CORPORATE GOVERNANCE, ACCOUNTING, AND SOCIAL MEDIA RISK MANAGEMENT: ACCOUNTING CADASTRE DATA PRIVACY

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***Abstract**: Social media risk (cyber security, accounting data privacy) is always an open issue in corporate governance and accounting, particularly today's after the "Facebook / Cambridge Analytica Scandal". This is even more important in cadastre and land administration cases where the accounting cadastre data privacy has had many dimensions (economical, psychological, political, historical, etc.). In order to address this problem, the innovative concept "Accounting Cadastre Data Privacy – Social Media Risk, ACDP-SMR" is introduced in this article. Then, the concept is projected in four contexts and became a framework rich in collaborative financial engineering functionalities. Finally, the article discusses, evaluates and reviews the application conceptual model as an intermediate step towards a well-defined and documented accounting and corporate governance social media risk management system, in accordance with the international cyber security standards for accounting data privacy.*

***Keywords:** Accounting cadastre data privacy, Social media risk, Cyber security, Social engineering, Collaborative financial engineering, Corporate governance*

1. Introduction

The term "*Social Media Risk*, SMR" has been defined in 2004 by the Committee of Sponsoring Organization's Enterprise Risk Management – Integrated Framework (COSO, 2004) [1]. Social Media (SM) can be described as "*a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user generated content*" [1]. Social media risks can stem from the organization's use of social media, from employees' use of social media, from external sources to the organization, or from a combination of these sources [2].

While SM use can be constructive and profitable to an organization or firm (e.g. cadastre/land administration), but it can pose increased risks due to its interactivity, inclination, tendency, and possibility and tendency of unedited content. Since SM is a communications tool that resides on an organization's ICT platform, it has the potential to increase ICT/cloud computing cyber security and information derivation risks [3]. SM use within cadastre/land administration organizations and firms can also decrease employee productivity and increase reputational risks.

Given that the SMR term focuses on the use of SM by an organization/firm and its employees, it particularly addresses a number of SM management and practice issues (terms) that an organization can control. For instance, the term "*corporate social responsibility*" refers to the respect of human rights in social engineering procedures, and the term "*perceived risk of management and practice*" involves how organizations view ICT/cloud computing security, information leakage, employee productivity, and reputational risks that may arise because of social media use. Also, the term "*policy implementation*" refers to the existence of

rules, guidelines, and policies designed to manage SM risks. Finally, the terms "*staff training*" and "*technical controls*" refer to the development of SM training programs and to implementation of procedures designed to support SM risk management policies [4,5].

The main goal and objective of this article is to examine and define in an application conceptual model, particularly useful in cadastre and land administration organizations and firms dealing with complicated "big" data (i.e. multidimensional social engineering "data": *economical, psychological, political, historical, etc.*); and therefore to propose SMR procedures in corporate governance and particular cadastre and land administration issues, in order to improve the performance of a social media risk management system (cyber security).

2. Background

Given that SM is a complex concept that touches many areas of an organization or firm, and the content of social media is more likely to be more simple and casual compared to other types of organizational communication, it engenders a number of risks not encountered in other forms of data transmission [6]. Particularly, SM risks can stem from the organization's use of SM, from employees' use of SM, from external sources to the organization, or from a combination of these sources. According to financial engineering risk management literature four broad categories of risk associated with organizational SM usage (in management and practice) were identified: ICT/cloud computing cyber security risk, information crack and exposure risk, employee productivity risk, and reputational risk [5,6].

Social media poses an ICT/cloud computing cyber security risk through the potential introduction of viruses, spam, and malware [7]. In particular, employees using social media on the organization's devices might be enticed through social engineering techniques to disclose corporate login and password information [8,9]. Social media use increases the risk of intentional crack or unintentional exposure of classified information, such as cadastre data privacy, employee personal data, proprietary data, intellectual property data, etc. This kind of information leakage may lead to regulatory, compliance, or legal issues if employees communicate classified organizational data via posting comments on social media [7,8,9].

