A CONCEPTUAL MODEL: IMPACT OF USAGE OF SOCIAL MEDIA TOOLS TO ENHANCE PROJECT MANAGEMENT SUCCESS

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Abstract

Research on the impact of social media in the workplace has focused on identifying ways in which the latest modes of shared communications has influenced productivity in project development, testing, and implementation. Traditionally, a written formal project management communication plan has been key in supporting the integration management that coordinates the project from beginning-to-end, to ensure a greater level of collaboration when managing project scope, schedule, budget and quality, and also to provide a greater sense of confidence in completing the project successfully.

However, how beneficial are social media networks in improving the project team's dynamics, which are important for successfully managing scope verification, budget adherence, and schedule compliance? How will these tools play a role in ensuring greater user involvement, senior management commitment, and user/system requirements?

The purpose of this research is firstly to recognize what types of social media networks have been used and accepted as potential models for improving project management, and secondly; to promote a discussion to advance research paradigms for investigating the impact of implementing social media networks in project management.

Key words: Social media, project management, productivity.

Introduction and Rationale for Social Media Networking

The United States population is currently about 321 million, of which the total number of adults aged between 21 and 65 is about 200 million, 91% of whom (about 180 million) use cell phones, as reported by the Pew Research Center's Internet and American Life Project. The report asserts that '…the cell phone is the most quickly adopted consumer technology in the history of the world …", and except for a demographic segment, "… people aged 65 and older; those who did not attend college; those living in households earning less than $30,000; and those in rural areas. [and] … women are statistically significantly less likely to own cell phones than men." Cell phones have been accepted as being an important component in establishing and sustaining social relationships. The predominant users are individuals younger than 55 years old, both white and black, college educated, and who earn more than $50,000. Where one lives does not make a difference.

The cell phone is the basic building block for first-order social media application - basic communications, texting, image capture, and storage, being a natural extension of the telephone, with the added convenience of non-tethered mobility, which has led to an ubiquitous technology which is pervasive on a global basis. The evolution of this building block has led to the use of smartphones, personal data assistants, tablets, iPads, etc., together with the adoption of more sophisticated and intelligent social media applications which enhance the ability for individuals to collaborate on many levels of information exchange. According to the Pew Research Center's Internet and American Life Project tracking survey, which was conducted in Spring 2013, 40% of cell phone users access a social networking site via their phone. The report also found a 40% jump in use of social networking sites by 18-29 year college-age old internet users. This implicit corollary is that today's and future career professionals will be equipped with the knowledge, skills, and the confidence in using an infrastructure that may well provide project managers with the necessary conditions for a more responsible communications management protocol.

The derived benefits of social networking imply that whereas individuals may maintain protective of their personal locus of control, they can use the attributes afforded by social networking to develop 'necessary connectivity' when required, meeting established goals/objectives/norms with positive outcomes reflecting the power of synergism. The Pew report supports the notion that instead of workgroups that do not provide a sense of community and trust for working towards a common goal, the emulation of real teams is achieved through an evolved sense of social support and the ability to develop close relationships that encourage a community of trust and sharing.

In particular, information technology (IT) projects often require that the project team operates in isolation from one another; and, quite often the case is that the project encompasses a virtual team which includes members from diverse geographic and temporal environments. Managing projects under these conditions has become the norm, rather than the unique. Equipping project managers with tools and techniques that take advantage of the positive attributes of social media

networking could provide a necessary step in the direction for overcoming one of project management's greatest criticisms – 'a lack of timely and accurate communications.'

Social Media Usage

Jeff Bullas (2013) says that the most significant social media facts and statistics in 2013 may include an insight into the most likely transition scenario by those most experienced project managers who are responsible for billions of dollars of private and public sector project initiatives. In general, the most experienced project managers are those who have been with the organization the longest and who are senior in age, as well as position. The following observations reported by Bullas include those trends that are most likely to influence the use of social media in project management:

1. Usage of social networks by older users is increasing
2. LinkedIn is the most popular media for older users
3. Facebook dominates social media engagement (the older generation feels the need to keep in touch with the younger generation, which thus encourages more social involvement)
4. The active usage of the major, global social platforms is growing worldwide, with mobile being the key driver
5. Mobile and tablet usage is beginning to heavily impact social media usage with mobile having the biggest effect

