

## SOCIAL NETWORKS AND THE EVOLUTION OF LEADERSHIP THEORIES IN THE TECHNICAL ENVIRONMENT

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### ABSTRACT

*Historically, major over-investment bubbles and their subsequent crashes often bring about profound socioeconomic changes. Technological advancement and the style of leadership also played a similar role but in a different way. With the collaborative development of open-source Web service platforms (e.g. Apache) that are more stable, reliable (Boulanger, 2005) and more widely adopted than their proprietary competitors (e.g. Microsoft IIS), large-scale 'server farms' with much higher capacities have become possible (Tuomi, 2003). Leadership style in the hi-tech era, hence, also evolved to adopt to such changes, from Francis Galton's (1892/2000) trait theory, Thomas Carlyle's (1841) 'Great Man' theory, leader-member relations (Duchon, Green & Taber, 1986) and Burns' (1978) transformational leadership to strategic leadership (Stumpf, 1988). Such evolution of leadership trend toward strategic leadership further favored the possibility of peer-to-peer technology (in which intense investment is generally required), and which, in turn, further expanded the scalability of the already rapidly growing computer networks (Nguyen, 2008) and fostered the adaptation of team work in the technical environment. This paper attempts to look at the evolution of social networks from the early 1980s to the present day along with the evolution of contemporary leadership theories applied within the technical environment over the last 20 years. Results showed that striking similarities exist between the evolution of leadership theories in the technical environment and the advancement of technology in the development of social networks – an invisible but clear link that is often overlooked by researchers.*

Keywords: Leadership theory evolution, technical environment, social network development

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### Amazing coincidences: Technological Advancement and Early Leadership Theories

Historically, major over-investment bubbles and their subsequent crashes often bring about profound socio-economic changes. The U.S. telegraph bubbles in the 1840s and 1850s gave birth to real-time news agencies (e.g. Associated Press 1846) and the introduction of 'wire transfer' (e.g. Western Union 1851). The railroad bubbles in the 1880s and 1890s facilitated country-wide logistics and led to the rise of today's international brands (e.g. Coke-Cola in 1886, Sears in 1893). The stocks bubble in the 1920s during the Great Depression of the U.S. fostered the establishment of the world's first deposit insurance in 1933 and social security systems in 1935 (Gross, 2007). The dot-com crash in the early 2000s, likewise, brought down the costs of information technology equipment as well as that of the international leased circuits (Aizu, 2002), making broadband connections and mobile phone services much more affordable.

Technological advancement also played a similar role but in a different way. With the collaborative development of open-source Web service platforms (e.g. Apache) that are more stable, reliable (Boulanger, 2005) and more widely adopted (see Figure 1) than their proprietary competitors (e.g. Microsoft IIS), large-scale 'server farms' with much higher service capacities have become possible (Tuomi, 2003). Leadership style in the technical environment during such a high-tech era, likewise, also evolved along with such changes, e.g. from the 'born leader' who bears certain physical traits, personality and characteristics that distinguish him from non-leaders (Ekvall & Arvonen, 1991) as described in Francis Galton's (1892/2000) trait theory<sup>1</sup>; or, from the 'event-making man' to the 'eventful man' (Dobbins & Platz, 1986) as spelt out in Thomas Carlyle's (1841) 'Great Man' theory, to one who no longer makes autocratic decisions, cares about his subordinates (Ryan & Tipu, 2013), and knows how to deal with leader-member relations (Duchon, Green, & Taber, 1986). A leader in the contemporary times needs to, through using his charisma, intellectually stimulate, support and inspire (Bass & Avolio, 1990), and hence effectively help transform (Bass, 1997) his peers – just as Burns (1978) had described in his transformational leadership theory. Peer-to-peer technology that further expanded the scalability of the already rapidly growing computer networks (Nguyen, 2008) would never have been possible had it not been for teamwork being more and more operational and innovative (Barczak & Wilemon, 1989) and team members be given more and more freedom as supervisors are perceived to be less and less technically skilled (Andrews & Farris, 1967). Advancement in material sciences, surface-mount and nanotechnologies coupled with newer processing and fabrication techniques (in which intense investment is generally required) also opened the door for lighter, smarter, less expensive, more robust and higher performing products (Ellsworth, 2004) as functional leaders try their best in keeping researchers updated with their relevant knowledge (Allen, Katz, Grady, & Slavin, 1988)

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<sup>1</sup> Francis Galton's (1892/2000) trait theory was said to be influenced by Thomas Carlyle's (1841) 'Great Man' theory.

