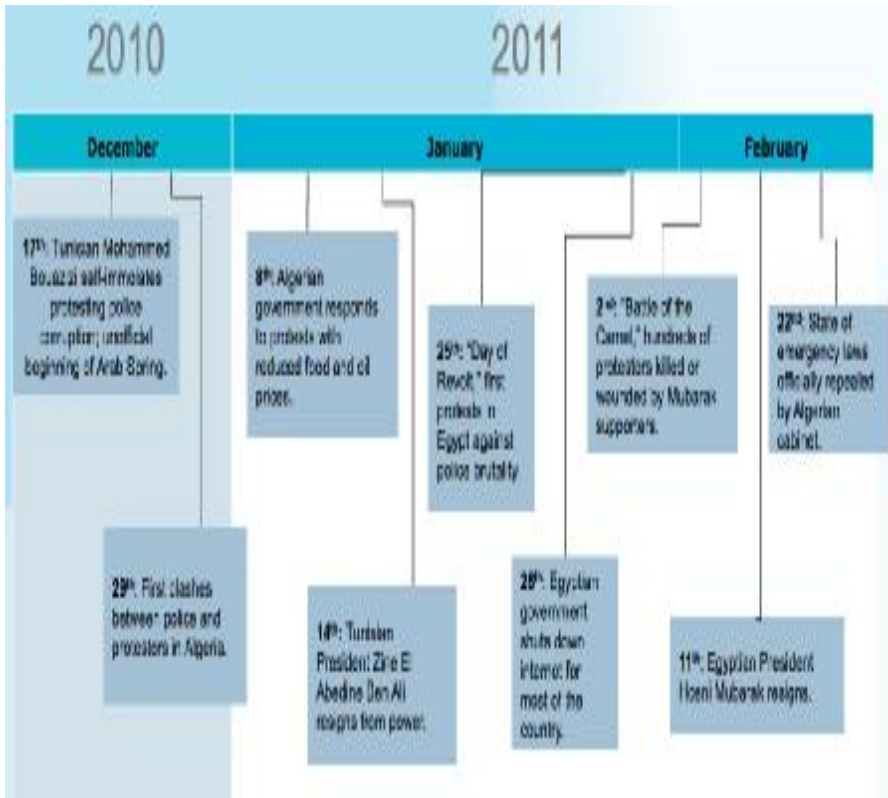


Table2:Series events after self-immolation Mohammed Bouazizi in Tunisia, Egypt and Algeria



2- Self-organization and Arab Revolutions: Self-organization is considered to be one of the hallmarks of a complex system. (Lemke, 1993 p. 247). Early work on self-organization was influenced by Maturana and Varela's research on biological systems (Maturana, 1980). They coined the term autopoiesis for internal processes in which each component is involved in the production or transformation of other components and hence the system as a whole – the system reproduces itself (Walby, April 2003 p. 6). Natural self-organizing systems function without central control and operate based on contextual local interactions. The particularity of self-organized systems is their capacity to spontaneously (without external control) produce a new organization in case of

environmental changes. These systems are particularly robust, because they adapt to these changes, and are able to ensure their own survivability. In some cases, self-organization is coupled with emergent behavior, in the sense that although individual components carry out a simple task, as a whole they are able to carry out complex tasks emerging in a coherent way through the local interactions of the various components (Serugendo. Gleizes. Karageorgos. 2006: 45) If the Arab Revolution is a complex system ,it requires as a living organism, to produce energy for their survival.

