

Presenting an Integrated Framework for the Introduction and Evaluation of Social Media in Enterprises

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Abstract—In this paper, we present an integrated framework that governs the introduction of social media into enterprises and its evaluation. It is argued that the framework should address the following issues: (1) the contribution of social media for increasing efficiency and improving the quality of working life; (2) the level on which this contribution happens (i.e., individual, team, or organisation); (3) a description of the processes for implementing and evaluating social media; and the role of (4) organisational culture and (5) management. We also report the results of a case study where the framework has been employed to introduce a social networking platform at a German enterprise. This paper only considers the internal use of social media.

Keywords—Case study, enterprise 2.0, framework, introducing and evaluating social media, social media.

I. INTRODUCTION

CHANGE has become for today's enterprises an imperative. Increased global competition, demographic developments (e.g., in many Western countries the average age of the population is increasing), or (disruptive) new technologies (e.g., in the realm of the Internet of Things), just to name a few, force enterprises to continuously adapt their business strategy [1], [2]. In order to cope with this challenge, agile and network-like organisation structures have been proposed that augment traditional hierarchies and management processes [3], [4]. However, as a recent study by Deloitte shows, challenges still remain [5]: "Only 14 percent of executives believe their companies are ready to effectively redesign their organizations; just 21 percent feel expert at building cross-functional teams, and only 12 percent understand the way their people work together in networks."

It can be argued that social media not only support change but also can be a catalyst for change (cf. [6]–[8]). Firstly, social media possess a range of interesting affordances. For instance, editability and visibility allow users to create content (and to change it on a continuous basis) and to make this content visible to others (for additional affordances, see below). Secondly, there are already examples (on the Internet) that show what is possible. Take, for instance, the initiative to revise the Icelandic constitution [9], the campaign of Barack Obama in 2008 [10], or how social media has been employed by the Occupy Wall Street movement [11]. Social media encourage interaction and networking between users. Just these two properties are the ones that allow people to a much greater extent than in the past to promote a cause, to win

supporters, to organise themselves, to develop joint positions, to plan actions, and ultimately to initiate change.

However, when looking how social media are employed in enterprises the situation is far from clear-cut. On the one hand, its usage increases steadily [12], [13]. On the other hand, their penetration is not only still low [12], [14] (e.g., in small and medium-sized businesses in Germany [15]) but "Our understanding of the role that ESM [Enterprise Social Media] play in organizational life is in its infancy" [16].

The main objective of this paper is to add to the understanding what part social media can play in organisational life. Its contribution is twofold: First, an integrated framework is presented that supports (1) the introduction of social media into enterprises and (2) provides the necessary means to evaluate this contribution. Secondly, we report the results of a case study where the framework has been employed to introduce a social networking platform at a German enterprise.

The remainder of this paper is organised as follows. The next section introduces social media. Section III discusses related work. In Section IV the framework is described. Section V presents the case study. Section VI summarises the major points and provides an outlook to further research.

II. SOCIAL MEDIA

Social media can be defined as "Web-based platforms that allow workers to (1) communicate messages with specific coworkers or broadcast messages to everyone in the organization, (2) articulate a list of coworkers with whom they share a connection, (3) post, edit, and sort text and files linked to themselves or others, and (4) view the messages, connections, text, and files communicated, articulated, posted, edited and sorted by anyone else in the organization at any time of their choosing." [16]

Social media possess a range of affordances (c.f. [17], [18]). At the centre is the individual or the group [19]. Capabilities to communicate with each other are essential in social media. What social media distinguishes from other media is not only that people, relationships, content and reviews are visible to the users of an application, but also that they offer insights into the communicative actions of other people and that the traces of these communicative actions are and remain visible [19], [20]. *Visibility* and *persistence* in turn are prerequisites for someone to expand the circle of people, networks or contents, of which learning is possible [16]. This is called

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social learning. There are two types of knowledge people can acquire using social media: instrumental knowledge and meta knowledge [16]. *Instrumental knowledge* is knowledge about how to do something, whereas *meta knowledge* expresses whom and what other colleagues know.

Association describes the relationships between people (e.g., in form of contact lists as part of public profiles), between people and the content they have created (e.g., as explicit reference to the author of a wiki article), and between content (e.g., by creating respective links) [19], [20].¹ Such associations may not only be made by the users themselves but also by means of algorithms. For instance, LinkedIn suggests with whom one could connect.

Closely related to association is *identity*. It describes to what extent users reveal themselves [17]. This can be done consciously (e.g., when users show their name, picture, interests, or responsibilities in a public profile) or unconsciously (e.g., over their comments). With what characteristics users describe themselves depends firstly on how they see themselves, and secondly how they want to be perceived by others [21], [22].

Reputation describes the social standing of users [17]. A user's reputation is influenced, for example, by the number of high-quality articles he or she publishes in a wiki or blog, or how many times he or she answers the questions of others.

Editability describes both the possibility that users not only create content but also that they can revise it after its publication [17], [19], [20]. By this, three things can be achieved [20]: (1) control of external representation (e.g., with what attributes to describe yourself in your personal profile); (2) creation of target group-specific content (e.g., blogs are created with respect to a particular readership); (3) improvement of the quality of information (by constantly revising the content and by having others participating, e.g., in the form of comments or, in wiki articles, as co-authors).

