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Sidestepping implementation traps when implementing knowledge management: lessons learned from Siemens

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This case study provides an in-depth analysis of Siemens' lessons learned when implementing knowledge management. For the analysis of the case-study data, we use established tools from the marketing literature, and integrate these with the change management literature. The aim is to provide a rich-yet-parsimonious conceptualisation of Siemens' lessons learned in dealing with two distinct implementation traps. The first trap is called customer trap and suggests that the needs of two 'knowledge management customers' have to be carefully balanced. Specifically, the 'end customer' of the initiative (the user of the initiative) and the 'business customer' of the initiative (top management) may have different expectations and requirements that need to be taken into consideration both separately and jointly. The second trap is called personalisation/standardisation trap and points to the need to balance standardisation (often needed due to the global scale of knowledge management initiatives) with customisation (too much of which can lead to an undifferentiated mix in which value propositions of individual initiatives are hard to appreciate).

Keywords: change management; knowledge management; strategy implementation

1. Introduction

Most business transformation initiatives fall short of the results that managers envisage. Large-scale, IT-enabled change is no exception. The popular press pegs the failure rate of knowledge management projects as high as 70% (e.g. Computerworld 2000) and the academic literature concurs. Many multi-year, multi-million dollar enterprise resource planning systems, for instance, have met with poor results (e.g. Ranganthan *et al.* 2004). The most recent disappointment is that despite the hype around Enterprise 2.0, this new technology seems unable to deliver on its promise to initiate, manage and sustain 'emergent collaboration' (e.g. Davenport 2007).

Often-heard reasons for this track record include the realisation that short-term budget goals and responsibilities are often higher priority in business transformations than the long-term opportunities that investments in knowledge assets are supposed to bring about. As a result, there is a lack of employee acceptance of change across functions and processes, change is not supported across organisational levels, and fledgling opportunities for lasting transformation are obscured by current business concerns and operational constraints. The truth is that managers' attempts

to implement change to the best of their abilities can paradoxically create a number of 'traps' that actually compromise the change effort.

In our work with the Siemens Corporation, we have found that adopting a marketing perspective – keeping an eye on the (end) customer of the initiative – can be instrumental in sidestepping two notorious implementation traps. These traps lie in wait for change managers in big organisations, especially when large-scale, IT-enabled change such as knowledge management is called for. In keeping with established marketing lingo and concepts, we call these traps the *standardisation/customisation trap* and the *customer trap*. (See Table 1 'The implementation traps').

Although these traps lie in wait for managers in many a change management effort (e.g. Kotter and Schlesinger 1979, Jick 1989), we submit that they are particularly dangerous when knowledge management is implemented. Many authors have suggested that knowledge is more difficult to transfer than information, as it is tacit and intricately bound to the individual owning this knowledge (e.g. Nonaka 1994). Long-standing, as well as more recent research further suggests that knowledge workers cannot be coerced into sharing their knowledge (von Krogh and Roos 1995, Damodaran and Olphert 2000), that

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Table 1. The implementation traps.

Trap	Manifestations	
Standardisation/ customisation trap	<ul style="list-style-type: none"> ● Big Bang: too much standardisation ● Fragmentation: change agents not in coalition 	<ul style="list-style-type: none"> ● Anarchy: too little standardisation ● Keep experimenting: roll-out never reaches conclusion
Customer trap	<ul style="list-style-type: none"> ● Marketing myopia: user needs not taken into account 	<ul style="list-style-type: none"> ● Management oblivion: top management expectations mismanaged

human collaboration in distributed knowledge sharing groups requires a trust-based relationship of mutual benefit (Davenport and Prusak 1994, Garrett and Caldwell 2002), and that intrinsic motivators are more effective than extrinsic rewards (e.g. Spender 1996, Hsiu-Fen 2007). As such, knowledge management implementation bears more than a passing resemblance to established marketing principles, including understanding customer (or knowledge worker) needs and motives, the building of mutually profitable relationships with business or end customers, as well as the relative advantages and disadvantages of standardisation versus customisation in product design. By building on these parallels, this article aims at discussing, in a compact form, implementation challenges, as well as their remedies that are specific to knowledge management.

The article is organised as follows. The next section discusses the logic of the two implementation traps. Thereafter, we conceptually and empirically demonstrate how adopting a marketing perspective can be instrumental in overcoming these traps.

2. Implementation traps

2.1. The standardisation/customisation trap

In general, the change management literature distinguishes between two kinds of change in large organisations, top-down or bottom-up. In the majority of cases, change is initiated at the top and implemented in a top-down, direction-setting mode. In the management information systems (MIS), and IS project management literature, examples include, enterprise relationship planning (ERP), customer relationship management (CRM) or web-centred projects which are generally led top-down by change managers (whether IT project managers and/or line managers). These change leaders assemble teams and push the initiative through the organisation's deep structures (e.g. Markus 1983, Cothrel and Williams 1999, Leiser and Hirschheim 2007). The top-down mode typically uses a standardised, one-size-fits-all approach. However, as many managers are aware, one size hardly ever fits all in large-scale change projects, and this route can lead the actual users of the initiative being reluctant to accept it. In a recent case on IT-enabled organisational

change at the University of Illinois Medical Center, for example, the project encountered fierce resistance from physicians in the form of: 'Our job is to provide healthcare, not to sit in front of computers and enter data' (Scott *et al.* 2004, p.38).

