

## 3.4 Integrating experience management into the every-day life of organisations

Edith Maier<sup>17</sup>, Ulrich Reimer<sup>18</sup>

**Abstract:** The paper discusses the results of extensive interviews to find out if and how companies these days actually manage experience-based knowledge. The study builds on the findings of a previous survey, which showed that experience was still considered a valuable resource in times of digital change but rarely managed systematically. Trust and mutual respect as well as good leadership emerge as essential for successfully integrating the exchange and transfer of lessons learned. The good practice examples selected also show that embedding the capture, provision and reuse of knowledge into daily work processes is primarily a question of organizational culture rather than tools. However, the increasing availability of data and process traces as well as advances in text mining and new interface technologies such as voice assistants have given rise to novel solutions that can provide knowledge proactively when- and wherever needed and without requiring additional effort on the part of users.

**Keywords:** experience management, tacit knowledge, lessons learned, organizational culture, good practice, learning organization, process-oriented knowledge management

### 1 Introduction

In a recent paper we concluded that “experience and lessons learned will continue to play an essential role in the face of digital change because they are the foundation for as well the source of sound judgement and problem solving” [MR18].

Our conclusion was based on the results of a survey conducted under the aegis of METIS, the European Institute of Experience and Management<sup>19</sup>, to find out if and how managers in the German-speaking countries actually documented, exchanged, managed and maintained experience-based knowledge [Ma16]. The survey was complemented by a wide-ranging literature search which focused largely on German publications, but also included relevant works from the Anglo-Saxon world, e.g. [BH16], [DW15], [FO17].

Although both the survey and the literature review showed that experience-based knowledge was still considered as a valuable resource, digital change had shifted the focus from products to customers. This implies new roles for employees such as supervising machines and processes and assessing data analysis results, whilst at the same

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<sup>17</sup> University of Applied Sciences St. Gallen, Switzerland, edith.maier@fhsg.ch

<sup>18</sup> University of Applied Sciences St. Gallen, Switzerland, ulrich.reimer@fhsg.ch

<sup>19</sup> [https://www.rfh-koeln.de/forschung-projekte/metis/index\\_ger.html](https://www.rfh-koeln.de/forschung-projekte/metis/index_ger.html)

time, digital transformation opens up new opportunities for implementing solutions for capturing, exchanging and preserving lessons learned. As a result, it was concluded that support could be offered that was both context-aware and situation-specific. For this purpose, we suggested that organizations might use technologies such as information extraction from texts, process mining and text mining as well as new interfaces e.g. ones based on natural language processing such as chatbots.

We also argued that to be accepted a solution should be integrated closely with project and workflow management and should not require any additional effort. Besides, methods will have to provide added value e.g. in terms of facilitating troubleshooting in case of failures or preventing problems in the first place. Only then, so we assumed, would companies be able and willing to tap the full potential of tacit knowledge for value creation.

To test these assumptions in real-life, we asked a group of master students to have a closer look at a range of companies from different industries and of different sizes and carry out in-depth interviews with managers and employees. In this paper we present the preliminary results of this investigation.

In the following section, we discuss the methodological approach, define the most relevant concepts and briefly describe the context in which the companies are active. Section 3 presents the preliminary results including the major impacts of digital transformation according to the companies interviewed as well as the role of leadership and organizational culture when faced with the challenges posed by digital transformation. Section 4 focuses on two examples of good practice for fostering the effective conversion of tacit or experience-based knowledge into organizational knowledge and thus a valuable asset. Section 5 discusses the new opportunities digital transformation can offer in terms of supporting the management of experience and problem-solving especially in the manufacturing domain. Section 6 concludes the paper by emphasizing the importance of organizational culture characterized by trust whilst keeping an open mind towards new technologies emerging with digital change.

