



An Investigation of the Impact of Social Media on Construction Project Management

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Abstract

One of the most important aspects of managing a project is communication. Although this issue has been widely covered in management, a lack of attention has been given in the project management, slight is known as the impact of social media tools on construction project management. The main purpose of the present study is to explore the potential of social media for the construction of the project management and to understand some of the difficulties that arise from social media implementation. For this purpose a 12 question and 20-item questionnaire has been employed and distributed as a soft copy questionnaires among the sample of 400 engineers who work in the construction field, either in the private sector including contracting and consulting companies (grade one and two) or in the public sector in Jordan. The number of participants who said that they apply social media tools in their projects was 357, while 43 participants, were eliminated as they do not apply social media tools in their work. The collected data from 375 participants were analyzed by using the Statistical Package for Social Sciences (SPSS). The results indicated that there is a positive impact of social media on project management and project team in construction projects especially in reducing time. Coringly, the study revealed the existing difficulties that arise from social media use in projects. The study also has concluded that using social media in the project is highly important to organize the management project recently.

Keywords: Social Media; Project Management; Construction Project; Performance; Jordan.

1. Introduction

Nowadays, social media platforms permeate nearly every aspect of our daily life; this is because of convenience users, who access social media from their smartphones at any time and from any place [1]. Therefore, we can't overlook social media as a tool that entered into the field of project management, where project communication is positively correlated with project performance and success, Zare et al. (2016) said that the engineering projects success depend on making balance between three constraints (time, the required quality, and within the authorized cost) [2]. For those project managers, who manages the three constraints for projects (cost, time, and scope), they will have to find ways to integrate social media effectively in project management activities to be more creative and innovative in delivering projects. Also, project team members will be required to possess knowledge and skills to use social media correctly to achieve project success [3]. Eskerod et al. (2013) claimed that for the success of any project stakeholders need to be kept informed on a steady basis. Social media platforms provide a new paradigm for

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communication and help stakeholders and project managers in communicating in official work-related matters. This, in turn, provides opportunities for project success [4]. The present paper aimed at investigating social media tools' impact on project management, as well as on the project team. Regarding the deficit of knowledge on the implementations of social media in project management, the researcher is analyzing the status of social media implementation in managing projects. The present research is going to identify which Project Management Body of (PMBOK) knowledge areas is the most suitable for social media to understand how social media tools affect on project management activities and consequently the performance of the project team.

The present study literature review is presenting the definition and origin of social media means. In addition, the impact of social media in project management and on project work team performance. It explains the methodology and involves the methods used to collect the data and the study population. It presents a detailed analysis of the results. Also, it shows the demographic description of the respondents as well as the descriptive analysis of the study variables and factors, while ANOVA analysis is used to test the hypotheses of the study. It includes a discussion of the results and the conclusions that can be drawn from the results obtained from the present study. In conclusion, a number of recommendations are suggested at the end of the study.

2. Literature Review

2.1. Social Media

2.1.1. Social Media Definition

Social media term refers to virtual groups of user-profiles [5] and a variety of applications built on the foundations of Web 2.0 (Web 2.0 includes a group of knowledge instruments that empower knowledge creation, cooperation, communication, and sharing [6]. Social media evolved from Web 2.0 [7]) that allow individuals to (1) participate in information and distribute and/or create the content; (2) create a public or semi-public profile that articulates a relationship with other users on a social media site, the nature of such connections may vary from site to site [8]. There are many tools that include laptop or desktop computers, smartphones, or tablets that can be used for communication in social media; the spread of these tools has risen sharply, indicating an intense usage in a huge number of fields, such as work functions and enterprises [9]. Kietzmann et al. (2012) suggested a social media functionality models that elaborates the contribution of social media to communication management [10]. These models are:

- "PRESENCE" functionality signifies the extent to which users know the accessibility of different users and their particular locations.
- "RELATIONSHIPS" functionality describes the extent to which users relate to each other and share data. Therefore, these relationships can build and develop trust among users.
- "REPUTATION" functionality predicts behavior based on past activities. It is about how trust can be created, evaluated and kept up.
- "GROUPS" functionality identifies the extent to which people participate and engage with one another in a specific group setting.
- "CONVERSATION" functionality determines the extent to which users communicate with one another via social media means, the social media environment is characterized by interaction and multi - directionality where the user participates in the content of a "one-way conversation" or a "multi-way conversation".
- "SHARING" functionality describes the extent to which users exchange and receive information.
- "IDENTITY" functionality is concerned with the extent to which users will go to uncover their identity while interacting on social media platform.

Kim et al. (2010) argued that work productivity and efficiency can increase by the use of social media due to the social media platforms provide an easy way among employees of information sharing and collaboration in the implementation of projects. On this basis, project managers need to employ this feature in effective ways in order to complete their projects successfully [11].