Tom Pick (2013), in a commentary on social media and digital marketing, echoes the trend cited by Bullas that social media has reached the middle age(d), with the fastest growing segment of social media users now being adults aged 45, who represent 54% of all users. Pick also notes that "…social media users are more social than non-social-media-using-internet-users in real life too…"[1], and at the same time, he cites a report in WordPress Hosting SEO, which indicates that "… As universal as business use of social media can seem to be, 26% of companies still block access to social media sites in their workplaces. 31% have no social media policy in place." Other interesting facts reported include the following:

1. 82% of buyers say they trust a company more when its CEO and senior leadership team are active on social media.
2. And yet – 36% of executives say their CEO "either does not care, or cares little, about the company's reputation in social media."
3. It helps having a woman at the top. Female small business CEOs are 78% more likely to say social media is highly valuable for their firm's growth (20.8% vs. 11.6%), and 43% are less likely to say it is not valuable (14.2% vs. 25%).

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[1] Top 30 Social Network Analysis and Visualization Tools.
http://www.kdnuggets.com/2015/06/top-30-social-network-analysis-visualization-tools.html

4. 90% of Inc. 500 companies use at least one major social media platform, and 62% say that social media is either "somewhat", or "very" necessary for their growth.

5. LinkedIn is the "social platform of choice" for companies in the Inc. 500, the index of the fastest-growing companies in the U.S. 81% of these firms use LinkedIn, compared to 67% for both Facebook and Twitter.

These observations complement the perspective that more senior employees have been 'dragged into' the world of social media networks by the emersion created by the younger social circles, most notably families, with whom they want to remain in close contact. Since project managers are typically senior employees with much experience in project management, it follows that there are implications for project managers. Marketing strategist, James Cofflin, suggests that the following are the five things that every project manager should know when '…striking the right balance between team members in a world full of modern distractions and technological complications':

1. Discipline + Focus = No distractions on Social Media: use social media to be a conduit for getting tasks accomplished, not an end in itself which causes distractions

2. Communication Is Two Ways: social media is not just a one-way media, as it requires interaction that provides a measure of understanding of the current status of an activity.

3. Catch Industry News instantly: project managers need to remain up-to-date, and have to recognize any new methods/techniques that may impact the way one does business.

4. Keep in touch with clients 24/7: project managers need to stay close to their stakeholders and to maintain them aware of the project's progress via updates, thus enhancing two-way communication for informative feedback.

5. Fun is not illegal: which enhances rapport between team members by interjecting levity and by using light-hearted challenges to motivate and provide 'welcome distractors' as a way to build team pride and confidence.

Social Media as a Tool

Social media is a tool that can be used to keep in touch with colleagues and clients, and thus enhance project management techniques. Mark Wintera, Charles Smith, Peter Morris, and Svetlana Cicmild, (2006) suggested changing project management from being an instrumental process, to being a social process. In other words, the thought process is to not consider the project life cycle as a production process, but to place more focus on social interaction among people as a way of improving project success. Furthermore, in a further commentary on social media and project management, one very important and key question was posed by Linky vd Merwe (2013), the founder of Virtual Project consulting, who states that with proper consideration to issues like security and confidentiality, social media tools can be used to enhance project delivery.

Social Media Tools available for Project Managers

Elizabeth Harrin (2010), a noted project management researcher, indicates that there are ten social media tools that are currently available for project managers, namely:

1. **Blogs**............................ [Online web pages used for the sharing of ideas, personal perspectives and opinions with others].

2. **Collaboration tools**.......... [Collaborative software for managing group activities].

3. **Instant Messaging**............ [Online chat].

4. **Microblogs**...................... [Blogging designed for mobile devices with viewing limitations].

5. **Webinars**........................ [Online educational seminar].

6. **Podcasts**........................ [Multimedia digital file made available on the Internet or downloading to a portable media player, e.g., iPod].

7. **Vodcasts**........................ [Video podcasts].

8. **RSS Feeds**...................... [Really Simple Syndication—content distribution: Twitter, Facebook, Myspace].

9. **Social networks**.............. [Infrastructure for information exchange].

10. **Wikis**............................. [A web-based collaborative community knowledge management repository].

Other social media tools for project management include 'yammer', an Enterprise Social Network that brings together people, conversations, content, and business data in a single location; slideshare.net; YouTube, and; LinkedIn, which are other ways of using social networking in project management. Whereas these are organizational social media network tools, the advent of Twitter, Facebook, FaceTime, Pinterest, Snap Chat, Texting, and others which are predominant tools of choice among the current generation of professionals that will be the project managers of tomorrow.