## **2 Methodological Approach**

### **2.1 Definitions and concepts**

We consider the concept of experience as closely related to terms such as good or best practice, lessons learned, tacit knowledge, knowledge-in-use. The management of experience can therefore be regarded as a special form of knowledge management and deals with methods and technologies suitable for collecting this type of knowledge from various sources and for documenting, sharing, adapting and distributing it. It also includes the organizational and social measures required to assure that these are integrated into business processes (see also [Be02]).

Lessons learned is one of the key concepts in our study – can be defined as experience distilled from projects that should be actively taken into account in future projects so as to reduce or eliminate the potential for mishaps or failures. Experience gained from lessons learned is a prerequisite for proper judgement, exception handling and problem solving. Continuous and systematic experience management is therefore highly needed in digital work environments, even when there is a high degree of automation of (production) processes (see e.g. [Pe17], [PS15] or the IEC’s White Paper Factory of the Future [IE15]).

As far as terms such as digitalization and digital change or digital transformation or Industry 4.0 are concerned, there is no consensus. For our study, we have adopted the one coined by [Bo15], namely “the change associated with the application of digital technology in all aspects of human society”, the definition which is also the one adopted by Wikipedia.

We prefer the term “digital transformation” as opposed to “digitalization” because it shifts the focus away from the introduction of software and online platforms to include the development of new business models and optimizing internal processes [To18]. With the help of new technologies, new communication channels are also opening up for the exchange with customers. Digital transformation is therefore a change that affects people and their consumer behavior in addition to technology [Sc18b].

The World Web Forum, the digital equivalent of the World Economic Forum, has also moved away from the term “digitalization” and embraced the buzzwords “leadership” and “transformation” [To18]. However, this does not mean that technologies no longer play a role. Rather, it indicates a shift towards an attempt to equip company managers with the right digital mindset. Digital change is therefore not the sole task of the IT department, but must be strategically defined at the top management level.

## 2.2 Interviews and documents

The interviews were carried out with representatives of Swiss companies as well as two companies based just across the border in Austria. According to the “Economiesuisse”, the Association of Swiss Enterprises, Switzerland as the innovation world champion has the ability to successfully cope with the digital transformation process. This is confirmed by the “IMD World Digital Competitiveness Ranking 2018”, where Switzerland occupies the fifth place, which is a great leap forward compared to 2017, when it ranked on place eight<sup>20</sup>. Currently, the USA is the leader followed by Singapore, Sweden and Denmark. The ranking is based on three main criteria: knowledge, technology and sustainability.

Switzerland is already a leader in some areas of digitalization, e.g. it has the highest density of smartphones in the world and internet bandwidth is also expanding rapidly.

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<sup>20</sup> See: [www.imd.org/wcc/world-competitiveness-center-rankings/world-digital-competitiveness-rankings-2018/](http://www.imd.org/wcc/world-competitiveness-center-rankings/world-digital-competitiveness-rankings-2018/)

Companies therefore benefit from an advanced technological infrastructure when confronted with new customer requirements, technological developments or regulations.

Prior to the interviews, the students carried out a literature review based largely on grey literature, i.e. internal reports or articles published in business or IT magazines since they found that very little scientific research has been published about how companies actually implement the management of experience-based knowledge. The literature review was used for identifying relevant categories for guiding and analyzing the interviews. The students selected seven companies which, based on the previous survey, boast an advanced degree of digitalization and therefore might offer examples of good practice. Their size ranges from fifteen to over 5000 employees and they are active in diverse industries including IT, telecoms, tourism, and mechanical engineering.

The interviews were conducted by two different groups of master students and lasted between one and two hours. One student group had a business studies background and comprised five members, the other group which consisted of four members had a more IT-oriented background. The former focused on investigating the role of experience-based knowledge in times of digital change and aimed at identifying the conditions and organizational prerequisites for successfully coping with the challenges of digital change in real-life settings. The IT-oriented students focused on new technologies that might be suitable for the provision and presentation of tacit knowledge in the field of mechanical engineering, e.g. to avoid and prevent errors or failures in the assembly process.

Apart from generic questions about the size, industry and main activities of a company, the questions were influenced by the findings of the previous survey [Ma16], especially the ones related to the methods that respondents considered useful and/or regularly used (see Figure 1).