By nonlinear systems, we mean the arrangement of nature—life and its complications, such as warfare—in which inputs and outputs are not proportional; where the whole is not quantitatively equal to its parts, or even, qualitatively, recognizable in its constituent components; and here cause and effect are not evident. It is an environment where phenomena are unpredictable, but within bounds, self-organizing; where unpredictability frustrates conventional planning, where solution as self-organization defeats control; and where the “bounds” are the actionable variable, requiring new ways of thinking and acting. (Edited by David S. Alberts and Thomas J. Czerwinski 1997)At the most basic level, dynamics is the study of the way in which systems change (Morrison, 1991). Dynamics explores the effect of various forces on the behavior of systems over time and the manner in which these systems seek optimal stable states. Dynamics may be used to explore a variety of systems. Some of these systems are relatively simple (e.g., a study of the forces acting on an apple that cause it to fall to a stable rest on the ground), whereas others are dauntingly complex (e.g., the forces that act on the fertilized human egg that lead to the development of a full-term infant). From a mathematical perspective, dynamics can be thought of as linear or nonlinear. The basic assumption underlying linear dynamics is that the way a system changes can be most effectively modeled with two or more equations whose solutions can be combined to obtain another solution (Morrison, 1991; Stewart, 1989). Linear equations work quite well for a number of problems in the physical sciences. For instance, they are very useful if one wants to predict the orbit of the planets or understand the effects of wind resistance and gravity on the trajectory of a missile. Because they are additive, they also work well for a number of problems in psychology.

They are, for instance, the cornerstone of statistics. When we perform an analysis of variance or enter data into a multiple regression equation, we are using linear equations to describe the relationships among variables.

But how could an unknown citizen's self-immolation lead to such unexpected results? Here for analysis How to convert a small event and seemingly the least important to series large events we focus on dynamics fundamental that daily events derived from them.

"Bouazizi's actions triggered the Werther effect, causing a number of self-immolations in protests emulating Bouazizi's in several other countries in the Middle East and Europe. In Algeria in particular, protests against rising food prices and spreading unemployment [51] replace numbers (51-58) according to your main reference writing method. me have resulted in many self-immolations. The first reported case following Bouazizi's death was that of Mohsen Bouterfif, a 37-year-old father of two, who set himself on fire when the mayor of Boukhadra in Algeria refused to meet with him and others regarding employment and housing requests on 13 January 2011. According to a report in El-Watan, the mayor challenged him, saying if he had courage he would immolate himself by fire as Bouazizi had done.[52] He died on 24 January. Maamir Lotfi, a 36-year-old unemployed father of six, also denied a meeting with the governor, burned himself in front of the El Oued town hall on 17 January, dying on 12 February. Abdelhafid Boudechicha, a 29-year-old day laborer who lived with his parents and five siblings, burned himself in Medjana on 28 January over employment and housing issues. He died the following day.

In the six months immediately after Mohamed Bouazizi's death on 4 January 2011, at least 107 Tunisians tried to kill themselves by setting themselves on fire.[55] The men who self-immolated are mostly young men from poor, rural areas, unmarried and have only basic education.[55] Amenallah Messaadi, who has collated the figures and is head of the Burns Centre, said that people shouldn't glorify the act of self-immolation and "should stop adding fuel to the fire".[55]

In Egypt, Abdou Abdel-Moneim Jaafar, a 49-year-old restaurant owner, set himself alight in front of the Egyptian Parliament. [56] His act of protest helped instigate weeks of protest and, later, the resignation of Egyptian President Hosni Mubarak on 11 February 2011. In Saudi Arabia, an unidentified 65-year-old man died on 21 January 2011, after

setting himself on fire in the town of Samtah, Jizan. This was apparently the kingdom's first known case of self-immolation.(Wikipedia)

We believe that these self-immolations provided the energy for life of the movement. Each self-immolation was further intensified their protests.

Another factor that played a role in self-organizing of this movement was information technology. Through the use of Web 2.0 technologies, these activists were able to speak out, share with the world what was going on in their homelands, organize action, and eventually help effect the resignation of their countries' autocratic rulers. Below is a more detailed discussion of this.

The origin of transformation: from revolution in communications to change people's abilities and orientations

We believe that Butterfly Effect is necessary factor but not sufficient to made such wide changes. It should be structural conditions that lead such radical and revolutionary movements. We believe have been effective four forces in this transformation that gradually formed and has shaped the country's political structures, public and private and provide conditions for Butterfly Effect.