Content does not always have to be created from scratch but can be assembled from existing content (including content from other authors). This is called *recombinability* [23], [24] or *replicability* [25].

In *collaboration* a number of users are grouped around a theme to edit it together [19], [24]. Wiki articles represent a good example.

Communication is also often considered to be an affordance of social media [17], [24]. However, it can be argued that communication is not a feature that sets social media apart from other media (cf. [19]).

From a tool perspective, you can distinguish between four groups: wikis, blogs, social networking applications, and social sharing applications [19].

III. RELATED WORK

You can organise related research into three groups.

The first group discusses the contribution of social media, either in general terms [16], [26], regarding certain tools / applications (e.g., blogs [27] oder social networking [28]), or with respect to specific tasks, such as knowledge generation

[18] or knowledge management and e-learning [29]. What is quite often missing, though, is a discussion of the *context* in which social media are used. It may make a big difference if a department operates in a (more or less) stable environment (e.g., defined processes) or whether the environment is constantly changing. Additionally, organisational development as an objective of introducing social media is hardly mentioned (an exception is [30]).

The second group looks at implementing social media in enterprises (e.g. [24], [30]–[32]). The approaches have in common that they consist of several steps, which are conducted in a cyclical order. For instance, the *Web 2.0 Implementation Framework* consists of four building blocks [30]: strategy, web 2.0 applications, policy, and process. However, even though evaluation is considered there is no indication when it actually has to occur and in what form.

The third group considers the evaluation of social media. Here, you can distinguish between two (related) questions: (1) What to measure, that is, the key performance indicators (e.g., [33]–[35] and (2) how to measure, that is, the methods (e.g., [36], [37]). It can be observed, though, that there is still no consensus on what is the “best” way to conduct an evaluation (e.g., when to conduct a questionnaire). While it can be argued that a mixed-method approach may be favourable, more practical experience is needed. Finally, the actual users could also be *co-investigators*, that is, actively involved into the evaluation (as suggested by the action research community [38]).

IV. FRAMEWORK

The framework addresses the following issues: (1) The contribution of social media for increasing efficiency and improving the quality of working life; (2) the level on which this contribution happens (i.e., individual, team, or organisation); (3) a description of the processes for implementing and evaluating social media; and the role of (4) organisational culture and (5) management. Fig. 1 shows the integrated framework. In the following, each of its elements is motivated in turn.

A. Contribution

Before introducing social media, the goals for doing so have to be determined. They serve, for instance, as mayor yardstick during evaluation.

Our approach differs from other work inasmuch as we make a direct reference to research in organisational development. In particular, Schanne analysed the different goals and subgoals of organisational development with respect to increasing efficiency and improving working life [39] (see appendix). In our work, we have used this list for three purposes. Firstly, it provides a convenient means to pick potential goals from. Secondly, it allows us to check whether possible goals may have been missed (or could be applicable at a later stage of a project). Thirdly, it helps to clarify terminology (and thus it is also easier to compare projects as they refer to a comparable set of goals).

¹Instead of association, the term *relationship* is also being used.

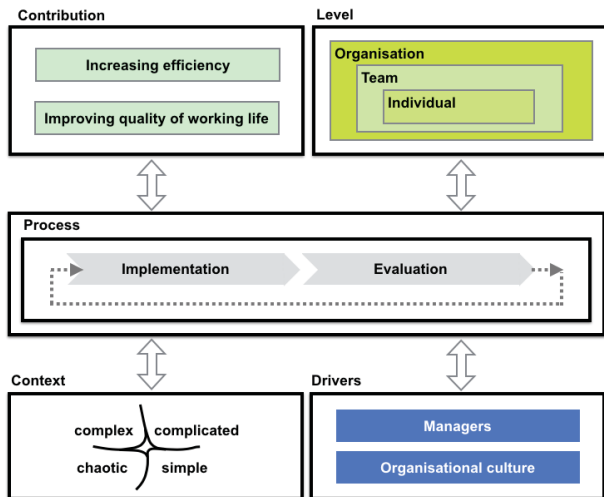


Fig. 1 Framework

B. Level

Social media can be employed on three levels: individual, team, and organisation. An employee may use a personal blog to share views and experiences with his or her colleagues; a team may collaboratively create a wiki in which its projects are documented; an organisation may establish a social network to facilitate knowledge exchange. On each level, different aspects have to be considered (cf. [40]):

- *Individual*: motivation, personal job satisfaction, or positive confirmation.
- *Team*: existing norms and group values.
- *Organisation*: participative management, relationship between organisational units.

So, if an initiative is planned that shall encourage employees to write personal blogs, it should be clarified in advanced what motivates them to do so, whether it improves personal job satisfaction, and whether it leads to positive confirmation.

C. Processes: Overview

There are two core processes: *implementation* and *evaluation* (see Fig. 2). In implementation, we distinguish between five phases (cf. [41]–[43]): definition, start-up, operation, development, and close. In each phase, the respective tasks can be carried out repeatedly. Additionally, each phase is organised into *sprints*, whose duration can vary depending on the phase.² This approach is inspired by agile methods in, for instance, project management [44], product development [45], or software development [46].

