SPECIAL THEME

Change factors in Enterprise 2.0 initiatives: Can we learn from ERP?

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Abstract The rise of social software and Enterprise 2.0 sees organizations rapidly deploying collaboration technologies. Implementing new technology entails change and challenges, and these aspects of Enterprise 2.0 have not been adequately addressed by research. This study investigates change factors specific to Enterprise 2.0 initiatives to contribute to our understanding of their characteristics and idiosyncrasies. Drawing upon grounded theory, we analyze 16 case studies and integrate the results in the context of socio-technical change. To contrast the findings, similarities and distinctions between Enterprise 2.0 and ERP projects are discussed. We further explore and evaluate the conclusions by conducting expert interviews with senior professionals in the field of Enterprise 2.0. Our results indicate Enterprise 2.0 initiatives involve specific change factors, require distinct management strategies and shape new roles in the organization. The findings can enable practitioners in navigating the pitfalls of transferring and applying change management to a new field. For researchers, the study constitutes a point of departure to empirically examine change in Enterprise 2.0 initiatives.

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Introduction and overview

Social software and Enterprise 2.0 are increasingly perceived as a major shift in the information technology industry: analyst firm IDC ranks social networks among the top four IT trends responsible for 80 % of growth in IT investment (IDC 2011). Gartner research reports collaboration technologies have become one of the top five technology priorities of CIOs (Gartner 2012a), and counts social customer relationship management and activity streams among the fast moving, emerging technologies to reach the plateau of productivity within 2 to 5 years (Gartner 2012b). Miles (2010) observes that 95 % of their survey respondents are familiar with the term Enterprise 2.0, and more than half (55 %) state Enterprise 2.0 to be important or very important to business success, an assessment shared by 80 % of the youngest demographic segment.

In light of this development, Enterprise 2.0 is an important field for research to explore. As is usually the case in novel research fields, a plethora of research addresses the field's definition, explicating its terms and boundaries (e.g., Koch 2008; Levy 2009; McAfee 2006) and deriving classification criteria (e.g., Back and Irmler 2012; Kaplan and Haenlein 2010; Williams and Schubert 2011). In addition, a multitude of contributions is focused on social media and their impact on enterprises' marketing and communication activities (e.g., Mangold and Faulds 2009; McAfee 2011b; Owyang et al. 2009). Other studies investigate the business potential Enterprise 2.0 initiatives can unlock (Miles 2011; Miller et al. 2012), and promise a potential 20–25 % increase in knowledge worker productivity (McKinsey Global Institute 2012). Finally, a stream of research deals with tools and functionality (e.g., Andriole 2010; Büchner et al. 2009; Williams and Schubert 2011). As Riemer et al. (2009) and Richter et al. (2013) point out, research needs to address the organizational

aspects of Enterprise 2.0 initiatives, particularly success factors driving the adoption, as well as barriers.

This study aims at bridging this gap and investigates the issue of change management in Enterprise 2.0 initiatives by following a grounded theory approach to compare 16 case studies. For our purposes, we adopt McAfee's (2006) definition of Enterprise 2.0 as "the use of emergent social software platforms within companies, or between companies and their partners or customers," a definition stressing that the use of these platforms reaches across supply chains.

A preliminary version of this study was presented at the 25th International Bled eConference (Diehl and Kuettner 2012). In this expanded article, we further explore and advance the results with findings from expert interviews, summarizing similarities and distinctions between change factors in ERP and in Enterprise 2.0 settings.

The remainder of this paper is organized as follows: starting from the research approach, we explain the theoretical lens and present the case study findings, which are then integrated with theory and compared to change in the ERP context. Concluding, we describe socio-technical change factors specific to Enterprise 2.0 initiatives.

Research approach

Whilst following grounded theory (Corbin and Strauss 1990; Glaser and Strauss 1967; Strauss and Corbin 1998) in the research process, we use a traditional structure for presenting our work, as suggested by Suddaby (2006). The following sections outline the interpretive research approach of this study in distinct phases for better traceability, describing the theoretical lens, research approach, underlying data and the coding process. It should be emphasized that this structure does not necessarily reflect the course of action as these phases are intertwined closely in the grounded theory approach. On occasion, this will be made apparent to the reader by cross-references.

The 8C framework as a theoretical lens

This paper discusses the findings of a comparison between 16 case studies of implementation initiatives for collaboration technologies within firms (Enterprise 2.0 initiatives). All of the case studies are based on the *eXperience methodology* for writing IS cases (Schubert and Wölfle 2007). As a theoretical lens, the study draws upon an established framework for classification of Enterprise 2.0 technologies, the *8C Framework for Enterprise Information Management* (Williams and Schubert 2011), which has been developed specifically to analyze and evaluate collaboration technologies. The framework has already been applied successfully in Enterprise 2.0 studies, particularly to analyze *eXperience* case studies (Schubert and

Koch 2011; Williams 2011; Williams and Schubert 2011; Diehl and Schubert 2012). Hence, the 8C Framework has served as a point of departure for this study, as it has been used to structure accordingly and thereby guide data analysis. See Fig. 1 for a representation of the framework.