2.1.2. Categories of Social Media

Despite the fact that there is no systematic way by which social media can be categorized some researchers provided some classifications categorized as follows:

Harrin (2010) and Jackson (2010) talked about the availability of different social media tools, clarifying that the following tools are the most used ones: social networking, blogs, semantic web, wikis, podcasts, mashups, texting messaging, microblogs, RSS and vodcasts [12, 13]. Harrin (2010) provided clarification to how blogs could be used in projects by categorizing them into four types: external-facing organizational blogs, personal blogs, educational blogs,

and internal-facing organizational blogs. In addition, other social media tools, such as microblogs, instant messaging, Harrin (2010) discussed RSS, vodcasts, wikis and podcasts. Harrin's work includes exploring social media tools and their classifications) [12]. On the other hand, the classifications proposed by Ngai et al. (2015), and Dolan (2013) provided limited examples of social media tools [14] and [15], where Dolan, (2013) classified social media tools into four groups based on functionalities of blogs, social networking, content communities and collaborative projects [15], whereas the classification proposed by Ngai et al. (2015) did not provide all available social media tools [14].

According to Kaplan and Haenlein (2010), social media tools can be divided into six different categories: 1. Collaborative projects 2. Blogs and micro-blogs 3. Content communities 4. Social networking sites 5. Virtual game worlds 6. Virtual social worlds. Here are some examples of these tools like Blogs and micro-blogs (e.g. Open Diary, Technorati and LiveJournal, etc), social networking sites (e.g. Facebook, MySpace, Googleþ), virtual social worlds (e.g. Second Life), collaborative projects (e.g. Wikipedia), content communities (e.g. YouTube, and Flickr), as well as virtual game worlds (e.g. Universe of Warcraft) [16]. Troukens (2012) classified social media tools into 13 categories depending on a survey conducted on the use of social media in project management [17].

Table 1. Social media categories

No.	Social media category	Social media tools
1	Microblogs	Twitter, Tumblr, Plazes, Twitpic, Jaiku, PLURK
2	Publishing	SharePoint, Joomla, Drupal, WordPress
3	Sharing	YouTube, Dropbox, Slideshare, Flickr, CrowdStorm, Instagram
4	Social Networks	Facebook, LinkedIn, hi5, Ning, MySpace, Yammer
5	Discuss	Skype, Google Talk, Yahoo Messenger, MSN
6	Planning	Project Manager.com, ZOHO Projects, Basecamp, Huddle, TeamBox
7	Event Organiser	EventBrite, Eventful, Doodle, Meetup
8	Live Casting	Yahoo Live!, Qik, Justin.tv, Upstream.tv
9	Advice	TrpAdvisor, Epinions, yelp!, Customer Lobby
10	Buzz Monitoring	Nielsen Buzz Metrics, Alterian SM2, Sysomos
11	Career	Monster, BCentral, Career Builder, StepStone
12	Crowd Sourcing	Crowd Spring, Innocentive, Test, Topcoder
13	Multiplayer Games	Zynga, CrowdPark, Farmville, Second Life, WarCraft, Lord of the Rings Online.

*(adopted from Troukens, K. (2012), <https://www.pmi.org/learning/library/social-media-project-manager-6409>).

Kaplan and Haenlien described social media in a very concise and direct manner, which appeals to people well - versed with technology [16]. On the other hand, social media definitions is very wide-ranging and help to understand the Internet-centric definition of social media [17]. The prominence of social media integration has been highlighted to confirm that data is integrated and tracked primarily. This integration can be done through a tool that only permits the link to other tools or can consider a more complicated solution, combining tool information. It is worth noting that the solution of integrating information using different social media entails time and investment by the organization. According to the contributors, the use of a common set of tools, notwithstanding of their integration, would bring prodigious welfares to the organizations, in terms of communication, flexibility, collaboration and contribution in information, and consequently their use does not hang on integration Solution [18].

2.1.3. Social Media in Construction Project Management

The research landscape concerning the use of social media in construction project management is wide ranged, since social media inception was thought that it has an impact on social media usage, which supports collaboration in construction project management. Project managers are responsible for developing communication with stakeholders and the project team [19]. Social media use is associated with a low cost [20]. Thus, social media will help a project manager carry out information to his/her team faster [21]. Cao et al. (2012) suggested that project managers have the ability to maintain connections among their team members, as follow:

- Identifying who needs information;
- Planning how information can be connected;
- Delivering information;
- Paying attention to misunderstandings;
- Ensuring that everyone has recognized the information delivered [21].

According to Eskerod et al. (2013) social media platforms effectively contribute to deliver information to the project team, which may affect the project team performance. He mentioned that there are some advantages of social media usage in project management for instance low cost of execution, synchronicity and availability (which means the ability to access data anywhere and anytime) [4]. In addition, Cao et al. (2012) indicated that social media could save time for a project team. Especially geographically dispersed project teams can effectively connect with each other without the need for face-to-face meetings [21]. Edosomwan et al. (2011) argued that social media usage contributes effectively to bridge potential knowledge gaps among the project team members by facilitating interaction and increasing information sharing, which is better for collective decision – making [22]. Rawalai (2017) mentioned that using social media in projects might affect some of the project parameters, such as investment, interest of the target group, creativity and resources whether being (material, human or technological). In terms of investment, it is positively affected by the use of social media, where some of the social media platforms (such as Skype) can be used to cut down travel costs, since the team members do not need to travel in order to meet. Resources like material, human, technological are not impacted so much, but the easiness of social media facilitate building relationships among team members. The researcher notes that there is general agreement regarding the existence of a positive impact of Social Media on project teamwork performance [19].