The research questions that arise offer challenges in discovering how to employ these latest types of social media tools to significantly improve the dismal record of failed projects, as reported by the the Standish Group's reports on factors that determine successful projects.

Social Media and Project Management: An Evolving Relationship

In a related study on Social Media meets Project Management, Michael Klynstra (2012) explains how social media can help project managers address troublesome team communication traps. This article extends the earlier study of Elizabeth Harrin (2010), and clearly describes the different social media tools and explains how they are used in various project management communication settings.

Some examples of social media tools and how they are used are listed below:

1. Social vs. Shared folders
2. Deliver real-time news, e.g. Twitter
3. Build a community, e.g. Facebook, yammer and Google +
4. Create a Free-Form, Flexible Space (e.g. Wiki)
5. Deliver Material in an Engaging Way (e.g. Vimeo and YouTube)
6. Crowdsource Intelligence (e.g. Escort Live Nation)

In another study, Zizi Papacharissi (2009), corroborates the theory that social media tools are indeed a good way to interact, and can thus be considered for use in project management, as follows:

- By highlighting the private/public balance present in each social networking site
- By providing styles of self-presentation in privately public and publicly private spaces
- By cultivating taste performances as a mode of sociocultural identification and organization
- The formation of tight or loose social settings"

A research study by AtTask, Inc. (2009) advocates that knowledge-rich peer networks enhance project managers' ability to get work done. Michelle Symonds (2014) suggests that social media tools can be used more effectively in day-to-day operations, to find new lines of communications and new ways of sharing information with team members and other people involved. Social media can also be used in project management to overcome geographical constraints (e.g., one team member based in Chicago, and another in Paris) by using Facebook, for example, to collaborate with team members.

Social characterizes networked structures in terms of nodes (individual actors, people, or things within the network) and the ties or edges (relationships or interactions) that connect them. Some examples of social structures that are commonly visualized through social network analysis, as mentioned by *Pinheiro, Carlos A.R. (2011) and D'Andrea, Alessia et al. (2009)*, include social media networks, friendship and acquaintance networks, kinship, transmission and sexual relationships.

SNA provides a variety of unique methods for modeling and analyzing relationships between people, organizations, and other entities. Applied in diverse fields, such Sociology, Business and Economics, Education and Medicine, etc., it is used to study the many different aspects of social networking: online and offline communities, team collaboration, organizational structure, the transmission of diseases, and many more.

A number of social network analysis (SNA) tools are available to analyze data. The SNA tools available depend on the type of data and analysis that one wants to carry out. Some examples of SNA tools include: GEPHI, UCINET, pajek, Cytoscape, and NodeXL. A detailed analysis of the top 30 SNA and visualization tools which have wide applications, including: biology, finance, sociology, network theory, and many other domains was carried out by KDnuggets (2015). NodeXL is one of the most easily-used softwares that analyses network graphs and data from Facebook, Exchange, Wikis and WWW hyperlinks.

NodeXL is a free, open-source template for Excel 2007 and 2010 which lets one enter a network edge list, click a button, and then see the network graph, all in the Excel window. One can easily customize the graph's appearance; zoom, scale and pan the graph; dynamically filter vertices and edges; alter the graph's layout; find clusters of related vertices, and; calculate graph metrics. Networks can be imported from, and exported to, a variety of file formats, and built-in connections for getting networks from Twitter, Flickr, YouTube and local emails are provided.

Exploring Social Media Tools Usage: A Conceptual Model for the Use of Social Media Tools to Enhance Project Management Success

It is evident from recent developments and trends that the use of social media is rapidly increasing, as seen by its ubiquitous adoption, especially by the younger workforce, who have grown-up with them being an omnipresent commodity for use in both personal and professional activities. Its potential use in enhancing the project management body of knowledge is very promising, especially in the area of project communications and integration management.

Based on the initial research of social media usage, its growth and impact on personal and organizational work effectiveness and efficiency, further research into trends and its use within organizations would provide greater insight into the impact of social media networks in project management.