As such, the top-down-bottom-up conundrum is reminiscent of the marketing challenge of balancing standardisation and customisation when adapting products to different consumer groups or when tailoring products to new geographic markets. On the 'personalisation' end of the standardisation–customisation continuum, the initiative for change is a type of grass roots 'popular movement', often in response to the limits of top-down approaches to change. The change management literature shows that such approaches to change management can be beneficial, particularly in achieving employee buy-in and acceptance of change (e.g. Kotter and Schlesinger 1979, Jick 1989). The latter is achieved by constantly involving middle managers in the change process (Beer *et al.* 1990), who then communicate the overall change vision to lower hierarchical levels in the organisation (Kotter 1995). The more information on the change process is communicated within the organisation, the more transparent the change process, and the higher the chance that employees perceive the transformation as legitimate and will support it (Klarner *et al.* 2007). At the same time, such bottom-up approaches commonly suffer from a 'keep experimenting' attitude. The issue then becomes how to gain management support for a particular iteration in order to boost the project to the next, more generalised, level. Sometimes the issue is even how to persuade management that a development emerging from individual needs can be generalised to the business unit or corporation as a whole. Consequently, a second facet of the standardisation/customisation trap is the flip-side of the top-down standardisation stigma. Bottom-up initiatives can suffer from fragmentation, the proliferation of myriads of related initiatives until managers 'can't see the wood for the trees', as one Siemens manager put it.

The current debate on how to enable 'emergent collaboration' and whether or not Web 2.0 technology will transform enterprises further illustrates the dangers of too much customisation (e.g. O'Reilly 2005, McAfee 2006, Davenport 2007). Enterprise 2.0

attempts to bring Web 2.0 technologies into the enterprise to provide an understanding of and describe how blogs, wikis, tagging, and other participative tools will change large bureaucracies. The belief is that they will empower employees, decentralise decisions, free up knowledge, and generally make for better workplaces. However, such a vision can hardly be achieved through new technology alone. The hitherto absence of such participative technologies is not the only reason for organisations and expertise being hierarchical (e.g. Markus 1983). Thus, MIS implementation and knowledge management in particular are prone to the standardisation/customisation trap (and perhaps more so than other changes initiatives).

2.2. The customer trap

The customer trap underlies the standardisation/customisation trap. The question – who is the direct customer for a change initiative? – does not have a straightforward answer. Intuitively one would think that employees who actually use the, for example, new knowledge management system and are supposed to share their knowledge would constitute this initiative's customers (e.g. Barnard and Versteegen 2005). However, owing to the standardisation/customisation trap, the initiative often fails to take sufficient heed of these end users' needs and requirements. On the one hand, therefore, the customer trap suggests that attention be paid to the needs of the end user (in parallel with a business-to-consumer (B2C) marketing focus). However, the assumption that a change initiative such as knowledge management merely needs to be sold to potential users, is but a part of the truth. As the literature on institutional theory (Zucker 1977, 1987, Powell and DiMaggio 1991) and top management (e.g. Jarvenpaa and Ives 1991, Chatterjee *et al.* 2002) reminds us, another critical customer is top management (in marketing terms, the business-to-business (B2B) customer).

Thus, successful change implementation also demands formal consideration of changing top management perceptions, interests, and pressures, particularly when an initiative is implemented bottom-up (e.g. when there is too much personalisation, as discussed above). As such, the customer trap is in line with the notion in the MIS literature that all important stakeholder groups need to be taken into account when implementing a system (e.g. Schonberger 1980, Huigang *et al.* 2007). For example, first line supervisors and the layer of managers immediately below top managers (e.g. the level immediately below partners in professional services firms) can also derail implementations if they are important to the success of a system and their needs are not addressed. Inter-company

systems are likely to have a larger number of influential stakeholder groups than intra-company systems. By conceptualising the important stakeholder groups within two (B2C and B2B) terms, our model seeks to capture relationships on various levels in a parsimonious way (Eisenhardt 1989), in order to build a rigorous, yet relevant conceptual framework (Davenport and Markus 1999).

3. IT-enabled change as internal customer relationship marketing

Peter Drucker famously said that, 'in the knowledge economy, everyone is a volunteer'. However, research on knowledge management implementation in international companies, including DaimlerChrysler, Deutsche Bank, Novartis and Siemens (e.g. Davenport and Probst 2002, Leibold *et al.* 2005), suggests that this principle has often been misunderstood or even neglected. Companies may delight in capturing their employees' knowledge in increasingly sophisticated databases and in providing a growing number of ways to access colleagues' knowledge, but employees and their managers have competing demands for their attention (e.g. Ocasio 1997, Davenport and Beck 2001). They not only have to juggle a flood of invitations to participate in the newest best-practice-sharing programme, but once their skill profiles have been entered into the company's intranet, they are inundated with urgent requests for their expertise from remote corners of the world and colleagues whom they have never met or heard of.

Ironically, the very steps that companies undertake to allow IT-enabled change to have a lasting, sustainable impact on the bottom line are often the steps that prevent it from happening. It further seems that the very initiatives that companies instigate to make knowledge more fluid in organisations may make it stickier. Why?