Social media use may threaten employee productivity. Social media presents employees with the challenge of navigating the boundaries between their personal and professional identities. Excessive employee social media use for personal purposes during working hours may result in productivity losses to organizations and misuse of resources [7]. Thus, it is not clear whether social media use decreases employee productivity, or if employees can overcome this challenge and employ social media to increase productivity [6,9]. Finally, regarding the reputational risk concerns that can arise from negative, embarrassing, or incriminating employee comments, hackers may crack (penetrate) an organization's SM accounts and post false or misleading information. In this domain, it must be noticed that controlling reputational risk is a difficult task as there are multiple, antagonistic and contrary viewpoints as to how SM risk should be controlled [6,8]. However, reputational risk that arises from SM use by customers or other parties outside the organization is outside the scope of the SM risk management model proposed in this article.

Following the background discussion, this article uses an organizational approach to manage social media risk (defined Term - personalized innovative Concept - collaborative financial engineering Framework - application financial engineering risk management Conceptual Model) and to introduce the usage of SMR in corporate governance and particularly in cadastre and land administration organizations and firms. The "defined Term" in the proposed organizational approach is the Social Media Risk (SMR) term discussed in Introduction.

3. Hypothesis Development Procedure

This Section indicates, in a concise way and without lengthy definitions, the logic (as a hypothesis development procedure) which has been used in this paper for the interpretation of the "*defined Term - personalized innovative Concept - collaborative financial engineering Framework - application financial engineering risk management Conceptual Model*" proposed organizational approach, referring to SMR adoption in cadastre and land administration issues.

3.1. The Personalized Innovative Concept (Accounting Cadastre Data Privacy – Social Media Risk, ACDP-SMR)

In accounting the management and practice of SMR is below any expectations according the European and International standards for risk management, although internationally the concept "Financial Engineering Risk Management, FERM" is increasingly accepted the last decade. In order to address this problem, the personalized innovative concept "*Accounting Cadastre Data Privacy – Social Media Risk*, ACDP-SMR" has been introduced in this article.

The concept ACDP-SMR is defined as a collaborative financial engineering term, which is actually a pool of factors influencing the utilization of Social Media Risk in accounting and particularly in cadastre and land administration, while focusing on the performance improvement of the risk management process because of the use of ICT and cloud computing technologies.

3.2. The Social Media Risk – Accounting Corporate Governance (SMR-ACG) Collaborative Financial Engineering Framework

For the purposes of the proposed (accounting and corporate governance rich in SMR functionalities) organizational approach, the ACDR-SMR personalized innovative concept is projected in four contexts (corporate social responsibility; rules, guidelines, and policies for social media fair-usage; staff training; and technical control implementation) and became a framework rich in collaborative financial engineering functionalities.

This proposed framework has been named "*Social Media Risk – Accounting Corporate Governance*, SMR-ACG".

3.3. The Application Financial Engineering Risk Management Conceptual Model (FERM Model)

Finally, the SMR-ACG framework has been transformed to an application conceptual FERM model (related to applications for accounting, cadastre and land administration) according to the flowchart-procedure demonstrated in following Figure 1. In order to perform this transformation, the SMR-ACG framework has been parameterized by the items of a 1-d array (i.e. the dimensions of the derived FERM conceptual model) well-defined as operational functionalities [1].

The six (6) items (dimensions) of this transformation modeling are the following:

- *The Human Rights – Accounting Data functionality*;
- *The Threat Identification functionality;*
- *The Risk Assessment functionality;*
- *The Risk Response & Environmental Uncertainty functionality;*
- *The Control Activities – Visual Computing functionality; and*
- *The Information Communication Technologies (ICT) / Cloud computing functionality.*

3.3.1 The Human Rights – Accounting Data Functionality

Commitment to human rights (HR) has become a regular future of voluntary corporate codes of conduct and corporate social responsibility (CSR) reports [10]. Though HR abuse can occur anywhere, debate in the international business accounting sector, as far as the CSR context is concern, tends to concentrate mainly on developing countries and social media companies (Google, Twitter, Facebook, YouTube, Snapchat, etc.).

These debates have focused partly on a number of concerns like, labour conditions, freedom of speech, carefully tailored messages across the digital channels, data-driven digital election campaigns (targeting different ads to different audiences in the months leading up to the election) [11], etc. The human rights – accounting data functionality is directly related to identifying an entity's perceived risk of SM usage.

Hypothesis 1 (COSO: Internal Environment). In the SMR domain, the internal environment of an entity (organization, firm) and particularly the accounting department, encompasses the tone of the entity in ACDP-SMR, and sets the basis of how risk is addressed (i.e. risk management philosophy; risk appetite; ethical values and integrity, etc.) in entity's SMR-ACG framework.