1- One of these, changes is in the communications space. As access to information communication technology (ICT) becomes more widespread, it has become part of national infrastructure and global networks used not only by governments and businesses, but by populations at large. Though there is considerable debate concerning the impact of communication tools—such as the Internet and mobile phones—on political engagement, there can be no question that communication tools are socially and economically embedded. Traditionally, limiting communications has been justified by the potential negative impact its content could have on the security of a nation. In reality, governments crack down on communications because they fear the negative impact of watchdog journalism and untethered opposition on their own positions of power. (Dunn 2011)

Over the past decade, fast scalable real-time Internet-based information and communication tools have become relatively accessible in Egypt (with broadband access starting at \$8/month). According to the Egyptian Ministry of Communications and Information Technology (MCIT), the country has over 17 million Internet users (as of February

2010), a stark 3,691 percent increase from 450,000 users in December 2000, and 4 million Facebook users. This total includes over 160,000 bloggers, with 30 percent of blogs focusing on politics (Ekaterina Stepanova 2011)

Over the last year, news broadcasts and magazine pages have been filled with images of political protest. The massive transnational Occupy movement and the regional revolutionary politics of the Arab Revolutions have dominated media coverage. One shared aspect of these two monumental phenomena has received quite a bit of analysis: the role of technology in fostering political contention. In particular, analysis has focused on the organizing potential of social media, the speed of information diffusion through communication technology and the sharing of ideas online. (Kula 2012).

The “Arab Social Media Report” by the Dubai School of Government provides penetration and usage data of some new media services within the respective region. For example, according to this report, in Revolutions 2011 Facebook had a penetration rate of 22.49% in Tunisia, and 7.66% in Egypt. Twitter had a penetration rate of 0.34% in Tunisia, and 0.15% in Egypt.

According to a report by the United States Institute for Peace on “New Media in Contentious Politics” there are several levels of new media influence that can be distinguished. While these levels are complex, interrelated and difficult to research empirically when applied to specific cases, they provide a useful framework:

- Individual Transformation: New media can affect politics via the effects they have on individuals, their competencies and their political views, e.g. new participants can be recruited to a movement.
- Intergroup Relations: New media can promote or undermine the bonding of group members to one another, and the bridging of members of different groups.
- Collective Action: New media can be used to initiate and organize collective action, such as marches or demonstrations.
- Regime Policies: New media can help established regimes to maintain their power in various ways, such as through censorship or counter-propaganda.
- External Attention: Information about a movement such as its ideologies and goals can be published to a wide audience, both domestically and internationally. This can happen in the form

of manifestos, statements, demands, images or videos on web sites or social networking services. As a result, political sympathy or hostility from outside actors can be mobilized. (Sabadello ,2012: 12).

Egypt

Internet Usage Statistics:

16,636,000 Internet users as of December/09, 21.1% of the population, according to ITU.

Latest Population Estimate:

78,866,635 population for 2009, according to US Census Bureau.

Internet Usage and Population Growth:

YEAR	Users	Population	% Pen.	Usage Source
2000	450,000	66,303,000	0.7 %	ITU
2006	5,100,000	71,236,631	7.0 %	ITU
2008	1,765,430	81,713,517	12.9 %	ITU
2009	16,636,000	78,866,635	21.1 %	ITU

Egypt - Telecommunications Reports

Egypt - Convergence, Broadband and Internet Markets Report Due to the successful implementation of a free Internet strategy in 2002, Egypt now has the largest Internet market in Africa with more than five million users in early 2006. However, Internet penetration is still relatively low and the vast majority of users are located in urban areas. The sector is highly competitive with around 300 Internet and data service providers. A broadband initiative launched by the government in 2003 will increase the number of broadband connections ten-fold within three years and has brought 24Mb/s ADSL2+ access to residential households. VoIP Internet telephony has been liberalized and several companies are rolling out Next Generation Networks (NGN) to provide converged voice and data services.