Is it possible that our enthusiasm for IT systems' information-gathering capabilities and the potential opportunities that more efficient usage of knowledge and information holds, have led us to forget that information sharing, like all relationships, takes two? Have we neglected to pinpoint our *real* customers in an IT-enabled change initiative and their vastly differing requirements, tastes and preferences?

When it comes to building relationships between knowledge workers, much can be learned from the customer relationship management literature. A fundamental tenet in this literature is to decide on the customers with which to build a relationship. The decision depends on various factors, including the customers' contributions to the firm's revenues, their projected lifetime value, or non-monetary pay-offs,

which include the potential for mutual learning (e.g. Dowling and Uncles 1997, Fournier *et al.* 1998, Peppers *et al.* 1999). In knowledge management implementation, a fundamental question should therefore be: with *whom* in the organisation should a relationship be built, and what are the habits, constraints, and preferences of that target customer. To sidestep implementation traps, we also need to take the time to figure out how and why we are undermining our own best efforts. That is, how we can remedy the lack of customer orientation that ails so many IT-enabled change initiatives. Put differently, to sidestep implementation traps, IT-enabled change should be considered from its customer's point of view.

4. The Siemens case: methodology

4.1. Sample

To discover more about sidestepping implementation traps by focusing on a change initiative's different customers, we studied three distinct but related knowledge management change projects at Siemens (Davenport and Probst 2002).

The first, corporate, initiative focused on supporting sales representatives organisation-wide in selling complex product and service packages (termed 'solutions'). This initiative was first rolled out in a single business unit, the telecom business unit. The roll-out was designed to test the feasibility and sophistication of the initial knowledge-sharing platform. Since the corporate initiative was designed for international use, its language was English.

The second, telecom, initiative goes back to 1997 when it was implemented at the telecom business unit's local company in Germany to support German-speaking sales representatives and service technicians. This initiative followed a 'Yellow Pages' approach in

that it provided access to other employees' knowledge by outlining their specific areas of expertise, and giving their contact details. This telecom initiative would eventually be substituted by the new corporate initiative described previously. However, as evident from Table 2, they co-existed for some time.

The third initiative was the organisation-wide sharing of best practices in knowledge management (called the best practice initiative). This initiative therefore sought to manage knowledge about the process of knowledge management. As one interviewee remarked, 'Here, we cannot only learn how to avoid re-inventing the wheel, but also how to avoid re-inventing the wheel while avoiding re-inventing the wheel'.

4.2. Data collection

In an attempt to balance rigour with relevance (Davenport and Markus 1999), the inquiry into implementation traps in large-scale, IT-enabled change started from a practitioner perspective (the first author was a Siemens employee when the research was carried out between 2000 and 2002).

Most of the data used in this article came from interviews with three types of interviewees: front line, day-to-day partners (e.g. development team leaders); more senior executives who played a direct key role (e.g. the division managers); and senior managers who were more indirectly involved in the three key projects investigated (e.g. the chief knowledge officer at Siemens, the chief strategy officer, or board members who bore special responsibility for the knowledge management topic, such as the head of corporate human resources, see Table 3).

The advantage of interviewing managers from different levels in the organisation, and with different

Table 2. Overview of key projects investigated.

	Corporate	Telecom	Best practice
Time period studied	Summer 2000–winter 2002	Spring 2000–fall 2002	Winter 2000–winter 2002
Level within the organisation at beginning of research	Business unit (started within telecom business unit)	Business unit (sales Germany of telecom business unit)	Corporate
Level within the organisation at end of research	Corporate	Business unit	Corporate
Phase of project at beginning of research	Roll-out had begun in one business unit	In operation	In operation
Phase of project at end of research	Implemented on corporate level	Substituted by corporate project	In operation
Short description	Intranet-based platform for global usage by telecom sales representatives, later for sales representatives in other business units (in English); connects documents as well as people	Intranet-based platform for national usage by sales representatives (in German); focus is on connecting people	Online discussion forum for international usage (in English); focus is on sharing of best practices in knowledge management

Table 3. Overview of interviewees and their affiliations.