The 8C Framework consists of two areas: the inner core, reflecting the functional goals of Enterprise 2.0 initiatives and the outer layer, describing the business context of the inner core goals. The focus of this work is the organizational context, rather than the functional goals (Communication, Cooperation, Coordination and Content Combination) of an Enterprise 2.0 initiative; hence, the discussion will address the outer layer only. A brief characterization of these outer four areas will be given in the following paragraphs.

> *Content management* covers the management of digital content across its whole life cycle. Common activities are the collection, storage, classification and access of information. Special attention needs to be paid to the integration of various information sources and the ability for a company-wide information search.
>
> *Compliance* pertains to information risks and compliance restrictions. This includes risk management and implementation of mechanisms for regulatory compliance. Privacy and data protection issues need to be dealt with. Additionally, clear statements need to address accountability for specific information, usage policies, long-term storage (archiving) and documentation in the case of litigation.
>
> *Change* focuses on the management of enterprise transformation and business process changes. Specifically, this
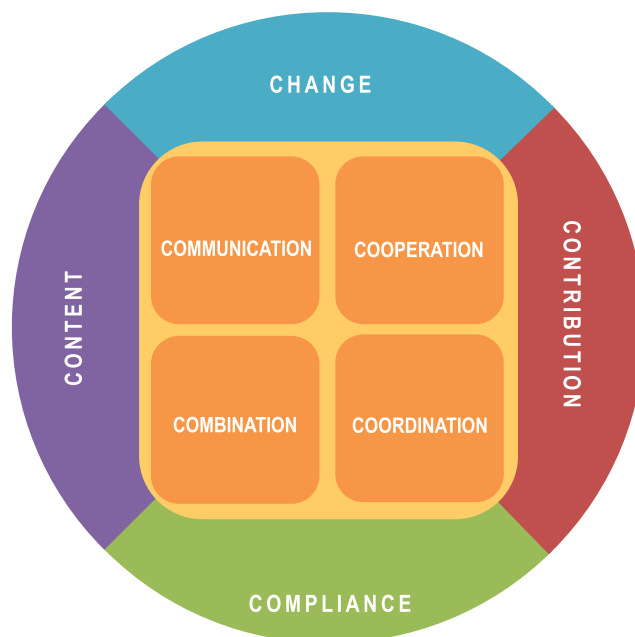

Fig. 1 The 8C Framework for Enterprise Information Management (Williams and Schubert 2011)

includes changes in corporate culture, anticipating conflicting attitudes and values, as well as concerns of employees. The inherent change within the implementation of a collaboration technology must actively be supported by a variety of different activities.

Contribution includes the consideration of costs and benefits that result from introducing a new technology. Whilst costs are frequently easy to measure, benefits are harder to grasp, but can be characterized as the realized (positive) change the initiative enables. Resulting benefits can then be measured both at the level of the individual employee, and the entire organization.

Emerging research questions

Following grounded theory, the research questions emerged and evolved over time rather than presenting a fixed point of departure (Glaser and Strauss 1967). Initially, we were interested in exploring the contextual factors that influence initiatives of introducing collaboration technologies in enterprises (Enterprise 2.0 initiatives). We were prepared to evaluate each area of the 8C Framework's outer layer introduced above, but as we moved on with the research, the preliminary findings (an emerged coding scheme, literature discussion, peer feedback) indicated an outstanding relevance referring to the area of *change* (Diehl and Schubert 2012) that is also reflected in the literature (e.g., Miles 2011). This led to the emergence of a research question addressing the area of organizational change:

RQ1: What factors of change can be identified during the implementation of collaboration technologies within a business?

As is often the case in grounded theory research, additional research questions emerged during later stages of the research (Corbin and Strauss 1990), and these are presented further below in the context they arose (the section on Theoretical integration).

Our understanding of change draws upon Wilson (1992), who stresses its multi-faceted nature and conceptualizes a change matrix, which characterizes change as either planned or emergent, and distinguishes between change as a process, and change as part of a strategy of implementation.

Research process

The research process we followed to investigate the Enterprise 2.0 initiatives consists of three phases, as depicted in Fig. 2.

In the initialization phase, the research interest took shape, and we identified the theoretical lens and selected case studies. The data collection and analysis phase consisted of intertwined coding activities, resulting in a thematic coding scheme. The coding process is described further below. In the evaluation and interpretation phase, we reviewed preliminary findings. Consistent with the study's grounded theory approach, research questions emerged and evolved over time (Corbin and Strauss 1990). In light of the emergent concepts, data was again analyzed, evaluated and further discussed in context of the field of ERP to find similarities and differences between both fields. In order to achieve in-depth understanding, we conducted interviews with experts from the IT industry to test our assumptions and discuss our findings as suggested by Corbin and Strauss (1990). The expert interviews represent an important complementary element in our research process, as they provided additional contextual insight, as well as a critical review of our conclusions.