Egypt - Key Statistics, Regulatory and Fixed-Line Telecoms Overviews

Egypt's telecom sector is performing consistently well with most sub-sectors being open to competition. Around 3,000 new fixed lines are installed in the country every day which has helped to reduce the waiting list by around 90% in recent years. The incumbent Telco, Telecom Egypt, is highly profitable and was partially privatized through an IPO at the end of 2005. The end of its fixed-line monopoly in 2006 will open up new opportunities for competitive service providers, as will the award of a third mobile license. Efforts are underway to roll out Next Generation Networks (NGN), offering converged IP-based voice and data services.

Egypt - Mobile Market, Overview and Statistics Report Egypt's mobile market has consistently grown at around 30% per year but accelerated to 67% in 2005 in anticipation of the country's third mobile license which was awarded in July 2006, including a concession for both 2G and Third Generation (3G) mobile services. The record price that was paid for the license indicates the potential that is seen in the Egyptian mobile market, at less than 20% market penetration which is about equally shared between two GSM operators. Both existing networks have launched a range of mobile data and information services. This report outlines the major developments in the market, with relevant statistics and profiles of the country's mobile operators.

Tunisia

Internet Usage Statistics:

3,500,000 Internet users as of December/09, 33.4% of the population, according to ATI.

Latest Population Estimate:

10,486,339 population for 2009, according to US Census Bureau.

Internet Usage and Population Growth:

YEAR	Users	Population	% Pen.	Usage Source
2000	100,000	9,666,900	1.0 %	ITU
2006	953,000	10,228,604	9.3 %	ITU
2007	1,618,440	10,342,253	15.6 %	ATI
2008	1,765,430	10,383,577	17.0 %	ATI
2009	3,500,000	10,486,339	33.4 %	ATI

Tunisia - Telecoms Market Overview & Statistics

Tunisia Telecommunications Report

As a result of heavy investments in the telecom sector since the mid-1990s, Tunisia now has one of the most developed telecommunications infrastructures in Northern Africa with a fixed-line teledensity of more than 12%. The mobile sector has experienced exceptional growth, especially since a second operator was licensed in 2002. Various 3G trial systems have been installed and as one of the first in Africa the country saw its first 3G call made in 2004. Internet access is available country-wide with a fiber optic backbone and international access via submarine cables, terrestrial and satellite links. In 2006 a 35% stake in the incumbent Telco, Tunisie Telecom, was sold to a UAE-based consortium.

2- The second factor in these countries is the inability of governments to find useful and successful solutions to the problems.

Meaning of "reduce the effectiveness"

By "effective decreasing", I mean increasing inability of governments to provide conditions and services for their clients (elites, citizens, allies) which represents the objectives they have determined for themselves, and their clients expect they provide them. (Rosenau, 1384: 534). But due to numerous social and economic problems in these countries, it was not so effective and we believe it is one of the basic parameters of a complex and chaotic politics of these countries.

Analysts say uprising in any country has several reasons: corruption, unemployment, inflation, economic injustice, inability to solve the country's problems. These are the reasons that analysts of different viewpoints mention for this uprising. But increasing inability of governments to solve these problems is only one of roots of turbulence in the political space of these countries.

the Egyptian Revolution took on its distinctive and historically significant character, becoming a spontaneous social movement led not by a "vanguard party" but rather by a general dissatisfaction with the political structure.). Brown, 2011: 14)

For example, in a country like Egypt, where living standards have been eroded by double-digit inflation in recent years and food inflation is currently more than 20% and rising, a new government will find it hard to

turn a blind eye to the plight of low-income groups. Based on a national income threshold for overall poverty, 40% of Egyptians are estimated to be poor, for example.

