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# Social Customer Relationship Management: An Architectural Exploration of the Components

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**Abstract.** In the recent years, social media have rapidly gained an increasing popularity. Companies have recognised this development and anticipate advantages from using social media for commercial purposes. Social customer relationship management (CRM) professionalises the use of social media and aims at integrating customers into operational procedures. This induces changes of existing structures, e.g. culture and organisation, business processes, information systems (IS), data structures, and technology. The intended transformation from CRM to social CRM is a complex task, because different aspects are affected, which also are mutually dependent. A prerequisite for the successful implementation of social CRM is understanding these aspects and its dependencies. Separation of concerns is a useful means of addressing complexity. The conglomeration of different issues is dissolved by conceptualising components and its relationships. This paper separates the concerns of social CRM using architectural perspectives and aims at building a better understanding. The research method is a literature review in which artefacts are gathered and assigned to five layers, which are business, process, integration, software, and technology. The conclusion states that social CRM is an emergent research field and comprises a call for more artefacts that concretise abstracted components of the business-layer.

**Keywords:** Social CRM, design science, Enterprise Architecture, artefacts, literature review.

## 1 Introduction

Social media have gained interest and popularity in the past years. They are applications that build on web 2.0, which is a concept that encourages connecting, participation, and collaboration of users and sharing of content over the Internet [1]. The high number of social media users attracts attention of companies, which aim to profit from the potentialities [2, 3]. At a first glance, with only little effort companies can use social media to publish advertisements that reach many people, which improves the marketing efficiency. This view, however, is short-sighted. A closer study reveals more opportunities, which are enabled by the integration of social media and the consumers into operational procedures. Examples of the potentialities are support-cost reduction, product innova-

tion, and improvement of the reputation [4–6]. Social customer relationship management (CRM) is a philosophy and business strategy that professionalises the relationship to customers using social media and aims at realising the opportunities [7].

The transformation of an organisation from CRM to social CRM is a complex task, because many different aspects are affected, which also are mutually dependent. For example, Askool & Nakata [8] highlight that a strategy must be developed to govern social CRM initiatives. The management's task is to provide for a supportive company culture and implement organisational changes [9]. Existing information systems (IS) need adjustments to enable and enhance business processes. Finally, Social CRM requires integrations on functional and technological level [10–12]. Without understanding social CRM and its components, implementation projects are likely to fail. However, a holistic view of the components is still missing. The existing literature either focuses on single aspects or provides an abstracted overview of multiple aspects without giving details [13, 14]. This is justifiable in consideration of the complexity of social CRM. Still, a complete picture is desirable. Separation of concerns is a useful means of addressing complexity. The conglomeration of different issues is dissolved by conceptualising the components and its relationships. Artefacts, which are the results of design science, document components and its relationships of a domain of interest. They contribute to actual design-oriented business problems and support the implementation of technology-based solutions [15, 16]. This paper aims to answer the following research question (RQ):

*RQ: What are the components of social CRM from an architectural perspective?*

The intention is to build a better understanding of social CRM from an enterprise architect's view. Instead of proposing another abstracted framework or deep diving into parts of the complex, the present paper reuses existing research results and integrates the findings into a holistic view. The concerns of social CRM are separated using connected architectural perspectives. This allows investigating social CRM focused on specific aspects and in its entirety. The research method is a literature review, which allows determining the current state of research. The artefacts of the discovered publications are assigned to five layers, which represent the architectural perspectives business, process, integration, software, and technology. The layers are adopted from Enterprise Architecture (EA), which is a holistic framework that helps representing an enterprise's artefacts. Each layer is a view from the perspective of a specific concern. All artefacts of all layers represent the entire body of knowledge within the research scope. The target groups of this paper are IS architects and researchers of social CRM.

The paper is structured in five chapters. Chapter 2 gives the background of the underlying concepts, which are social CRM, artefacts, and EA. The research method is described in chapter 3. Then, the findings are presented considering each architectural layer. Finally, the paper concludes with a discussion and interpretation and guides further research.

## 2 Conceptual Foundation

Fig. 1 provides an overview of the architectural exploration of the artefacts of social CRM. Each EA-layer may contain artefacts, and a single artefact may also address concerns of multiple layers mutually. Artefacts of social CRM and artefacts of CRM are included to broaden the perspective.

