



## Towards Maturity Modeling Approach for Social Media Adoption in Innovation

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# Towards Maturity Modeling Approach for Social Media Adoption in Innovation

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**Abstract:** Social media provides new opportunities for innovation, however its adoption especially in business-to-business innovation has remained moderate. While many companies are experimenting to develop and adopt social media approaches in innovation, many experiments fail, or are not designed in a useful way to maximize learning and social media adoption. Much has been studied and is generally known about the adoption of organizational innovations, such as IT-based solutions. However, very few studies relate directly to the unique challenges of social media adoption and use. Our aim is to develop a pragmatic and easy-to-use and understand framework for aligning social media –related development efforts, basing the framework on many-dimensional maturity modeling not earlier found in academic literature. Using literature and interviews of business-to-business companies, we determined preliminarily major maturity dimensions for social media maturity model in innovation, and preliminary descriptions related to the low and high maturity in each determined dimension.

**Keywords:** social media adoption, maturity models, innovation, business-to-business

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## 1 Introduction

The paradigm of "open innovation" emphasizes importance of the efficient use of knowledge and information, particularly the significance of knowledge residing outside company borders. This is because valuable innovation-related knowledge is being increasingly widely distributed to different actors, organizations and communities.

Importantly, various types of collaborative web approaches, such as social media, can significantly increase the use of distributed knowledge both within and outside company.

Even though social media provides new opportunities for innovation and new ways of involving customers in innovation (Bernoff & Li, 2008; Cachia et al., 2007), social media adoption in innovation has remained low (Inkeroinen, 2010), and especially, its adoption in business-to-business innovation has been moderate (Isokangas & Kankkunen, 2011; Kärkkäinen et al., 2010). While many companies are experimenting to develop and adopt social media approaches in innovation, a large part of the experiments fail, or are not designed in a useful way to maximize learning and social media adoption.

Our aim is to develop a pragmatic and easy-to-use and understand framework for aligning social media -related development efforts. This means, for instance, that we aim to include and focus on the most critical few managerial dimensions that affect adoption in specifically innovation context. We base the framework on maturity modeling, which is commonly used in similar types of roadmapping approaches, e.g. in innovation and collaboration. Maturity modelling has not been previously applied in academically reported studies in social media adoption in innovation. The general purpose of the framework is to enable the development of novel social media -related knowledge and capabilities in a more planned and coordinated way, thus facilitating the adoption of social media. In line with experiences of maturity modeling approaches in other application fields, the purpose of the maturity model framework is to increase the probability of success in social media efforts in innovation.

## **2 Organizational innovation adoption and maturity models**

At general level, much has been studied and is known about the adoption of organizational innovations, such as IT-based solutions. However, while several studies have been conducted on the topic of challenges faced by organizations during the adoption and use of various enterprise systems, very few of them relate directly to the unique challenges of social media adoption and use (Kuikka & Äkkinen, 2011). Some found studies on the issue of social media adoption include the studies of (Far, 2010; De Hertogh et al., 2011; Corrocher, 2010; Zeiller & Schauer, 2011).

There is a huge stream of literature that helps to understand generic factors affecting adoption of organizational innovations or technologies, such as various IT solutions. Generally accepted individual adoption factors, as perceived by potential adopters, include the relative advantage and complexity of the innovation, its trialability, compatibility to current practices, innovation familiarity, etc. As a second adoption approach, there are several adoption models, e.g. Rogers' adoption model (Rogers, 2003) and Technology Acceptance Model (Davis, 1986). These aim to explain the potential users' intention to use technological innovations, more than the adoption per se. As a third approach, in complex and long-term adoption processes, such as the adoption of large IT solutions and the alignment of IT with business, companies have been able to support adoption by using maturity modeling approaches. Maturity models can be described as roadmaps for implementing practices in organisations. Conceptually a maturity model represents phases of increasing quantitative or qualitative capability changes of a maturing element in order to assess its advances with respect to defined focus areas (Kohlegger et al., 2009). We use maturity modelling design literature, as well as found existing maturity modeling approaches of various application areas as important

ingredients in designing the maturity model for social media adoption. Maturity models have shown great promise in helping companies to adopt various types of ICT- related approaches both on organizational level and individual process level.