Various methods are used for the (accompanying) evaluation that provide both quantitative and qualitative data. These are: collection of statistical indicators (by log file analysis), (online) questionnaires (for large groups), interviews (selected users) and content analysis (all or selected content). Thus possible bias can be overcome that may arise when an investigation

²In the start-up phase a sprint will be considerably shorter than during the operation phase.

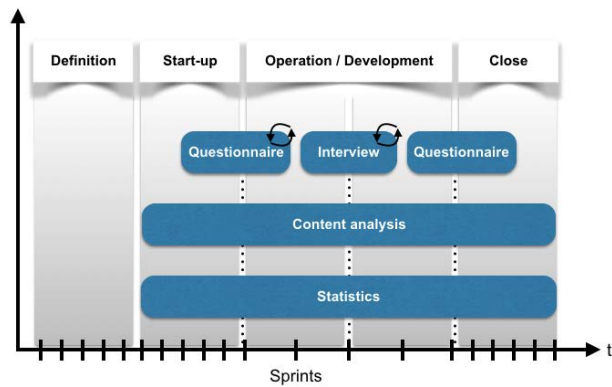


Fig. 2 Processes

only relies on one source of information, one method, one observer, or one theory (triangulation).

This *hybrid approach* (cf. [47]) ensures on the one hand a stringent procedure, on the other hand it provides the necessary flexibility to react, for instance, to unforeseen requirements (cf. [48]–[50]). In the following two subsections, we will describe both processes in more detail.

D. Implementation Process

1) *Definition*: In the definition phase, the primary question that arises is for the purpose: What is to be achieved? Especially the sponsor of a project and the project leader are asked here to provide clarity. The purpose can be summarised in the form of a guiding principle. Then the target groups have to be defined. Is the effort directed at the whole enterprise (as it would be the case of an enterprise wiki), are different departments addressed, or is the focus on experts for a specific topic? It should also be determined what is expected from users. Can they mainly consume content or are they expected to produce it as well?

This is followed by the question of how the new social media fits into the existing information and communication landscape. In general, enterprises suffer from information overload and any other medium (whether wiki, blog, or network) only adds to this surplus of information. From the perspective of future users, therefore it is necessary both to clarify what is new and cannot be found in this form elsewhere and on the other hand, what other information channel can be possibly omitted.

The netiquette has to be defined (in addition to the terms of use). For instance, users should know how to acknowledge valuable contributions or what happens in case of conflicts. It has also to be determined what budget is available (e.g., for producing content or for organising face-to-face events for members of an online community) and what work must be done before the actual start (e.g., create an editorial plan).

2) *Start-Up*: The start-up phase is about the start of a social media application and its establishment. As a guide for the duration of this phase, the 100-day period may be used that new (political) officeholders will be granted until they have to produce results. From the perspective of those who are responsible start-up means to organise the official

launch, to attract and introduce new members, to find for the application a suitable place with regard to the user's tasks, to work out what contribution users can make, and to help users to establish relationships with other users. Managers must also be visible [41]. From a user perspective, it must be clear who is responsible and who to contact in case of need. Responsible colleagues should also create content of their own [51] and moderate disputes (if necessary). Visibility contributes significantly to the reputation of a responsible person.

3) *Operation*: The operational phase is characterised by a certain stability: the acting persons are known, reliable relationships have been formed, and procedures and rules have been established. The focus is on task fulfilment [43]. It is advisable to organise regular meetings among social media users (either online or face-to-face), to make sure that valuable contributions are acknowledged (e.g., liking or writing a respective comment), to actively manage subgroups (e.g., around sub-topics), and to ensure content quality (cf. [41], [52]).

4) *Development*: Social media have to remain open for new ideas. The necessary adjustments in the development phase are referred to as adaptation or as exaptation [53]. Adaptation takes place in response to changing conditions, which may be unplanned and radical, and in response to the ideas of new users [41]. Adaptation may mean that social networks are establishing a regular exchange with other networks or that blogs include other authors to cover more topics. In exaptation users "experiment" social media (e.g., in terms of content, the processes or the existing rules) with the aim of finding new and unexpected applications. Prerequisites for exaptation are that the technology allows a degree of freedom and that users are willing to try something new [53]. For example, a departmental wiki, which formerly contained only information on organisational changes or guidelines, is suddenly used for project documentation. In order to get new ideas, new users can be asked for their opinion ("What would you do differently?"), an exchange with colleagues who are in charge of other social media (inside and outside of an enterprise) can be established, or suitable information sources can be evaluated (e.g., company newsletters).

5) *Close*: Lack of activity, declining quality of content, unorganised processes, or temporary memberships (in social networks) are signs that a social media application begins to lose relevance [54]. Internal factors (e.g., managers who take their job not serious enough or too few active users) and external factors (e.g., changes in business strategy or restructuring) may be the cause. This final phase should be initiated as long as a sufficient number of active users is still available [42].