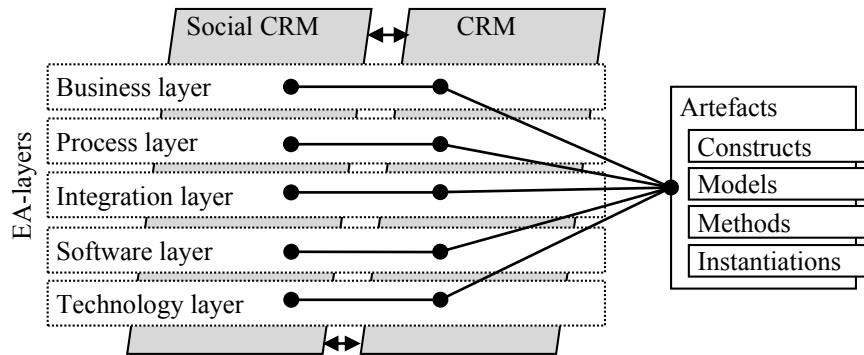


Fig. 1. Overview of the architectural exploration

### 2.1 Social CRM

Web 2.0 is a concept of the internet, which enables users to create content collaboratively and build a network with other users. The characteristics are user participation, openness, and network effects [1]. Openness means that results from user participation (e.g. posts, comments, and profiles) are accessible by other parties of the community. The concept is the foundation for social media, which are applications of the web 2.0 concept.

A basic feature of social media is to connect to other users to share information with them [17]. This principle is beneficial for the CRM of the company, which has the objective to establish and maintain profitable relationships to key customers and customer segments. CRM is a strategic approach that “involves identifying appropriate business and customer strategies, the acquisition and diffusion of customer knowledge, deciding appropriate segment granularity, managing the co-creation of customer value, developing integrated channel strategies and the intelligent use of data and technology solutions to create superior customer experience” [18].

Companies participate in the social network of users connecting to its target group. This facilitates the opportunity to gain business-relevant insights from the accessible data of the communication between the users. These insights help to intensify the relationship and to align the business with consumer needs. The integration of CRM with social media leads to the term "social CRM", which is a philosophy and business strategy [7]. Customers are engaged to participate in business processes with the result of a value-added for both: the company and the customer.

## 2.2 Artefacts

Design science research is a paradigm that aims at solving real-world problems by designing general solutions. It is a fundamental IS discipline, which develops artefacts that improve the capabilities of organisations [15]. Generality means that an artefact solves a class of problems instead of an individual problem of a single organisation. March & Smith [19] identify four artefact-types, which are constructs, models, methods, and instantiations.

Constructs are the basic language of concepts needed to describe phenomena. Models build on constructs and relate them with each other. Methods describe activities to meet specified targets. These foregoing artefacts can be instantiated in specific implementations representing the fourth artefact-type. The two main evaluation criteria are that artefacts are innovative and valuable [20]. Artefacts are ideal candidates to answer the research question, because they make components and its relationships explicit.

## 2.3 Enterprise Architecture

EA is a holistic framework, which provides views of an organisation's system from the perspective of specific concerns [21]. According to ISO/IEC/IEEE 42010:2011(E) [22] architecture is defined as the "fundamental concepts or properties of a system in its environment embodied in its elements, relationships, and in the principles of its design and evolution". The elements of a system can be related to five EA-layers, which are business-layer, process-layer, integration-layer, software-layer, and technology-layer [23].

The business-layer represents the strategy and subsumes organisational goals and success factors, products/services, targeted market segments, core competencies and strategic projects. The process-layer contains models to represent organisational units, business locations, business roles, business functions, metrics and service flows, for example. Applications and enterprise services are associated with the integration-layer. The software-layer contains software-components and data resources. Hardware units and network nodes operate on the level of IT infrastructure (technology-layer). Relationships exist between components associated to the same layer and across layers. In the context of social CRM, sales and support are connected processes, for example, which both are associated to the process-layer. Social media are applications, which ultimately run on hardware. Thus, a connection between components of the integration-layer and components of the technology-layer exists. Aier, Gleichauf, & Winter [21] identify the dissolution of information silos as an exemplary means of use of EA, which is the intention of use in this paper.

## 3 Method

The method for finding the existing artefacts is a literature review. Vom Brocke et al. [24] propose guidelines of a rigorous process of literature reviews. They state that not only results should be presented, but, to allow replicability, also the approach. Table 1 characterises the conducted literature review following the taxonomy proposed by

Cooper [25]. The focus (1) is on existing constructs, models, methods, and instantiations that support the design, implementation and governance of social CRM. The goal (2) is to connect to existing knowledge to solve the research problem on a conceptual level (3).