Figure 1. Market share for top webserver platforms 1995-2011. Source: Netcraft.

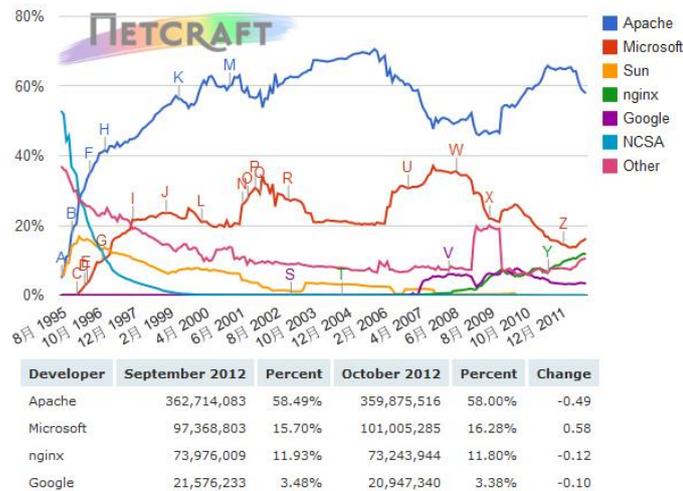
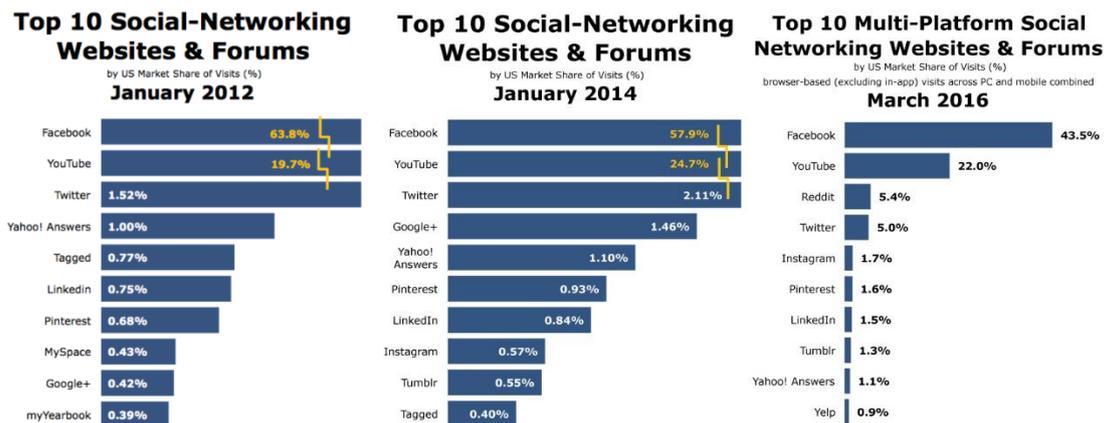


Figure 2. Top 10 social networking sites (2012-2016). Source: Marketing Charts.