On the other hand, Gonzalez (2012) and Leonardi et al. (2013) indicated that decision makers may be worried and hesitant to use social media at work, because social media may be misused, like use it for personal purposes [23, 24]. Storey et al. (2014) mentioned that social media might cause a complexity increase when interacting with stakeholders [25]. Further, Leonardi et al. (2013) stated that social media usage might have dangerous implications associated with maintaining business privacy and secrets like arrival of information to staff members who do not need this information [24]. In addition, Ristenpart et al. (2009) indicated that while using social media in businesses, the fear arises from sensitive information leakage to competitors, particularly when the staff lacks knowledge of how to use social media in a safe manner. Lack of knowledge on social media platform usage may be correlated with age and experience of using information technology [26]. The risk of losing reputation represents a danger to organizations in many ways. The loss of reputation influences the trust and faithfulness of stakeholders, as well as competitiveness and media relations [27]. According to Floreddu and Cabiddu (2016), a company's reputation is positively related to its capacity to allow customers participating in an online correspondence [28]. A company's reputation will be reinforced when it can build up straightforward and transparent online connections. Social media usage expands the range of reputation risks and increases the possibility of causing damage to an organization if its utilization of social media is not strictly observed and controlled. Organizations need to know how to manage reputation loss risks and how to manage the utilization of social media [29]. Omar, Stockdale and Scheepers, (2014) stated that it is important for project managers to manage social media tools in the right format and to practice due care in using these tools. It can be argued that the type and usage of social media tools may be suitable or unsuitable for project management [30].

2.1.4. Impact of Social Media on PMBOK Knowledge Areas

In 2012, as part of the Global PMI Congress Proceeding, in France, the project management community's use of social media in Belgium was presented in a survey conducted by Troukens Company in 2011, in which 67% of the respondents were project managers. This survey showed that many project managers had LinkedIn and Facebook profiles. Also, the PMBOK knowledge areas which benefitted from and controlled by social media tools were reported, where communication management benefitted most from the use of social media, followed by human resource management and then by time. The ranking of PMBOKE knowledge areas according to being controlled by social media tools is shown in Table 2 [17].

Table 2. PMBOK knowledge areas controlled by social media tools

No.	Knowledge Area	Percentage (%)
1	Communication	28
2	Human resources	15
3	Time	12
4	Integration	11
5	Risk	10
6	Scope	8
7	Quality	7
8	Procurement	5
9	Cost	4

*(adopted from Troukens, K. (2012), <https://www.pmi.org/learning/library/social-media-projectmanager-6409>)

The present study determined the contribution of social media tools to PMBOK knowledge areas depending on the respondents' perceptions. There were studies seeking to explore the impact of using social media in project management. After reviewing and evaluating literature on the usage of social media tools in project management, it can be confirmed that if these tools are used correctly and effectively, they could help both the project manager and the project team and contribute to the success of projects. Literature review and available knowledge provide the impetus to the understanding of the social media usage impact on project management efficiency.

3. Data Collection, Analysis and Results

3.1. Methodology

The study instrument is a questionnaire. The research was conducted all through the following stages:

1. Reviewing related literature studies;
2. Identifying main and secondary variables for study;
3. A structured questionnaire survey is designed to obtain further information to support the research objectives. It is designed to identify the social media impact on construction project management that will, in turn, affect the selection of project managers of the best social media tools in construction projects. The questionnaire research questions are constructed based on:
 - The literature review stated.
 - The experience of the researcher and some engineers in project management.
4. Analyzing obtained data;
5. Presentation of results;
6. Concluding and presenting recommendations;
7. Composing the material.

The methodology adopted for this research can be summarized in the Figure 1.

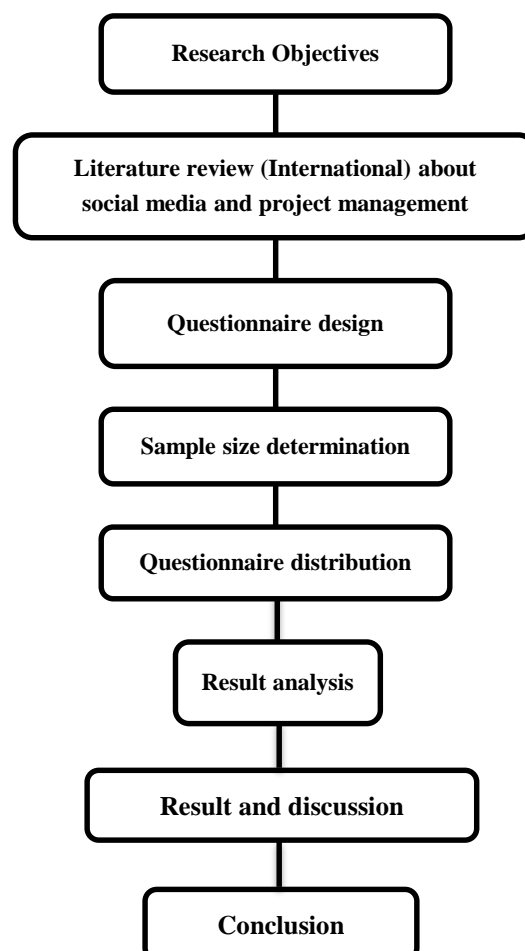


Figure 1. Flowchart of the research methodology

The study questionnaire consisted of three sections.

