

# Mobile Knowledge Management

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## INTRODUCTION

Whereas knowledge management (KM) has gained much attention in the field of management science and practice as the eminent source of competitive advantage (e.g., Davenport & Prusak, 1998; Drucker, 1993; Nonaka & Takeuchi, 1995; Probst, Raub, & Romhardt, 2003), one issue has been largely neglected: The aspect of mobility.

Conventional solutions for knowledge management systems (KMSs) have in common that they are designed for stationary workplaces and consequently require the corresponding infrastructure—that is, personal computers and fixed-line network access. Thus, they do not cater for business processes in which workers move around in or outside the premises. The result is that knowledge support for mobile workers is often rather restricted, once a task has to be performed outside of the office. Organizations in which parts of the workforce belong to one of the following classifications are concerned in that context:

- Specialists, mobile on the premises (e.g., in-house technicians)
- Specialists, mobile outside the premises (e.g., members of the sales force)
- Specialists and executives in companies with mobile operations (e.g., organizations like contracting business, police, or armed forces)
- Decision makers (e.g., CEOs who are required to make timely and well-funded decisions disregarding their current position)

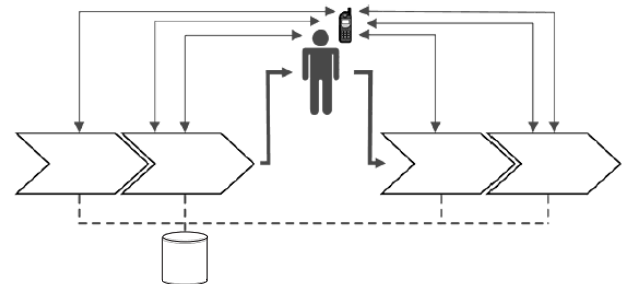
The need for mobile KM stems from one of the most prominent challenges in KM: ensuring the availability of knowledge in the moment of knowledge demand. Insufficient knowledge at “point-of-action” is the wording Wiig (1995) uses to describe that problem. There exist situations in the course of daily work that require particular knowledge that is not owned by the individual actor. As long as organization members are located at the same place, knowledge repositories can be easily accessed. In some cases it might for example be sufficient to walk down the office floor and ask colleagues for help in order to

establish a basic form of knowledge exchange. Another example is the access of best practices databases using a stationary computer.

Analyzing business processes with mobile elements, it is obvious that the insufficient integration of many mobile workplaces leads to suboptimal processes. It is usually required to interrupt the actual task in order to feed knowledge into or retrieve it from repositories. A mobile worker can access his company’s knowledge infrastructure not at all or only indirectly. This leads to a time-consuming process in which workers spend valuable working hours searching for knowledge instead of pursuing their actual job. That is exactly what has to be avoided, considering the imperative of making access to knowledge as simple as possible. Figure 1 illustrates the break existing in the process chain due to the insufficient integration of mobile workplaces: as the mobile worker is not integrated into the process chain, the information and knowledge flows in mobile business processes are equally disrupted.

As the aspect of mobility is underrepresented in KM literature, we aim at providing an evaluation framework for managing knowledge in mobile settings (i.e., mobile KM). In order to do that, we will resort to the insights gained in the discussion of mobile techniques. As both concepts have not been sufficiently put together, we think that substantial benefits can be derived by merging the ideas behind mobile techniques and KM.

*Figure 1. Non-integration of mobile workplaces into the process chain*



## BACKGROUND

As a survey of KM literature shows, mobile KM has been largely neglected. The following section presents an overview of exemplary articles dealing with mobile KM.

The works of Fagrell (2000) can be regarded as some of the first valuable approaches to address the area of mobile KM. With NewsMate, Fagrell is presenting a KMS application that aims at supporting mobile knowledge workers. In this system KM is integrated with the relevant task that needs to be supported. A proof of concept is given by presenting a working prototype. This prototype allows journalists to access internal and external information. Further, NewsMate acts as an expert finder by automatically identifying colleagues who have worked on the same topic.

Grimm, Tazari, and Balfanz (2002) are discussing limitations of mobile devices for the purposes of mobile KM and present a framework for the implementation of mobile KMSs. In the course of that, they address technological as well as human limitations and thus touch the area of human computer interaction (HCI). The authors aim at using the potential of mobile technology to deliver context-specific information by using the user's location to determine relevant context. Using a "virtually centralized" context manager to handle profiles of relevant objects, a situation recognition engine enables the context-specific provision of knowledge.

Martens and Gronau (2003) introduce the potentials of mobile KM by primarily referring to the dimension of ubiquity. They base their analysis on specific characteristics of mobile technology as discussed in literature dealing with the mobile economy. As a result, the reductions of spatial and temporal limitations, as well as persistent connectivity, are isolated as relevant factors. Further, the authors present short examples of how those potentials can be used in the area of KM.

Two areas can be pointed out as deficits in existing mobile KM literature. There is a lack of a holistic concept, as the focus is put either on specific technological or on KM-related issues. Additionally, it can be observed that the term "mobile KM" is used for a wide variety of cases (e.g., Lehner & Berger, 2001). That said, some of those cases do not deserve the term mobile KM, as they represent simple data integration processes. In order to structure the different applications termed mobile KM, the following three categories are developed:

1. **Mobile information exchange** includes the transfer of data and information using e-mail as well as the access to operational systems used in an organization to retrieve sales figures or market data.
2. **Mobile business intelligence** refers to the access of processed enterprise data using mobile devices. It

involves the technologies introduced earlier (e.g., data mining and data warehouses).

3. **Mobile KM** describes that management process in the course of which mobile communication techniques in conjunction with mobile devices are employed for the creation, validation, presentation, distribution, or application of knowledge.

The basis for those categories is the knowledge versus information view (Holsapple, 2003). One of the authors representing this point of view is North (1999). He argues that information—derived from signs and data—is the basis for knowledge as soon as it is associated with context or other information (North, 2001). Starting with signs (e.g., "0123") and structuring them with a certain syntax will result in data (e.g., "10,23"). Data plus semantic becomes information (e.g., "10.23 refers to the percent improvement in sales figures"). This information is relatively useless, because up to that point it cannot be assessed whether—in this example—the increase can be judged as being sufficient enough. Only in context with other information and experiences is one able to determine that an increase of 10.23% is positive indeed for a company that operates in a shrinking or stable market, whereas it would be considered below average for a company in booming business. Included in the knowledge stair is the idea that knowledge is a direct precursor of competence, because it enables competent action. Information on the other hand is relatively useless (Sveiby, 1997), as long as it is not processed and linked with other information, judgments, or personal opinions.

Talking about mobile KM in the narrower sense, we think that only those processes dealing with representations that have been to some degree mentally processed by human actors can be considered mobile KM. Additionally, mobile KM must be integrated into a holistic KM concept. Mobile data access as well as mobile business intelligence serve as supporting techniques in the context of mobile KM as they provide the input for human knowledge creation and thus can be referred to as mobile KM in the broader sense.

## MAIN FOCUS OF THE ARTICLE

We state that for the success of mobile KM, it is not sufficient to merely make a conventional KM application available with new media. Instead, the use of mobile communication technology is only remunerative if it results in obtaining distinct supplementary added value. In order to verify the contribution mobile technology can make to KM, we are referring to the theory of informational added values (IAVs) which has been augmented with

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