Yet the concept of social networks (SN) does not entirely have its roots in any one of these socio-economic impacts nor technological leadership reforms. The concept of SN, in fact, existed well before, but just in different forms – first as ‘Bulletin Board Systems (BBSes)’ piggy-backed on slow modem connections in the 1970s, USENET newsgroups in the 1980s, and eventually ‘online communities’ in the 1990s. But no matter how it had existed before, their development conformed also with the development of leadership ideas in the technical environment because, in those days, BBSes were mostly run by either a sole proprietor or a small group of enthusiasts sharing the same goal – just as described in House’s (1996) path-goal theory<sup>2</sup>. These BBSes had clear goals (in terms of both service stability and subscription targets – who were often invited and was not open to public) and had to maximize the value of such achievement, thereby affecting co-worker’s expectancies, valence, performance, and satisfaction (House, 1971; 1996; House & Dessler, 1974). Yet, not everyone in these small BBS teams might share the same goal and would respond the same way to ambiguousness of each other’s roles (Schriesheim & Schriesheim, 1980; Stinson & Johnson, 1975; Yukl, 1981). Only those who could maintain good leader-member relations, specifically in terms of trustworthiness and loyalty – which is crucial in initiating exchange among team members as per House and Aditya (1997), are those few BBSes who could successfully transform and survive the millennium as these are the ones that could trigger innovative behavior for both associative and bisociative problem-solvers (Scott & Bruce, 1994; 1998). It was these businesses that would be able to reap the benefits of the carrier price slashes as well as the emergence of the various technologies later during the dot-com boom and crash around the millennium. For instance, classmates.com (now a nostalgic site for the elders) and Match.com (a dating site) were launched in early 1995 as the very first batch of web-based online communities followed by SixDegrees and GeoCities in 1997. Later reviewed as ‘moves simply ahead of their time’ (Marion, Omatayo, 2011), both SixDegrees and GeoCities went out of business in 2001 and 2009 respectively, together with a handful others. Those that managed to stay to

<sup>2</sup> House’s (1996) path-goal theory is said to be inspired by Vroom’s (1964) expectancy theory of motivation, Georgopoulos, Mahoney and Jones’ (1957) path-goal approach, and Evans’ (1970) idea that a particular behavior (path) leads to a particular outcome (goal).

enjoy the coming of Web 2.0 and Web 3.0<sup>3</sup> are either launched with specific purposes in mind or has a leadership structure that accommodated time-lagged, sporadic, and non-market nature to its outputs (Narayanan, 2001), e.g. Dogster.com for dog lovers, MyChurch.com for church-goers, and DemocraticHub.com for democrats, or the geographically and/or linguistically focused VK.com for Russians (see Table 1 below). Some other online communities, originally designed to cater for the public, chose a different survival path and transformed to support a smaller niche group (see Table 2 below). The dot-com crash and the technology did not alone give birth to social networks – it was those SNs that was led with the right leadership style that managed to ride on the waves into the post-millennia.

Table 1. Major SNs<sup>4</sup> and their Alexa® ranking (2012/10- 2016/03). Source: Alexa.com

Name of SN	Rank <sup>5</sup> 2012	Rank 2016	Brief Description
Facebook	1	3	General Internet population
V Kontakte.ru (vk.com)	32	15	European-based social network active in Russia, Ukraine, Kazakhstan, Azerbaijan and Belarus; users in the age range 18-24, graduate school educated and browse from home
Odnoklassniki.ru	66	154,332	Russian word for 'Classmates', popular in Russia and former Soviet republics; home users in the age range 25-34, have children, are graduate school educated
MySpace.com	182	3,144	Previously the largest SN in the U.S., users in the age range 18-24, have no children and browse from school
Mixi.jp	377	1,968	Popular in Japan, targets males in the age range 45-54, have no children, no college education who browse from work
Orkut.com (Google owned)	496	98,762	Popular in Brazil, India, Japan; targets males in the range 18-24, have no children and are graduate school educated
Tagged.com	240	1,162	Popular in Dominica, Sudan, Malaysia, Iraq, Kenya, Puerto Rico, UAE; targets males in the age range 45-54, received some college education and browse from home
Match.com	338	1,406	Users in age range 55-64, have no children and received some college education
Classmates.com	1,392	10,502	Popular in U.S.; users are mainly females over 65 years old, received some college education and browse from home; increasingly focused on nostalgic content since 2010
Cyworld.kr	3,183	n/a	Popular in South Korea; targets female users in the age range 35-44, have no children and browse from work; first Korean company to profit from the sale of virtual goods
Hyves.nl	3,471	645,803	Sounds like 'Bee Hives'; popular in Netherlands and Belgium; targets males who are graduate school educated and browse mainly from school
Bebo.com	4,236	155,527	Popular in the U.K., Australia and New Zealand; targets males in the age range 18-24, have no children, received some college education and browse from home
iWiW.hu	4,653	602,131	Stands for 'International Who is Who'; popular in Hungary and Romania; targets users in the age range 35-44, have no college education and browse from home
Geocities	7,905	317,374	An early online community first appeared in 1994, purchased by Yahoo in 1999, closed in 2009

<sup>3</sup> For details on Web 2.0 and Web 3.0, please see 'What Is Web 2.0? Design patterns and business models for the next generation of software' by Tim O'Reilly, dated September 30, 2005, and <https://www.youtube.com/watch?v=V6BR9DrmUQA>

<sup>4</sup> Google+ (Google Plus) is not listed in Alexa's ranking. See Figure 2 for ranking.