### 3 Research design

The research design for the maturity model framework for aligning social media –related development efforts included the following steps:

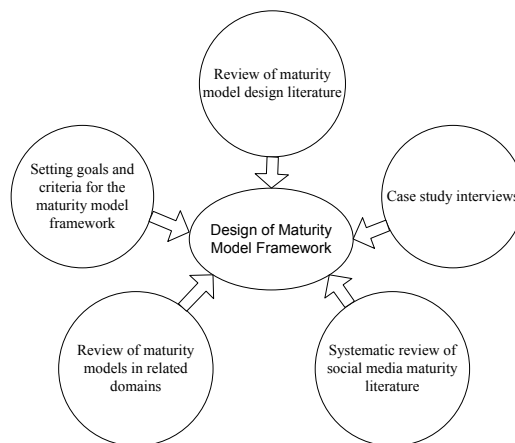


Figure 1: Major factors affecting the maturity model framework design

First we reviewed maturity model design literature for establishing important design criteria (Mettler, 2009; De Bruin et al., 2005). Second, we used the literature and our own objectives to setting goals and criteria for the maturity model framework (Kohlegger et al., 2009; Jokela et al., 2006). Third, we reviewed existing maturity models (Scheper, 2002; Batenburg et al., 2006; Fraser et al., 2002; Hain & Back, 2011; Essmann & du Preez, 2009) in related domains for identifying critical managerial dimensions, creating a picture of potential major dimensions for the maturity model framework. Fourth, we carried out a systematic literature review of social media maturity literature (see section 3.3) in order to identify the critical success factors of social media adoption, combining these to the previous preliminary dimensions and thus complementing the preliminary framework. Finally, we carried out case study interviews in different types of business-to-business companies with different expertise and interests in business-to-business social media, for complementing the picture and determining the criticality of the dimensions from the perspective of the companies. We also assessed the major links between dimensions by the interviews.

#### 3.1 Creating and selecting suitable maturity dimensions for social media maturity model

*Degree of specificity of the social media maturity model.* Since maturity models can be both generic or specific (e.g. industry specific) (Mettler, 2009; De Bruin et al., 2005), this overall goal must be first taken into consideration when planning and selecting the

dimensions. In our case, our goal is to create a maturity model which can be applied in social media development in innovation and business-to-business contexts. Thus, ideally the dimensions should be (at least relatively) independent of for instance business-to-business companies' a) industry b) business logic, and c) product type. Due to the aim of a rather generic model, instead of a strictly company or industry-specific model, the assessed companies and their maturity levels should be at least somewhat comparable according to the dimensions.

*Number of maturity dimensions.* Quite generally, the number of organizational 'foci of assessment', i.e. the dimensions or viewpoints through which the organizations are examined and evaluated according to the maturity levels, varies from 1 to over 20 (Jokela et al., 2006) being typically around 3–7, depending on the model and its purpose. Concerning the number, no exact rule can be given, but the number should be such that the maturity model is capable to detect relevant differences between companies, and to provide useful instructions for improving the level of maturity in the context of the exact maturity assessment task. In addition, the results should be easy to understand. Since humans have limited cognitive capacities for memory, attention and perception, it has been suggested that five to seven items (Miller, 1956), generally known as the golden rule of 7, can be considered simultaneously in human decision making, and later research has maintained that the real number is even less, between three to five (Cowan, 2001). Bearing the above in mind, in our case, while we emphasize the easiness of use and the usefulness of the maturity assessment framework for continuous development of social media use, we aim for the least reasonable amount of dimensions, which would allow the continuous development of social media maturity.

First, the dimensions should be **critical for the maturity assessment purpose**, in our case social media maturity assessment and development. Taking into consideration our important maturity assessment aims, simultaneously, there should not be too many dimensions first, to make the assessment both easy to understand as a whole, and second, not to make the assessment too heavy for the organization or the assessors.

*Generic planning goals.* Maturity dimensions should reflect the critical success factors of social media, as well as the main competence areas which allow the planned adoption of social media. Closely related to social media maturity assessment, the commonly used basis for assessing maturity in information systems are people, processes or objects, or their combination (Kohlegger et al., 2009).

*Alignment and coordination of development in maturity dimensions.* Generally it is thought that in maturity modelling, the advancement in the dimensions should be aligned and coordinated. On the other hand, the relevance of a particular dimension may differ between companies, meaning that it may depend on the companies which dimensions should be most mature. Therefore, ideally, the dimensions, the scales and the levels should be selected also to reflect the above principle in the advancement of social media maturity.