As can be seen in Figure 1, many people-oriented methods such as succession planning, induction programs for new employees or mentoring are considered very useful, but in the “real world” it is the more formal methods such as written reports, meetings or professional or further training courses that tend to dominate. When asked for the reasons in follow-up interviews, lack of time and resources were cited most frequently [Sc16]. As a result, the implementation of measures for capturing and preserving employees' experience is often given low priority.

We assumed that the methods with the largest discrepancies between “useful” and “in regular use” were the most promising in terms of added value which is why we were particularly interested in learning if companies had any practical solutions for integrating new employees, succession planning, mentoring or moderated experience exchange. All of these require the capture and transfer of experience-based knowledge. Another question – inspired by [Sc16] – was how lessons learned and decision support could be integrated into organizational processes so as not require any additional effort on the part of employees/users.



Fig. 7: Methods for the exchange of experience

### 3 Impacts of digital change on the management of experience

According to the interviewees, digital transformation has had the following major impacts on the management of knowledge in general:

- tremendous growth in information and data,
- increasing complexity,
- the resulting difficulty in making decisions,
- the emergence of new technologies and interfaces to support knowledge management.

The demand for decision support has been voiced by both staff and management. This finding is closely linked with the competencies that have been identified as crucial when confronted with new challenges brought about by digital change, namely

- the ability to cope with complexity and
- the willingness to deal with changes proactively.

There is a general consensus that an organizational culture tolerant of failures, trust and mutual respect between management and employees and a willingness to learn and adapt to new environments are essential for coping with the above-mentioned challenges. These traits are typical for so-called “learning organizations” [PMJ04]. According to

North [No16] a learning organization requires combining individual with organizational learning cycles. Organizational learning is a cumulative process and implies taking into account the lessons learned from previous projects, recognizing potential for improvement and finding new strategies for solving problems ([AS99], [La10], [Va15]). Learning organizations are characterized by agile and dynamic processes which help them to adapt smoothly to external circumstances and changing requirements.

With regard to the management of knowledge, this translates into a company's ability to learn from experience and make use of it in future projects and decision-making. Corporate culture, leadership and the attitude and skill profiles of employees have emerged as the decisive factors that influence how experience is managed. Figure 2 illustrates the impacts of digital change on the factors that influence the management of experience-based knowledge.

Opinions diverged somewhat when it came to the role of leadership, incentives and the potential or usefulness of tools. On the one hand, knowledge management may thrive in a company with a hierarchical structure and strong leadership, where the CEO often acts as the main driver. On the other hand, in a democratically organized company where many employees work from home, staff may routinely exchange their lessons learned without being instructed to do so by their managers.

As far as incentives are concerned, most respondents agreed that these should be exercised in terms of immaterial rewards such as recognition or respect, e.g. gaining the status of expert, rather than money. This policy is in line with insights from motivational psychology which show that extrinsic rewards significantly undermine intrinsic motivation [DKR99]. This also coincides with the empirical results from knowledge management scenarios [Lo17]. Even in companies characterized by clear hierarchies, a knowledge-sharing culture could not be imposed top-down. Instead it was felt that the leadership or CEO should act as an example to encourage the exchange of knowledge.

With regard to the use of tools, the students found that most interviewees were familiar with new technologies such as augmented and virtual reality, machine learning, new interfaces controlled by gestures or natural language. However, on the whole they did not consider or employ them for capturing, (ad-hoc) presenting or sharing knowledge. Only some companies in the mechanical engineering field are actually making use of augmented reality applications in the framework of training activities.

The students identified two companies that could be regarded as good practice examples, namely Meusburger GmbH and Haufe umantis. What is particularly interesting is the fact that the two companies illustrate two opposite ends when it comes to IT affinity. In the following section we discuss in more detail how they go about capturing experience-based knowledge.