<sup>5</sup> The term 'rank' here refers to the Alexa's daily Internet traffic ranking reports (www.alexa.com). Alexa is funded by Amazon Inc. and provides traffic ranks for approximately 16 million websites (amounting to 4.5 billion web pages) around the world.

Affinity Circles	432,842	> 4.5 mil.	An early player in the social media business that targets university and college graduates; users in the age range 35-44, graduate school educated and browse from work
Six Degrees.com	1,051,186	> 1.5 mil.	Users are males in the age range 18-24, have no children, college educated and browse from home; ceased to operate in 2001, restarted in 2010 (note: do not confuse with the sixdegrees.org initiative)

Table 2. SN-turned gaming sites. Source: Alexa.com

SN-turned sites	Rank 2012	Rank 2016	Brief Description
Hi5.com	633	3,231	Popular in Angola, Congo, Cameroon, Ecuador, Costa Rica; targets male users; recently transformed into a social gaming network upon purchased by Tagged.com (Raice, 2011)
Friendster.com	15,074	271,306	Popular in Malaysia, Singapore, India, the Philippines and Bangladesh; users in the age range 18-24; recently transformed into a gaming network

### The Rise and Fall and Colonization of Social Networks & Strategic Leadership

Meanwhile, as the whole new breed of Web 2.0 applications (and even Web 3.0) and media tools flushed the world, less multi-functional applications like instant messaging (e.g. AIM, ICQ, QQ in China), real-time chat, micro-blogging (e.g. Twitter) are either being replaced gradually by stronger brands with similar functions (see Figures 3a and 3b) or are simply acquired and integrated into other SNs to form stronger portfolios. For example, Google purchased<sup>6</sup> YouTube in 2006 to fortify its SN presence and Facebook acquired<sup>7</sup> Instagram in 2012 to complete with Pinterest, a photo-sharing rival targeting mainly at young females<sup>8</sup>. Leadership, at this point of time, had moved toward the more strategic end of the spectrum. As SNs sizes grow at lightning speeds, coordination of virtual teams for huge, distance, global projects became crucial and technical personnel had to be led and managed with minimal conflicts (Montoya-Weiss, Massey, & Song, 2001). SN sites that do not measure up in terms of functionalities or fail to innovate were substituted, no matter how large they once were. MySpace, a previously leading SN founded in 2003, started losing its members to Facebook since 2008 (see Figure 3a) due to their ineffective coordination of internal resources to protect teenage users from being exposed to pornography<sup>9</sup>. Just as Bloomberg<sup>10</sup> had reported, ‘Influential peers pull others in on the climb up – and signal to flee when it’s time to get out.’ Given MySpace’s leading position as the #1 player back in 2007, the phenomenon suggested that the number of ties within an SN (or even number of members) do not necessarily mean longer or more stable memberships, but rather, it could be an indirect metric of the members’ potential collective actions to become detrimental in times of difficulties, especially when leadership fails to coordinate large-scale counter-measures. This is also true because when computer-mediated interactions contribute positively to community interaction and involvement (Kavanaugh, Carroll, Rosson, Zin, Reese, 2005), members are easily mobilized (Hampton, Wellman, 2003) and ‘flee together’. In fact, intense use of financial tactics, including acquisitions and divestitures, have resulted in more financial-based controls in terms of leadership with less and less internal innovation (Hitt, Hoskisson, Johnson, & Moesel, 1996). And it was by then, the world of SNs had drifted toward the new notion of strategic leadership (Stumpf, 1988). Any project that is not terminated or sold by the top management (or the strategic leader) is one that contributes nicely on the return on investment, provides strong business advocacy while keeping the size of investment reasonable, if it was still considered innovative.