Last February's 15% increase in public-service wages cost the government about seven billion Egyptian pounds (US\$1.2b). Similarly, government expenditure in the current financial year is expected to rise by a quarter, with salaries for Egypt's 5.8 million public-sector workers increasing by 20% and expenditures on health and education also expanding. Egypt is now a net oil importer and fuel subsidies alone add up to about \$16.6 billion annually—accounting for a fifth of all government spending. Revolutionary upheavals are well-known for causing economic disruptions. (Hakimian 2011)

Figure 2 shows that while the total unemployment rate is in double digits across the region, youth unemployment is often twice as high (between two and four out of ten people aged 15 to 25 years are unemployed). (Hakimian 2011)

Now, with the continued rise of food prices, a rate of unemployment that accounts for almost 10% and adds more than half million jobless people every year, 20% of its population living under the poverty line¹, and over 60% of its population aged less than 30, one would naturally argue that one of the factors that threw people into the streets was the economic condition in which they were living, they simply could not continue like that. (Pereda 2012:5)

3 - The third Transformation engine is the shape of various political groups, the dysfunctional effects of previous policy, to solve these problems, groups and sub-groups offer new claims. Some of these groups have a long history of political activism. For example Muslim Brotherhood is the Arab world's most influential and one of the largest Islamic movements and is the largest political opposition organization in many Arab states. They have never been in power, so now is the time they can run their solutions to solve problems. Under Mubarak's 30 year rule the government was unable to provide the Egyptians with basic services, furthermore the widespread unemployment and poverty has alienated tens of millions Egyptians (Anderson). The message of the protesters which were on focus was legal and political issues, including police brutality, state of emergency laws, lack of free elections, and freedom of speech, uncontrollable corruption, food price inflation. It was not only political parties that protested, it was a variety of organizations,

civilians, and movements emerged, such as the April 6th movement, and single persons such as Asmaa Mahfouz, who thought internet networking sites such as Facebook and Twitter, led the uprising on all fronts. There were two movements who especially played a important part in the ending of Mubarak's regime, first the Kifaya movement which also was against him in 2005, this is led by the secular older generation in Egyptian society, many of these are human rights activist, and they played a big part in mobilizing the masses, secondly the Muslim brotherhood also was a big part of the opposition, as many of their members had been imprisoned since 2008. The last movement that should be mentioned is the April 6th movement, which was the voice of textile workers and other laborers.

4- And the fourth factor, the feedback effects of the three previous scan and skills towards making people, the same people who make up the group and become a member. Today, because of the increase in individual skills and awareness of previous generations can easily change their orientation and become more involved with issues, get more information and publish information than previous generations. The impact of these skills in the Arab Revolutions is quite evident. There is no doubt that the three basic dynamics has caused of Fast change, and strong skills and orientations of people.

Communications and Information Technology (MCIT): the country has over 17 million Internet users (as of February 2010), a stark 3,691 percent increase from 450,000 users in December 2000, and 4 million Facebook users. This total includes over 160,000 bloggers, with 30 percent of blogs focusing on politics.

The profile of the most active users—young, urban, and relatively educated—fully corresponds to the core of the first anti-government protesters in January that later led to a larger and more mass-based campaign. Overall, the input of the social media networks was critical in performing two overlapping functions: (a) organizing the protests and (b) disseminating information about them, including publicizing protesters' demands internationally (Facebook reportedly outmatched Al Jazeera in at least the speed of news dissemination).

The tide of mass protests that swept through the Middle East in early 2011 highlighted the distinct role of modern information-communication technologies (ICT) and digital social media tools and networks. The impact of these technologies was felt globally, affecting both developed

and developing nations, if not in the same way. While the “Arab Revolutions” may point to a phenomenon of new mass forms of sociopolitical protest facilitated by social media networks, particularly in regard to their organizational and communication aspects, it should also produce some major reservations about the applicability of any “direct lessons” to other regional and sociopolitical contexts.(Ekaterina Stepanova 2011)

In the 2011 “Arab Revolutions”, social networks played an important role in the rapid disintegration of at least two regimes, Tunisia and Egypt, while also contributing to sociopolitical mobilization in Bahrain and Syria. ICT and social media had little to do with the underlying sociopolitical and socioeconomic factors behind the protest movement. In Egypt, the sociopolitical gap between the small ruling elite and the bulk of the population had long reached critical levels, prompting most experts on the region to expect a major upheaval at some point. However, the fact that the crisis occurred sooner rather than later, in direct follow-up to protests in Tunisia, was largely due to the initial mobilizing effects of ICT and social media networks. The protests were kickstarted by a Facebook campaign run by the opposition “April 6 Youth Movement,” which generated tens of thousands of positive responses to the call to rally against government policies.

