



# **Guideline for a Company-Wiki**

**as knowledge transfer instrument  
to reduce the shortage of skilled workers**

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## **Preface**

Already for a long time a shortage of skilled workers in technical sectors appears in several regions in Europe. Despite continuous unemployment and the financial crisis the problem of the shortage expanded also on the skilled worker level of the producing sector. Until a short time ago the technician and the engineer range are affected, and now a shortage of specialists on the skilled work level predominantly increases. Smaller and medium sized enterprises (SME's) are concerned predominantly, because they stand above the difficulty to hire skilled workers and to develop constantly the qualification of the co-workers. Often suitable instruments and operational resources are missing to those companies, in order to identify the current as well as the future requirement. This situation is intensified by the influence of the demographic change on the specialists supply (marginal offer of young co-workers, fluctuation and retirement of older ones).

Against this background of the European LEONARDO DA VINCI project "Shortage of Skilled Workers" qualification and personnel development concepts are created and converted together with enterprises of the producing sector (metal and electrical industry). The project takes up the deficits mentioned and tends to develop concepts for the avoidance of the shortage. In the Leonardo project partners from six European countries cooperates. The request consists of the development of personnel-economic instruments in enterprises for the level of well qualified skilled workers to prevent rather to remove the shortage of specialists. Apart from personnel development concepts (inclusive career and qualification plans), the apprenticeship and the further training in enterprises, internal and external recruitment strategies, the inhouse transfer of know-how is an important starting point. In the context of the project the developed instruments shall make it possible to identify betimes the potential need on and the qualifications for specialists in enterprises and point out courses of action.

On the occasion of the threatening drift from experience-based and working process-oriented knowledge a knowledge transfer instrument was conceived in the project that purposefully is addressed to the target group of the skilled workers in the producing industry.

In the present guideline the background, requirements and conditions as well as examples for installation and finally a proposal for implementation are illustrated.

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## 1. Background/Outline of the problem

Based on the current results of the project „Shortage of Skilled Workers“ an instrument should be developed which safeguards a sustainable preservation and transfer of experience-based knowledge of the skilled personnel on the level of skilled work of the manufacturing sector in the metal and electrical industry. In the medium and long term, this instrument could contribute to counteract and to reduce a shortage of skilled workers.

Already today companies are confronted with a knowledge drain caused by the retirement of older employees and by the “poaching” of skilled staff. Therefore it is necessary to tackle the problem of knowledge drain at an early stage. With regard to the selection of an adequate instrument which safeguards both the preservation of knowledge and its transfer, the concept of a Company-Wiki could be taken into consideration for the following reasons:

- Identification of a problem-oriented/ work process related knowledge of the skilled personnel and the creation of transparency of the existing knowledge;
- Simple handling during the preparation/ creation of documents,
- Participation in the knowledge of other employees,
- Optimization of work processes,
- Avoidance of mistakes and identification of problematic issues and sources of errors,
- Sustainability of explicit knowledge and
- Free software.

The Company-Wiki is based on the principles of the Wikipedia Encyclopaedia and is well known among the population. Thus the valued feature of a quick retrieval of information is familiar to most of the users and is another reason for choosing this instrument.

## 2. Solution approach

With the help of a Company-Wiki, skilled workers as well as semi-skilled and unskilled workers will be supported in documenting and retrieving their specific work process related knowledge for their own use and the for the use by others. The Wiki-System is a compilation of documents and articles which are not only read but also created and continuously updated by their users (skilled workers of the company). With this instrument joint texts and contents may be generated and revised if necessary. The documentation of work process related knowledge can thus contribute to:

- A description of processes of individual tasks/ the operation of machines,
- A description of proposals to deal with errors and problems,
- The transfer of specific experience knowledge (e.g. specific customer data) and
- The naming of “experts” as contact persons providing assistance with certain fields of work, processes and functions.

The information is posted on an open, non-hierarchical user platform. This kind of knowledge structuring allows the identification, the documentation and the transfer of specific knowledge. In addition, the posted information can be expanded into work processes, specific problem solutions or special customer requirements by additions and revisions made by the colleagues.

### 3. Structure and Composition

The Company-Wiki is an alternative of the electronic information and communication platform with the possibility to document, structure, safe and to transfer the specialised and experience-based knowledge. The concept is based on the principle of a Wikipedia Encyclopaedia and is well known among the population. Into the Company-Wiki written articles and documents e.g. of certain work processes are adjusted by the personnel. These can be downloaded, updated and revised/ edited (see Bachner 2007<sup>1</sup>).