<sup>6</sup> See ‘Google buys YouTube for \$1.65bn’, BBC, dated October 10, 2006, available at [news.bbc.co.uk/2/hi/business/6034577.stm](http://news.bbc.co.uk/2/hi/business/6034577.stm)

<sup>7</sup> See ‘Facebook finalizes Instagram deal - but the price drops from \$1bn to \$300m (although it does throw in 23 million shares)’ dated September 7, 2012, available at [www.dailymail.co.uk/sciencetech/article-2199925/Facebook-finalises-Instagram-deal--prices-drops-1bn-300m-does-throw-23-million-shares.html](http://www.dailymail.co.uk/sciencetech/article-2199925/Facebook-finalises-Instagram-deal--prices-drops-1bn-300m-does-throw-23-million-shares.html)

<sup>8</sup> Not only do young females use social networks to more frequently maintain contact with friends (Barker & Ota, 2011), they are also much more willing to buy over the Internet than males (Dittmar, Long, & Meek, 2004).

<sup>9</sup> See ‘Do you know what your kids are doing on MySpace? It’s not as scary as you’ve heard and you can keep them safe’ by Dr. Larry D. Rosen, available at [education.com/reference/article/Ref\\_MySpace\\_Your\\_ChildMe/](http://education.com/reference/article/Ref_MySpace_Your_ChildMe/) and ‘CT, NC Attorneys General say MySpace response to subpoena reveals 90,000 registered sex offenders with profiles’, Connecticut Attorney General’s Office, dated February 3, 2009, available at [www.ct.gov/ag/cwp/view.asp?A=3673&Q=433228](http://www.ct.gov/ag/cwp/view.asp?A=3673&Q=433228)

<sup>10</sup> See ‘The rise and inglorious fall of Myspace’ by Felix Gillette, dated June 22, 2011, available at [www.businessweek.com/magazine/content/11\\_27/b4235053917570.htm](http://www.businessweek.com/magazine/content/11_27/b4235053917570.htm)

Figure 3a. Popularity comparison of selected social media tools. Source: Google Trends.