To close can mean to archive content, to merge with other social media (and thus to create again a critical mass of users), or to split an existing group into several sub-groups (e.g., when the thematic spectrum has become too broad). This final phase also includes an emotional component. Employees may have the feeling that some of their work gets "lost" and that relations that have been formed over years come to an end. It is therefore more than appropriate when the responsible users

express their appreciation for what has been accomplished.

E. Evaluation

Evaluation is based on a mixed-method approach. It combines statistical key figures with online questionnaires, interviews, and content analysis (for an overview, see Table I). In the following, we discuss each aspect of the evaluation in more detail.

1) *Purpose*: Evaluation serves four distinct purposes: (1) collection of requirements for further development; (2) comparison of the current state with the target state; (3) justification of the investments; (4) creation of an understanding of how and why social media are used.

2) *Data Collection*: *Statistical key figures* support controlling the project and also help to legitimise a project. Primarily they are used to investigate *usage* or *vitality*, respectively [55]. In the start-up phase, the figures indicate how fast a social media application gets accepted by its intended users and in the operation phase they give an account whether usage remains stable. Usage is determined based on the access frequency (i.e., how many people use a social media application during a specific period), the number of published articles, comments, and likes, the number of active and passive users.

Questionnaires provides primarily quantitative data. The questionnaire is divided into five parts: the (subjectively) perceived benefits for a user, the community and for Festo form the first three questions. The fourth question deals with the possible barriers of use. For each question between four and eight statements are formulated and users can rate these statements along a 5-point Likert scale ("strongly agree", "agree", "neither agree nor disagree", "disagree", "strongly disagree"). At the last, the fifth question, the participants are able to leave a comment. The answer options in the first four questions are derived from the framework. Table II gives the statements a user has to evaluate regarding the benefits.³

Interviews collect primarily qualitative data. The interview guide is divided into six areas. At the start of the conversation, the interviewer first explains to the interviewee the objectives of the interview and then asks him or her to briefly introduce themselves. In the next block, it is discussed to what extent efficiency is increased by using social media and this at the three levels of the individual, the team, and the organisation as a whole. Then the question is addressed what expectations could not be met. This is followed by questions on which topics are particularly suitable for social media, what impact the size of the users group has, whether social media seem to be suitable for complex environments and how as (potential) loss of control is handled (in social media you typically cannot control who is contributing what). In the block operation it is examined to what extent procedures have been changed (i.e., do users work differently than before) and what support measures are needed (i.e., in addition to providing the

³The statements for each of the four questions stem from a literature research. That is, papers on "social media", "enterprise 2.0", "social software", or "social web" were scanned for references to potential benefits and possible barriers. These were then mapped to the three levels and the goals of organisational development given above.

TABLE I
CASE STUDY DESIGN

Dimension	Our Approach	Comment
Purpose	Development	Collecting requirements for further development
	Control	Comparing the current status with the objectives
	Legitimation	Justification of investments
	Comprehension	Analysis of how and what for social media are being used
Data collection	Statistical key figures	Collecting quantitative data (access frequency, number of published articles / comments / likes, number of active and passive users)
	Online questionnaire	It provides primarily quantitative data (assessment of benefits for individuals, teams, and the organisation as a whole).
	Interviews	Collecting qualitative data (assessing the benefits of using social media, reflecting the introductory process, and collecting expectations for future development.
	Content analysis	Created content is evaluated.
Subject	Effect	It is investigated what benefits social media possess but also what barriers for their usage exist.
	Process	The implementation process is evaluated.
Level of analysis	Individual, team, organisation	All three levels are taken care of.
Type	Formative	The evaluation is conducted during the project.
	Analytic	Separate parts will be evaluated and not the project as a whole.
	Internal	The evaluator comes from the organisation.
Time	During	Content analysis and the collection of statistical data is conducted on a continuous basis. During operation / development surveys can be conducted on a yearly basis. Interviews are intended to provide an in-depth view of selected users.
	End of a phase	It is recommended to distribute questionnaires at the end of the start-up phase and before the closing phase.
Sample	Extreme	Content analysis: contributions are selected that are markedly different from the others.
	Typical case	Content analysis: focus on contributions that are typical for a social media application.
	Stratified purposive	Interviews: participants are selected based on pre-defined criteria.
Involved people	None	Questionnaire: all users of social media can participate
	Evaluator	He or she is in charge of the evaluation.
	Target group	All users of social media contribute to the evaluation.

TABLE II
EVALUATING THE BENEFITS OF SOCIAL MEDIA

How do you evaluate the benefits of social networking for individual users?	How do you evaluate the benefits of social networking for teams?	How do you evaluate the benefits of social networking for the organisation?
Communication with colleagues has become easier	Sharing and reviewing documents has become easier	Networking with colleagues from other departments has been facilitated
Social networking allows me to expand my professional network	Current activities of colleagues are more transparent	There is a change towards a more open communication culture
Social networking allows me to promote my work-concerned initiatives	Social media facilitates the exchange of experiences	Social media improves business processes
It has become easier to find experts in the organisation	Meetings and events can be organised more efficiently	Information distribution and communication is more transparent
Problems can be solved faster	Social media allows everyone to get heard	
Awareness about and finding of relevant information has been improved	Ideas can be developed collaboratively	
I now discover information of which I did not know it exists	Decisions are made faster	
	Communication in a team is more efficient	

electronic platform) to exploit the potential of social media. The block measurability discusses based on which (objective or subjective) criteria the benefits described above can be measured. The next block focuses on the implementation

process, that is, how the interviewees perceive the introduction process and the people involved therein. The end form two questions in which interviewees are asked first to formulate their future expectations. Finally, they can bring all the points

to the table that are deemed important and have not yet been addressed. All questions are open. The guide was proofread by three colleagues, tested in a sample interview under realistic conditions and adjusted according to the given feedback.