3.3.2 The Threat Identification Functionality

The threat identification functionality refers to the act of identifying those internal and external events which affect achievements of entity's goals and objectives. Obviously in SMR, these events can serve either as risks or as opportunities [5]. The threat identification functionality is directly related to identifying an entity's perceived risk of SM usage.

Hypothesis 2 (COSO: Objective Settings). Objectives must exist before entity's management can identify potential events, with SMR functionality, affecting their achievement. Enterprise risk management ensure that management has in place a process to set ACDP-SMR objectives and that the chosen objectives support and align with the entity's mission and scope, and they are consistent with its risk appetite and entity's SMR-ACG collaborative financial engineering framework.

Hypothesis 3 (COSO: Event Identification). Internal and external events affecting achievements of an entity's ACDP-SMR objectives must be identified, distinguishing between risks and opportunities. Opportunities are channeled back to management's strategy or objective-setting processes in entity's SMR-ACG collaborative financial engineering framework.

3.3.3 The Risk Assessment Functionality

Once a firm or organization identifies its risks, the risk assessment functionality component involves the analysis of the possibility, tendency and significance degree (magnitude) of each risk.

This kind of analysis provides a basis for determining how the entity should manage each identified risk. The risk assessment functionality is directly related to identifying an entity's perceived risk of SM usage [5].

Hypothesis 4 (COSO: Risk Assessment). Risks are analyzed, considering likelihood and impact, as a basis for determining how they should be managed towards the ACDP-SMR objectives [1]. In this hypothesis the risk are assessed on an inherent and on a residual basis as well, in entity's SMR-ACG collaborative financial engineering framework.

3.3.4 The Risk Response & the Environmental Uncertainty Functionality

The risk response functionality refers to how an entity manages its risks. In this domain management develops a set of actions to reduce risks always in line with the official entity's risk tolerance policy.

The environmental uncertainty functionality focused on a number of concerns like global warming, acid rain, air pollution, urban sprawl, waste disposal, ozone layer depletion, water pollution, climate change and many more affect every human, animal and nation on this planet.

Hypothesis 5 (COSO: Risk Response). Management selects risk responses and developing a set of actions to align risks with the firm's or organization's risk tolerances and risk appetite as well on defining the ACDP-SMR objectives. The management risk responses include: avoiding, reducing, sharing, and accepting risk functionalities in entity's SMR-ACG collaborative financial engineering framework.

Hypothesis 6 (COSO: Environmental Monitoring). The corporate environmental responsibility is monitored and modifications to SMR-ACG collaborative financial engineering framework made as necessary. In this domain, management selects risk responses and developing a set of actions to align risks with the firm's or organization's risk tolerances and risk appetite as well on defining the ACDP-SMR objectives. Environmental monitoring is accomplished through ongoing management activities, internal reviews, external evaluations, etc.

3.3.5 The Control Activities - Visual Computing Functionality

The control activities a firm or organization may decide to implement are: (a) staff training activities, in order the entity to ensure that its employees follow formal SMR rules, guidelines, and policies; and (b) technical control activities, such as SMR procedures that have been designed to spot, prevent, or block potential security incidents from SM usage.

Technological competence as it expressed by visual computing utilities in training activities is expected to has impact on ACDP-SMR management and practice [1,5]. Obviously, training is necessary in providing employees with basic ICT knowledge.

Hypothesis 7 (COSO: Control Activities). The ACDP-SMR management and practice performs better in a controlled environment. Hence, in entity's SMR-ACG collaborative financial engineering framework, rules, guidelines, and policies are defined and implemented to help the entity to ensure that the necessary risk responses, on request, have been effectively carried out.

Hypothesis 8 (COSO: Visual Computing Technological Competence). In now-a-days firms and organizations accounting departments with better technological competence, like the visual computing equipment functionality, are more likely to achieve greater ACDP-SMR management and practice and therefore better SMR-ACG collaborative financial engineering framework functionality.

3.3.6 The ICT & Cloud Computing Functionality

ICT and cloud computing functionality is present since staff training conveys information to employees regarding the proper implementation of entity's SMR management.

Hypothesis 9 (COSO: Information & Communication). Relevant raw data, metadata, and information are identified, captured, and communicated in a form and time-frame that enables entity's employees to carry out their SMR responsibilities, to describe their ACDP-SMR objectives and to support the SMR-ACG collaborative financial engineering framework.