Apart from the preservation, transfer and further development of knowledge, a Wiki-System also offers “learning bridges” by making use of the available knowledge. Figure 1 outlines the generation process for knowledge in a simple way.

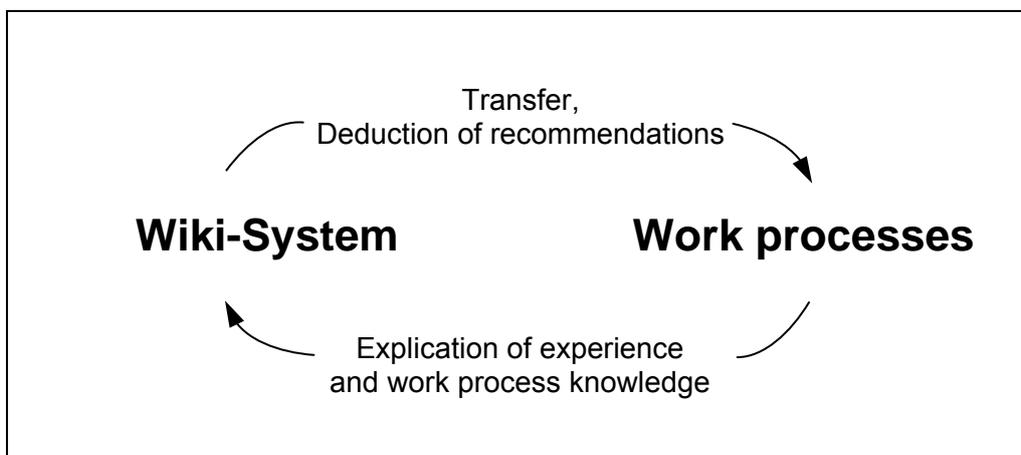


Figure 1: Process of knowledge generation from work processes by a Wiki-System (based on the project Optilog)

This process is based on the explication of individual experience and individual knowledge on several work processes which should be subject of the Wiki-System. The knowledge documented in the Wiki-System is interpreted, processed and transferred to concrete actions by the other users and/or recommendations for actions can be derived which in turn may have an impact on the work processes. A Company-Wiki offers the opportunity to improve continuously the work processes.

#### 3.1 Application Area and Target Group

The application of a Company-Wiki is suitable against the background of fast accesses to knowledge and its exchange. The system can be used and handled by each employee, if there is a computer with intranet access. The Company-Wiki is particularly indicated for medium sized enterprises.

A Company-Wiki is advisable for

- the identification of the problem oriented, work process related knowledge of skilled workers and the creation of transparency of the existing knowledge,

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<sup>1</sup> Bachner, H.: Wiki-Systeme als Wissensmanagementtools. GRIN Verlag, Norderstedt 2007.

- the simple handling during the preparation, creation and upload of documents,
- the participation in the knowledge of other employees (exchange between younger and older skilled workers),
- the optimization of work processes and
- the avoidance of mistakes and identification of problematic issues and sources of errors.

The management together with the specialists have to decide in which sections of the company the implementation of a Wiki-System is useful to achieve the largest success.

### **3.2 Benefit**

The chosen Wiki-System offers extensive benefits for both the company and its employees.

A contribution can be made to the description of the course of several activities, to the description of mistakes and problem solving suggestions and the transfer of specific (experience) knowledge e.g. specific customer information. Furthermore so called "Experts" can act as contact persons in certain fields of work.

The information is posted on an open, non-hierarchical user platform in the form of a knowledge data base. Above all the company is benefiting from the safeguarding and the preservation of work process oriented knowledge. In addition the software is free of charge. Other advantages of the Wiki-System are:

- Documentation of e.g. specific problem solving strategies and information for customers and therefore
- Cause and effect analyses in order to avoid future errors,
- Optimisation of work and business processes,
- Offering of "learning bridges" by making use of the available knowledge of other persons,
- Transfer of knowledge during initial and further training,
- Sustainability of explicit knowledge.

### **3.3 Requirements**

For the implementation of a Company-Wiki some few requirements need to be complied e.g. the initialisation of PCs with an intranet access for the personnel, the linkage of the free available software like "MediaWiki". This software can be downloaded under <http://www.mediawiki.org/wiki/MediaWiki/de>. This homepage offers assistance for the creation of own Wiki pages, including an instruction for the posting and updating of articles.

For implementation the access to a computer at any time is necessary for the employees, apart from the free software. A short instruction or training session of technical sequences on the operation and the use of the computer is recommended to become familiar with it. In addition a trial phase is necessary in which the system can be practised and tested.