Job title	Affiliation	Interviews
1. Line manager	Telecom business unit	1
2. Head of best-practice sharing programme	Corporate Knowledge Management Department	1
3. Member of the board	With special responsibility for Telecom	2
4. Senior line manager	Telecom business unit	2
5. Knowledge manager	Corporate KM project	1
6. Head of cooperation strategies	Corporate Development Department	2
7. Chief corporate strategy officer	Corporate Development Department	1
8. Head of business communication	Project manager in best-practice sharing project	1
9. Member of the board	With special responsibility for Human Resource Management	1
10. Member of the board	With special responsibility for e-business and the European Union	2
11. Programme manager strategy development	Telecom business unit	1
12. Head of competitive intelligence	Telecom business unit	1
13. Head of strategic marketing department	Corporate Development Department	1
14. Former head sales telecom business unit	Information and communications sales Germany	2
15. Vice President	Corporate Technology Department	1
16. CEO and Chairman of the Board	Siemens AG	1
17. Former head of business communication	Information and communication networks sales Germany	1
18. Former member of the board (now retired)	With special responsibility for Asia	1
19. Member of the board	With special responsibility for best-practice sharing	1
20. Head of service management	With special responsibility for best-practice sharing	1
21. In-house consultant	Information and communications networks, sales Germany	1
22. Vice President	Information and communications executive office	1
23. Head of service management project	Telecom business unit	1
24. Head of business communication	Telecom business unit and best-practice sharing	1
25. CEO	Osram Lighting Devices	1
26. Head of knowledge management	Telecom business unit	2
27. Knowledge manager	Information and communications	1
28. In-house analyst	Corporate Development Department	1
29. In-house consultant	Information and communications networks, sales Germany	1
30. Strategic Marketing Officer	Corporate Technology Department	1
31. CEO	Information and communications networks	2
32. Head of quality management	Transportation systems with special responsibility for knowledge management	2
33. CEO	Building technologies with special responsibility for best-practice sharing	1
34. Junior knowledge manager	Medical Solutions, with special responsibility for best-practice sharing	2
35. Head of corporate knowledge strategy	Corporate knowledge management	1
36. Senior knowledge manager	Information and communications networks, sales Germany	1
37. CEO	Information and communications	1
38. Head of corporate business accelerator	E-Business Department	1
39. Chief knowledge officer	Corporate Knowledge Management	1
40. Knowledge manager	Information and communications, sales Germany	1
	Overall	Σ 49

degrees of involvement in the three initiatives, was that it enabled us to assess not only an individual's opinion on how a project went, but also to discover how this account corresponded to, or differed from, the one given by his or her superior. This made it possible to ensure both the construct validity and reliability of the propositions being generated, and to confirm that we were assessing level-specific logics of action, rather than simply recording the beliefs and attitudes of the individual interviewed. Interviews were generally

scheduled for 90 min, but in some cases extended to half-day sessions. Follow-up interviews usually took no more than 30 min, as they served to clarify specific points that had emerged during an earlier interview. Appendix 2 provides an overview of our interviewees, their position and affiliation within the company, and also sketches the role they played in the three projects investigated.

In preparing the interviews, extensive use was made of archival data to challenge interviewees' memories

and to generally corroborate interview data. This helped us contain the difficulties associated with the interviewees' possible selective retrospective biases, as well as helping to recreate the managers' temporal and contextual frame of reference. In short, it helped ascertain the internal validity of the research procedures (e.g. Eisenhardt 1989, Yin 1994).

4.3. *Data analysis*

The (deliberately broad) questions, 'What are the key variables impacting on knowledge management implementation?' and 'How can we discuss these variables and their relationships in a succinct way?' were the starting point for the data analysis. These were questions for which the literature did not appear to provide satisfactory answers. We then began to carve out initial shortlists of key variables, as well as their structural and temporal relationships. As the analysis of these data proceeded, we started to recognise patterns in the overall process of the knowledge management implementation under scrutiny.

A surprising – and for us as researchers challenging – finding was that individual elements in the knowledge management implementation process seemed to lack internal consistency. For instance, the interviewees' answers to questions such as, 'What organisational processes must be in place to make a knowledge management project successful?' 'What is the role of top management in pushing knowledge management initiatives?' and 'How can knowledge management initiatives be made more user-friendly?' often contradicted one another. Some interviewees replied that a key success factor was the standardisation of a knowledge management tool such as an intranet-based best-practice sharing platform (in terms of the English language used, common templates for entering best practices, etc.). Others explained that standardisation was counterproductive, leading to an impersonal tool 'with something for everyone and nothing for me', as one interviewee commented.

The seemingly contradictory patterns and viewpoints prompted the idea for this article. In the Siemens case data, we therefore chose not to iron out these divergences. Instead, we chose to use the emerging paradoxes in the process of knowledge management implementation as a creative challenge to formulate a 'rich, yet parsimonious' set of two traps (Eisenhardt 1989).

Consequently, the next question in the data analysis was which framework to use in order to make sense of the apparent paradoxes that we had found, and to use them constructively. In formulating the two traps, we found it useful to follow Scott Poole and van de Ven's advice (1989) to 'use paradox to

build management and organisation theories'. We specifically operationalised these authors' notion that four different modes of working with paradox can be useful in theory building: (1) accept the paradox and use it constructively, (2) clarify levels of analysis, (3) separate the two levels temporally, and (4) introduce new terms to resolve the paradox. We found, for example, that the initial high profile selling of a knowledge management initiative, particularly to top management, had to be traded off against the need to reconsider inflated targets and expectations later on. Valikangas and Gibbert (2005) inspired the tying together of the trade-offs in the form of 'traps'.

4.4. *Sidestepping implementation traps: considering IT-enabled change through the eyes of the customer*

In analysing and clustering the qualitative data, we found that sidestepping implementation traps involved several actions that could be conveniently summarised in terms of marketing principles:

- Awareness of cultural preferences;
- Segmenting user preferences and tastes;
- Using buzz marketing techniques to achieve customer (or employee) buy-in;
- Keeping customer segment profiles clear-cut; and
- Deciding whether the primary customer is the end-consumer or a business customer.