In the unrests in Tunisia in late 2010 and Egypt in early 2011, ordinary individuals rose up against oppressive regimes, demanding change. In Tunisia, for example, Lina Ben Mhenni posted photos and videos to her blog and Facebook site of murders during government crackdowns. ‘[T]here were no journalists doing this. And moreover, the official media started to tell lies about what was happening’ (Ben Mhenni cited in Giglio 2011). Ben Mhenni used the internet to disseminate truth which was not being communicated accurately anywhere else. Another Tunisian activist collected photos, videos and other resources throughout the uprising and posted them on Facebook and Twitter, not only to inform others of what was happening but also ‘to feel free—and to say what I believe’ (Ali cited in Giglio 2011). In Egypt, Asmaa Mahfouz employed Facebook and other social media in the fight against the corrupt, dictatorial government. In an interview shortly after the overthrow of Egyptian President Mubarak, she recalled that she used Facebook to announce that she was heading to Tahrir Square in downtown Cairo, which became the gathering point for much of the political activity in the

city, to 'demand the rights of the people'. In her Facebook post she called for anyone who was also worried about the fate of their country to come with her (Mahfouz 2011).

In Tunisia for example, Facebook as well as Youtube were used to spread images of the riots in the town of Sidi Bouzid following the self-immolation of Mohamed Bouazizi on December 17, 2010. Even though long-term resentments against the government such as unemployment, corruption and restricted civil liberties have existed for some time, it was the publicity around the events in Sidi Bouzid that laid the emotional foundation for the outbreak of the revolution.¹ One user stated in a message on the Twitter micro-blogging platform: "Let's hope that this event in Sidi Bouzid isn't limited to Bouazizi's health ... this is only the beginning!!!" One Facebook group that has generated significant support is "Nhar 3la 3ammar" ("Day of Ammar"), which has criticized the restricted freedom of speech in the country. Similarly, in Egypt, a famous Facebook group named "We are all Khaled Said" was set up by activists to raise awareness and generate sympathies for Khaled Mohamed Saeed, who was beaten to death by police on June 6, 2011, which is generally considered to be the single most decisive event that led to the 2011 Egyptian Revolution. One leading Facebook activist who was involved in setting up this group and has emerged as a public face of the protests in Egypt was Google executive Wael Ghonim.³ This has led to the company celebrating itself as promoting democracy.

Another important Facebook group that contributed to the uprising was the "April 6 Youth Movement".⁴ Twitter was also used by the protesters to organize their collective actions, primarily through the "#jan25 hashtag", which on the Twitter platform acts as a keyword that can be searched for and subscribed to. The Facebook event titled "The Day of the Revolution Against Torture, Poverty, Corruption and Unemployment" which called for mass protests on January 25, 2011 was advertised through Twitter and received more than 80,000 clicks (Sabadello, 2012: 12).

Conclusions

In this paper, it was said that In the past two decades political analysts failed to predict important events such as the collapse of the Soviet Union 1990, the collapse of the Berlin Wall in 1989, the 1979 Islamic

Revolution in Iran and some other important political phenomena. These events shocked everyone. Another exciting event is the Arab Revolutions. We told analysis of political events according to Newton's four assumptions. For Newton, the universe was rationalistic, deterministic and of clockwork order; effects were functions of causes, small causes (minimal initial conditions) produced small effects (minimal and predictable) and large causes produced large effects (Keith Morrison, 2008:29). And believing in the wrong assumptions is the reason that disabled to analyze political phenomena. The political system is an example of complex systems. Because political systems are complex systems we cannot be look at them with Newton's lens. Chaos theory is the study of complex, nonlinear, and dynamic systems .