- Section one: it includes general information about the participants in the research study. It consists of questions relevant to personal information of participants and the characteristics of their organizations, such as organizations type, the participant's position, working experience; gender and age.
- Section two (social media): this section set up the actual questionnaire. It consists mainly closed questions related to the respondent's representative profiles in social media. This section aimed to know the rate of social media implementations in the project and the purposes of using social media in the project.
- Section three: It consists of 20 items highlight the effectiveness of social media uses. This section aimed at classify the pros and cons of social media use in project management from the factors related to social media use, by using a five-point Likert scale ranging from one to five was used. Ratings ranging from one strongly disagree to five strongly agree was formed in order to estimate the respondents' responses.

3.2. Data Collection Instrument

The questionnaire was designed on Google drive and sent to sample members by E-mail, and put link of questionnaire on the online (Facebook, WhatsApp etc.). The population of this study was the engineers who work in the construction field, either in the private sector including contracting and consulting companies (grade one and two) or in the public sector in Jordan. Based on a report of the Jordan Engineers Association (JEA) issued in 2019, there are 27276 engineers working in the construction field in Jordan.

The sample size was identified to be 384 individuals (We used 400). The relevant required sample size was calculated based on the equation of Israel (1992):

$$n = n' / (1 + (n'-1) / N) \tag{1}$$

Where:

n: Sample size from a finite population;

N: Target population;

n': Sample size from an infinite population, calculated via the formula $[n' = Z^2pq/e^2]$;

Z: Z value, which is a statistic for the confidence level;

P: Expected prevalence. The most appropriate P value is 0.05 (5%);

Q=1-P;

e: Acceptable margin of error, which is the acceptable error of the estimate for the proportion being estimated.

3.3. Data Analysis

The questionnaire was distributed to 400 individuals from the targeted research population. The percentage of participants who said that they use social media tools in their projects was 89.25%, while 43 participants (10.75%) were eliminated, as they do not use social media tools at work. Table 3 shows the information of the participants (i.e. gender, type of institution sector, occupation and years of experience).

Table 3. Gender, type of institution sector, occupation and experience of participants in the survey

Gender	Male(s)	192	53.8%
	Female(s)	165	46.2%
Type of Institution Sector	Governmental	74	20.7%
	Private sector	283	79.3%
Occupation	Supervisor	67	18.8%
	Project Manager	75	21.0%
	Office Engineer/ Designer	56	15.7%
	Site Engineer	129	36.1%
	Safety and Sales Engineer	27	07.6%
	Others	3	00.8%
Years of Experience	0- 5 years	130	36.4%
	6-10 years	82	23.0%
	11-15 years	68	19.0%
	15-20 years	55	15.4%
	More than 20 years	22	6.2%

The result shows that (53.8%) of the sample members are males while (46.2%) are females. There is an apparent diversity in the sample although the majority of respondents were males in alignment with the nature of the requirements of the engineering industry without eliminating the decent representation of females.

For institution type, only about 20% of the participants work for governmental organizations, and the rest came from the private sector (79.3%). The occupations show that the highest ratio was for site engineers with 36.1%, followed by 21% for the project managers and 18.8% for the supervisors. The years of experience distribution supports the results related to age groups and occupations, where the highest experience group was 0 to 10 years, with about 59% of the sample.

Respondents were asked how many hours a day, on average; they spend on social media sites at work. Figure 2 shows the percentages related to this question, among the 357 respondents.

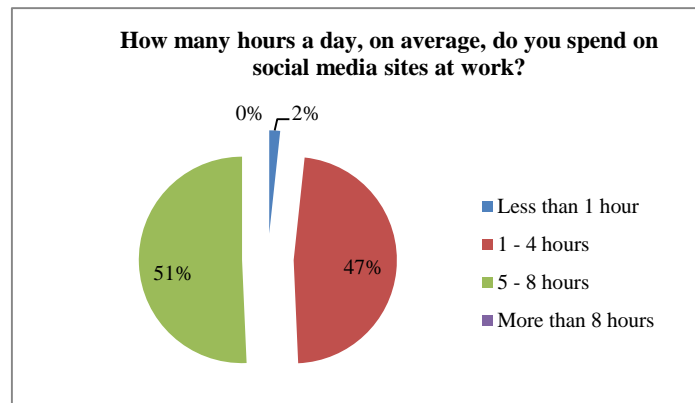


Figure 2. The time that daily spent by respondents on using social media at work

The results show that most of the surveyed engineers use social media from (5 – 8) hours a day at work (50.7%), followed by a period of (1-4) hours (47.6%). The results show that users who use social media for less than one hour a day at work are the group aged 20-35 while the statistics show that the group aged 51-60 are mostly use the social media from (5 – 8) hours a day at work. This indicates that the age do not have vital role on the number of hours of social media usage in construction projects.