Finally, *content analysis* serves a double purpose. Firstly, articles are selected that are markedly different from the others and then investigated with respect to what makes them different (e.g., topic chosen, tonality, timing) and how do people react to these articles (e.g., number and content of comments, number of likes). This analysis provides useful information for authors and responsables alike in terms of what users may find interesting or how articles should (or should not) be written to stir interest. Secondly, it will be examined what (kind of) content is typical for a social media application. This gives an indication whether the initial objectives are met. For instance, if a social network has been designed to be a question-answer forum and if it only contains posts that inform users then there is an obvious deviation.

3) *Subject*: The evaluation focuses on:

- *Effect*: It is important to determine what impact social media have at the three levels individual, team, and organisation. Both quantitative data (e.g. the number of accesses, the number of active and passive users, or the amount of created or changed content) and qualitative data are recorded. Long-term effects are thus determined that questionnaires are filled in repeatedly and the content analysis is carried out on a continuous basis.
- *Process*: The implementation process is investigated. This refers to the acting persons, the documents used (e.g., the training material) and the process itself (e.g., has important information been distributed at the right time).

4) *Level of Analysis*: All three levels are taken into account. More specifically, for each level it will be analysed what the contributions of social media are.

5) *Type*: The type of the evaluation is formative, that is, it takes place during the implementation. An evaluation as part of development is advisable if the objectives of a measure cannot be defined in advance, but emerge only in the course of time or are constantly changing (as is often the case in complex environments).

6) *Time*: Evaluation takes place on a continuous basis (analysis of statistical data and content analysis) and at the end of specific phases (questionnaire and interviews). Continuous does not mean that the analysis has to be performed on a daily basis (more likely is a monthly or quarterly rhythm) but that it is not tied to a particular phase.

7) *Sample*: The following sampling techniques are employed [56]:

- In content analysis, extreme case sampling and typical case sampling are used. With respect to the former, contributions are selected that are markedly different from other contributions, regarding the latter the focus is on contributions that are typical for a social media (e.g., a particular blog).
- In interviews, sampling is stratified purposive, that is, participants are selected based on pre-defined criteria.
- With regard to questionnaires no sampling is conducted. Thus, all users of a social media can participate.

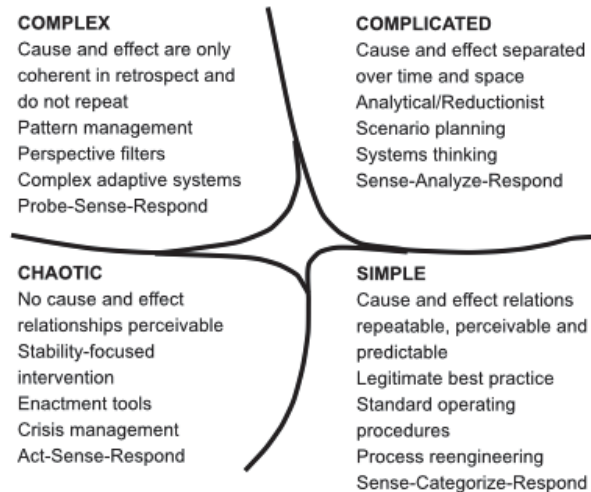


Fig. 3 Cynefin [60]

8) *Involved People*: The evaluator is in charge of the evaluation process. He or she selects the interview participants, picks the content to be analysed, and administers the questionnaires. It can be expected that for each social media application (e.g., for a social network or a wiki) one or more colleagues are responsible. These colleagues will be asked to support the evaluation by, for instance, suggesting people for interviews or by promoting the questionnaire.

F. Context

In the opening paragraph of this paper it has been pointed out that today's business environment is getting more complex. However, this might not apply for every enterprise all the time, and when looking inside a enterprise, some departments may operate in a more stable environment while in others it is more turbulent. Additionally, this may also change over time (e.g., a former stable environment may experience some dramatic changes).

There are different approaches to describe an environment [57]–[60]. They have in common that they distinguish between different *contexts*. For instance, the *Cynefin-Framework* developed by Dave Snowden (see Fig. 3) describes four contexts: complex, complicated, simple, and chaotic.

Depending on the context, an enterprise (or a government agency) may ask itself different questions. For instance, if you consider a health care system to be complicated, the question could be "What are the structures we need to make the health care system sustainable?"; do you perceive it to be a complex system then the question could be instead "How do we build on current structures and relationships to stabilize and enhance Medicare?" [57]. Secondly, depending on context the strategies how to operate change. For instance, in a complex context Snowden suggests to go on as follows [60]:

- Create environments and experiments that allow patterns to emerge
- Increase levels of interaction and communication
- Use methods that can help generate ideas: Open up discussion (as through large group methods); set barriers;

stimulate attractors; encourage dissent and diversity; and manage starting conditions and monitor for emergence

Therefore, it is advisable to evaluate the environment carefully before introducing social media.