Fig. 8: The impacts of digital change on experience management

## 4 Good practice examples

The *Meusburger Group* is a leading international manufacturer of high-quality products for die, mould, jigs and fixtures construction. It has 1550 employees, an annual turnover of 291 million euros and 18500 customers world-wide. As a part of the Meusburger Group, the Meusburger company based in the Rhine valley is the market leader in the field of high-precision standard parts.

In the last 20 years, the company has developed a knowledge-oriented management method, the so-called WBI method for improving the integration of knowledge into daily routines (WBI is the abbreviation for the German phrase “Wissen besser integrieren”). The WBI approach consists of content (WiDoks) such as workflows, guidelines, documentations, training documents etc. as well as software (WMS). The aim has always been that both should be suitable for everyday use and applicable in any industry. The company has defined clear criteria for evaluating which knowledge is valuable to a company and thus worth collecting, sharing and saving for the long term [Su18].

WiDoks are stored in a knowledge database and can be accessed around the clock, which ensures that all employees including sales representatives have access to the information they need for successfully accomplishing their tasks. Every employee can create and edit a new document or upload an existing document in Word, Excel, PowerPoint or PDF format. He or she then becomes the owner of the WiDok and is responsible for regularly updating it. The CEO actively encourages staff to document knowledge that is considered valuable and keeps track of all WiDoks. The quality is thus assured by the management itself and by peer review since colleagues (potentially) interested by a particular

WiDok are expected to read them as soon as it has been published and provide feedback [Me18].

New employees are given access before they actually start working at the company. As a result, they are already familiar with a lot of the processes and tasks associated with their jobs and are better able to cope with incidents or questions that may arise in the actual daily business. Employees are motivated to share their knowledge and lessons learned because this is seen as beneficial and is rewarded by recognition and respect. For example, those who manage and maintain a certain number of high-quality knowledge documents gain the award of a “Content Manager”. Owners of knowledge documents are held in high esteem which leads to an organizational culture where experience-based knowledge is quickly translated into organizational knowledge and helps facilitate decision-making.

Recently, Meusburger started to offer their WMS software and method to their existing clients and new customers. Quite often the former realized in the course of their dealings with Meusburger that they also might benefit from systematically integrating knowledge management into their daily routines. Some customers also see it as a way to comply with certain ISO requirements concerning the documentation of internal know-how. The size of WBI client companies ranges from 20 to 300 employees. They are active in a variety of industries including healthcare, financial services and manufacturing. Their feedback is integrated into the further development of the WMS software, e.g. the latest update is able to display which user(s) are working on a particular document.

The *umantis AG* was founded in 2000 in St. Gallen and is a spin-off of the University of St. Gallen (HSG) and the Swiss Federal Institute of Technology Zurich (ETH). In 2012, the IT pioneer became part of the Haufe Group which is a leading provider of digital workplace solutions and services as well as training and further education. Today Haufe-umantis has about 150 employees based in St. Gallen and is one of the leading European providers of talent management solutions and stands for democratic corporate management.

The Haufe Talent Management Solution aims at allowing an organization to concentrate on its most important goals and enabling the smooth cooperation between HR, management and employees. It is based on the philosophy that the greatest facilitators of long-term success are people who do the right thing.

At Haufe-umantis employees use the company’s own tools, for example the Instant Feedback App for sharing their daily work highlights or anecdotes. These may be accompanied by a picture and a short text. Since many employees work from home, this application to a certain extent has come to replace the classic chats around the coffee machine. The company is currently working on a tool or platform with which employees can share their experiences with short videos. The content will then be automatically transcribed and annotated with metadata so later on one can search for particular sequences that may be of interest to other employees. The tool is expected to simplify and enhance the exchange of experience even more.



The talent management software can be compared to an expert directory and is used for closing skill gaps of employees by transferring them to colleagues with the appropriate skills or experience. In most cases this triggers a mentoring process or leads to an exchange of knowledge between colleagues. The system also supports swarm intelligence since employees tend to have many skills apart from the ones required for their jobs, e.g. a command of foreign languages. By including these in the directory, the pool of expertise is enlarged by skills that would otherwise lie fallow.