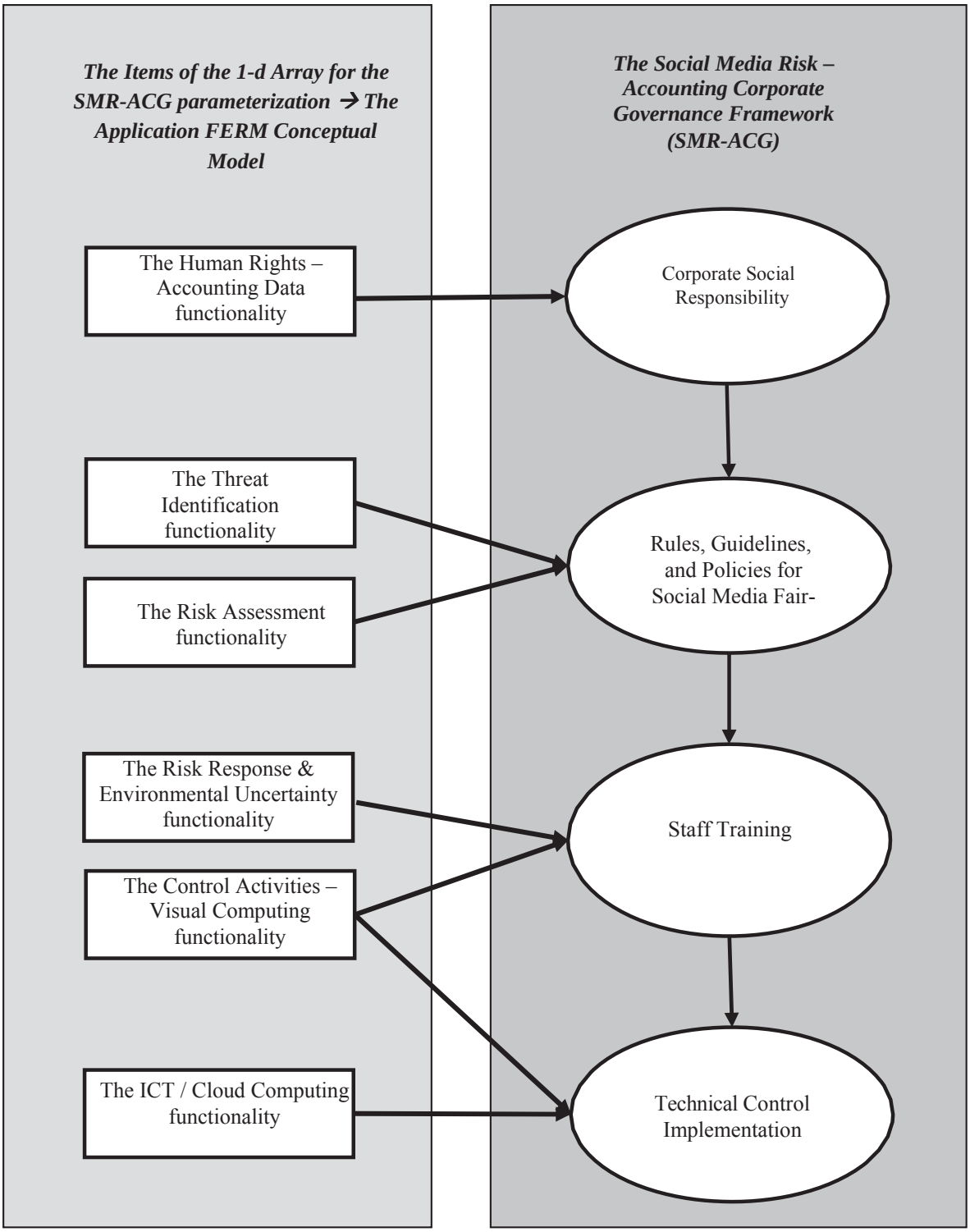

Figure 1 - From the SMR-ACG Framework to the Application FERM Conceptual Model

The proposed application FERM conceptual model could be regarded as an intermediate step towards a well-defined and documented accounting (e.g. cadastral auditing and land administration) and social media risk management corporate governance system, in accordance with the international accounting and SMR standards. Following Figure 2 presents the procedures involved in such as system.