Overview of case studies

For analyzing the business context of Enterprise 2.0 initiatives, 16 case studies were selected from research case study databases. A qualitative sampling was carried out to select the case studies (Miles and Huberman 1994; Kelle and Kluge 2010). The main selection criterion was the usage of a collaboration technology within the implementation initiative. The cases had been written by independent authors as suggested by Fereday and Muir-Cochrane (2006), all of them using the *eXperience methodology* for writing research cases (Schubert and Wölfle 2007). The *eXperience methodology* is based upon principles of case study research (e.g., Yin 2003; Eisenhardt 1989) and provides a common template that allows for cross-case comparisons. Nine of the case studies were
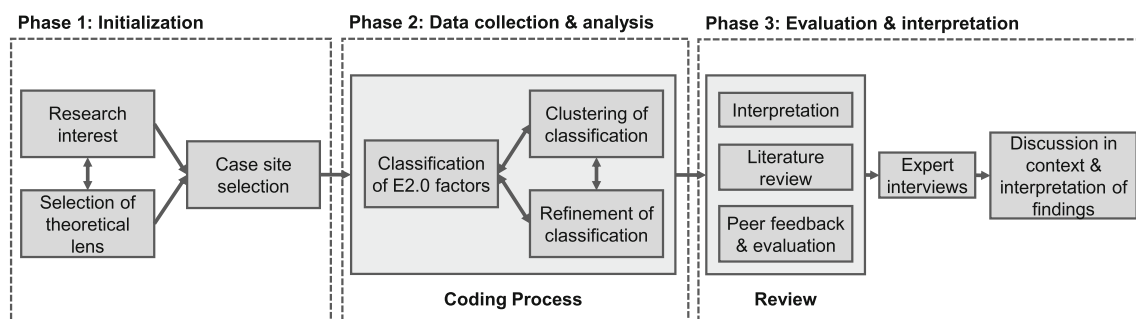

Fig. 2 Research process

retrieved from the *eXperience* database (www.experience-online.ch) and the seven remaining cases from the Enterprise 2.0 cases database (www.e20cases.org). On occasion, cases from the online database have been used in other publications (e.g., Williams and Schubert 2011, use seven of the cases analyzed here in a different context). The case studies are presented in Table 1.

Coding process

The interpretive research approach of this study (encoding) is based upon the principles of grounded theory (Charmaz 2006; Strauss and Corbin 1998). To avoid drifting introspection on the data, we followed Fereday and Muir-Cochrane (2006), and utilized the 8C framework for classification, as its areas are sufficiently abstract to allow concepts and explanations to emerge. The selected case studies were analyzed using established coding techniques and tools. The coding was carried out with ATLAS.ti (e.g., Mayring 2000; Saldaña 2012).

In developing the initial coding scheme, we followed Miles and Huberman (1994) and the "grounded" or "open coding" approach of Strauss and Corbin (1998). Two researchers independently coded three of the studies before they performed the first check-coding to achieve an agreement of the emerged codes and their meaning. The studies were recoded based on the codes agreed upon. Frequent meetings were held during the coding of the remaining case studies to assure constant high inter-coder-reliability. Hereby conflicts were resolved early and complete agreement was achieved. The result of this coding process was a classification scheme consisting of the emerged inferential codes (Miles and Huberman 1994), also referred to as *themes* (Saldaña 2012), e.g. *regulations* or *benefits* as represented in Table 2. Along with the late phases and matching meetings of the open coding, more explanatory themes emerged and were discussed. In the next step, we identified more general structures and explanations for local incidents, and connections between codes. Pattern coding (Miles and Huberman 1994) was applied and more abstract analytic units could be identified to group the codes. This step also resulted in recoding cycles, a refinement of the classification scheme and, thus, conceptual density of the codes (Corbin and Strauss 1990). For a more detailed specification of our work (see Diehl and Schubert 2012).

Table 1 Overview of analyzed case studies

Case	No. of employees	Source	Industry sector	E2.0 project objective	Software
ABB AG	120,000	E2.0 Cases	Energy and automation technology	Blog and Wiki for enterprise communication	Windows SharePoint Services 3.0
ADTELLIGENCE	10	E2.0 Cases	Advertising	Organizing all information with social software (start-up company)	Misc. Web 2.0 tools
Börse Berlin	26	eXperience	Securities trading, B2B	Communication exchange between exchange and private investors	Invision Powerboard
BSCC	700	eXperience	Chamber of Commerce	Communication with members	Salesforce
Capgemini	100,000	eXperience	Service and solutions, B2B	Expert identification and discussion	Yammer
Communardo Software	180+	E2.0 Cases	IT, software	Enterprise microblogging	Microblogging bespoke software
ESG	700	eXperience	Development, integration and operations, B2B	Knowledge management	Atlassian Confluence
FRITZ & MACZIOL	700	eXperience	Consulting and system house, B2B/B2A	Knowledge gathering, transfer and expert search	Lotus Connections
Lecos	157	eXperience	Consulting and services, B2A	Team rooms, document exchange with external partners	Lotus Quickr
Namics AG	280	E2.0 Cases	E-Business services	Company-internal multi blogging	Wordpress Blog
Obermeyer Planen + Beraten	700	eXperience	Construction	Internet-based collaborative project management	Conject project management software
Pentos AG	35	E2.0 Cases	IT, software, consulting	Employee blogging	IBM Lotus Notes
Rheinmetall	20,000	eXperience	Development and production, B2B/B2A	Team room, discussions and yellow pages	IBM Lotus Collaboration Technology
SFS Services AG	4246	E2.0 Cases	IT services	Wiki for knowledge transfer	MediaWiki
Siemens	405,000	eXperience	Consulting, development and production, B2B	Global knowledge management and expert search	Liferay
T-Systems Multimedia Solutions	1,000	E2.0 Cases	Software, consulting	Collaborative team work	Atlassian Confluence Enterprise Wiki