The perspective (4) can be characterised as neutral representation, because the position is unbiased. Practitioners and researchers of social CRM are the target audience (5). The results are representative (6) for the IS community because prominent data sources have been queried.

**Table 1.** Taxonomy of the conducted literature review (borrowing from [25])

Characteristic	Categories			
(1) focus	research outcomes	research methods	theories	applications
(2) goal	integration	criticism	central issues	
(3) organisation	historical	conceptual	methodological	
(4) perspective	neutral representation		espousal of position	
(5) audience	specialised scholars	general scholars	practitioners	general public
(6) coverage	exhaustive	exhaustive and selective	representative	central/pivotal

A keyword search in the databases of AISEL, EBSCO, Emerald, IEEE, JSTOR, ProQuest, and Web of Science in title (TI), topic (TO), abstract (AB), keyword (KW) and full text (TX) fields was applied. The first search-string was built to find specific design science results containing the term “social CRM” in particular. The total number of hits without duplicates was low (24). As a consequence, the search-string has been broadened. The second search-string includes design science results that consider CRM and also social media or web 2.0. This ensures the inclusion of research results that are applicable to the research scope whereas the term “social CRM” is not used. Only reviewed publications have been considered to ensure the level of quality. Duplicate publications of the two searches have been removed. The relevance of the distinct papers has been determined by reading the full texts. For example, publications that defined the term “CRM” as “component reference model” or “core reaction model” have been treated as not relevant. Only original publications written in English have been incorporated. The artefact-type of the found artefacts has been determined and the publication has been assigned to an architectural-layer. In cases where no unequivocal assignment could be made, multiple assignments of the same publication to all fitting layers have been made.

## 4 Findings

Table 2 shows the numerical results of the literature review. The two search-strings, which ultimately lead to the relevant publications, are the following:

*Search-string (1):* “social crm” AND “design science”  
*Search-string (2):* (crm OR “customer relationship management”) AND (“web 2.0” OR “social media”) AND “design science”

The keyword “design science” proved to be eligible, because it allows an efficient and effective search. Prior searches with the keywords “architecture” or “integration” did not lead to noteworthy results. Applying the keyword “model” shows results, but this term is more often used in the context of quantitative research and signifies statistical models and does not lead to the sought architecture elements. Both terms “elements” and “components” are too broad and do not reduce the results sufficiently.

**Table 2.** Numerical results of the literature review

Data source	Search fields	Search string		Publications	
		(1)	(2)	Total <sup>1</sup>	Relevant
AISeL	TI, AB, KW, TX	21	38	53	12
EBSCO	TI, AB, KW, TX	2	53	53	5
Emerald	TI, AB, KW	--	1	1	--
IEEE	TI, AB, KW	1	4	5	2
JSTOR	TI, AB, KW, TX	--	5	5	--
ProQuest	TI, AB, KW	3	46	46	1
Web of Science	TI, TO	--	--	--	--
<b>Total<sup>1</sup></b>		<b>24</b>	<b>137</b>	<b>151</b>	<b>21</b>

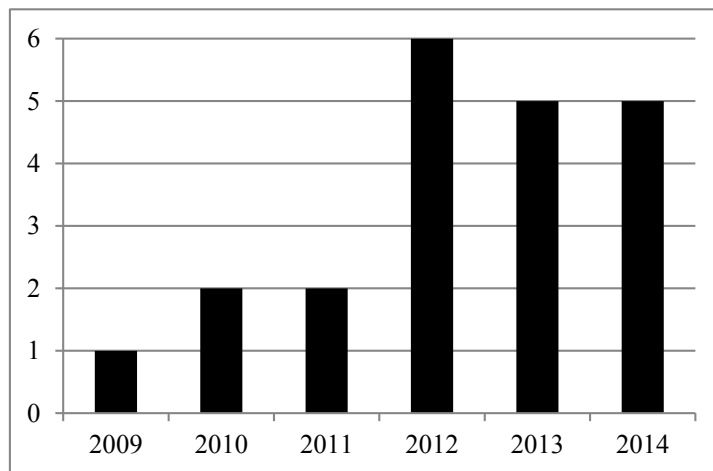
Applying the search-string (1) to the data source AISeL displays 21 results. This indicates two different things. Firstly, social CRM is a present research field of the IS community. Secondly, design science is a common research paradigm of this research field. Apart from that, Emerald, JSTOR, and Web of Science display no results for search-string (1). A possible reason is that Emerald and JSTOR include mainly journal publications and no conference papers. The publication-period of conference proceedings is usually shorter. Hence, “social CRM” is a novel term that is not yet established in journals. The fact that JSTOR has results for “design science”, but no results for “social CRM”, supports that argument. Emerald does not feature to search the full texts of publications and the occurrence of “social CRM” and “design science” in the metadata is non-existent. This also applies to Web of Science, where only title (TI) and topic (TO) fields are searchable. In total, search-string (1) leads to 24 unique publications.