G. Drivers: Management and Organisational Culture

Behaviors, values, and basic assumptions all have an impact on how social media are used in a company. Looking at different types of cultures, it is precisely innovative and collaborative cultures that promote information exchange. In social networks the impact of hierarchy decreases over time; members meet more and more as equals.

Part of organisational culture, and also relevant for social media, is *psychological safety*, which is defined by Amy Edmondson as “‘shared belief held by members of a team that the team is safe for interpersonal risk-taking.” (cited in [61]). Publishing something on social media that everyone can read and comment on is some form of risk-taking. No-one will do so if her or she does not feel “safe.” Psychological safety also influences to a large extent team efficiency [62].

Managers play a special role in the implementation and use of social media. They should promote self-determination and participation, which means to set a good example, to appreciate contributions, and also to let go. In addition, they should try to facilitate networking. If employees can collaborate independently and freely in networks then this unfolds higher creativity and innovation than in the traditional top-down structures. Last but not least, they are instrumental in furthering psychological safety (see above).

V. CASE STUDY

A. Festo AG & Co. KG

Festo (www.festo.com), founded in 1925, is an independent family-owned company based in Esslingen, Germany. It is one of the leading companies in the field of automation technology. Festo offers products, systems and services for electric, pneumatic and servo-pneumatic drive and control technologies.

Festo is represented in 61 countries with over 250 offices and serves approximately 300,000 customers in 176 countries. The company employs around 18,700 people and posted 2015 sales of EUR 2.64 billion. Production takes place in eight countries. Apart from Germany, these are Bulgaria, Brazil, China, India, Switzerland, Czech Republic, and Hungary.

B. Overview

Connect!

In February 2013, Festo started a project called *Connect!* whose main objective has been to determine what positive effects (if any) introducing an enterprise social network (ESN) has for Festo. At the outset, the following hypotheses were formulated:⁴

- (Urgent) questions can be answered throughout the organisation.

⁴The first four hypotheses are aimed at increasing efficiency, while the last is directed at improving the quality of working life (cf. [39]).

- Colleagues with similar interests can be more easily identified.
- Valuable information can be more easily detected.
- Overall, the productivity increases.
- Relationships between colleagues across departmental, regional, or country borders are strengthened.

As a consequence, the resulting social fabric shall Festo make more resilient in times of economic crises.

The project is managed jointly by Human Resources (team *Knowledge and Competence Management*) and IT (team *IT Product Management Collaboration*). The author of this paper is one of the two project leaders. The data protection officer and the workers council were involved right from the start.

The technical basis forms a product called Social Sites from Sitrion (www.sitrion.com). It is an add-on to Microsoft SharePoint and provides the necessary functionality (e.g., the means to write posts / to ask questions, an activity stream that shows all post / questions in a chronological order, and the possibility to follow communities, colleagues, and topics).

Social networking at Festo means that users can found *communities* for a department (e.g., to improve information flow), a project (e.g., to improve project management), or for a specific topic (e.g., to foster information exchange between experts). Requests for new communities may be submitted by an electronic form. In addition to the name of the planned community, its objectives, the approximate number of members, the type of community (team, project, or topic), the names of at least one community manager (i.e., the colleague who will be in charge of the community), and the name of a manager that supports the community must be specified. The project team will examine the application and may request additional information. Upon approval, a SharePoint site can be supplemented by the corresponding functions and the new community manager are invited to a respective training.

C. Design

1) *Statistics*: Social Sites collects a number of statistical indicators. These are firstly the sum of “events” (i.e., an event is a new post, a new question, a new response or a like and if an employee joins a community) and their chronological sequence, plus an analysis of how quickly questions are answered and whether an answer is judged to be good (i.e., someone who asks a question can mark an answer as “good answer”). Additionally, project management of Connect! tracks the number of communities, the number of community members, and the types of communities.

2) *Questionnaire*: Two questionnaires were sent out at intervals of one year to allow a before-after comparison. Addressed were all users of Connect! worldwide. In questionnaire 1 all questions were asked in English, in questionnaire 2 a German questionnaire was also offered. Both questionnaires were tested and approved in each case by the data protection officer and the works council. Anonymity of participants was ensured.

The first survey took place from 28 July 2014 to 11 August 2014. 77 colleagues participated, which corresponds to a response rate of roughly 10% (in August 2014 approximately

800 colleagues were member in one or more communities). Participants came from all six communities that existed at that time.

The second survey took place from 27 July 2015 to 28 August 2015. 63 colleagues participated, which is a response rate of 5% (in August 2015 the membership in communities had doubled). Out of those who participated in the survey, 3 were less than a month, 21 between 2 and 6 months, 24 between 7 and 12 months, and 15 more than 12 months member in a community. Participants came from 20 different communities (out of 32 who existed at that time).