### 3.4 Wiki options

- Pbwiki
- MediaWiki
- DokuWiki
- TWiki

#### 3.4.1 PbWiki

Pbwiki (<http://pbwiki.com/>) is a commercial wiki website that has the background “that most wiki software was overly complex for a layman to set up and manage, requiring an extensive knowledge of Linux, and their own server”(<http://en.wikipedia.org/wiki/Pbwiki>). One of the three cofounder of pbwiki, came up with the idea of providing easy-to-use privately hosted Wikis through a website - which he named "PeanutButterWiki", because he has the belief that "making a wiki is as easy as making a peanut butter sandwich"<sup>2</sup>.

Pbwiki uses its own proprietary software which is under permanent enhancements. The users are able to create free basic wikis, or even upgrade to a premium wiki to access additional features. “A number of business and corporations use Pbwiki to create private wikis for employees; one case study from CNN described a legal firm which had transitioned to Pbwiki as a document management system in order to cut their IT costs”<sup>3</sup>.

#### 3.4.2 MediaWiki

MediaWiki is a free-available open source software, which was originally written for the Wikipedia. This software package is basis for all designed Wikis of the Wikimedia Foundation as well as many other Wikis at the market.

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<sup>2</sup> Hagopian, Peter (2007-09-10). "[Everything You Need To Know To Get Started With Content Management Systems](http://www.informationweek.com/news/internet/showArticle.jhtml?articleID=201805279&pgno=4&queryText=&isPrev=)". [InformationWeek](http://www.informationweek.com/news/internet/showArticle.jhtml?articleID=201805279&pgno=4&queryText=&isPrev=). Retrieved on 2009-03-23.

<sup>3</sup> Nussenbaum, Evelyn (2008-02-12). "[Boosting teamwork with wikis](http://money.cnn.com/2008/02/11/smbusiness/wiki_software.fsb/?postversion=2008021211)". [CNN Money](http://money.cnn.com/2008/02/11/smbusiness/wiki_software.fsb/?postversion=2008021211). Retrieved on 2009-03-23.

### 3.4.3 DokuWiki

“DokuWiki is a standard-conformal Wiki that is easy to handle and which mainly tends to the development of documentations of all kinds. Developer teams, working groups and small enterprises are addressed. Its simple but powerful syntax ensures the fact that the data is also readable outside the Wikis and simplifies the development of structured texts. All data are stored in text files – no data base is needed” (Source: <http://www.dokuwiki.org/de:dokuwiki>).

### 3.4.4 TWiki

Due to its flexible plug-in architecture TWiki ranks among the function-richest Wiki systems on the market. Particularly in the surrounding of enterprises it has been established, because it allows the conception of own Wiki applications and so offers numerous fields of application. The system can be used e.g. by intranet technology at different places without any problems. Furthermore different company departments, external partners (suppliers), service providers and customers so can be involved suitable. Separate scopes and rights of access can be assigned to each group.

The TWiki system offers many interfaces to existing systems. So it allows e.g. the authentication by an inhouse LDAP<sup>4</sup> as well as the connection to external data bases. „TWiki belongs to the Wiki systems of the second generation, with which own applications to Wiki basis can be provided. This becomes possible by the structured administration of metadata. Hence contents can be typed and provided with additional information. Thereupon own applications can be developed within a short time that can be adapted to the respective needs of the company” (Source: <http://www.kontextwork.de/wiki-systeme/twiki>).

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<sup>4</sup> Lightweight Directory Access Protocol is an application log in computer technology, with which the inquiry and the modification of information of a listing service (one in the network hierarchical data base distributed) is possible.

## 4. How to use the wiki (in practice)

This paragraph describes how a Company-Wiki can be used in a company. Therefore a wiki via “pbwiki service<sup>5</sup>” has been created and an example for use will show the availability.

No matter the size of a company it is important to make the knowledge (consolidated and in constant development) visible, to share and to manage it. Nowadays the adoption of ICT (information and communication technology) inside of companies and in particular the introduction of the web 2.0 concept<sup>6</sup> at least cause the discussion of following aspects:

- the way through which the knowledge is created, shared and managed inside the company,
- the relevance of each person involved in the company, to produce knowledge, competences, skills (and culture).

Thus, the Company-Wiki conceived as a tool for the knowledge management, it can really contribute to promote a participatory approach thanks to each employees, not only to grow up their knowledge/skills, but they can also improve a new “participatory approach” in managing the knowledge management system inside the company (and this could also promote the sense of affiliation).

For installation of a wiki tool in companies one has to be aware of the character of this system. The knowledge follows a process and needs to be managed. This is important against the background of implementation and because of the need of administrators who will be in charge of filtering the information that is given/ written by the users. On the other side it is advisable to define the roles and rights of each user, e.g. to clarify who is reader, writer, observer or does everybody should get the same rights.