Findings from the case studies and expert interviews

In the following sections, the outcomes of the coding process will be discussed: a coding scheme and theme analysis, as well as implications.

Conceptualized coding results

Following our research interest, 170 codes emerged during the coding process as described in the previous section. Specifically for the area of change, a classification scheme of 54 refined inferential codes emerged, relating to 267 quotations within the case studies.

A comprehensive representation of the classification scheme for the area of change management in Enterprise 2.0 initiatives can be found in Diehl and Kuettner (2012). The classification scheme consists of a list of inferential codes that were grouped as described within the section Coding Process. These groups were sorted into three major categories: *prerequisites*, *measures*, and *implications*. Moreover, we identified four areas of action within a business as a second dimension, the codes related to: *organization*, *processes*, *people*, and *technology*. All of the categories and areas appear to be closely interrelated and interdependent.

Review of coding results

In this section, we will discuss local incidents and resulting dependencies within our data, starting with the major categories identified in our classification scheme.

Prerequisites characterize the initial situation of the organizations, whilst *implications* describe the post-implementation state. *Measures* were carried out from existing prerequisites and lead to implications of the Enterprise 2.0 initiatives. These observations allow for a sequencing of the major categories: initial situation (*prerequisites*), followed by actions within the initiative (*measures*), resulting in a final situation (*implications*).

To illustrate the major categories and their existing relations, Table 2 shows the common themes based on their quotation frequency.

Further comparison of the *areas of action*, based on the distribution of codes across them draws a relation to the sequencing order of the major categories:

- Prerequisites (total: 12 codes) can be primarily found in the area *people* (seven codes), whereas four codes are associated with *organization*.
- Measures (total: 27 codes) most often address the area of *organization* (22 codes).
- Implications (total: 15 codes) are spread evenly over the four fields of action (*organization:* five codes, *people:* four codes, *processes:* three codes, *technology:* three codes).

Table 2 Quotation frequency of common themes in major categories

Category	Theme	Frequency
Prerequisites	Management involvement & support	48 %
	(Open minded) Culture	36 %
Measures	Implementation strategy	40 %
	User training	20 %
	Regulations	19 %
	Internal promotion	16 %
Implications	User acceptance	45 %
	Design of processes and access management	20 %
	Benefits	17 %
	Innovation capabilities	6 %

Despite the prominent association of the area people within *prerequisites*, *measures* are mostly taken in the organizational area, although *implications* are almost equally distributed across all areas.

Expert interviews

Following the case study analysis and the theoretical integration (Urquhart et al. 2010) of the findings, we conducted three interviews with Enterprise 2.0 experts in different IT industry roles. The motivation to gather additional data was twofold: firstly, we aimed at thoroughly discussing and, thereby, examining our conclusions as suggested by Corbin and Strauss (1990). Secondly, we strived to achieve a deeper understanding of the individual change factors identified, especially in context of the PSIC model's depiction of change (Lyytinen and Newman 2008). Industry experts can provide critical insight, as they are able to report on a multitude of cases they encounter in their work and can compare individual case findings with industry trends.

For the industry experts, we specifically selected interviewees who exhibit the following traits: most importantly, each interviewee's professional role is focused on the field of Enterprise 2.0, which assures a wide range of expertise in the subject of our study. Moreover, all of them have been professionals in the IT industry for more than ten years, ensuring they command a broad overview of IT projects beyond Enterprise 2.0 initiatives only. Their roles, however, differ, and encompass three perspectives, ranging from product management, to solution management and presales. Finally, the organizations they belong to fill distinct roles in the industry value chain: one is a channel partner, the other a global software vendor, whereas the third is a global information technology vendor. Table 3 provides an overview of the interviewees, and their respective companies and roles.

The interviews were split in two segments: the first segment followed a semi-structured interview guideline with the

Table 3 Expert interviews, corresponding companies and roles

Interview	Company	Role
A	Global software vendor	Product manager for Enterprise 2.0 suite
B	Channel partner	Enterprise 2.0 solution manager
C	Global IT vendor	Enterprise 2.0 presales specialist

aim of exploring the experts' knowledge on Enterprise 2.0, especially focusing on the aspects of change and distinctions to ERP projects. At this point, the interviewees had not been informed by the findings from the cases, and their answers drew upon their own ideas.