4.5. *Awareness of cultural preferences*

In all three knowledge management initiatives, Siemens had chosen an intranet application as its tool for change. The rationale was straightforward, as one manager explained:

'Historically, transfer of knowledge has taken place orally, which is terribly inefficient. You have to be at a particular place and time to make it happen We leverage the intranet, not only as a one-way publishing tool, but also to have everybody contribute – on a democratic basis – to a truly interactive exchange. You can suggest an idea and have many people view it. You start hearing from people who would never have been involved – who you would never have known would have any knowledge of or experience with the topic'.

A key interactive feature of all three intranet-based applications was the 'urgent request' system. Employees posted questions on the intranet in the hope that someone, somewhere would have an answer. The idea was that users of the platform would regularly check the list to see if there was a request with which they could help. An example is: 'My customer needs a business case for implementing this new router technology by Monday. Can anyone help?' As one

manager explained: 'Urgent requests are like asking the whole world for help' (MacCormack 2002). Thus, anyone in the global knowledge-sharing network could post an urgent request to the entire community of 7000+ colleagues. However, an assessment of the number of questions and answers this function engendered showed that after the first year, almost no urgent requests were posted from colleagues in China. When asked for the reason, one Chinese interviewee explained: 'I do not want to have my ignorance broadcast to everyone else in the company'.

The Chinese culture therefore raises barriers to knowledge sharing. A further complicating factor was that as urgent requests were for a global audience and the lingua franca was English, some Chinese were afraid that their grammar and spelling were too inadequate to post a request for help. The one-size-fits-all system had thus failed to provide for the Chinese cultural group, making a key feature of the system redundant for the Chinese.

Measures taken to ameliorate this situation were more culturally aware and included additional workshops for local managers to overcome cultural barriers to knowledge sharing, as well as a Chinese version of the user handbook. Additionally, contributions in Chinese were not only allowed, but also actively encouraged. To make this compatible with the standard system, employees had to categorise their contributions' key terms into predefined English categories in order to facilitate the capturing of local knowledge and make it available to the global community (Davenport and Probst 2002, Gibbert *et al.* 2002, Voelpel *et al.* 2006).

4.6. Segmenting user preferences and tastes

There was an additional problem associated with the intranet-based top-down approach, which some interviewees described as 'evangelical' rather than 'democratic' in character. By studying the three initiatives, another variable precipitating the standardisation/customisation trap became evident: user requirements and habits.

Managers of the telecom initiative, for instance, chose to go down the standardisation route, providing a one-size-fits-all intranet-based knowledge management service that could in theory be used by virtually everyone in the business unit's sales department for virtually every issue sales representatives might encounter. The main problem with the standardised top-down approach was that it was not sufficiently sensitive to (pre-)existing personal networks, or the media through which these networks were (self-)organised. As one senior sales representative noted: 'What is the value-added of having a formalised,

impersonal tool on the intranet for this, when I can get the same information via my telephone by simply relying on personal contacts?'

Similarly, the corporate initiative's platform was geared towards accommodating the knowledge requirements of two types of employee: service technicians and sales representatives. However, the two differed greatly with respect to their knowledge requirements and modes of knowledge retrieval. Service technicians tended to take pride in sharing the newest technical tips and tricks with their colleagues – and happily used the intranet platform established for this purpose. Conversely, the sales representatives were much more reluctant to publicly broadcast the knowledge they had gathered through years of dealing with customers, and which they viewed as their stock-in-trade. 'Sure we have knowledge about our customers', one manager explained, 'but it's not for free' (Gibbert *et al.* 2000, MacCormack 2002). The sales representatives thus preferred to rely on existing, and trusted, personal networks to trade the knowledge they needed in private. The tool used for this purpose was the tool they were most accustomed to: their mobile phone.

When this became apparent, the incentive and reward system for sales representatives was changed from individual to team-based incentives to encourage knowledge sharing. For example, at the beginning of 2000, the management launched a programme through which users of the initiative could collect ShareNet shares – similar to frequent flyer miles. Users were awarded such shares for entering knowledge, accessing knowledge, and rating others' contributions. Shares could be redeemed for gifts and prizes such as Siemens-made mobile phones, textbooks, overseas trips, etc., and career promotions were in part based on the employee's knowledge-sharing account.

4.7. Using buzz marketing techniques to achieve employee buy-in

Buzz marketing is defined as the amplification of initial marketing efforts by third parties through their passive or active influence. These third parties, typically innovators and therefore 'opinion leaders' (e.g. Greg-Metz 2004: 64), or 'lead users' (von Hippel 1988), are the first to adopt a novelty and, in turn, influence other early adopters to follow suit. To jumpstart adoption, marketing professionals need to identify these innovators and encourage them to try a product. As such, buzz marketing involves cultivating opinion leaders and stimulating them to spread information about a product or service to others in their communities. In a successful buzz marketing campaign, each carefully cultivated recipient of a brand message becomes a

powerful agent, spreading the word to yet more users, much as a virus rampages through a population (e.g. Ahuja *et al.* 2007). At Siemens, managers found this approach to be useful in gaining employee buy-in. In the telecom initiative, one interviewee called this using an ‘infection’ approach, and explained:

‘To implement knowledge management in a company, you need to work with viruses. Infections must concentrate on small teams and their specific needs and requirements. These teams need to be confronted with the benefits of [the change] for their job, such as fewer overtime hours, better quality offers, and an edge over the competition. As with biological viruses, the infected teams will spread the virus and infect others as the benefits materialize’.