Applying search-string (2) displays results in all data sources, except Web of Science due to the limitation to search in the abstracts or the full texts of the publications. The high total number of unique results (137) indicates that CRM is better established in research than social CRM. More precisely, the term “social CRM” is not as widely used as the combination of CRM and web 2.0 or social media. This is not surprising, because

<sup>1</sup> The total numbers are not equal to the column and row sums respectively, because duplicates have been counted only once.

all three terms CRM, social media, and web 2.0 are the foundation and a prerequisite to define social CRM. EBSCO, ProQuest, and AISEL are the data sources with the highest totals for search-string (2).

In summary, 21 relevant publications describe artefacts that represent components of social CRM. Fig. 2 shows the yearly distribution of the publications. The findings indicate that social CRM is a contemporary research field. All artefacts have been published in the past six years. The year 2012 is remarkable, because the number of publications increased threefold compared to the previous year. Since then, the number of publications that include artefacts relevant to social CRM amounts five to six per year in the queried data sources.



**Fig. 2.** Distribution of the relevant publications per year

Table 3 lists the publications, the artefact-types, the artefact-names, and the addressed EA-layers. A model is the most commonly occurring artefact-type among the explored publications. Eleven publications present models, five describe instantiations, three develop a method, and two publications propose constructs. Models, methods, and instantiations are built on constructs [19]. Consequently, every publication that describes an artefact contains or relies on constructs. In cases where models, methods, and instantiations implicitly rely on artefacts of other types, only the targeted artefact of the publication is incorporated. As a result, the number of counted constructs can be less than the number of the other artefact-types.

The business-layer includes the most artefacts. Ten artefacts address aspects of the business-layer, nine thematise processual issues, nine target applications of social CRM (integration-layer), seven outline software issues, and no artefact depicts components of the IT infrastructure (technology-layer). The artefacts of ten publications address concerns of multiple EA-layers. Examples are framework-models, which provide different views of components and its relationships [13, 26, 27]. Five artefacts address aspects of the integration-layer and software-layer in conjunction. The combined consideration of the business-layer and process-layer occurs four times and is second most therewith. This indicates a close architectural relationship between these layers.



A model of the business-layer is most frequent counting seven occurrences. Four publications develop models that highlight processual issues and four other publications describe instantiations that relate to the integration-layer implementing applications.

**Table 3.** Explored publications, artefact-types, artefact-names, and addressed EA-layers

Publication	EA-layer					Artefact-type			Artefact	
	Business	Process	Integration	Software	Technology	Constructs	Model	Method		Instantiation
[28]	○	○	●	●	○	○	●	○	○	<i>Framework of an ontology-based social media analysis</i>
[29]	○	●	○	○	○	○	○	○	●	<i>Text mining application for exploring the voice of the customer</i>
[30]	○	○	○	●	○	○	●	○	○	<i>Data model of data objects of social networks</i>
[31]	○	○	●	○	○	○	●	○	○	<i>Framework for gathering business intelligence from blogs</i>
[32]	○	●	●	●	○	○	○	○	●	<i>Social CRM tool framework</i>
[33]	●	○	○	○	○	○	○	●	○	<i>Method for developing a taxonomy of social media</i>
[14]	○	○	●	●	○	○	○	○	●	<i>User interface design for Twitter</i>
[34]	●	●	○	○	○	○	○	●	○	<i>Social media innovation method</i>
[35]	○	○	●	○	○	○	○	○	●	<i>Social data analytics tool (SODATO)</i>
[26]	●	●	○	○	○	○	○	●	○	<i>Social CRM framework</i>
[36]	●	○	○	○	○	●	○	○	○	<i>Web 2.0 factors and value drivers</i>
[37]	●	●	●	○	○	○	●	○	○	<i>Maturity model for the adoption of social media</i>
[38]	●	●	○	○	○	○	○	●	○	<i>System dynamics model and word-of-mouth effects</i>
[39]	○	●	○	○	○	●	○	○	○	<i>Ontology for IS sentiment analysis</i>
[13]	●	○	○	○	○	○	○	●	○	<i>Enterprise 2.0 management framework</i>
[40]	○	●	●	●	○	○	○	●	○	<i>Blueprint of an analytical social CRM system</i>
[41]	○	○	○	●	○	○	○	●	○	<i>Social network data model</i>
[42]	●	○	○	○	○	○	○	●	○	<i>Customer satisfaction theoretical framework</i>
[43]	○	○	●	●	○	○	○	○	●	<i>Multimedia platform providing social e-services</i>
[27]	●	○	○	○	○	○	○	●	○	<i>Social media strategy framework</i>
[44]	●	○	●	○	○	○	○	○	●	<i>Social app prototypes</i>