*Independence of maturity dimensions.* Concerning the measurement aspect, ideally the dimensions should also be independent in the respect that for instance maturity in one dimension would not automatically imply maturity also in some of the other dimensions. Naturally, the dimensions, their names and descriptions should be well-defined and similarly understood by all making the assessment.

Bearing the above in mind, we first develop and describe preliminary major dimensions for a social media maturity model in the context of innovation and B2B industry, that is easy to use and comprehend.

### 3.2 Review of maturity models in related domains

As a starting point, since there were no academically described earlier maturity models in the field of social media in innovation or social media in general, one approach was to search for and utilize maturity modeling approaches in related fields. Considering the very substance field, innovation, we were able to find several related maturity models in product development and innovation. Second approach was to benchmark maturity models used more generally in Business Process Management. Third, taking into consideration that social media is based on web2.0 and various related IT- based solutions and applications, we benchmarked models related to the alignment of IT and business, and fourth, since the essence of social media is in collaboration support, several models were found that concentrate on various aspects of business-oriented collaboration, such as e-collaboration, product development collaboration and product lifecycle management (PLM). PLM maturity model is interesting because PLM is essentially about both intra-organizational as well as inter-organizational collaboration, in the specific context of information and knowledge management during the whole lifecycle (Batenburg et al., 2006).

Even though the models had their own more specific focus areas, they had many similarities, as well. Taking into consideration the topic area, social media in innovation, as well as our main design criteria, we benchmarked the maturity dimensions of especially the below described relevant models, but also other ones that seemed to integrate major dimensions or success factors that are important for social media adoption. Most relevant ones for our topic area were Information technology / Systems, Organisation / Processes / Management / Structured development process, People / Culture, Monitoring / Management / Control, and Strategy / Policy / Strategy and objectives / Collaboration strategy. Benchmarking other models, further relevant maturity model dimensions were for instance Incentives / Human Resource Systems / Human Resource Management (Niemi et al., 2009; Hammer, 2007; Kwak & Ibbs, 2002), and Information security (Lessing, 2008; Sallé, 2004). The last two ones are also among the major success factors of social media in business (see next section). In next section, we will combine found critical success factors having an impact to social media adoption to the analysis of the above potential maturity dimensions, deriving more understanding of most relevant maturity dimensions for our model.

**Table 1** Related maturity model domains and their dimensions.

<i>Maturity model domain</i>	<i>Maturity model dimension</i>
Business/IT-alignment (Scheper, 2002)	Strategy and policy, Monitoring and control, Organisation and processes, People and culture, Information technology
Product Lifecycle Management (Batenburg et al., 2006)	Strategy & policy, Management & control, Organisation & processes, People & culture, Information technology
Business Process Management Maturity (Rosemann et al., 2006)	Information Technology and Systems, Culture, Accountability, Methodology, Performance
Product development collaboration (Fraser et al., 2002)	Collaboration strategy, structured development process, systems design and task partitioning, partner selection, getting started, partnership management, partnership

	development
E-Collaboration (Hain & Back, 2011)	Strategy, Processes, People, Systems
An Innovation Capability Maturity (Essmann & du Preez, 2009)	Strategy & Objectives, Function & Processes, Organisation & Management, Data & Information, Customers & Suppliers

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### 3.3 Critical success factors of social media adoption

The existing studies mainly report only individual factors that affect social media adoption, such as management support, people's skills and culture, processes, and empowerment. Supplementing the social media –related maturity modes' maturity dimensions, we attempted to relate the found social media critical success factors to maturity dimensions. One critical area was found to be Incentives, rewards and motivations, not included as a separate dimension in the maturity model studies among the most closely related ones. This was mentioned as critical in almost all critical success factor studies. Second critical area of similar fashion was Information security, mentioned as critical in several success factor studies. Other commonly mentioned ones included top management support, empowerment and simplicity / ease of use. Information technology or Monitoring, management or control did not find very much support in success factor studies, but this does not necessarily mean that they are not among the important factors.