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<sup>5</sup> For further information see: <http://pbwiki.com/>

<sup>6</sup> “The term *Web 2.0* refers to a perceived second [generation](#) of [web development](#) and [design](#), that aims to facilitate [communication](#), secure [information sharing](#), [interoperability](#), and [collaboration](#) on the [World Wide Web](#). Web 2.0 concepts have led to the development and evolution of web-based communities, [hosted services](#), and [applications](#); such as [social-networking sites](#), [video-sharing sites](#), [wikis](#), [blogs](#), and [folksonomies](#)“ (Source: Wikipedia, *Web 2.0*, see the following url: [http://en.wikipedia.org/wiki/Web\\_2.0](http://en.wikipedia.org/wiki/Web_2.0)).

## 5. A wiki example “Leonardo project: Shortage of Skilled Workers”

As above introduced the partnership involved in the Shortage of Skilled Workers project has set up a Company-Wiki in a pilot scheme by using *pbwiki* service. Below the steps for its development are demonstrated.

- 1) Go to the pbwiki site and create your own account.
- 2) Receive via mail a confirmation about the success of your registration
- 3) Click on the link related to your wiki and
- 4) Start to customize your wiki as you prefer.

By adding logos or pictures it is possible to give the wiki sites an individual appearance.

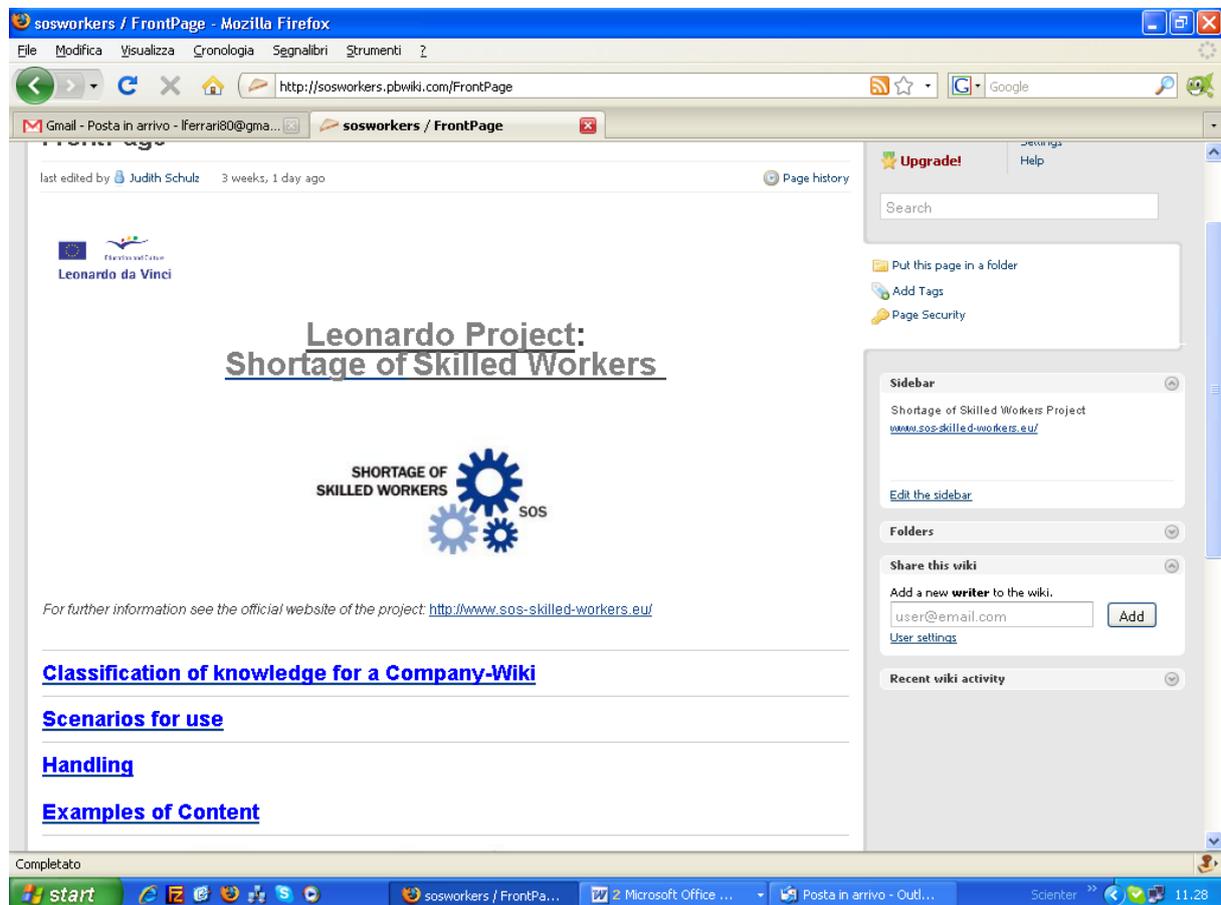


Figure 2: Screenshot “Front Page” of the SOS-Wiki

The figure above shows the front page of the Company-Wiki created within the Leonardo project. As you can see, the page presents four sections that are composed with a series of sub-sections. In this case the sections are:

- Classification of knowledge for a Company-Wiki,
- Scenarios for use,

- Handling and
- Examples of Content

The sections are replaceable by any other categories that are preferable or important for a company.

## 5.1 Classification of knowledge

In the first section several categories are shown that give an overview of possible volumes that are identified in the project to reflect and to refer to problem oriented and working process-related knowledge.

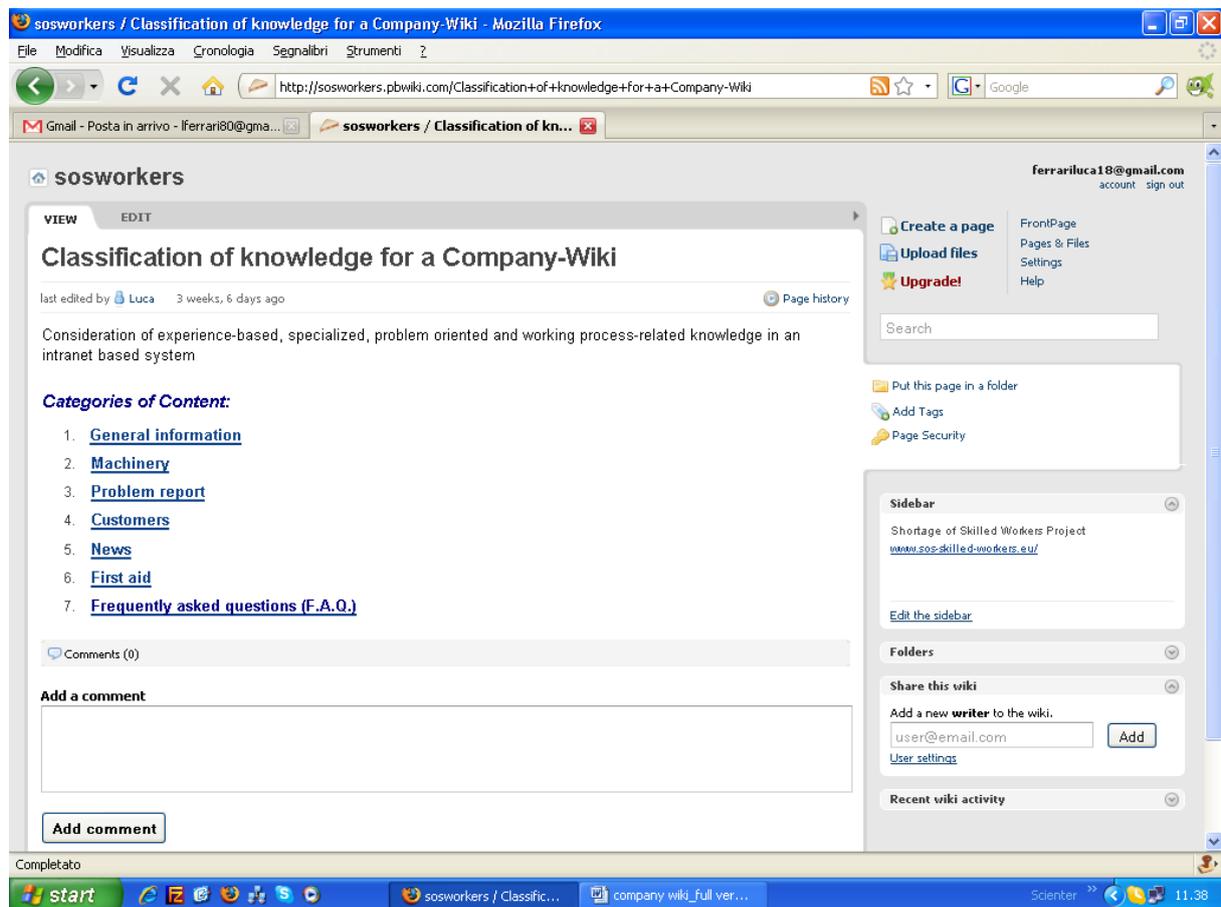


Figure 3: Screenshot "Classification of knowledge for a Company-Wiki"

The first subsection, *general information*, contains the following sub-categories:

- Company sector/ domain: in this sub-section information related to the company can be positioned, such as: its story, its mission/vision, its characteristics in relation to the labour market (number of employees, kind of products, technology used and customers).
- Organigram/ organisation plan: the internal organisation chart can be set up; this is particular recommended for the medium and big enterprises (all the employees can have an instant picture about the structure of the company).