After the first segment, we provided the interviewees two tables summarizing the conclusions from the case analysis (see Tables 6 and 7, further below). We explained the tables' structure and context and asked for the interviewee's evaluation and comments. The main purpose of this segment was to utilize the experts' judgment to review the findings and advance our conclusions. The interviews lasted for 60 to 90 min and were fully transcribed.

The additional insight provided by the interviews played a key role in further refining the findings. For reasons of clarity and readability, the interview findings have been integrated in the following sections.

Theoretical integration

The previous chapter consisted of a cross-case analysis of Enterprise 2.0 case studies, following a grounded theory approach. As suggested by Urquhart et al. (2010) for grounded theory research, we put the findings in context to achieve theoretical integration. In doing this, our objective is to contribute to understanding the following additional research questions:

RQ2: How do the case study findings relate to research in the IS field, specifically the issue of socio-technical change in information systems?

RQ3: Are the findings consistent with socio-technical change issues in enterprise resource planning (ERP) settings?

RQ4: What constitutes the characteristics of socio-technical change in the context of Enterprise 2.0?

In order to address these questions, we will briefly discuss theoretical contributions in the field of socio-technical change in information systems, drawing upon one framework – Lyytinen and Newman's (2008) PSIC model – in particular, as well as evaluate the findings in comparison to research findings in the area of ERP systems. Finally, we will examine the compatibilities and differences, and point out what we find to be specific characteristics of change in Enterprise 2.0 settings.

Socio-technical change in the information systems discipline

Change in the context of information systems remains a complex, challenging issue, which spans across several disciplines, including computer and information science, as well as management and organization sciences. As the aspect of socio-technical change plays an important role as inhibitor or enabler in the successful adoption and use of information systems (Bostrom and Heinen 1977), it has been a focus area of IS research.

Socio-technical systems were first conceptualized by Bamforth, Emery and Trist (Trist 1981) of the Tavistock Institute, in their action research in the coal-mining industry and the concept later evolved into an important theoretical lens in IS (Mumford 1985), and especially in context of socio-technical change (Ropohl 1999). A socio-technical system consists of two subsystems, a social subsystem, encompassing people (actors) and structure, and a technical subsystem, consisting of tasks and technology (Kaiser and Bostrom 1982).

In their approach to explaining information systems change, Lyytinen and Newman (2008) develop a punctuated socio-technical change framework they termed PSIC model (see Fig. 3 for a representation of their framework). They define change as multi-level and punctuated: it is multi-level, since it "re-configures work systems by embedding… information technology components". As these work systems are rigid and complex, Lyytinen and Newman (2008) postulate IS change "must be planned and deliberate".

Following Gersick's (1991) understanding of change, Lyytinen and Newman (2008) also define IS change as primarily punctuated, taking place in metamorphic (revolutionary) episodes, and not primarily being incremental and continuous. Socio-technical systems, Lyytinen and Newman (2008) posit, possess deep structure, go through periods of stability and face episodes of system upheaval. This punctuated change appears on multiple levels of the system. They also point out that this change does not need to be understood as a negative event.

Lyytinen and Newman (2008) define four possible outcomes from events: the first is a failed intervention, which is not sufficient to remove a gap. The second is a successful intervention, removing the gap with incremental change to the system. The third outcome is punctuation, a revolutionary change that generates a new deep structure. Finally, the fourth possible outcome would be a crisis, which would include an increased gap, and imply further problems and an ongoing transition.

Although their framework is not focused on incremental change, Lyytinen and Newman (2008) argue that it does, in fact, account for phases of incremental change, as well.

Closer examination reveals that the findings of our study can be represented through the PSIC model, but the framework's paradigm that IS change needs to be "planned and

Fig. 3 Framework of punctuated socio-technical change: PSIC model (adapted from Lyytinen and Newman 2008)
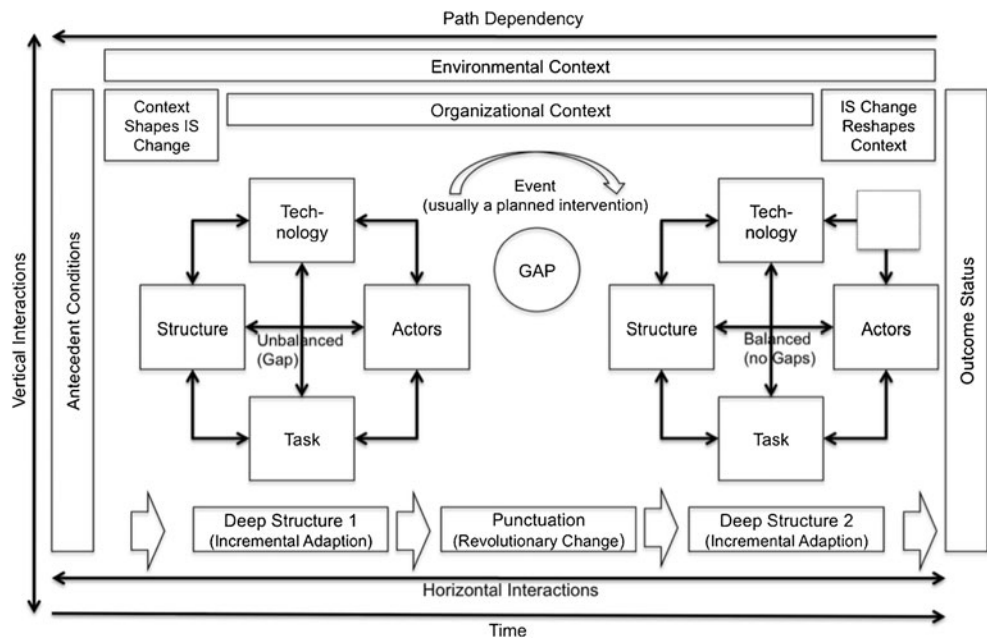
deliberate", is in conflict with our findings, which indicate gradual and sometimes incremental adoption.