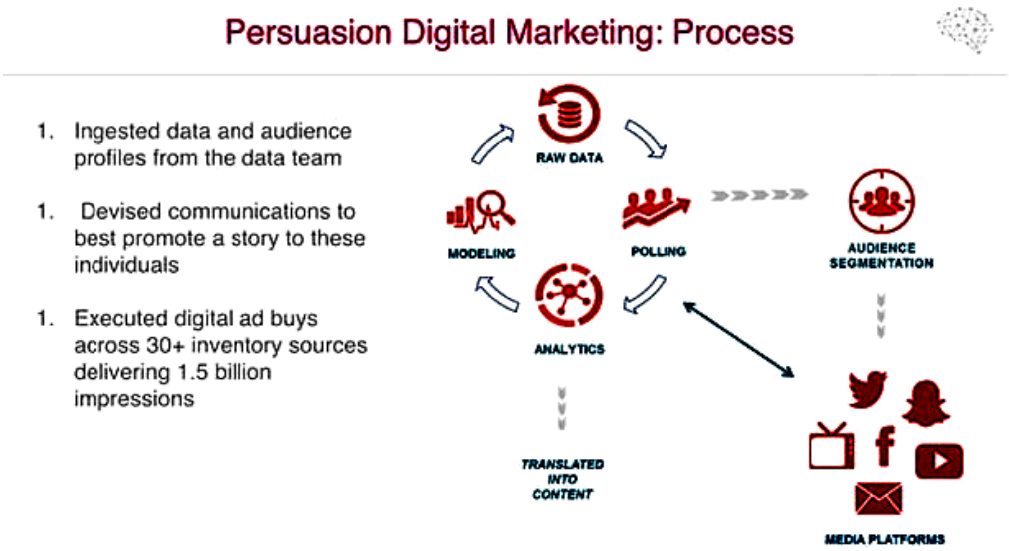

Figure 2 - The final FERM Accounting & SMR Management Corporate Governance System

4. Research Methodology – Analysis - Results

In order to evaluate the proposed methodology a survey was conducted. The survey data were collected from finance, accounting, and risk management professionals during the service of the author of the article at the Career Services Office (CSO) of the Aristotle University of Thessaloniki (Thessaloniki, Greece). The sample consists from 109 individuals and at a preliminary level two questions (*survey constructs*) were asked for filtering purposes.

These questions were the following:

(a) "*Does your Organization/Firm/Company have an established Social Media Risk Policy/Rules/Guidelines?*"; and

(b) "*What Specific Areas do your Social Media Risk Policy/Rules/Guidelines Address?*"

From the 109 participants in this survey, 6 participants were dropped off from the sample, because they answered NO for the (a) question but YES to at least one sub-question from the (b) question-group. Following, a number of questions were asked that assessed, in a scale from 1 (represents: "*strongly disagree*") to 10 (represents: "*strongly agree*"), the four context used by this article for the projection of the ACDP-SMR personalized concept (i.e. social media usage & CSR; perceived risk of social media use; staff training; and technical controls implementation).

Social media usage and CSR (SMU-CSR context) is a formative construct which represents survey participants' perceptions regarding how their organization/firm is using SM externally with customers and internally with employees. This analysis treats SMU-CSR as a formative construct, since any changes in the various indicators of SMU-CSR are assumed to determine relative construct value changes, and these indicators are not necessarily correlated [5]. The perceived risk of social media usage (PR-SMU context) is a reflective construct depicting participants' perceptions of their organization/firm treat risk concerns regarding SM usage [7,8]. This analysis treats PR-SMU as a reflective construct, since the values of the individual measures are assumed to be taken by participants' overall perceptions of the social media risk (SMR) and these individual measures are expected to be correlated [12].

The social media training (SMT context) is a single construct with one reflective measure to the extent to which an organization/firm has adequate training of employees on

SM usage. The technical controls implementation (TCI context) is also a single construct with one reflective measure to which an organization/firm has technical controls to address SM usage. In this domain and for the last two contexts, the policy implementation actually reflects the degree to which an organization/firm has implemented specific rules/guidelines/policies regarding SM usage. It is actually a second-order reflective construct with 3 underlying 1st order construct that address rules/guidelines/policies on employees' personal use of SM; on employees' work-related use of SM; and on human resources related policies.