- Internal standards and regulations: in this section internal documents related to the standards and regulations can be uploaded. Each document needs to be visible for all employees as well as it should be editable and continuously updating from the company-direction.

In the second sub-section, *machinery*, detailed information can be given about job descriptions, maintenance and specific characteristics:

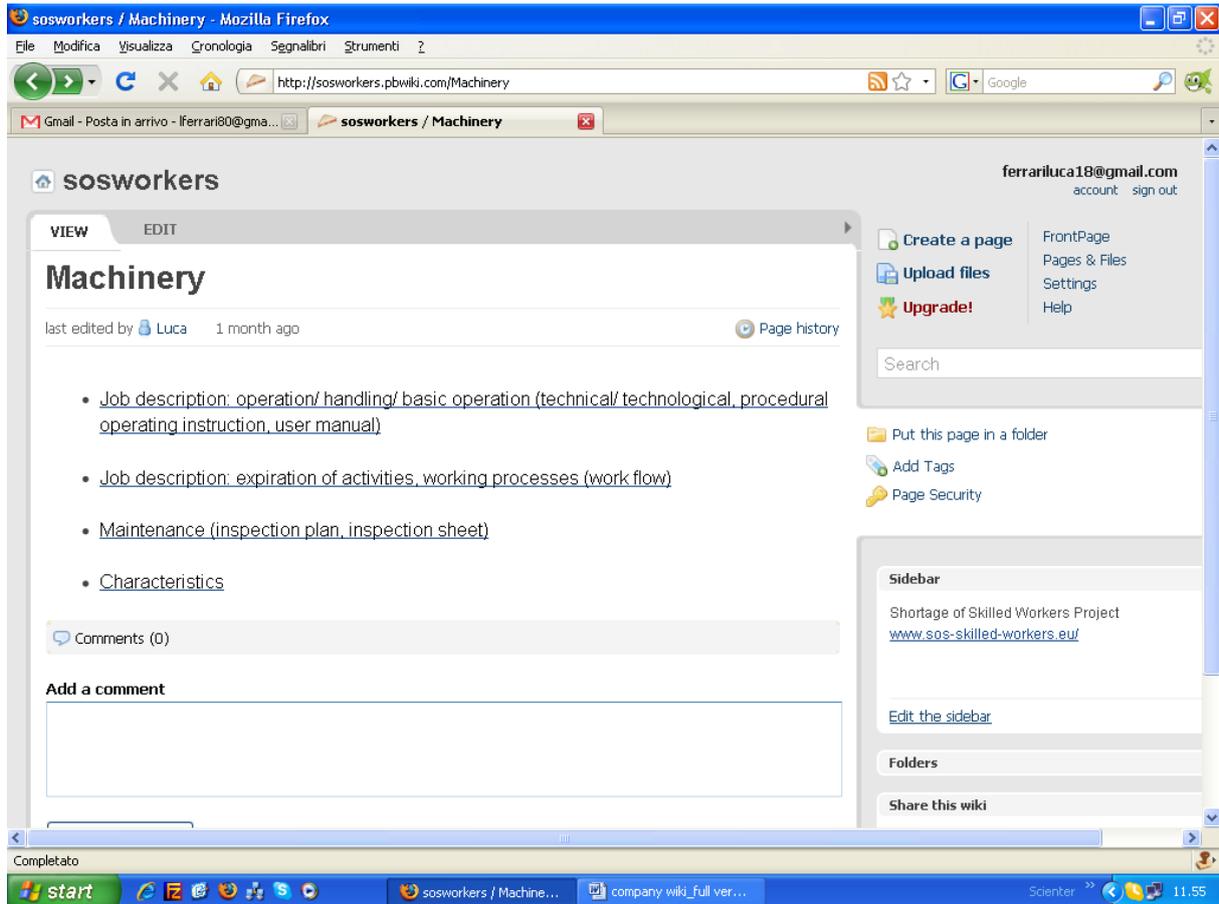


Figure 4: Screenshot „Machinery“

In one sub-category of the *job description* (on micro level) the skilled workers can describe all information related to the tasks necessary to carry out a work with the help of his/her head of department, such as: basic operation, technical procedures etc.