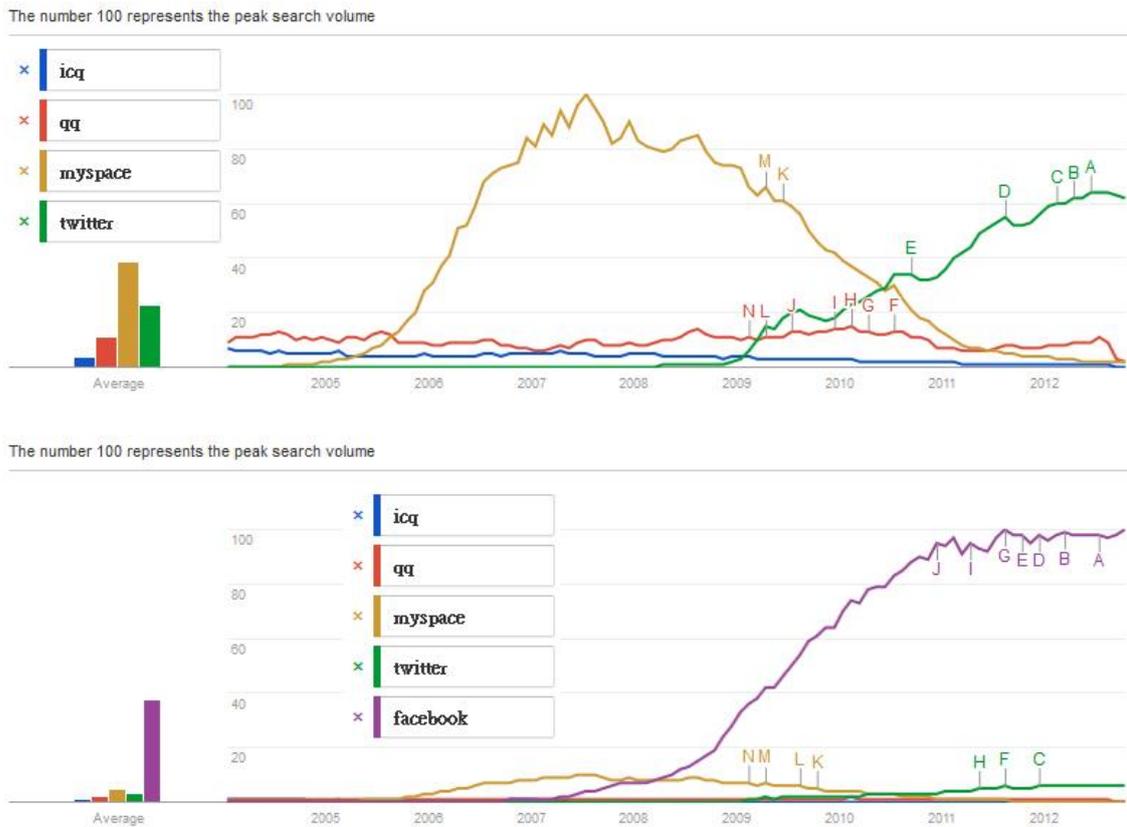
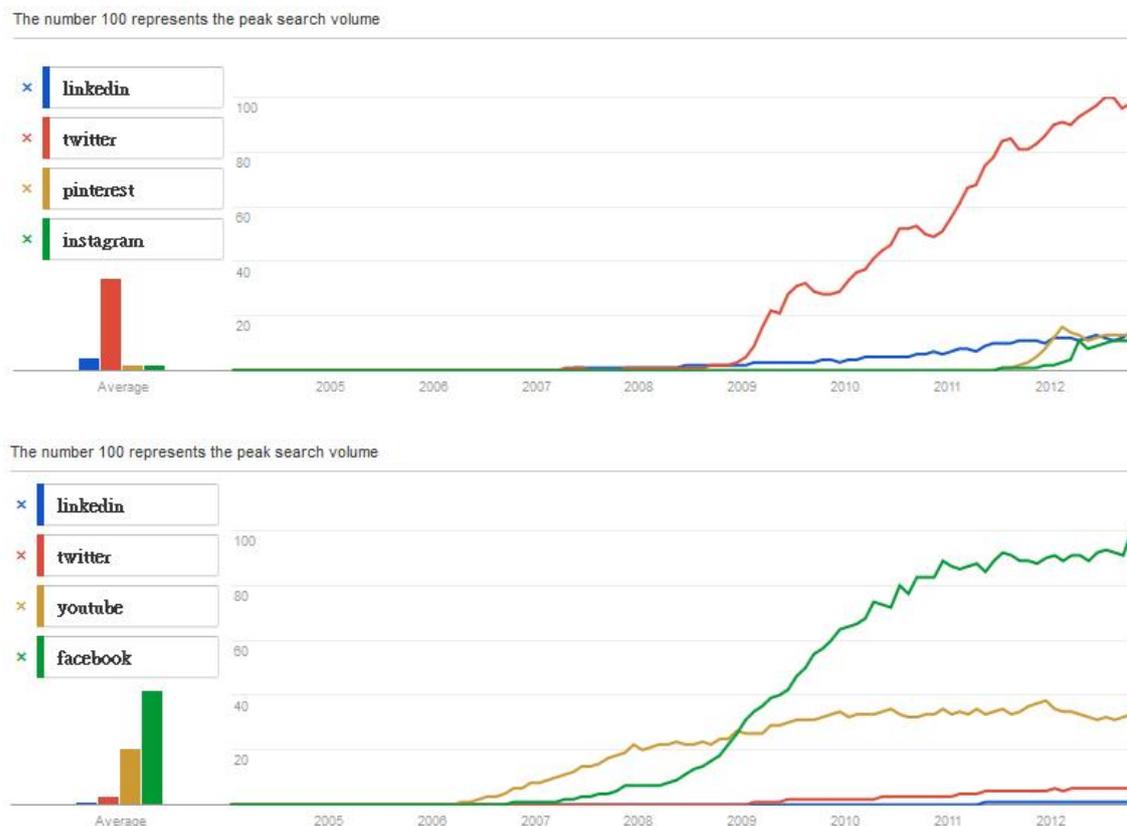
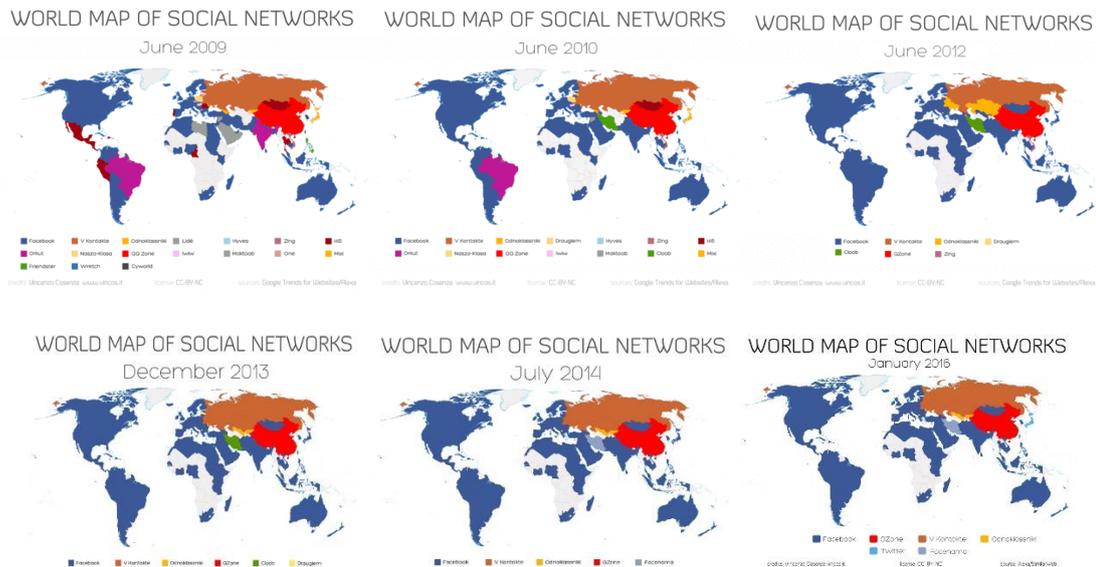