In following Table 1 the conducted survey's constructs (questions) are presented:

Table 1 – The Survey Constructs

Social Media Usage – Corporate Social Responsibility (SMU-CSR)[a]

Your organization/firm uses social media to:

- (SMU-CSR 1) Improve communications with customers/CSR disclosure.
- (SMU-CSR 2) Increase sales leads and sales.
- (SMU-CSR 3) Develop and maintain our brand/CSR disclosure.
- (SMU-CSR 4) Develop new products/CSR disclosure.
- (SMU-CSR 5) Recruit new employees.
- (SMU-CSR 6) Communicate with current employees.

Perceived Risk of Social Media Usage (PR-SMU)[a]

Your organization/firm is concerned:

- (PR-SMU 1) That the use of social media can damage our reputation.
- (PR-SMU 2) That viruses and malware may be introduced into the corporate network because of employee use of social media.
- (PR-SMU 3) About intellectual property leakage due to social media use.
- (PR-SMU 4) About litigation due to social media use.

Social Media Training (SMT)[a]

Your organization/firm has adequate:

- (SMT 1) Training in place for employees to ensure that understand of appropriate uses of SM.

Technical Controls Implementation (TCI)[a]

Your organization/firm has adequate:

- (TCI 1) Technical controls to support social media rules/guidelines/policies.

[a] Respondents indicated the level of agreement/disagreement with each statement on a 5 point scale, where 1 = strongly disagree and 5 = strongly agree.

In following Table 2, the statistical variable Average Variable Extracted (AVE) for each reflective construct (survey question) well exceed 0.50, while the variable Composite Reliability (CR) well exceed 0.80 for all constructs (survey questions). Hence, according to the statistical theory, the AVE and CR variables ("measures" or 2nd level metadata) indicate that the reflective constructs possess **convergent validity** as a good-quality indicator.

Table 2 - Construct descriptive statistics and correlations (103 accepted participants)

Construct	Mean	Std. Dev	CR	AVE	SMU-CSR	PR-SMU	SMT	TCI
SMU-CSR	3.609	1.054	0.860	0.523	0.716			
PR-SMU	3.750	1.038	0.854	0.614	0.239*	0.794		
SMT	3.033	1.122	0.899	0.803	0.377***	0.329**	0.263	
TCI	3.022	1.103	0.889	0.782	0.354***	0.317**	0.252*	0.877

Notes:

CR: Composite Reliability.
AVE: Average Variance Extracted.
* Denotes correlation among constructs with p-values of 0.05.

** Denotes correlation among constructs with p-values of 0.01.
*** Denotes correlation among constructs with p-values of 0.001.

In following Table 3, the factor loadings for 1st order reflective item indicators (PR-SMU, SMT, and TCI) are greater than 0.80, and the loadings are all greater than the related cross-loadings. This notice actually provides an additional support for **convergent validity** as a good-quality indicator.

Table 3 - Item loadings and cross-loadings (103 accepted participants)

Construct	Indicator	PR-SMU	SMT	TCI
	PR-SMU 1	0.804	−0.178	-0.155
	PR-SMU 2	0.819	−0.154	-0.133
	PR-SMU 3	0.802	0.199	0.177
	PR-SMU 4	0.819	0.132	0.123
	SMT 1	0.022	0.894	0.905
	TCI 1	-0.022	0.893	0.905

5. Conclusions and Future Research

Social Media (SM) usage has emerged now-a-days as the principal mean to communicate between organization's / firm's stakeholders. But as we are benefit from the social media functionalities we are starting to become aware of risk associated within the social media usage (Social Media Risk, SMR). In this article, an application financial engineering risk management (FIRM) conceptual model has been presented.

In order to develop this model a personalized innovative concept was introduced and described (ACDP-SMR); then this concept was projected in four state-of-the-art (according to social media risk literature) contexts. So, the proposed model incorporates these four components as SMR dimensions (Social media usage & CSR; Perceived risk of SM usage; Social media training; and Technical controls implementation) in a collaborative financial engineering framework (SMR-ACG) rich in risk management functionalities.

Finally, for future research the proposed application FERM conceptual model has been discussed as an intermediate step towards a well-defined and documented accounting and corporate governance social media risk management system with spatio-temporal e-learning functionalities [13,14,15], in accordance with the international cyber security standards for accounting data privacy while maintains the default social media communication functionalities.

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