3) *Interviews*: A total of ten people from four different departments were interviewed. Five of these ten coming from the Headquarter and five of sales companies from Europe and America. Five participants were members of the management. On average, the interviewees were member in 2.9 communities.

Participants were addressed directly. Participation in the interviews was voluntary. Interviews have been semi-structured and open. They were conducted either in person or by telephone. Of the ten interviews six were in German and the remaining four in English. All interviews took place in June, 2015.

The interviews were recorded and then transcribed [63]. The transcripts were evaluated and interpreted based on a category system [64]. The categories were formed deductively and inductively.

The applied analytical techniques are *summary* and *structuring*. The transcripts were systematically analysed, coded, and evaluated using a category system. Categories have been developed both deductively and inductively. The content analysis of the transcripts was computer-assisted with the software MAXQDA⁵ [65].

4) *Content Analysis*: It is not feasible to analyse all content from all communities. Rather, the content of selected communities has been analysed to identify key aspects. Additionally, individual contributions that are of particular (theoretical) interest are studied [64], [66]. As a basis, the category system (see above) was used. Additional categories were inductively formed.

D. Results

1) *Statistics*: In August 2014 (roughly one and half years after project start), there were 800 members in six communities. One year later, in August 2015, 1,600 colleagues participated in 32 communities, and in August 2016 we talk about 2,950 members in 47 communities. The number of people in a community ranges from eight (a community that only consists of managers) to more than 300 (for all IT employees worldwide). Not all of them were active, though. Five showed no or limited activity.

Looking at activities, Fig. 4 shows a typical pattern. In general, activity is rather low with occasional spikes in activity. However, this does not come totally as a surprise considering the fact that most communities are based on a question-answer

use case. Here, it is more important that upcoming questions are answered fast and satisfactorily.

2) *Questionnaire*: The response rates for the two surveys are with 10% and 5% very low. For comparison: in an analysis of 1,607 surveys in organisational research, Baruch and Holtom show an average response rate of 52.7% (with a standard deviation of 20.7%) [67]. However, a low return rate reduces not necessarily the significance of the results [68]. Nevertheless, the results have to be interpreted carefully.

For the analysis of the results, "agree" and "strongly agree" were denoted as "positive" and "disagree" and "strongly disagree" as "negative". "Neutral" refers to the undecided position ("neither agree nor disagree"). We further distinguished between a high approval (more than 75% of respondents answered agreed or strongly agreed to a statement), an average approval (between 50% and 74 %) and a low approval (below 49 %).

The results of both surveys can be summarised as follows:

- In terms of the benefits for an individual, for a team and for the organisation, in 16 out of 19 statements more than 50% of the participants either agreed or strongly agreed. This figure was slightly higher in the first than in the second survey.
- Respondents feared in particular that the use of social media in addition to existing tools will decrease their productivity. In survey 2, 30% of respondents agreed or strongly agreed to a corresponding statement. In survey 2, the greatest growth receives the statement that a public profile leads to a loss of privacy (survey 1: 9%, survey 2: 17%). Whereas according to survey 1 on average 20% agree with each statement, compared to 21.8% in survey 2 (i.e., more people have reservations regarding the usage of social media).
- In survey 2, four of the eight comments criticised an increase in irrelevant information. In survey 1 there was only one such a comment.

Whereas in survey 1 in terms of the benefits on average 9.3% held a negative view, in survey 2 it were 15.1% (i.e., in survey 2 respondents were more sceptical). A possible explanation can be that in the early stages of the project those colleague participate who have a more favourable view of social media, while in the later stages more sceptical colleagues may join. Another explanation could be that for some social media simply did not live up to its expectations.

3) *Interviews*: Regarding an increase in efficiency, individuals mostly benefit from the possibility to share information quickly (named by eight colleagues) and that colleagues can be reached faster (six out of ten). In relation to teams the avoidance of e-mails is highlighted. But even here the better interaction and communication is emphasized (e.g., "I think the main advantage is to keep the members always updated"). The benefit for the organisation is seen mainly in the construction of a collective knowledge base. But there are also "softer" factors that play a role, such as a growing sense of belonging together.

New ways of working (e.g., to obtain fast group feedback) or the substitution of one information channel by another

⁵www.maxqda.de

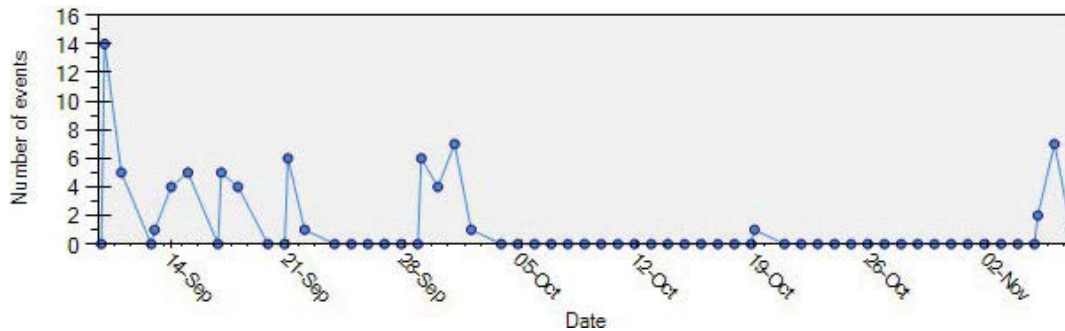


Fig. 4 Number of activities during a 90-day period

(social network instead of e-mail) are mentioned. However, their effects are (still) small.