Networking Analysis (SNA)

Otte, Evelien; Rousseau and Ronald (2002) define Social Network Analysis (SNA) as being a strategy for investigating social structures through the use of network and graph theories. It

A New Paradigm

The traditional Project Communication philosophy, as defined by (PMBOK), follows the path of exchanging project content with team members by using appropriate electronic media as often as possible, to achieve the desired objective of greater collaboration among project stakeholders and thus ensures that a quality project is completed within budget, scope, and on schedule.

We now propose an additional communicational approach to the interaction between project team members; the use of social media networks. We propose to study the usage of social media tools on various dimensions of project management communication and integration management, to ascertain the impact that these tools are having on enhancing project delivery and success.

Social Media Tools / Project Management Tasks/Activities	Blogs	Collaboration tools	Instant messaging	Micro blogs	Webinars	Podcasts	Vodcasts	RSS	Social Networks	Wikis
Project Spec										
Project Changes										
Project Status										
Dignosing problems										
Solving Problems										
Milestone Communication										
Project Accomplishments										
Project Monitoring										
Sharing Project Ideas										
Interaction with Clients										
Real Time Project Inforamation										
Project Announcements										
Distributing Project Information										
Project Alerts										
Project Warnings										
Project Motivational Tools and Aids										
Project resource Allocations										
Sharing CBK										
Project management organization										
Connecting with Other Project Managers										
Best Practices on Project Management										
Finding Experts in Project Management										
Feedback from Customers										
Streamlined Problem resolution										
Real Time Project Adaptation										
Document Updates										
Capturing Project Events										
Creating Functional Space for project Team										
Collaboration with Team Members										
Overcome Geographical constraints										
Disseminate informtion to team members										

Figure 1: Social Media Tools and Project Management Tasks/Activities

The questions will be based on an experimental design that would constitute the usage of a Social Network media as one factor and also collect data on the interaction and inter-relationship between team members to build network graphs, which in turn can be used to generate analytical measures, by performing a cluster analysis in order to understand the structure of the relationships between project team members, to understand sub-group relationships, and also the specific roles played by team members during the interaction.

Added to this experimental design and SNA analysis would be the addition of a second factor - "mentor", into the design. An example of a mentor would be a PMP, who would help and guide during the interaction and exchange between team members.

Design of the Questionnaire

A questionnaire as shown in Appendix A will be designed, based on the interaction matrix of Figure 1 and the two experimental design factors; "Medium" and "Mentor", as described above.

MENTOR / MEDIUM	WITH	WITHOUT
WITHOUT		
WITH		

Figure 2: Mentor Medium Matrix

A few aspects regarding the experimental design would be:

- Keep the subject matter/content the same across groups
- Have four teams, with the combinations of mentor and social medium shown in Figure 2

The matrix in Figure 2 will provide the following team composition, as shown in Figure 3, in order to test the effect of mentor and medium on communication among team members and project performance.

Team A	**Without any Social Media, but with a mentor**
Team B	**Without any Social Media and without a Mentor**
Team C	**With Social Media and With a Mentor**
Team D	**With Social Media, but without a Mentor**

Figure 3: Mentor team composition

Results and Conclusions

The survey will be tested and then administered randomly to project managers and the data will be compiled and analyzed to understand what social networking tools are used for which project management activities.

The survey will be tested and then administered randomly to project managers and the data will be compiled and analyzed to understand what social networking tools are used for which project management activities. A detailed analysis will be carried out to find the answer to the following previously specified research questions:

- How constructive social media networks are contributing to increasing the probability of a successful project?
- How Social Media affects a project team's communication and collaboration in such a way that it improves the measures of project success/increase the project's performance level?
- How social media usage enhances team collaboration and redefines organization structures?

Additionally, demographic data collected from the respondents will give an insight into specific trends with respect to the usage of social media tools in certain industries for some specific project management tasks/activities. This will bring clarity to the following issues:

- How the mentor drives project success
- Whether more people in the team drive project success
- If and how the mentor and team members drive project success together

NodeXL Software

The second activity tool would be to use a social networking analysis (SNA) tool, such as NodeXL, which makes it easy to explore network graphs. With NodeXL, we will be able to enter a network edge list in a worksheet, click a button and see a graph, all in the familiar environment of the Excel window. NodeXL will allow us to import data from social network tools used by project team members and to understand the relationship between project team members.