Similarities with above mentioned maturity dimensions:

- Incentives / rewards / motivation (a, b, c, d, g, e, h, i)
- People / Culture / Skills / Attitudes (b, f, g, h, i)
- Information security (d, f, i)
- Organisation / Processes / Management / Structured development process (a, b, d, f)
- Monitoring / Management / Control
- Information technology / Systems
- Strategy / Policy / Strategy and objectives / Collaboration strategy

**Table 2** Critical success factors in social media adoption.

<i>Social media maturity studies</i>	<i>Critical success factors in social media adoption</i>
a) Governing Web 2.0 (De Hertogh et al., 2011)	Empowerment, Processes, Collaboration, People and Culture
b) Adoption, Motivation and Success Factors of Social Media for Team Collaboration in SMEs (Zeiller & Schauer, 2011)	Empowerment, Processes, Collaboration, People and Culture
c) The adoption of Web 2.0 services: An empirical investigation (Corrocher, 2010)	Ease of use, usefulness, tool experience, Extrinsic motivation and intrinsic motivation
d) Evolving the Social Business: A Look at Stages of Growth	Issues of ownership, approval, branding and responsibility, Security, Empowerment, Management

	for Web 2.0 Integration with Business Activities (Jacobs & Nakata, 2010)	models, business models and processes, Motivation
e)	A Conceptual Model for Dimensions Impacting Employee's Participation in Enterprise Social Tagging (Allam et al., 2010)	Perceived usefulness, Perceived usability, Perceived sociability
f)	A Comparative Study on the Use of Web 2.0 in Enterprises (Fuchs-Kittowski et al., 2009)	Business processes, organisational principles of Web 2.0, Top management support, Security, Corporate culture
g)	Web 2.0 in Unternehmen – Eine Fallstudien-Analyse (Granitzer & Tochtermann, 2009)	Management support, Attitude of management, Management acting as a role model, Using opinion leaders and promoting to attract attention and raise interest of employees, Training
h)	Exploring the value of enterprise wikis – A Multiple-Case Study (Stocker & Tochtermann, 2009)	Management commitment and attention, Corporate culture privileging open communication, Convinced users and first-movers that motivate others
i)	Overcoming Organisational Resistance to Using Wiki Technology for Knowledge Management (Pfaff & Hasan, 2006)	Open democratic approach to knowledge sharing, Security and legal concerns, Rewards

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#### 4 Case study interviews

Case study interviews of four B2B company's key persons: CEO of social business design and social media consultancy company, Managing Director and Project Leader of Business-to-business marketing agency, Marketing and Product Manager of automation technology company, CEO and CTO of software company, were performed to determine the criticality of the dimensions from the perspective of the companies and to assess the links between the dimensions. Information oriented selection strategy was used in the selection of cases in order to maximize the utility of information from small samples and single cases (Flyvbjerg, 2006). The intent was "to obtain information on unusual cases, which can be especially problematic or especially good in a more closely defined sense" (Flyvbjerg, 2006), from two companies with extensive experience of social media maturity as well as extensive experience on various types of companies in the business-to-business sector, and two business-to-business organisations with less experience of social media maturity in innovation. Four cases were found to be sufficient for in-depth cross-case analysis (Eisenhardt, 1989). Triangulation of researchers was used in the case company interviews and data analysis in order to explore the phenomena from multiple perspectives (Baxter & Jack, 2008).

##### *Case study 1: Social business design and social media consultancy company*

Company A is a social business design and social media consultancy company focused on helping companies understand and utilize social tools and ways of working to improve



their competitiveness. Company A has broad experience of social media adoption in business-to-business companies ranging from small to large enterprises representing different industries.

Based on extensive practical experience and studies conducted by the company, companies describe several critical managerial dimensions with varying degrees of importance. At a general level especially the innovation-related processes seem challenging for companies. Companies are finding it difficult to integrate social media efforts into business processes. Regarding managerial dimension of needed skills and competences, there seems to be a generational gap, while the younger generation are adept at utilizing social media the older generation have less personal experience with social media, which can lead to different misconceptions about the adoption of social media. Concerning social media practices companies are having difficulties in adopting more interactive and collaborative ways of working. Regarding the motivation to adopt social media companies are finding it difficult sell the benefits of using of social media internally, without knowing “what is it in for me”, there is less incentive to adopt social media. Regarding information security there is yet a relatively common misconception that using social media means sharing all content openly in a public network, which limits the perceived potential of social media.

Two critical links between the managerial dimensions are important from the business perspective. If senior management is not leading, or is lacking on needed skills and competences, it is more likely that the business functions adopt social media rather independently, for example product development uses social media, such as wikis, internally in product development, but the efforts are not coordinated with other functions. Information security is another influential managerial dimension, which has many implications on the social media practices of the company.

### *Case study 2: Business-to-business marketing agency*

Company B is marketing and communications agency specialised in business-to-business context. Company B provides development and implementation for brand- related concepts, marketing solutions, advertising solutions, communication solutions and social media solutions for different industries and companies.