Respondents were asked if they think that their institution regulates the use of social media tools. Figure 3 shows the percentages related to this question, among the 357 respondents.

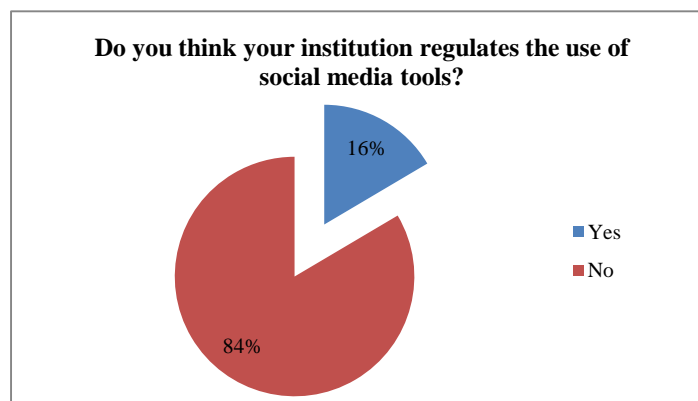


Figure 3. Regulating the use of social media in organizations

Figure 3 shows that as social media has recently emerged to business environments, most of the companies have not regulated its usage in their operations, with a percentage of (83.5%). Using crosstab analysis, the results show that three respondents who work for governmental organizations said that their organizations regulate the use of social media, while 56 from those working in the governmental sector said that their organizations do not regulate the use of social media. For the private sector, 51 respondents said that their companies regulate the use of social media, while 247 respondents working for the private sector said that their organizations do not regulate the use of social media. This finding indicates that most of governmental or private organizations do not regulate the use of social media. This result comes in agreement with King'ori, R. (2013) who argued that it is the responsibility of organizations to think about how social media tools can be regulated in order to enhance performance, especially since social media tools are commonly used at work today [31]. From this perspective, organizations should regulate the use of social media tools in order to utilize them as much as possible with avoiding risks associated with their usage.

Respondents were asked (Which knowledge area mentioned in the Guide to the Project Management Body of Knowledge (PMBOK® Guide) would be best controlled by using social media tools? Rank in order from the most controlled knowledge area to least controlled one, with 1 referring to the most controlled knowledge area and 10 referring to the least controlled one.) This question was not compulsory, because some of the surveyed engineers probably do not know what PMBOK knowledge areas are. The results presented from 74 respondents were project managers. It was found that all respondents (100%) chose communication as the most controlled knowledge area. This finding is not surprising, as social media platforms play a significant role in facilitating effective communication, thereby greatly enhancing communication. Human resources is second one, due to the fact that social media platforms provide the opportunity of coordination between team members. Social media platforms also support the time knowledge area, which ranked third through providing access to useful information in less time. Stakeholders, cost, quality, scope, risk, integration and procurement came in the ranks (4-10), respectively. Project procurement was shown to be the least benefitted knowledge area by the use of social media. That can be attributed to the nature of procurement, which requires traditional project management, where the principal factor contributing to this. So, this is represented in security issues concerning information privacy of numerous aspects, such as contracts, material pricing, and payments. This result was supported by a result from Kanagarajoo (2018), who found that the most benefitted knowledge area was communication, followed by stakeholders, integration, human resources, time, scope, cost, quality, risk and procurement, respectively [3].

For the response time spent on a message that sent by respondents on any social media platform, Among 357 respondents, (64.4%) of the surveyed respondents said that they get a response to a message that has been sent in a time of less than 1 hour. This is important for saving time of the project manager and the project team members. A response time from 1-4 hours came in a second place with (35.6%). There is an agreement upon that saving time as a prominent feature of social media usage.

The questionnaire includes a number of statements about the effectiveness of social media use in projects. Respondents were asked to indicate to what extent you agree with these statements. Table 4 shows the most relevant indicators of the items, including means to show the best data presentation and standard deviations to show data spreading determined by the variability of answers, as well as the level of importance for all research instrument items [32].

Table 4. Questionnaire Items

#	Item	Mean	Standard Deviation	Level of Importance
1	I find it easy to use social media.	3.68	0.801	High
2	Social media platforms are appropriate for project communication.	4.27	0.509	High
3	Social media can store information safely without potential leakage.	1.19	0.536	Low
4	A group chat with the project team can help with fast response time.	3.68	0.745	High
5	Social Media helps me to find all the information, I'm looking for regarding the project.	3.75	0.607	High
6	Social media enables to receive information needed at the right time, regarding issues or events happening in my project.	3.74	0.569	High
7	Misunderstanding is often the reason for tasks not being completed in time.	3.84	0.602	High
8	I use social media for personal communication during the work	4.12	0.733	High
9	Social media help me hold emergency meetings.	3.35	0.621	Medium
10	I sometimes get excess data, as a result of using social media during the project.	3.61	0.816	Medium
11	I find knowledge gaps in skills of social media usage among workers.	3.33	0.567	Medium
12	I am willing to use only one social media platform for information sharing in my projects.	3.59	0.915	Medium
13	I solely rely on information received from social media to do my assignments without consulting other sources.	3.69	0.677	High
14	I follow the latest developments in my projects through social media.	3.76	0.544	High
15	Social media negatively affect work time.	2.91	0.534	Medium
16	Using social media makes certain tasks easier.	3.68	0.944	High
17	I share pictures and videos related to the project with the project team by social media	3.81	0.459	High
18	I will never use social media in my projects.	1.24	0.685	Low
19	I use more than one social media platform for information sharing in the project.	3.76	0.685	High
20	Using social media makes training courses easier and faster.	3.87	0.333	High

According to the results in Table 4, the mean values range in the three levels of importance; (High, Medium and Low).