Legend: ○ not a focus of the publication; ● focus of the publication

#### 4.1 Business-layer

The artefacts of the business-layer address abstracted concepts, strategic aspects, organisational goals or success factors relevant to social CRM. Emamjome et al. [33] propose a method for developing a taxonomy of social media in an organisational context. The findings help to create an understanding of the concepts and support building a foundation for further research. Patten & Keane [13] conceive social CRM as a com-

bination of three dimensions of a company-wide concept. Their Enterprise 2.0 Management Framework relates the dimensions (1) technology, tools and capabilities, (2) user-generated content, and (3) employee and customer applications, which are governed by culture and policies.

The maturity model of organisational adoption of social media allows positioning and comparing of the companies' achievements along the dimensions strategy, processes, IS, culture, and governance [37]. The artefact is useful to determine and adjust the approach to social media from a strategic perspective. Factors and value drivers of web 2.0 support the creation of a social CRM strategy, because they show causes and effects in a business context. Lehmkuhl & Jung [36] identify social networking, interaction orientation, user-added value, and customisation/personalisation as factors, which have a varying relevance for a specific company depending on the business model. A commerce-oriented online marketplace, for example, should encourage the customer-company and customer-customer communication (interaction orientation). A content-oriented online newspaper can profit from gathering and exchanging information and opinions of its readers by enabling social networking. According to Werder et al. [27], the social media strategy should include three components, which are scope, capabilities and governance. The scope is defined by actors, platforms and interaction. Social media objectives and activities are conceived as capabilities. The governance-component addresses value, resources and risks. Customer experience and customer satisfaction are further strategic focus areas that need attention and allocation of funds [42].

Yoon et al. [44] develop a conceptualisation of social commerce identifying the components user contribution, participation, collaboration and technological features. By reference to the customer life cycle model they argue that web 2.0 supports business goals. Interesting to note, social commerce addresses similar aspects of what Greenberg [7] terms social CRM. A clear differentiation between both terms is missing. In summary, the artefacts of the business-layer help to understand basic concepts, identify strategic aspects for planning and organising social CRM, include recommendations for governance, and “[stimulate] thinking about the impact of social media beyond the marketing function” [27].

## **4.2 Process-layer**

In order to implement social CRM in organisations the management needs to introduce, adjust, and evaluate business processes. A framework model helps to scope the tasks and structure work packages. The core processes for planning social CRM are readiness assessment, strategy development, value creation, multichannel management, information management and performance measurement [26]. The implementation-activities are governed by project management & change management and employee engagement. Helms et al. [34] focus on user participation in the innovation process developing a social media method for matching innovation tasks with social media characteristics. The characteristics are organised in three dimensions, which are audience, content and time. Botzenhardt et al. [29] focus on supporting the product development process. Their instantiation is a text mining software that analyses the unstructured content of

customers' posts in social media. Maier & Reinwald [38] support the decision-making in the complaint management process. The authors propose a system dynamics model and incorporate the influence of social media on word-of-mouth effects and the customers' repurchase behaviour. Online social networks act as an accelerator and can have both: positive and negative effects.

The artefacts of the process-layer represent only some processes of social CRM. Other relevant processes are not covered, e.g. customer support, lead management, up-selling/cross-selling, and market research.