Company B has gained broad experience in implementing and using social media with their business-to-business customers. With the experience Company B has, they stated innovation-related processes, needed skills and competences, social media practices and information security as the most critical managerial dimensions affecting social media adoption. Regarding business processes, according to Company B, companies find it challenging to integrate social media with business processes. Social media is often considered as a new dedicated process in companies, without any connection or need to rethink the role of the existing processes. Another important managerial dimension according to Company B was needed skills and competences where social media adoption encountered challenges with different age groups. The lack of knowledge and skills complicates social media adoption and use among older generation employees and management.

Company B highlights especially one critical link that is between innovation- related processes and social media practices. In innovation- related processes it is difficult to connect and integrate social media with and between processes because companies have the notion that each process requires its own dedicated resources that typically are

established as a separate function from other processes. When adopting new technology, such as social media, the ways of working also with existing technology should be re-examined.

#### *Case study 3: Automation technology company*

Company C provides automation systems. Since the foundation of the company a couple of decades ago, continuous development of innovative products and solutions has been the basis of continued success.

In social media, Company C is utilizing social networking as a source of innovative ideas. Based on the experiences, Company C considers the most critical managerial dimensions being: Information security, Social media practices, Innovation-related processes and Incentives and motives for participation. Company and customer confidentiality must be secured in social media. Not all the social media channels are such, where customers are willing to communicate openly, e.g. about their products or product related problems. Generally, understanding the benefits of social media both personally and for the business can work as an Incentive and motive to participate.

Company C highlighted two critical links between the managerial dimensions. Firstly, the importance of information security is influencing social media practices because it places boundaries for participation of customers in innovation. Not all information is suitable to be shared in social media. Secondly, related to both the Innovation-related processes and Incentives and motivations for participation, it is challenging to measure the financial outcomes of social media adoption and use.

#### *Case study 4: Software company*

Company D is a software company that helps its clients to make better decisions about their property by developing software that adapts to the client's needs and helps to reduce operation costs and increase the value of the investment. Company D can be described as a business-to-business company that is just beginning to adopt social media in innovation with their customers, although they have extensive knowledge of web 2.0 technologies.

Considering information security it's necessary that confidential customer information is only discussed in two-way interaction with customers and not posted on community that is open and visible for all users. Different types of incentives are suitable for different audiences. For example, the key customers could benefit from the opportunity to tailor the product to better meet customer's needs, e.g. to participate in more detail in the ideation of new product features. Whereas, for the broader customer base, the open and visible customer community that provides an opportunity for everyone to post, and comment on new ideas about product features can facilitate learning from others and thus motivate to contribute.

The company described two critical links between the management dimensions. Firstly, depending on the social media practices there are different issues about information security that have to be addressed. Secondly, different incentives have to be used at different levels of social media practices.

### Summary of case-studies

The cross-case analysis (Table 3) summarizes, which managerial dimensions the companies considered most critical. Innovation- related processes, social media practices, incentives and motives for participation and information security were seen in all companies as critical managerial dimensions. Six different critical links between the managerial dimensions were described in the interviews, which indicate that parallel and coordinated development of managerial dimensions is needed.

**Table 3** Summary of cross-case analysis.

	<i>Social business design and social media consultancy</i>	<i>Business-to-business marketing agency</i>	<i>Automation technology company</i>	<i>Software company</i>
Most emphasized critical managerial dimensions				
a) Innovation- related processes	X	X	X	X
b) Needed skills and competences	X	X		
c) Social media practices	X	X	X	X
d) Incentives and motives for participation	X	X	X	X
e) Information security	X	X	X	X
Most emphasized critical links between managerial dimensions				
	(a) and (b), (e) and (a), (e) and (c)	(a) and (c)	(e) and (a), (a) and (d)	(a), (c) and (e), (d) and (c)

## 5 Preliminary social media maturity model dimensions and framework

Based on review of maturity model design literature, related maturity models, social media adoption success factors, and case company interviews the selected critical managerial dimensions and their preliminary low and high level descriptions are illustrated in Figure 2. Other possible managerial dimension candidates include strategy, culture and measurement. However, since strategy should control all managerial dimensions it is perhaps not best represented as another managerial dimension, but as a separate entity spanning all dimensions. Culture is partly connected to Incentives and motives of participation e.g. top management support and attitude of management and also Needed skills and competences, as in participatory culture that manifests e.g. as changed attitude toward intellectual property and strong support for creating and sharing one's creations. Measurement that many other maturity models also do not treat as a separate dimension, is also linked into Incentives and motives for participation. For

example, the need to perceive personal and business benefits in using social media is mentioned in the interviews.