Regarding measurability, it is striking that colleagues primarily rely on their gut feeling (e.g., “My opinion is based more on the feeling. I am not measuring a concrete thing, I am just feeling what is changing in the way I am contacting other colleagues. And I see a benefit in this, but I can not measure or I am not measuring this benefit at the moment.”). The same colleague also points to the limited significance of numbers: “I like numbers, but I did understand numbers are not always the basis for a decision.” Even a loss of objective measurability is not a problem for some. On a team level, especially the level of activity is the decisive criterion (expressed by the number of posts, comments, questions, answers, and likes). The number of members is also mentioned sporadically. In relation to the organisation two interviewees mention cost savings, a higher company profit, or improved process-specific KPIs.

The introduction process itself was considered to be appropriate. However, the project team was not visible enough in the sense that it should have, for instance, published more about the project in the company newsletter or contributed in the communities.

4) *Content Analysis*: One focus of content analysis has been to find out whether employees were willing to discuss (potentially) controversial topics. In a couple of cases this has happened, for instance: One colleague voiced his surprise about the omission of an (in his view) important topic in the strategy of his department; members in a department were arguing in favour of more flexible regulations for home office; and in one community, the use of certain information channels was questioned.

Common to all three cases was that there were far more comments and likes (compared to other posts), that people became active who had done so only occasionally before, and that management was actively involved. Also, in all three examples actions were taken: the department strategy was discussed in team meetings, people were allowed to spend more time in the home office, and the definition what information to send to whom over what channel was sharpened.

Even though there are still only a few such examples but they still show that people are willing to address such topics, that their colleagues take then an active part in the discussions, and that results can be achieved.

VI. CONCLUSION

In this paper, we presented an integrated framework for introducing and evaluating social media. Its contribution can be summarised as follows:

- Implementation and evaluation are seen together and not as separate units. There are clear recommendations when and in what form to carry out the evaluation. Regarding implementation, a hybrid approach is advocated that combines a stringent procedure (based on five phases) with an agile approach.
- The context in which social media will be employed is explicitly described. Based on this context social media may contribute differently and also the way they are introduced may change.
- All four approaches employed in evaluation (statistics, questionnaire, interviews, and content analysis) provide complementary insights, and findings yielded by one method are backed up by others. However, the proposed approach is very time-consuming and combined with large amounts of data.
- The results of the case study lend further support to the claim that a mixed-method approach is suitable for evaluating social media, it adds to the discussion how social media can contribute to organisational development, and last but not least it shows that the framework can be applied in practice.

Further work is needed in at least two areas. First, it is recommended to carry out investigations in other companies. Two mutually complementary courses of action lend themselves well: (1) Selection of companies that resemble Festo (i.e., in terms of size or sector) with the aim of replicating the findings, and (2) selection of companies that are (drastically) different from Festo, for instance, that are significantly smaller or work in another industry, with the aim to increase validity of results. A second direction is the integration of social media into business processes. So far, only a few publications handle this issue (for an example, see [69]).

APPENDIX

A. Goals of Organisational Development

Table III provides an overview of goals and subgoals of organisational development.

TABLE III
GOALS OF ORGANISATIONAL DEVELOPMENT [39]; SUBGOALS MARKED WITH AN ASTERISK (*) CANNOT BE ASSIGNED TO ONE DIMENSION ONLY
(TRANSLATION DONE BY THE AUTHOR)

Goals	Subgoals	Dimension
Increasing efficiency	- Maintaining / increasing flexibility	Flexibility,
	- Advancing willingness to innovate / to change	Adaptability
	- Advancing the learning aptitude of the systems	Learning aptitude of system
	- Developing knowledge about change management	Reduction of frictions
	- Improved level of information *	
	- Clear mechanisms for mediating conflicts *	
	- Conflict resolution (instead of downplaying conflicts)	
	- Ability to designate a problem (instead of developing awareness of a problem)	
	- Improving employee qualification *	Improvement of performance
	- Stabilisation of health *	Business success
Improving quality of working life	- Increasing market share / turnover, improving product quality / profit situation	
	- Low fluctuation rate, low rate of absenteeism	Personnel-related performance
	- Increasing subjective satisfaction *	Autonomy
	- More freedom of action / decision	
	- Personal responsibility / autonomy	
	- Freedom of choice	
	- Stabilisation of health *	Well-being
	- Increasing subjective satisfaction *	
	- More participation in consulting and decision processes	Participation/ democracy
	- Control of the immediate own working conditions	
	- Reducing alienation at work	
	- Improved level of information *	
	- More possibilities for development	Personal development
	- Long-term possibilities for personal development	
	- Spontaneity (= less peer pressure)/ more individuality)	
	- Improving employee qualification *	
	- Ability to work in a team / to cooperate	Social integration
	- Balance between autonomy and involvement	
	- Clear mechanisms for mediating conflicts *	

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