In the other sub-category the *job description* (on Meta level) is related to the expiration of activities and information concerning the working process is presented. These two pages of job descriptions need to be updated constantly.

The page *Maintenance* can give information how to maintain/manage machineries. Basic instructions how to operate in case of problems can be put in as well. So it is

important to specify how to activate the assistance, who are the professionals in charge to assist the machineries etc.

The last sub-category *Characteristics* contains details about specific characteristics of certain machineries (year, monthly assistance etc.).

The third sub-section *problem report* contains several strategies to avoid possible problems. In case of occurring problems the skilled workers (but also all the employees) can follow the deposited instructions on the one side. On the other side the users can update the wiki by positioning new information concerning the problem solving. The page below shows the possible structure of the problem report.

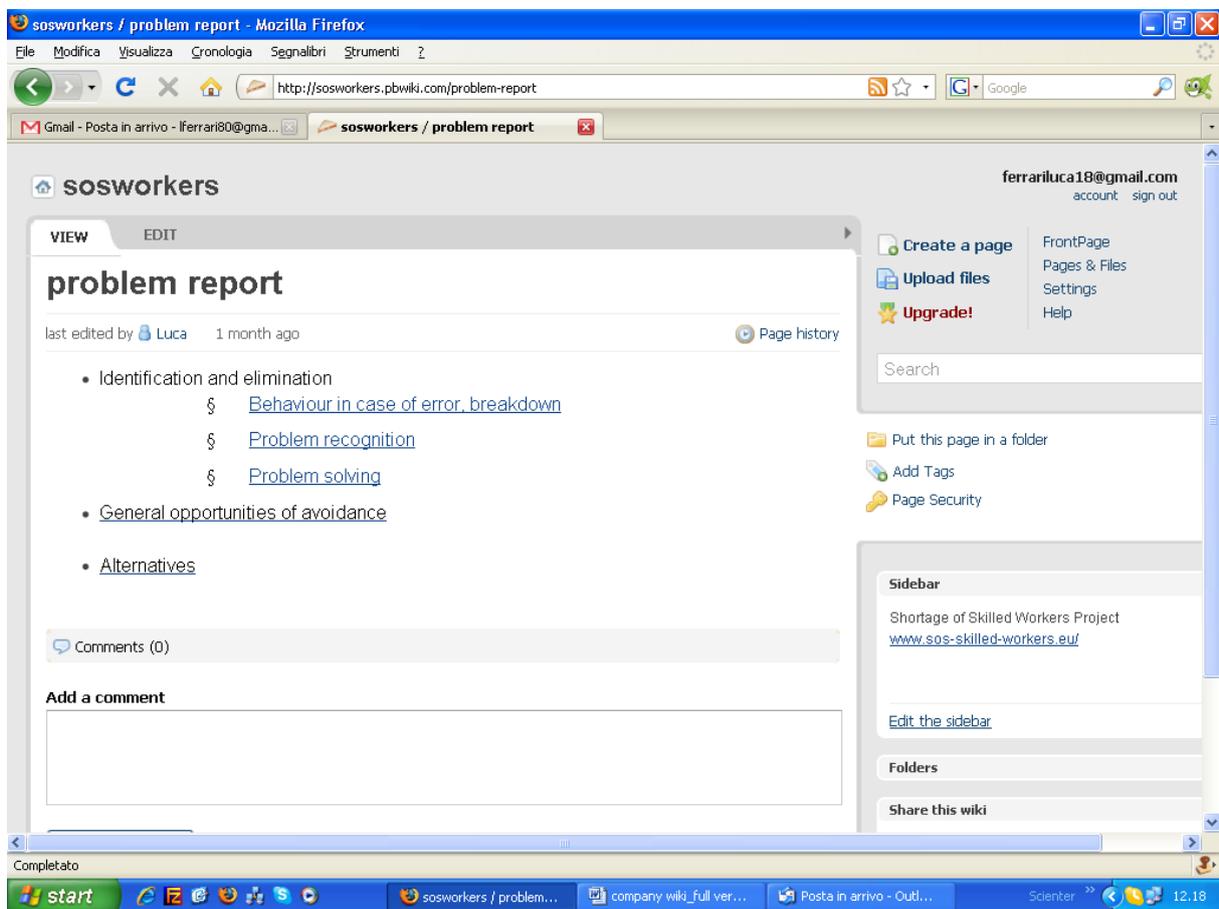


Figure 5: Screenshot „Problem Report“

The fourth sub-section *customers* could be a strategically “agora” open not only for the company-employees, but also for the customers. In fact the Company-Wiki allows creating a bidirectional communication channel between the own company and the internal or external network of partners.