Figure 3b. Popularity comparison of selected social media tools. Source: Google Trends.



While the collectivistic ‘flee together’ nature of SNs can play against itself, it can also be constructive, especially when the more successful ones are mostly strategically, financially, led and grew. It is reported<sup>11</sup> that, since early 2009, Facebook have been ‘colonizing’ in some countries previously dominated by other local SNs. Mixi (Japan), Cyworld (Korea), etc. fell one after another with Google’s Orkut (Brazil) surrendered (i.e. losing the #1 place) in 2011. The number of top social network sites dropped dramatically from some 17 (in June 2009) to 7 in June 2012 and recently stabilized at 6 (in March 2016), yet the number is still expected to be shrinking as ‘colonization’ through acquisitions and mergers continue (see Figure 4a below).

Figure 4a. World map of social networks 2009-2016. Source: Google Trends.



Countries that fell quickly to Facebook since 2010 are those marked as less individualistic countries (or more collectivistic), and which, coincidentally or not, had already been previously dominated by one or more geographically and/or linguistically focused SN(s). Such an interesting combination provides a quick answer as to why Facebook has landed in these countries so conveniently. First, new members from these countries already had previous working knowledge about social networking. And while customer education is key to successful market development (Aubert, Khoury, and Jaber, 2005), potential members from these collectivist countries will more likely conform, and hence become quickly mobilized in groups and switch over (or flee!), particularly when Facebook also provides localized versions. And as Facebook welcomed its first-billionth user (Ortutay, 2012), leading social networks in the former Soviet republics (i.e. V Kontakte and Odnoklassniki) are left alone to resist and fight on their own in the colonization war, unless there is strong government intervention<sup>12</sup>, censorship<sup>13</sup>, political crackdowns<sup>14</sup> or anti-media laws<sup>15</sup> that may ‘come to the rescue’. In the language of leadership theories, we can see that while individualistic leaders

<sup>11</sup> See ‘Facebook colonization of the world progress report’ by Dan Farber, CNET, dated June 10, 2012, available at [news.cnet.com/8301-1023\\_3-57450075-93/facebook-colonization-of-the-world-progress-report/](http://news.cnet.com/8301-1023_3-57450075-93/facebook-colonization-of-the-world-progress-report/) and ‘World map of social networks’ by Vincenzo Cosenza, available at [www.vincos.it/world-map-of-social-networks/](http://www.vincos.it/world-map-of-social-networks/)