Very similar to a bottom-up implementation style, the virus would spread within and between teams as they co-operated naturally with one another, and would eventually link all the employees in a global knowledge-sharing network. This approach seems to have worked. One end-user asserted: ‘There is nothing that convinces you more of the benefits of using knowledge management than seeing the colleague who shares the desk with you leaving the office on time because he found an already existing solution that required only minimal adaptation to fit the new customer’.

The managers we interviewed advocated the buzz or viral approach, because it created a feeling of mutual trust: it used existing networks rather than imposing artificial new ones, the interviewees said. However, a prerequisite for creating a buzz around a change is the clear positioning of the knowledge management initiative as a true value-adder that solves problems relevant to employees’ day-to-day work. Emphasising the value-added is critical to prevent the platform from being portrayed as ‘yet another headquarters project that would be demanding precious resources’, as one line manager put it. Consequently, the corporate initiative developed its platform as a joint effort by a core team of sales people from all over the world (the ‘opinion leaders’ of the buzz marketing campaign, e.g. Greg-Metz 2004) who recognised that local sales and marketing executives felt that they too had a vested interest in the development of such a system.

4.8. Keeping customer segment profiles clear cut

While the telecom and corporate initiatives illustrated the benefits of using a bottom-up approach, the standardisation/customisation trap suggests that its potential downside is too much fragmentation. This became apparent in the best practice initiative. The knowledge managers started at the grassroots when a

previously informal community of employees wanted to develop a formal organisational platform for sharing thoughts on and experience with knowledge management activities and requested corporate support.

This community had started off with 15 members who began to meet (more or less accidentally) and exchanged their experience with and their understanding of knowledge management. If an issue emerged, they would get in touch with one another to discuss and share experiences. Informally, they began telling one another stories about their successes or failures with the handling of knowledge until, about a year after their request, the formal community was founded. After its inception, the community grew rapidly as a result of an ever-increasing interest in knowledge management topics within Siemens. With time, the community involved more staff in actively contributing towards the transfer of knowledge across all hierarchical and group levels. The buzz campaign was so successful that it eventually produced almost 120 different groups, chat forums, communities of practice and knowledge repositories. However, what some managers saw as a rich diversity of available tools and mechanisms, users often described as ‘mind boggling’.

In addition to insufficient customer segmentation within a given initiative, there was also some confusion between the three projects. For example, the telecom initiative, which was implemented on a local level, saw itself increasingly confronted by emerging knowledge management projects on a global, corporate level. As a result of this emerging competition, individual initiatives’ conceptual and practical value-proposition boundaries became increasingly blurred, which is always a danger sign, and suggestive of the customisation trap. Employees were confused as to which database to consult and where to log their skill portfolio. More confusion arose about the relevance and applicability of individual knowledge management projects, which impaired the willingness of employees to participate.

This issue loomed ever larger because the global initiatives (i.e. the corporate and best practice initiatives) were of course implemented on a much greater scale, and in-house media attention largely overshadowed the more local initiative, which interviewees described as ‘low-level’. In addition, both the corporate and best practice initiatives were presented in English, which many non-English-speaking users found trying. The project debriefings and other knowledge assets in the telecom initiative were in German, and people who had already entered this knowledge into the telecom database were reluctant to enter it a second time in the corporate platform, let alone do the required translations.

Sidestepping the standardisation/customisation trap therefore demands formal anticipation and recognition of other projects (knowledge management or other) that constitute 'substitute products' or 'new entrants' and have the potential to develop into 'competitors'. Clear-cut positioning in terms of communicating the value proposition of a given initiative relative to competing projects is critical, and this requires top-down co-ordination to segment the market for the change initiative not only within but also between initiatives. In the absence of top-down co-ordination, great care should be taken to position individual value propositions appropriately to maintain a competitive space for each of them. At Siemens, it became clear that the assumption that knowledge management initiatives operate in a competitive vacuum was naïve. In the words of one senior knowledge manager, 'no knowledge management initiative is an island'.

4.9. B2B or B2C?

An issue underlying the standardisation/customisation trap is that of the direct customer. The marketing literature differentiates between business-to-business (B2B) and business-to-consumer (B2C) approaches. In the former, the direct customer is the industrial buyer, who turns suppliers' products and services into end products. In the latter, the direct customer is the end consumer.

In IT-enabled change, the question regarding who the ultimate customer is does not have a straightforward answer. Intuitively one would think that employees who actually use the knowledge management system and are supposed to share their knowledge would constitute the knowledge management initiative's primary customer (almost like the 'end customer' in B2C). However, the assumption that knowledge management needs to be sold to potential users only is only partly true: another critical knowledge management stakeholder is top management (representing the 'industrial buyer' in the B2B analogy). It may be easy to grasp this point intellectually, but it is difficult to execute in practice, as it requires actively anticipating, interpreting and acting on top management perceptions, constraints and interests as they evolve over time.

At Siemens, we learned that the role of top management increased over the change project's implementing phases. For example, while it is important to have top management support during the early phases of a change project to raise awareness and to create incentives for use, it is even more important to secure sustained support over time, and to reassure users that knowledge management is still on the

agenda. However, not only do managements' goals change over time and in keeping with the organisation's evolving strategy, but so do their perceptions about how a given initiative fits in within the big picture. The challenge is therefore to secure the interest and commitment of a top manager who continues to champion an initiative.