Socio-technical change in ERP

Enterprise resource planning (ERP) systems represent a significant area of both investment and change for enterprises, with large firms usually spending hundreds of millions of dollars on ERP implementation (Seddon 2005). Supporting enterprise-wide business activities, they represent complex socio-technical change, and they require integration with existing technologies, infrastructures, policies and practices, both on an intra- and inter-organizational level (Williams and Hardy 2005). By integrating an enterprise's workflows and information, an ERP system "imposes its own logic on a company's strategy, organization, and culture" (Davenport 1998). Thus, ERP systems embody socio-technical change, and the process of successful adoption has been extensively addressed by research (e.g., Aladwani 2001; Finney and Corbett 2007; Holland and Light 1999).

Hong and Kim (2002) have found organizational fit to be of critical importance to ERP implementation success, while organizational resistance plays a minor role. Markus and Tanis (2000) point out the normative nature of change in the ERP context, as system use is usually mandatory, which could explain that organizational resistance is often fruitless or carried out on a non-transparent level.

In their literature review of ERP success factors, Finney and Corbett (2007) state that change management is "one of the most critical of all ERP implementation success factors", but concede that there is "still much confusion […] what exactly is included in the construct". Shedding light on the importance of success factors in various stages of ERP implementation, Somers and Nelson (2001) prioritize top management support, project team competence and interdepartmental cooperation as the top three factors overall (see Table 4). In the acceptance stage, the top three factors identified were interdepartmental communication, interdepartmental cooperation and top management support (see Table 5). Not within the overall top five factors, but ranked fifth during acceptance stage, was education about new business processes. Although change management appears separately in their study, ranked 19th, many of the other factors fit the range of typical change management activities, such as building management commitment, setting goals, involvement and training of users (Finney and Corbett 2007).

These rankings provide an interesting basis for comparison with our findings. Because ERP systems are so widely used by enterprises, their implementation challenges have been addressed in more detail than those of Enterprise 2.0 initiatives. In the following section, we investigate the general and specific characteristics of Enterprise 2.0, by discussing the similarities and differences of change factors between ERP and Enterprise 2.0 (see Table 6).

Distinction of socio-technical change in Enterprise 2.0 and ERP contexts

In this section, change factors of ERP projects are compared with those identified in Enterprise 2.0 initiatives. In addition to the studied Enterprise 2.0 cases, we draw upon the findings from the expert interviews in this part.

Top management support, ranked first among ERP implementation success factors, includes setting reasonable

Table 4 Ranking of ERP CSFs across all stages (adapted from Somers and Nelson 2001)

All stages	
Rank	Critical success factor
1	Top management support
2	Project team competence
3	Interdepartmental cooperation
4	Clear goals and objectives
5	Project management

objectives, developing an understanding of IT's potential and limitations, and communicating corporate strategy (Somers and Nelson 2001). This understanding fits the Enterprise 2.0 case finding that *management involvement* and *support* is a critical pre-requisite. Not surprisingly, this is supported by the expert interviews, as well. Apart from repeatedly pointing out the importance of top management commitment in general, one of the experts also stressed that Enterprise 2.0 "[…] projects are only accepted by the majority, if the new processes are exemplified by top management." In this aspect, the role of top management is distinctive in Enterprise 2.0 initiatives: visibly using the new technologies is seen as an important factor for management to demonstrate credibility and to inspire an organization's adoption.

Project team competence, covering the skill level of the project team, and including both technological expertise and understanding of business requirements, was ranked second, overall (Somers and Nelson 2001). In our study, the corresponding measures of *project management*, *organization* and *project support* have received less attention and are not as focused on skill levels. A reason for this difference can be seen in the more complex nature of ERP implementations, both on a technological and business process level, whereas the Enterprise 2.0 initiatives we studied emphasize leaner project teams. In our interviews, experts pointed out that ERP projects are technologically more demanding, whereas an Enterprise 2.0 implementation "[…] is a technical task to a much smaller extent […]". The change in Enterprise 2.0 projects is on "[…]

Table 5 Ranking of ERP CSFs in the acceptance stage (adapted from Somers and Nelson 2001)

Acceptance stage	
Rank	Critical success factor
1	Interdepartmental communication
2	Interdepartmental cooperation
3	Top management support
4	Project team competence
5	Education on new business processes

the human and cultural level, that is, the collaborative processes are changing, the information flow is changing, which means the organization is changing."