A framework for SNA can be visualized in Figure 4, which will help us observe or analyze the interaction with team members. The circles represent team members, and the arrows show the interaction between team members.
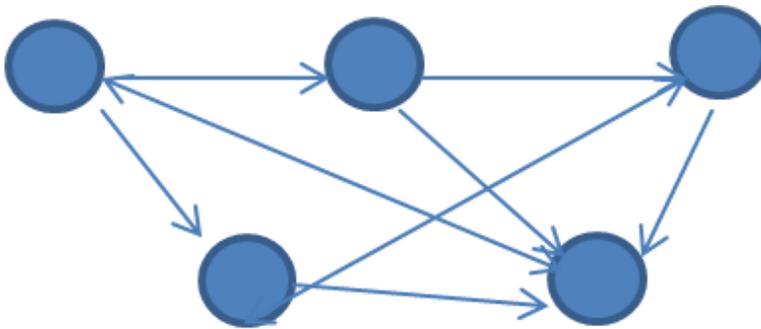
Figure 4: SNA Framework

SNA/NodelXL Analysis Method

Social networks can be represented as graphs. This process involves identifying a number of items that are needed to create a social network. A social network can be conceptualized as being a set of agents and the relationship between these agents. These agents can be individuals, organizations, diseases, or other entities. Relationships can be friendship, response, etc., and relationships can be directed (i.e., a person responds to another person), or undirected (i.e., two people are friends). All such relationships can be represented as a graph. Weights can be assigned to specify the strength of the relationship between agents. The strength of relationships between agents depends on the frequency of interaction between agents and the number of items exchanged. In a project management scenario, the interaction between project team members and the interaction between project team members and the project manager (Mentor) is defined as a 'discussion forum'. NodeXL requires an 'edge weight' to be defined to represent these interactions. An example of an 'edge weight' could be the number of posts or interactions between two project team members.

Other aspects relating to NodeXL analysis require the following definitions:

- Measure of centrality
- Path between nodes
- Bridge nodes

A cluster analysis of the data in NodeXL will reveal the levels of interaction between, and among nodes, which will enable us to discover the group dynamics between project team members and between project team members and project managers.

The analysis from NodeXL will help improve the following:

- Project communication among team members
- Project performance - adding value to the project and it success
- Convenience - project members interacting at any time, in any place, all at the same time

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Social Media Networks and Project Management

Appendix A

This survey questionnaire is designed to identify what types of social media communication networks were used by teams during the semester. The data collected will be used to assess what networks were deemed most helpful in completing team assignments.

A.   Team Collaboration

In the table below, enter a percentage use in each of the cells of those tools that reflects the extent to which your team used them in completing assignments. For example, media=Email, %=85; media=Google Docs, %=15. The totals for each row should be 100% (e.g., 85% + 15% = 100%).

Social Media Network	ASSIGNMENTS						
	Team Charter	Business Case	Project Infrastructure Stakeholder Analysis	Scope Mgmt. Plan	Project Plan	Project Risk Mgmt. Plan	Quality Mgmt. Plan
Email							
Texting							
Twitter							
Facebook							
Blackboard /forum							
Google Docs							
LinkedIn							
Other (classmates, meetup, etc.) Specify							
Other: Specify							

B.   Mentorship

Yes **No**

1. Would a business mentor help the quality of your assignment submissions?

If yes, please specify how the mentor might add to the quality of the experience.

If No, Please specify why not.

Yes **No**

2. Would more or less people in the team drive project success?

If more, please specify how more team members would help in driving project success.

If less, Please specify why?

C. Mentor and Medium Matrix

If mentors from the business community were used to help project teams, how do you think you would answer the following?

On a scale of 1 to 5 (1 being minimum and 5 being maximum) please rate the following scenario combinations in terms of their contribution to project team success by entering an X in the appropriate cell:

	1	2	3	4	5
Team A: Without any Social Media, with a Mentor					
Team B: Without any Social Media, without a Mentor					
Team C: With Social Media, with Mentor					
Team D: With Social Media, without a Mentor					

1. What should be the role of a mentor towards project success? Please specify

2. Describe your learning experience in designing the Martial Arts Academy IT Project Plan.

3. Overall, rate your learning experience in working with your team on project assignments (indicate number):

	Terrible	Less than expected	Okay	Better than expected	Wonderful
Rating					

Optional Information: This information will be held in confidence and not shared other than in the aggregate. Place an X in the appropriate cell.

Gender

Male	Female

Academic class

JR	SR

Major

IS	Other

v
v
v
v
v

	None	Some	Full-Time Job
IS Work Experience			