In the third year of the telecom initiative, for instance, it appeared that the chief executive officer's (CEO's) outlook was still heavily influenced by the initial claims, which had been made in a more buoyant economy and tended to be rather ambitious with regard to the project's financial viability. Several interviewees noted that a key challenge was that top management's perception did not synchronise with the realities. Interviewees further said that the initial claims, while appropriate in the conceptualisation phase of the initiative, were increasingly anachronistic as the initiative matured. The result was a widening gap between the CEO's perception and the new reality.

The implementation of an IT system, the motivation and reward system, as well as the change in the organisational structure and culture contributed to making the corporate initiative very expensive – reported to have been \$7.8 million at the end of 2000. Unhappily, while the costs of sharing knowledge were quite obvious, the benefits were less obvious. The knowledge management initiative therefore had to demonstrate its benefits to top management with a realistic business case. Two main types of more or less quantifiable benefits were delineated: first, the saving of costs, for example, by re-using tenders or re-using knowledge on how to simplify processes; second, increased revenues, for example, by increasing the quality of tenders by re-using knowledge of the success factors of tenders, or by simply being faster than the competition in re-using documents. For example, in Switzerland, Siemens won a \$460,000 contract to build a telecommunications network despite the fact that its bid was 30% higher than that of its competitors: via the corporate knowledge management initiative, colleagues in the Netherlands had helped the Swiss sales reps prove that Siemens' offer was more reliable (MacCormack 2002).

In summary, successfully implementing IT-enabled change needs much 'blowing hot and cold', as one interviewee described it. While intensive championing of the change seems essential to create the high-profile visibility and management support needed to kick-start an initiative, this behaviour can later backfire when change managers need to back-pedal on initial, over-optimistic financial forecasts. This issue is particularly acute when the financial bottom line of IT-enabled change is difficult to quantify as with knowledge management. The Siemens case furthermore suggests

that as knowledge management projects mature, the emphasis often shifts to a more ‘hands-on’ stage during which good workmanship carried out in a more painstaking fashion is required. Nevertheless, it is a major mistake to emphasise good workmanship at the expense of an inspiring ‘calls to arms’ in the later phases of the project, particularly when the economic climate is deteriorating. A firm link with corporate or business unit strategy can help iron out legitimisation issues in mature knowledge management initiatives, thus ultimately helping to sidestep the customer trap.

5. Discussion

Most change initiatives, including large-scale, IT-enabled change, may have to address issues of top-down implementation, bottom-up initiatives, or stakeholder interests in the organisation. In short, most change initiatives will be exposed to the standardisation/personalisation, and customer trap. However, theory, as well as our observation, demonstrates that these two traps are particularly dangerous when knowledge management implementation is called for. Unlike information management, knowledge management deals with an organisational resource that is intimately bound to the individual and cannot be transferred by coercion. As such, knowledge management implementation – achieving knowledge worker *buy-in* – can be compared to successful marketing, since knowledge workers cannot normally be coerced to accept a knowledge management platform, just as customers cannot normally be coerced to buy goods and services. We use established marketing lingo and concepts to parsimoniously conceptualise not only the implementation traps, but also what can be done about them.

5.1. Sidestepping the customer trap

The customer trap should perhaps be regarded as an indicator of pending trouble. Once a standardised initiative is implemented in a top-down mode, it may be difficult to sustain adequate levels of attention to individual users’ needs and requirements while avoiding management finding itself with too much standardisation. Consequently, evangelising supplants democracy in scaling up the initiative as the user community grows. Should a company find itself in such a position, it may be advisable to bound further expansion by focusing on user needs and requirements, as user resistance may ultimately be the deeper cause of trouble surrounding the change initiative.

The customer trap also underlies problems of accountability when a maturing bottom-up initiative finds it difficult to sustain the possibly high-flying

claims to cost savings and revenue generation. If this is the case, it may be opportune for change managers to reorient their communication strategy and bound it by adopting the perspective of top management as a key stakeholder in bottom-up initiatives. This may be done by carefully positioning the initiative vis-à-vis other, perhaps larger initiatives and by framing its value propositions from the perspective of top management, as well as that of users.

5.2. Sidestepping the standardisation/customisation trap

On the one hand, the standardisation/customisation trap suggests that a one-size-fits-all approach is counterproductive because it ignores individual user requirements and habits despite (or because of) interactive features, including urgent request functions. Ironically, while the global scale of an organisation’s operations provides a strong rationale for a standardised knowledge management system, intercultural variables may question its feasibility.

However, too little standardisation is counterproductive, too. The more competing initiatives spring up in an organisation, the greater the need for top-down standardisation to ensure that users understand how and where to access and contribute knowledge. Efforts to transform companies via bottom-up approaches, such as organisation development and quality circles, may have failed because they were implemented piecemeal without clear direction from and standards set at the top. Bottom-up approaches that are initially geared towards greater sensitivity to the individual users’ needs and requirements may result in an overly differentiated patchwork of sub-initiatives and platforms that employees desiring quick and efficient knowledge retrieval find hard to comprehend.