## 5 Digital transformation – new opportunities for experience management

Both our survey and the results from the follow-up study show that people are reluctant to participate in knowledge management activities if it implies additional effort. Such activities have therefore to be integrated into daily work practices so that they become an integral part of it and are no longer a separate activity [MR18]. This requires approaches that automatically extract knowledge and make it automatically available when needed.

Digital transformation has been laying the ground to achieve exactly that because of the increasing availability of *data and process traces*, which enable the following approaches (also cf. [Zh15], [LT16]):

- *Proactive knowledge delivery*: Digitalization results in more and more data traces being generated by processes and employees' work activities. Thus the IT systems of an organization can register an employee's activities in real-time, anticipate his or her next activities and then proactively provide the knowledge needed for a particular situation in a specific context. This idea has been put forward before and has come to be associated with process-oriented knowledge management and just-in-time knowledge delivery (see e.g. [ABH00], [RNS01]). However, only now is it possible to implement such an approach on a larger scale [U115].
- *On-the-fly knowledge capturing*: The data traces of past work, i.e. of problem situations and the decisions that were made, feed into the possible reuse of that experience e.g. via case-based reasoning systems [Be02]. Furthermore, the analysis of historical data can help to predict upcoming production problems early on and suggest counter-measures [Ta18], [Le13].

An additional driver of more efficient knowledge management are the advances in *text understanding* and text mining. These have contributed to a paradigm shift in information retrieval from providing documents that contain the needed information but first have to be read, to providing answers to queries directly (e.g. [AZ15] for the medical domain).

Furthermore, new technologies in the area of *human-computer interaction* facilitate the access to knowledge. Queries can be posed through conversational interfaces in a hands-free fashion [Sc18a]. Speech-controlled devices are especially helpful on the shopfloor of manufacturing companies or for service engineers who tend to have their hands full

when repairing a machine, for example. Answers to queries can be provided either via voice output or via augmented reality interfaces [Ne12], [YON16].

Manufacturing is a particularly rewarding application area for these new developments [Ha18]. Due to the increasing degree of automation and the digitalization of the production process and supply chain, employees in the manufacturing industry are nowadays less engaged in routine tasks but involved in decision-making, problem-solving and trouble-shooting activities ([Ar07], [La15], [Ne18]). For performing such tasks, they require advanced expertise and problem solving know-how and would greatly benefit from ad-hoc provision of relevant knowledge. As more data is becoming available from which to glean insights and suggestions for how to solve problems and give advice on how to proceed in specific situations, such knowledge management solutions are no longer unrealistic and are coming within reach.

There are many cases where knowledge management in manufacturing companies still suffers from the most basic infrastructure problems [St17], but many companies have recognized the need for advanced knowledge management support and initiated projects to that extent as described in [Ob18], [WH18].

## 6 Conclusions

To summarize, it can be said that advances in automation and so-called “smart factories” badly require advanced knowledge management services (sometimes called KM 4.0) to enable their employees to cope with their new responsibilities and task profiles. At the same time digitalization may serve as an enabler of novel knowledge management solutions [Ne18].

Both companies that have been selected as good practice examples confirm that trust and mutual respect are essential for successfully integrating the exchange and transfer of lessons learned. If these are missing, managers might call for compulsory checks or even sanctions, for example when employees fail to document relevant know-how as consultants from Meusburger found out when advising clients on how to introduce their WBI approach. The examples also show that embedding the capture, provision and reuse of knowledge into daily work processes is also a question of organizational culture and not just tools.

Still, the new technological trends associated with digital change such as process mining or conversational interfaces do offer new opportunities of externalizing tacit knowledge and recording of experience as exemplified by Haufe umantis. Managers will therefore need an open mind towards new technologies emerging with digital change so as to be able to harness them for value creation. However, our investigation has – once again – shown that there is no secret recipe for effective transformation, but that each company must find its own individual path.

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