We enumerate the four roots of the current chaos. We have shown the political arena in Egypt and Tunisia (as in the entire world) is a chaotic field. In this space structures and policy processes enter the realm that there is no rule. In these circumstances small events can have large consequences. And that is why self-immolation of a poor young man, Mohammad Bouazizi can lead to the overthrow of three dictators. And with explaining other concepts of chaos theory (self-reported) showed that the movement is like a living organism which each component is involved in the production or transformation of other components and hence the system as a whole – the system reproduces itself. Repeated self-immolations and their dissemination by media reproduced these movements regularly.

References

- Alberts ,David S. and Czerwinski ,Thomas J. (1997) *Complexity, Global Politics, and National Security* ,National Defense University Washington, D.C.
- Banathy, B. H. (1991) *Systems design of education: A journey to create the future*. Englewood Cliffs, N.J., Educational Technology Publications
- Banathy, B. H. (1996) *Designing social systems in a changing world*, New York, Plenum Press
- Basselgia, Jennifer (2012) *A Forecast for the Middle East The Reemergence of an Islamic Caliphate in the Midst of the Arab Revolutions*, Senior Honors Papers
- Brown, Simon (2011) Reform and Revolution :The Arab Revolutions at One Year , *political review* ,Vol. 8, No. 1
- Cartwright, T. J,(1991) Planning and chaos theory, *Journal of the American Planning Association*, 57(1)
- Checkland, Peter (1981) *Systems Thinking, Systems Practice*. s.l. : Wiley
- Dunn , Alexandra (2011) Unplugging a Nation: State Media Strategy During Egypt’s January 25 Uprising, *The Fletcher Forum of World Affairs*, vol.35: 2, Summer
- Dobson ,Rhea (2008) *Chaos Theory and the Effort in Afghanistan*, United States Air Force
- Dandoy Régis and Joan Pere Plaza i Font (2006) *Chaos Theory and its Application in Political Science*, Fukuoka, 9 – 13 July
- Geyer, Robert (2003) “Europeanization, Complexity and the British Welfare State”. Paper presented to the UACES/ESRC Study Group on The Europeanization of British Politics and Policy-Making, Department of Politics, University of Sheffield, September 19th
- Gleick, James (1987) *Chaos*, New York, The Viking Press.
- Giglio, M. (2011); "Tunisia Protests: The Facebook Revolution," *The Daily Beast* ,15 January, in:
<http://www.thedailybeast.com/blogs-and-stories/2011-01-15/tunisia-protests-thefacebook-revolution/> , accessed 31/5/11
- Hassan ,Hatem (2012) "Islam, SMOs, and the Arab Revolutions :A New Perspective on Social Movements in the Middle East", Senior Thesis
- Herman, Jacques J (1994) "Chaologie, Politique et Nationalisme". *Revue Internationale De Politique Comparée*, 1 (3)