Firstly, the results did not support the usefulness of social media to save information safely, as seen by the result of the item "Social media can store information safely without potential leakage", The item: "I will never use social media in my projects" also scored a low mean. Although the respondents know that "social media can't store information safely without potential leakage", they will use social media in their projects, this result calls for discussing to highlight how social media can be made safer. The item: "I use social media for personal communication during the work" scored a high mean. It is therefore important that project managers act appropriately to overcome this problem. The study revealed that knowledge gaps in skills of using social media among workers are medium. This finding is somehow surprising, because the use of social media tools in the daily life is so widespread, where it can be considered as a normal use. According to the study results, the impact of social media on project management extends too many factors, thus strengthening project team and, improving team members' communication, relationship building, cohesion, coordination and trust. Thus, effective relationship building among a project team contributes to project success and efficient management. Many previous studies support this result of the current study, such as Leftheriotis et al. (2014) and Sun and Shang (2014) [33, 34].

On the other hand, the results support the easiness of use of social media, e.g: "I find it easy to use social media", as well as the usefulness of social media to save time, as seen by the result of the item: "A group chat with project team can help with fast response time". There are also items of high importance that support the most widely spread function of social media in projects, which is information sharing, such as the items like "Social media help me to find all information, I'm looking for regarding the project", "Social media enable to receive information needed at the right time, regarding issues or events happening in my project" and "I share pictures and videos related to the projects with the project team by social media". The results of these items stress the role of social media in the effectiveness of information sharing. Also, the results of some items like "Misunderstanding is often the reason for tasks not being completed in time", "I follow the latest developments in my projects through social media" and "Using social media makes training courses easier and faster", support using social media in different tasks related to project management. The study revealed that there is a positive impact of social media on project management. This result has been supported by many studies, such as Kanagarajoo (2018), Georgescu and Popescul (2015) and Olteanu et al. (2015) [3, 35, 36].

Table 5. The result of construct validity, reliability and normality

Variables	KMO	Cronbach Alpha	Skewness
Social media	0.811	0.596	0.758
Project management	0.832	0.733	0.134

As per the results shown in Table 2, the KMO (Kaiser-Meyer-Olkin) values for social media and project management show that the sample is adequate for the analysis, as all the values are above 0.8.

Reliability values (Cronbach Alpha) are (0.596 and 0.733) for social media and project management, respectively, which are above the cutoff point recommended by Pallant (2020) [37]. This gives creditability to the results of the study. The results indicate that the skewness results fall in the acceptance range where the values are between -3 and +3 (0.758 and 0.134) for social media and project management, respectively. For the two variables, the results confirm the ability to generalize the study conclusions about the impact of social media on project management over engineers working in Construction Projects.

3.3.1. Regression Analysis and Hypothesis Testing

In order to examine the hypotheses of the study and determine the impact of social media on project management, single regression will be used. The correlation coefficient is a widely implemented statistical measure that determines the direction and strength of any relationship/impact between any two variables [38]. In addition, the "Coefficient of Determination (R^2)" measure the extent of how much that independent variable (i.e., social media) can justify from the dependent variable (project management). R^2 values range between zero and one. The higher R^2 values mean the improved regression model and more close fitting to the observations as per Salkind (2016). Tables 6, 7, and 8 show the model summary, ANOVA, and coefficients for the impact of social media on project management, respectively.

H_{01} : There is no statistically significant impact for social media on project management at the significance level ($\alpha \leq 0.05$).

Table 6. Model Summary – H1

Model	R	R Square
1	0.354 ^a	0.126

According to the results shown in Table 6, the multiple coefficient (R) value is 0.354, which indicates that the correlation between social media and project management is positive and medium. In addition, the value of R² is 0.126, which indicates that social media can justify about 12.6% of project management issues. Last of all, the adjusted R² value shows that analyzing the whole population can justify 12.3% of project management.

Table 7. ANOVA^a – H1

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	3.924	1	3.924	50.980	0.000 ^b
Residual	27.323	355	0.077		
Total	31.247	356			

According to the ANOVA results presented in Table 7, the F- test shows a significant impact of social media on project management (P-value is 0.000 < 5%) at F-value of 50.980. Thus, there is a positive impact of social media on project management.

Table 8. Coefficients^a – H1

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.034	0.243		8.377	0.000
Avg. Social Media	0.511	0.072	0.354	7.140	0.000

T-test results illustrated in Table 8 shows a significant impact of social media on project management at a significance level of 5% and a T- value of 8.377, which is higher than 2. The beta (β) value is 0.511, which means that any increase in social media variable (as an independent variable) by one unit will enhance project management by 51.1%. This is a supportive result to implement social media in project management context. In view of that, H01 will be rejected and the alternative hypothesis will be accepted.