The factors of *interdepartmental communication* and *cooperation*, ranked first and second during acceptance stage, includes the broad activities of sharing common goals, coordinating and communicating across departments, and within the project team (Somers and Nelson 2001). In our study, equivalent was *internal promotion*, which has a slightly different connotation. In ERP projects, business processes have to be defined and agreed upon across different business units, which implies the importance of cross-departmental cooperation. In the Enterprise 2.0 context, we found communication and coordination activities to be more limited to promoting tool capabilities and benefits to inspire acceptance. The expert interviews confirmed the use-inspiring and voluntary nature of most initiatives, however experts also remarked that the technology's adoption could benefit from a certain level of mandatory use: "Nobody cuts email off overnight. […] Sometimes it would be better […] to get people out of their comfort zone." This issue of a required critical mass of adopters (Markus and Connolly 1990) is further emphasized by the information that there are "[…] functionalities that work only if they are used enterprise-wide, such as profiles." Thus, our study indicates organizations face the challenge to balance the potentially conflicting objectives of voluntary, use-inspiring adoption and wide dissemination of an Enterprise 2.0 initiative.

Clear goals and objectives, ranked fourth in Somers and Nelson's (2001) study, encompasses determining the direction of the project, managing the "triple constraint" of scope, time and cost, as well as defining measurable objectives, and setting goals prior to approaching top management. In our research, the matching measures are *implementation strategy*, and the establishment of a *set of rules*. While this also implies setting objectives, it emphasizes the actual activities of implementing and using the tools, whereas in the ERP context, the meta-level aspect of project controlling is more prominent. The interviews confirm this reasoning, and experts point out that "[…] benefit is formulated little, or not at all. In the best case, customers have an idea of […] use cases." Even more so than in ERP projects (e.g., Kohli and Grover 2008; Kuettner and Schubert 2012), they concede a lack of measurability in Enterprise 2.0: "[…] It is still very difficult to quantify actual benefits," comparing the challenge with "[…] asking how much employee talk benefits from the coffee machine."

Project management, ranked fifth overall, is a broad term, including project planning, control, as well as defining and managing size, structure and scope (Somers and Nelson 2001). Again, the corresponding measures of *project management*, *organization* and *project support* in the cases we studied point at a different level of complexity. ERP projects are large-scale undertakings involving project organizations

Table 6 Factors in ERP context compared to Enterprise 2.0

Factor	ERP	Enterprise 2.0
Top management support	Setting objectives, communicating strategy, IT's potential and limitations Enterprise 2.0: Top management exemplifies use	
Project team competence	Skill-level, technological and business requirements	Lean project teams, users as project team, lower degree of specialization
Interdepartmental communication and cooperation	Cross-departmental, cross-company alignment	Promotion-focused, use-inspiring, requires critical mass
Clear goals and objectives	Constraints management, measurability, meta-level	Implementation-focused, set of rules
Project management	Large-scale, complex project organization	Lean project teams
Education on new business processes	Gain support, training programs, alleviate fears	Inspire to use, lean training or learning-by-doing, top management and evangelists exemplify use, alleviate privacy concerns

consisting of steering committees, core teams and sub-teams. Actual teams of Enterprise 2.0 initiatives, on the other hand, often consist of less than a dozen members. The interviews supported this perspective, however one expert specified, "[…] companies wishing to introduce Enterprise 2.0 are doing it chronically understaffed, […] because they are not aware of the complexity." In fact, experts pointed out that in Enterprise 2.0, "[…] go-live is 10 %, and then follow 90 % which nobody considers." Compared to ERP, in Enterprise 2.0 initiatives, the post-implementation phase is more important and requires a larger share of the total project resources.

Finally, *education on new business processes*, ranked fifth in the acceptance stage, is concerned with the business process reengineering perspective, and with educating and communicating goals and perspectives to gain support of employees (Somers and Nelson 2001). This corresponds to *internal promotion* and *training* in our study. However, in the Enterprise 2.0 context, training programs are often straightforward and basic, and sometimes dispensed with completely, when tools support a learning-by-doing approach (McAfee 2011a). In the ERP context, the business process reengineering perspective also addresses fears relating to job security, whereas Enterprise 2.0 tools are often promoted as increasing productivity without endangering employment. In the interviews, however,

the experts extensively stressed privacy concerns: "It starts with the works council: 'Surveillance'. […] In the collaborative or social approach it is more about how people train their soft skills, netiquette, for instance. How do I publish in a blog? How private is it? It is very important to alleviate fears." Contrasting to ERP projects, the experts pointed out that in Enterprise 2.0, "it is not about an anonymous process you execute." People are public, and would ask, "Could this cause harm to myself and my company. […] Could I face jurisdiction?" The experts also questioned the value of training

Table 7 Nature of socio-technical change in Enterprise 2.0 vs. ERP

Traditional (ERP) context	Enterprise 2.0 context
Revolutionary change	Evolutionary change
Large-scale projects	Small-scale projects
Cross-departmental business processes	Ranging from project-team focused to enterprise-wide
High degree of planning and foresight	Flexibility and adhocracy
Mandatory use	Often voluntary use
Existing change management skill set	New change management skill set, new organizational roles

programs and rather called for "[…] a team of evangelists and enthusiasts […]" to inspire users with ideas and collaboration scenarios.