### **4.3 Integration-layer**

The artefacts of the integration-layer propose models of applications and describe real-life instantiations of social CRM applications. The framework of an ontology-based social media analysis is a social CRM system model [28]. The central component is the Text Mining Framework, which has social media interfaces to access data of social media and database interfaces to enrich the data of enterprise systems (e.g. CRM system). The Ontology Engineering component extracts domain concepts of the company (i.e. ontology) from the data of its enterprise systems. The extracted company information and information about products is forwarded to the text mining application, which uses the ontology for filtering relevant and irrelevant social media data. The insights from social media data can be used to enhance products or plan marketing campaigns, for example. Chau & Xu [31] propose a framework for collecting and analysing business intelligence in blogs. This model is more concrete and regards blogs, which are a type of social media. The approach is the same: content analysis techniques are used to gather insights from the user-created content. Deng et al. [32] apply network analysis technologies to enhance marketing and sales processes and implement an application. The publication contains details of the data resources and software components and thus is additionally assigned to the software-layer. The Social Data Analytics Tool is a software-instantiation that fetches the social graph and the social text from social media [35]. The social graph represents actors and actions. Sentiments, keywords, and topics are extracted from the social text. Spagnoletti & Resca [43] implement a multimedia online platform and highlight that an online-community is a valuable tool for CRM.

Most artefacts of the integration-layer concentrate on gathering insights from social media data using analytical technologies. The represented integrations between enterprise systems and social media have in common that they follow an extract-transform-load (ETL) approach. This leads to a unidirectional connection from social media to the enterprise systems. However, a communication needs a two-way integration.

### **4.4 Software-layer**

The artefacts of the software-layer model components of social CRM applications. Examples of components are the user interface and the data model [14]. Rosemann et al. [41] include social media data in a Business Intelligence (BI) system that is capable to report on characteristics, needs, wishes and demands of customers. These insights are

extracted by analytical operations on a combined set of the data of the CRM system, the data warehouse and social media. Key activities and components of the analytical social CRM system can be organised by the groups social web, multi-channel-management, analytical CRM, data, and operational CRM [40]. Analytical operations on the data are analysis, reporting, monitoring, and generating. The operational activities are planning, executing, and controlling CRM processes.

The identified artefacts are valuable to describe the structure and function of social CRM applications. The models and instantiations either focus on single components of a social CRM application in detail or give an overview of multiple components and its relationships.

#### **4.5 Technology-layer**

No artefact represents technological aspects of IT infrastructure, such as hardware units, network nodes, and physical servers. It is undisputed that technology is an important component of a social CRM system [7]. However, the artefacts discovered in the literature review do not provide details about necessary or recommended IT infrastructure components.

## **5 Conclusion**

Social CRM is an emergent research field with an increasing number of publications that present artefacts. However, the term is not commonly established. Besides “social CRM”, researchers use the terms “Enterprise 2.0”, “CRM 2.0”, and “social commerce” without clear differentiation [13, 44, 45]. The findings help to establish a better understanding of social CRM, because the explored artefacts reveal the components and its relationships. Social CRM, in entirety, comprises aspects of the business-, process-, integration-, software-, and technology-layers. No single artefact, however, covers all components of all layers mutually. This is explainable by the complexity of social CRM and, in consequence, the need to examine the philosophy and business strategy on different levels of abstraction and by separation of concerns. No discovered artefact represents components of the technology-layer. A possible reason is that the setup of hardware units, network nodes and servers are specific to an organisation and depend on company-size and individual organisational requirements. However, research results should also be applicable to other (similar) situations. Artefacts provide a general solution to a problem in a specified context [15, 19]. Hence, it is not surprising that the technology-layer is under-represented in research. On the contrary, artefacts of the technology-layer are a possible research output. Examples are design principles of successful infrastructure-setup to accommodate the high load of the analytical social media data processing.

The findings have managerial impacts. Not all artefacts, however, are relevant to all stakeholders of social CRM. For example, the management of an organisation might want to adduce artefacts of the business-layer to refine the social media strategy, while

developers receive conceptual guidance from the models and instantiations of the integration-layer and software-layer in particular.

A limitation of this research is that the quality of the discovered artefacts has not been evaluated. Furthermore, due to the research question, only design science results, i.e. artefacts, are included in the literature review.

Further research may focus on components of a single layer, multiple layers, or the connection of the layers. A higher layer gives orientation and determines aspects, which need further concretisation on a lower layer. For example, culture and governance are mentioned as important issues of the business-layer [13, 37]. However, no artefact on the process-layer continues these aspects. It is not sufficient to identify *what* the important components of social CRM are, but also *how* the components function. In summary, the findings lead to a call for more artefacts that concretise the components of the business-layer. Especially constructs, which define a common terminology and methods that guide the successful implementation of social CRM components are sparse.

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