4. Conclusion

The present study aimed at investigating the impact of social media on construction project management. The study revealed that there is a positive impact of social media on project management. The study shows that most respondents use social media in their project, which means that project managers must realize the importance of social media tools in project management and its role in implementing successful projects. On the other hand, there is general agreement among participants upon that their companies do not regulate the use of social media tools. It is necessary to look at deficiencies in this aspect to regulate the use of social media tools at work in a safe and secure way. The present study is also able to rank knowledge areas that most benefitted from the use of social media as follows: communication, human resources, time, Stakeholders, cost, quality, scope, risk, integration and procurement.

Easy use of social media tools is an important reason for utilizing them in project communication. In addition, social media tools have many features, including easy access, speed of information exchange, cost efficiency and time saving. The study found that social media tools provide great opportunities for exchanging pictures, audios and videos related to the project with the project team. The study also indicated that the participants use social media for personal communication at work with a high rating, Project managers should therefore keep that in mind. In addition, the participants said that they sometimes get excess data, because of using social media during implementing the project. This problem can be solved by using only one social media platform for information sharing in the project.

5. Declarations

5.1. Data Availability Statement

The data presented in this study are available in article.

5.2. Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

5.3. Conflicts of Interest

The authors declare no conflict of interest.

6. References

- [1] Mowafy, Gina. "Social media effects on the academic performance of Nile University students.", Master's Thesis, American University in Cairo, Egypt (2018).
- [2] Bahadori Kosanji Zare, Mehdi, Alireza Mirjalili, and Mohammad Mirabi. "The Necessity of Management Team Formation and Its Effect on Civil Engineering Projects Success." *Civil Engineering Journal* 2, no. 6 (June 30, 2016): 286–294. doi:10.28991/cej-2016-00000033.
- [3] Kanagarajoo, Muralitheran V. "A framework for social media use in project management." (2018).
- [4] Eskerod, Pernille, and Anna Lund Jepsen. *Project stakeholder management*. Gower Publishing, Ltd., (2013).
- [5] Hughes, David John, Moss Rowe, Mark Batey, and Andrew Lee. "A Tale of Two Sites: Twitter Vs. Facebook and the Personality Predictors of Social Media Usage." *Computers in Human Behavior* 28, no. 2 (March 2012): 561–569. doi:10.1016/j.chb.2011.11.001.
- [6] Jackson, Paul. *Web 2.0 Knowledge Technologies and the Enterprise: Smarter, lighter and cheaper*. Elsevier, (2010).
- [7] Schürig, H., (2010). *Social Media statt Web2.0*. Available online: <http://www.henningschuerig.de/2010/social-media-statt-web-20/> (accessed on June 2020).
- [8] Parveen, Farzana, Noor Ismawati Jaafar, and Sulaiman Ainin. "Social Media Usage and Organizational Performance: Reflections of Malaysian Social Media Managers." *Telematics and Informatics* 32, no. 1 (February 2015): 67–78. doi:10.1016/j.tele.2014.03.001.
- [9] Adams, Raewyn. "The Cybrarian's Web 2: An A-Z Guide to Free Social Media Tools, Apps, and Other Resources." *The Electronic Library* 35, no. 1 (February 6, 2017): 211–212. doi:10.1108/el-05-2016-0122.
- [10] Kietzmann, Jan H., Bruno S. Silvestre, Ian P. McCarthy, and Leyland F. Pitt. "Unpacking the Social Media Phenomenon: Towards a Research Agenda." *Journal of Public Affairs* 12, no. 2 (March 14, 2012): 109–119. doi:10.1002/pa.1412.
- [11] Kim, Won, Ok-Ran Jeong, and Sang-Won Lee. "On Social Web Sites." *Information Systems* 35, no. 2 (April 2010): 215–236. doi:10.1016/j.is.2009.08.003.
- [12] Harrin, Elizabeth. "Social media for project managers." Philadelphia, PA: Project Management Institute, 2010.
- [13] Jackson, Paul. *Web 2.0 Knowledge Technologies and the Enterprise: Smarter, lighter and cheaper*. Elsevier, 2010.
- [14] Ngai, Eric W.T., Ka-leung Karen Moon, S.S. Lam, Eric S. K. Chin, and Spencer S.C. Tao. "Social Media Models, Technologies, and Applications." *Industrial Management & Data Systems* 115, no. 5 (June 8, 2015): 769–802. doi:10.1108/imds-03-2015-0075.
- [15] Dolan, Callum. "Investigation of the uses of social media in a project environment and the quantification of the benefits of applying social media paradigms to a project environment." PhD diss., University of East London, (2013).
- [16] Kaplan, Andreas M., and Michael Haenlein. "Users of the World, Unite! The Challenges and Opportunities of Social Media." *Business Horizons* 53, no. 1 (January 2010): 59–68. doi:10.1016/j.bushor.2009.09.003.
- [17] Troukens, K. "SM for Project Managers." In *Proceedings of the 2012 PMI Global Congress-EMEA, Marsailles, France, (2012)*.
- [18] Ikemoto, Miriam Naomi, Marcirio Silveira Chaves, Sonia Gantman, and Rosaria De Fatima Segger Macri Russo. "SM4PM: a Prescriptive Framework for Guiding Integrated Use of Social Media in Project Management." *International Journal of Management and Enterprise Development* 19, no. 4 (2020): 330. doi:10.1504/ijmed.2020.110780.
- [19] Rawalai, Viliame. "Social Media Platforms for Construction Project Management." (2017).
- [20] Curtis, A. R. "From Arab Spring to Shahbag: The role of social media in terms of national crisis." *Journal of Mass Communication Journalism* 5, no. 2 (2015): 1-3.
- [21] Cao, Xiongfei, Douglas R. Vogel, Xitong Guo, Hefu Liu, and Jibao Gu. "Understanding the Influence of Social Media in the Workplace: An Integration of Media Synchronicity and Social Capital Theories." *2012 45th Hawaii International Conference on System Sciences* (January 2012). doi:10.1109/hicss.2012.618.
- [22] Edosomwan, Simeon, Sitalaskshmi Kalangot Prakasan, Doriane Kouame, Jonelle Watson, and Tom Seymour. "The history of social media and its impact on business." *Journal of Applied Management and entrepreneurship* 16, no. 3 (2011): 79-91.
- [23] Gonzalez, Ester S. "Internal social media's impact on socialization and commitment." PhD diss., Baylor University, United States, (2013).
- [24] Leonardi, Paul M., Marleen Huysman, and Charles Steinfield. "Enterprise Social Media: Definition, History, and Prospects for the Study of Social Technologies in Organizations." *Journal of Computer-Mediated Communication* 19, no. 1 (October 2013): 1–19. doi:10.1111/jcc4.12029.