Socio-technical change in Enterprise 2.0 is distinct and calls for new roles

In the preceding part, similarities and differences between change factors in the ERP and Enterprise 2.0 contexts have been discussed. We found that most factors that highly ranked in the ERP context (Somers and Nelson 2001) could be mapped to corresponding change factors in the Enterprise 2.0 context (see Table 6). However, a closer examination of the corresponding factors revealed distinct and different focus areas: whilst ERP projects call for complex project management activities, the equivalent activities in Enterprise 2.0 initiatives implied much leaner team constellations. More importantly, the large-scale nature of ERP implementations with its mandatory use and set go-live dates requires a planned approach to managing change in a revolutionary context. The adoption of Enterprise 2.0 initiatives, on the other hand, often includes gradual diffusion and evolutionary change, being based on voluntary use or starting with one business unit or project team. Hence, change strategies have to rely more on promotion. This more positive connotation of Enterprise 2.0 inspired change, in comparison to ERP implementations, is a significant difference, and implies an Enterprise 2.0 specific approach to change management (see Table 7). In particular, the results of the expert interviews indicate Enterprise 2.0 requires a novel skill set to deal with socio-technical change, and creates "new roles, such as the communication officer," who tracks internal communication jointly with IT staff, or "social media managers, […] who facilitate projects."

As a caveat, despite the idiosyncrasies, there are interdependencies between ERP and Enterprise 2.0, as well. The experts outlined, "it is our approach to integrate these worlds" and stressed it is paramount to avoid "using a parallel system and enter data twice."

Conclusion, limitations and outlook

The purpose of this article is to contribute to the understanding of socio-technical change in the Enterprise 2.0 context. To accomplish this, we have followed a grounded theory approach to analyze 16 case studies of Enterprise 2.0 initiatives and identify common patterns of pre-requisites, measures and implications. Integrating the findings into theory, we have drawn upon socio-technical change theory and compared the results to research in the ERP field. In doing so, we have identified similarities and distinctions between change in Enterprise 2.0 initiatives versus ERP projects. To review the conclusions and further advance our findings, we have conducted interviews with industry experts, leading us to refine the results. Whilst similarities exist especially on the top level in terms of change factors, the results indicate that change in an Enterprise 2.0 context differs from change in ERP projects in several ways: ERP projects, due to their complex and business-critical nature, require large-scale projects with a high degree of control and foresight, affecting the whole organization, often in a big-bang roll-out. Accordingly, socio-technical change in ERP projects is revolutionary and often actively managed in a change program, which represents a project in itself. Enterprise 2.0, on the other hand, frequently implies evolutionary change, as new initiatives are gradually adopted and regularly used on a voluntary basis. Hence, managing change in Enterprise 2.0 initiatives relies less on formal training and planning, and more on promotion and exploration (Richter and Stocker 2011). Thus, the success of Enterprise 2.0 initiatives is to a greater extent determined independently of the technical implementation phase, and requires the organizations to skillfully plan and manage the adoption process (Miller et al. 2012). This includes new change management skill sets and roles, and calls for the establishment of evangelists and the involvement of top management to exemplify utilizing collaboration technologies. Simultaneously, since integration of business processes is the overarching paradigm of enterprise systems (Davenport 1998; Markus and Tanis 2000; Lee et al. 2003), organizations are required to balance these initiatives and their interdependencies with existing enterprise systems. As a result, we expect a new era of enterprise application integration initiatives, integrating enterprise resource planning systems (ERP) and enterprise collaboration systems.

Our findings contribute to both research and practice: practitioners benefit from caution when applying change management concepts from other areas, such as ERP, to Enterprise 2.0 initiatives. Instead, their activities need to be adapted to the specifics of Enterprise 2.0. For researchers, our study presents a point of departure to further investigate the specifics of socio-technical change in the Enterprise 2.0 field. We suggest a research agenda combining three perspectives: firstly, adapting a socio-technical change framework to integrate Enterprise 2.0 specifics would contribute to theory and provide a basis for future research. Secondly, defining the tasks, skill sets and roles of Enterprise 2.0 evangelists would refine and advance our contribution. Thirdly, investigating the integration of ERP systems and enterprise collaboration systems is essential to identify interdependencies and future developments. Finally, we look forward to testing and expanding the findings on a broader empirical basis. This could address the main limitations of this study, which are rooted in its narrow qualitative sample and, hence, do not support generalization.

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