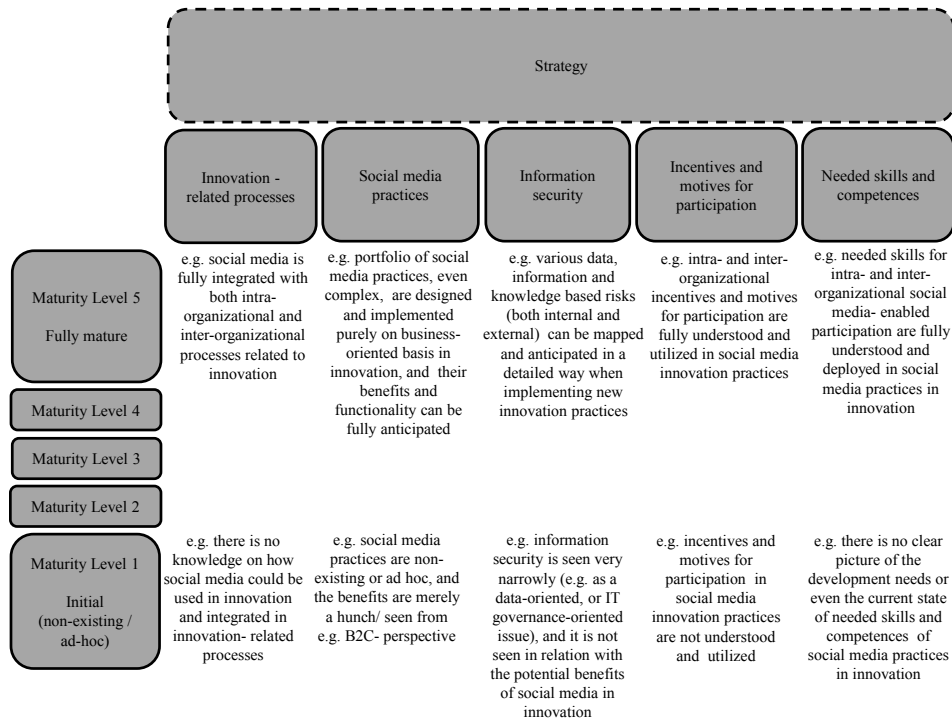


Figure 2. Critical maturity dimensions of social media adoption in innovation, and the preliminary low and high level descriptions of dimensions

## 6 Discussion and conclusions

Our aim was to develop a pragmatic, easy-to-use and easy-to-understand framework for aligning social media -related development efforts, focusing on the most critical few managerial dimensions that affect the adoption of social media specifically in the innovation context.

Using current literature and interviews, the few most critical managerial dimensions having an impact on social media adoption in innovation were Innovation- related processes, Social media practices, Information security, Incentives and motives for participation, and Needed skills and competences. Other possible managerial dimension candidates included strategy, culture and measurement. We created also preliminary descriptions related to the low and high maturity of each dimension. In addition to these, we described some critical links between dimensions important for coordination of efforts, on the basis of literature and company interviews.

It would perhaps be possible to end up slightly in different types of dimensions than the above, for instance depending on in which manner the critical social media adoption factors would be organised and categorised into larger entities. Still, we consider our model and model dimensions to be a good first attempt towards maturity modelling

approach in social media- supported innovation. The framework and dimensions will be further validated and developed in future studies.

Our study contributes to the social media adoption literature in innovation context first by adding our understanding of social media adoption in innovation as a process, as well as the adoption in the form of a roadmap (maturity model). Second, we contribute to the above literature by understanding social media adoption as a sequence of parallelly and coordinatedly developed adoption stages, and as the development of related knowledge, competences and capabilities. Earlier related studies have not considered social media adoption as a process and as the coordinated parallel development of competences that are interconnected.

Considering the managerial implications, first, the developed maturity model will help companies to adopt social media in a more coordinated and faster way. Second, it can be presumed to increase the probability to succeed in social media efforts, and to enable the companies to create more intelligent and realistic experiments when facilitating social media adoption. Third, it enables the development of novel social media -related knowledge, capabilities and competences in a more planned way, and develop a roadmap for their facilitation in the longer period of time

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