<sup>12</sup> China puts blocks on foreign websites like Facebook and YouTube, see ‘Facebook’s China problem’ by Jessi Hempel, CNN Money, dated September 10, 2012, available at [tech.fortune.cnn.com/2012/09/10/facebook-china-problem/](http://tech.fortune.cnn.com/2012/09/10/facebook-china-problem/) and also Global Post article, ‘China: Facebook, Twitter have millions of users despite ban, survey shows’ by Allison Jackson dated September 28, 2012, available at [www.globalpost.com/dispatch/news/regions/asia-pacific/china/120927/china-facebook-twitter-users-ban-survey](http://www.globalpost.com/dispatch/news/regions/asia-pacific/china/120927/china-facebook-twitter-users-ban-survey)

<sup>13</sup> Iran is said to be preparing for an ‘internal version’ of the Internet by blocking all international traffic, see ‘Iran deploys domestic Internet system, blocks Google’ by Ellyne Phneah dated September 24, 2012, available at [www.zdnet.com/iran-deploys-domestic-internet-system-blocks-google-7000004686/](http://www.zdnet.com/iran-deploys-domestic-internet-system-blocks-google-7000004686/)

<sup>14</sup> Three Vietnamese reporters who blogged on government corruption issues were prosecuted, see ‘Vietnam cracks down on blogs (Hanoi)’, Associated Press dated September 13, 2012, available at [www.northjersey.com/news/international/169618006\\_Vietnam\\_Cracks\\_Down\\_on\\_Blogs\\_\\_Hanoi\\_.html](http://www.northjersey.com/news/international/169618006_Vietnam_Cracks_Down_on_Blogs__Hanoi_.html)

<sup>15</sup> With the enactment of the new Cybercrime Prevention Act of 2012 on September 12, 2012, the Philippines government can imprison anyone who commits libel either by written messages, comments, blogs, or posts in sites such as

aim at producing better financial results, collectivist leaders tend to prioritize long-term needs of colleagues when engaging in leadership in exchange for loyalty and commitment, hence favoring even more on mergers and acquisitions (Jogulu, 2010).

### Conclusion: The Next Wave

The rise and fall patterns of social networking sites as well as the relative growth and decline in popularity of the various online tools remind us of one simple fact – it is not just the socio-economy, technological advancement, or the number or preferences of SN users that shaped the future of social networks or altered the way leaders lead but also the changes and evolution of leadership concepts that we apply in the course of operating these social networks. Just as administration thoughts (Cheng & Macapagal, 2016) and pragmatics (Cheng, 2015) both follow the trends of socio-economic development, leadership evolve accordingly as well and those who failed to adapt to the newly evolving styles of leadership (e.g. from simple path-goal to strategic leadership focusing on mergers and acquisitions), would be slowly eliminated by market forces, if not the society. Yet failing to catch up, does not mean being incapable. In fact, while the SN arena has yet to top off or have reached any state of equilibrium, its volatility simply makes it difficult in measuring their effects (Larson & Watson, 2011). And, mingled with concerns over their ROIs<sup>16</sup> (Hoffman & Fodor, 2010), this makes it even more difficult to align business (or non-business) goals with the proper SN strategies, let alone deriving from them any measurable commercial or social value (Culnan, Mchugh, & Zubillaga, 2010). It is, therefore, still a bit too early to tell if moving from the previous path-goal notion to, if not only, strategic leadership is the right move to help grow SNs that require tremendous amount of innovation and investment. And until social networks become a sustainable business with a sound profit or operational model, they are still susceptible to the downside of the collectivist member's highly efficient coordinated capacities (Gorodnichenko & Roland, 2011), 'fleeing', in particular. After all, given the current trend of leadership evolution, it is just a matter of time when Facebook eventually loses its popular face to another more innovative, investor-friendly, drop-dead attractive new social gadget – which Facebook was, sadly, once an outstanding example.

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<sup>16</sup> ROI, Return on Investment

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