- Juan Ignacio Pérez Pereda (2012) Egyptian revolution in the awake of the Arab Revolutions, *debate social*, number 27,p p 1- 14
- Jung ,Dietrich (2011) " Unrest in the Arab World: Four Questions", *Insight Turkey*, Vol. 13 / No. 3
- Kula, Eric (2012) Geographic Margins, Technological Connections and Political Protest: The Case of Airport Protests, in:
<http://www.wpsa.research.pdx.edu/meet/2012/kula.pdf>
- Kauffman, S. A.(1991) 'Antichaos and adaptation', *Scientific American*, 265(2)
- Keith Morrison (2008) *Educational Philosophy and the Challenge of Complexity Theory*, Macau Inter-University Institute
- Lemke, Jay L. (1993) Discourse, Dynamics, and Social Change. Cultural Dynamics. Special Issue, Language as Cultural Dynamic, *M.A.K. Halliday*, Issue Editor, 1993, Vol. 6, 1
- Martín, Miguel Ángel; Morán, Manuel and Reyes, Miguel (1995) *Iniciación al caos, Sistemas dinámicos*, Madrid, Editorial Síntesis.
- Levy ,David (1994) *Chaos Theory and Strategy Theory,Application.N D Managerial Implication* , Department of Management, University of Massachusetts – Boston: Boston, Massachusetts, U.S.A
- Mitleton- Kelly, Eve (2005) A Complexity Approach to Co-creating an Innovative Environment, in: *World Futures Journal: Special Issue on Complexity and Innovation*, Nicholas S.M., Garcia-Lorenzo L., Zeeuw de G., Sell-Trujillo (eds.)
- Marie- Pierre Gleizes, Anthony Karageorgos (2006) *Self-Organisation and Emergence in MAS: An Overview*, Giovanna Di Marzo Serugendo University of Geneva, Switzerland
- McBurnett, M. (1996) "Probing the Underlying Structure in Dynamical Systems: An Introduction to Spectral Analysis." In: *Chaos Theory in the Social Sciences*, edited by D. Kiel, and E. Elliott. Ann Arbor: The University of Michigan Press.
- Maturana, Humberto R. and Francisco J. Varela. (1980) " Autopoiesis and Cognition: The Realization of the Living", Boston: *Studies in the Philosophy of Science* : Dordrecht: D. Reidel, . Vol. 42
- Mahfouz, A. (2011) ‘Interview with Memri TV on Jan 31st 2011. In:
<http://www.youtube.com/watch?v=2uzdOLXLoes> , accessed 31/5/119-
- Wheatley, M. J. (1999) *Leadership and the new science: Discovering order in a chaotic world*, San Francisco, Berrett-Koehler Publishers

-
- Reigeluth, Charles M. (2004) *Chaos Theory and the Sciences of Complexity: Foundations for Transforming Education* ,Indiana University
 - Stepanova ,Ekaterina (2011) The Role of Information Communication Technologies in the “Arab Revolutions, Implication beyond the Region”, *Ponars Eurasia Policy Memo*, No. 159
 - Sauter, Theresa & Kendall, Gavin P. (2011) Parrhesia and democracy : Truthtelling, WikiLeaks and the Arab Revolutions. *Social Alternatives*, 30(3)
 - Hakimian, Hassan (2011) *The Economic Prospects of the ‘Arab Revolutions’: A Bumpy Road Ahead*, London Middle East Institute and Reader, Economics Department, SOAS 2011 /development viewpoint ,Number 63
 - Stephan Rosiny(2012) *The Arab Revolutions: Triggers, Dynamics and Prospects*, GIGA Focus International Edition
 - Sabadello, Markus (2012) *The Arab Revolution: Reflections on the Role of Civil Society, Human Rights and New Media in the Transformation Processes* , Austrian Study Center for Peace and Conflict Resolution (ASPR)
 - Walby, Sylvia. April (2003) Complexity Theory, Globalisation and Diversity, Department of Sociology, Lancaster University, [Online] April 2003, [Cited: 9 March 2007.] [http:// www. lancs.ac.uk /fass /sociology /papers /walbycomplexityglobalisationdiversity.pdf](http://www.lancs.ac.uk/fass/sociology/papers/walbycomplexityglobalisationdiversity.pdf)
 - Wilner , S. Alex (2011) "Opportunity Costs or Costly Opportunities? The Arab Revolutions, Osama Bin Laden, and Al-Qaeda’s African Affiliates", *perspectives on terrorism journal*, Vol 5, No 3-4
 - Zamaneh, Koshan Ali Khidhir (2012) The Impact of the Arab Revolutions on the Future of Egypt-Israel Relations" <http://koshanali.blogspot.jp>
-[http:// www.internetworldstats.com/af/eg.htm](http://www.internetworldstats.com/af/eg.htm)
-[http:// www.internetworldstats.com/af/tn.htm](http://www.internetworldstats.com/af/tn.htm)
 - [www .en.wikipedia.org](http://www.en.wikipedia.org)