- [25] Storey, Margaret-Anne, Leif Singer, Brendan Cleary, Fernando Figueira Filho, and Alexey Zagalsky. "The (R) Evolution of Social Media in Software Engineering." *Future of Software Engineering Proceedings* (May 31, 2014): 100-116. doi:10.1145/2593882.2593887.
- [26] Ristenpart, Thomas, Eran Tromer, Hovav Shacham, and Stefan Savage. "Hey, You, Get Off of My Cloud." *Proceedings of the 16th ACM Conference on Computer and Communications Security - CCS '09* (2009): 199-212. doi:10.1145/1653662.1653687.
- [27] Allcott, Hunt, and Matthew Gentzkow. "Social Media and Fake News in the 2016 Election." *Journal of Economic Perspectives* 31, no. 2 (May 1, 2017): 211–236. doi:10.1257/jep.31.2.211.
- [28] Floreddu, Paola Barbara, and Francesca Cabiddu. "Social Media Communication Strategies." *Journal of Services Marketing* 30, no. 5 (August 8, 2016): 490–503. doi:10.1108/jsm-01-2015-0036.
- [29] Roberts, Deborah L., Frank T. Piller, and Dirk Lüttgens. "Mapping the Impact of Social Media for Innovation: The Role of Social Media in Explaining Innovation Performance in the PDMA Comparative Performance Assessment Study." *Journal of Product Innovation Management* 33 (November 17, 2016): 117–135. doi:10.1111/jpim.12341.
- [30] Omar, Khayri, Rosemary Stockdale, and Helana Scheepers. "Social Media Use in Local Government: An Australian Perspective." *International Journal of Public Administration* 37, no. 10 (August 12, 2014): 666–675. doi:10.1080/01900692.2014.903270.
- [31] King'ori, R. "Explorong social media in organizational processes: a task-technology perspective." Master's thesis, University of Twente, Netherlands (2013).
- [32] Salkind, Neil J., and Leslie A. Shaw. *Statistics for People who (think They) Hate Statistics Using R*. SAGE Publications, (2019).
- [33] Leftheriotis, Ioannis, and Michail N. Giannakos. "Using Social Media for Work: Losing Your Time or Improving Your Work?" *Computers in Human Behavior* 31 (February 2014): 134–142. doi:10.1016/j.chb.2013.10.016.
- [34] Sun, Yuan, and Rong-An Shang. "The Interplay between Users' Intraorganizational Social Media Use and Social Capital." *Computers in Human Behavior* 37 (August 2014): 334–341. doi:10.1016/j.chb.2014.03.048.
- [35] Georgescu, Mircea, and Daniela Popescu. "Social Media – The New Paradigm of Collaboration and Communication for Business Environment." *Procedia Economics and Finance* 20 (2015): 277–282. doi:10.1016/s2212-5671(15)00075-1.
- [36] Olteanu, Alexandra, Sarah Vieweg, and Carlos Castillo. "What to Expect When the Unexpected Happens." *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing* (February 28, 2015): 994-1009. doi:10.1145/2675133.2675242.
- [37] Pallant, Julie. *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*. Routledge, (2020).
- [38] Hair, Joe F., Christian M. Ringle, and Marko Sarstedt. "PLS-SEM: Indeed a Silver Bullet." *Journal of Marketing Theory and Practice* 19, no. 2 (April 2011): 139–152. doi:10.2753/mtp1069-6679190202.