The ever-present risk of triggering the customer trap clarifies why it is necessary to initially aggressively ‘sell’ change initiatives such as knowledge management inside an organisation, and particularly to top management. It also explains why this high-level lobbying can be counter-productive in the long run when the difficult quantifiability of the change’s value-added makes it hard to live up to the expectations created. In later phases, it is, however, possible for change managers to maintain the momentum despite the limited quantifiability of knowledge management and other IT-enabled change by, for example, creating a dynamic link with a company’s evolving strategic direction. Knowledge managers should further be careful not to oversell their initial promises regarding the value-added of a planned initiative. It is better to produce a consistent stream of relevant success stories as the initiative

Table 4. How to sidestep implementation traps.

Trap	Strategies-in-use	Explanation/rationale
Standardisation/ customisation trap	<ul style="list-style-type: none"> ● Standardise in early stages to push initiative top-down and to create critical mass. ● Personalise later to remain relevant to users' needs and constraints (pull). ● Avoid fragmentation and losing ground to larger initiatives later on by teaming up and forming alliances with other initiatives to create joint value propositions. 	<ul style="list-style-type: none"> ● Bounding implementation process by focusing primarily on the user as the direct customer. ● Keep change goals and milestones relevant to top management perceptions and constraints.
Customer trap	<ul style="list-style-type: none"> ● Provide quick wins to create visibility among top management early on, while anchoring initiative in constraints and user preferences. ● Be nimble: reposition initiative continually vis-à-vis company's evolving strategic direction. 	<ul style="list-style-type: none"> ● Bounding implementation process by differentiating the customers of the initiative (management and/or users).

matures, and to firmly anchor those in management's constraints, perceptions and expectations (e.g. Schonberger 1980, Ranganathan *et al.* 2004, Leiser and Hirschheim 2007). The idea here is to 'not fire all your guns at once', as one manager put it. While this insight is well established in MIS implementation, it assumes a particular relevance in knowledge management implementation, where the tacit nature of knowledge makes it difficult to quantify the value-added of knowledge management.

6. Conclusion

This case study has provided an in-depth analysis of Siemens' lessons learned when implementing knowledge management. Beyond illuminating the specifics of the Siemens case, the study aims at conceptualising, in a parsimonious yet rich way (e.g. Davenport and Markus 1999) two general knowledge management implementation traps and how these can be avoided. The first trap is called customer trap and suggests that needs and requirements need to be adequately balanced of both the 'end customer' of the initiative (the user of the initiative) as well as the 'business customer' of the initiative (top management). The second trap is called personalisation/standardisation trap and points to the need to balance standardisation (often needed due to the global scale of knowledge management initiatives) with customisation (too much of which can lead to an undifferentiated mix in which value propositions of individual initiatives are hard to appreciate).

As such, avoiding the implementation traps involves striking the right balance between their different manifestations. However, how can chief information officers (CIOs) find the sweet spot on the seesaw, so to speak? What are the choices to be made and are they

better viewed as complements rather than opposites or alternatives?

The starting point for managers is to orient or anchor their thinking deeply in the habits, constraints and requirements of the 'customer' of the initiative. A fundamental question to ask is whether the initiative in question has been (or is being) implemented top-down or bottom-up. This distinction helps draw attention to the most important issue: the *direct* customer of a given initiative (thereby escaping the customer trap). If the change initiative has been implemented top-down, the key customer is the actual user of the initiative. Consider the corporate initiative at Siemens, if change is implemented bottom-up the direct customer is top management. This borderline, crude as it is, draws attention to the very different constraints users and managers are exposed to.

Consider the corporate initiative at Siemens, which was initiated when top management decided that given the competitive dynamics in the industry, a change initiative was needed that would allow the company to better exploit its knowledge resources. The backbone of the initiative was an intranet platform that could be accessed by just about anyone. Standardised incentives were given to create a critical mass on the knowledge database. After this 'evangelical' phase, however, the company learned that while standardisation is necessary to gain a critical mass, or 'market share', it is counterproductive in later stages, when it becomes necessary to personalise the initiative in order to make it more user-relevant and to maintain top management support.

The Siemens experience suggests some strategies-in-use that can help managers find the balance between customisation and standardisation. This does not, however, mean that there is a map indicating the exact location of the seesaw's sweet spot. The overall success

of an IT-enabled change project is far too complex to be explained by any one factor alone, and it may be influenced by factors other than the traps discussed here. Nevertheless, viewing the choices that constitute the traps as opposites, rather than as points on a seesaw, is certain to lead to poor performance of the initiative, sooner or later (See Table 4 ‘How to sidestep implementation traps’).

A CIO or senior manager planning to implement, or having already initiated, a knowledge management system that has to transform the way organisational members interact, should consider the following questions:

- What are your most recent change experiences?
- Which groups of stakeholders are most likely to have a major impact on the design and execution of the change effort?
- Is your initiative firmly anchored in these constraints? For example, have you identified who your direct customer is in the organisation?
- Have you segmented your ‘target market’ thoroughly enough? That is, are you clear about how the change effort adds value to your customer’s daily routine? To what extent are you actively using this knowledge?
- How do the needs and requirements of your direct customers impact not only on the initiative itself, but also on how it is to be presented to your superiors to get through the next round of funding? What ‘drives’ your boss *these days*?

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