The fifth sub-section *news* gives information about the current status of the staffing in the company. It is listed which employees for example are absent because of

holidays or further training. Other sub-categories are e.g. an instruction for shift changeover, further training initiatives and pages of so called experts (persons who can be contacted for certain tasks, processes etc.).

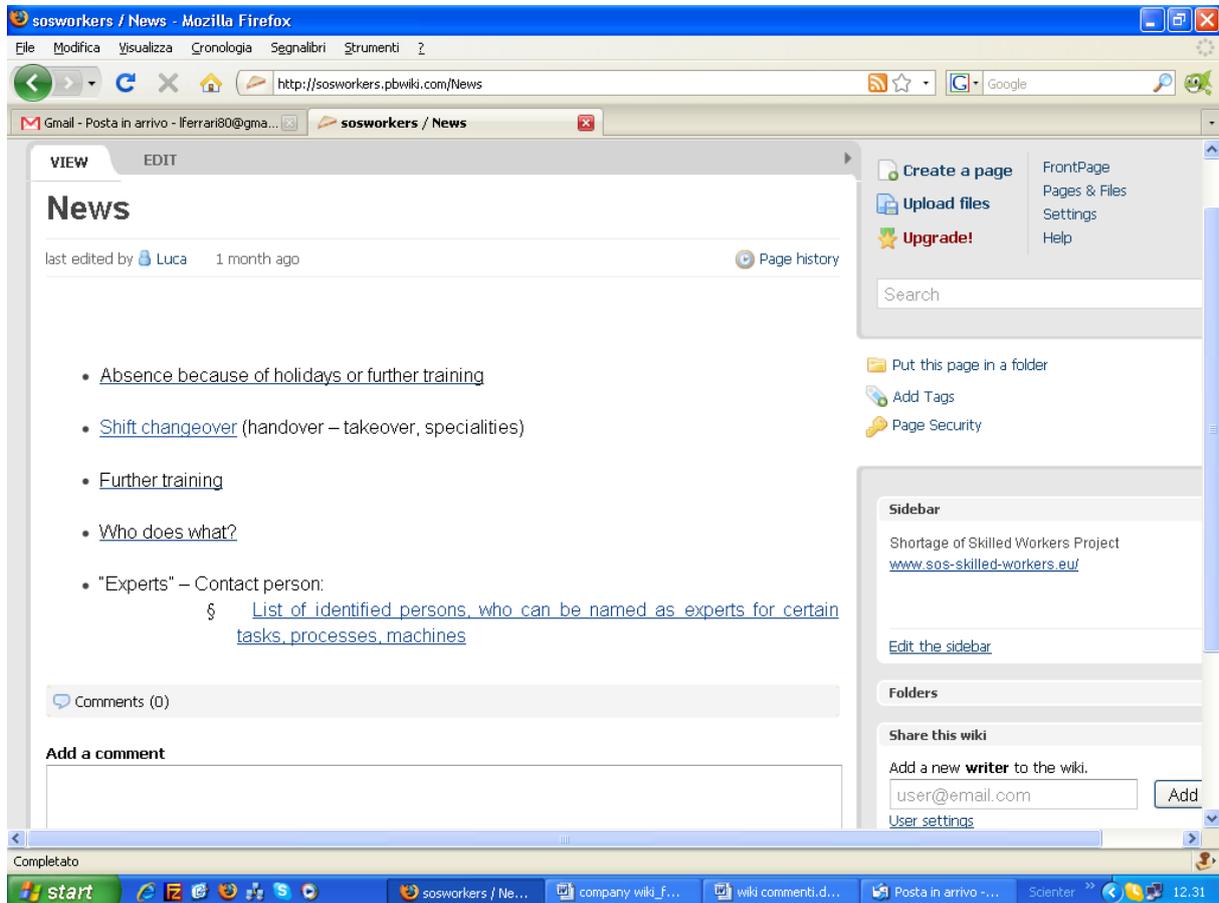


Figure 6: Screenshot „News“

The sixth sub-section contains the procedures the employees have to follow in case of *first aid*, such as:

- Behaviour in case of emergency;
- Medical first aid guide.

The last section *Frequently asked questions* (F.A.Q) contains all potentially questions and answers that arises. This relevant section wiki might be constantly updated both from the management and from the employees.

## 5.2 Scenarios for Use

The wiki system can be used in several ways and for several needs. In case of the target group four usages are possible. First of all a Company-Wiki is able for documentation of the inventory of knowledge in a company. Thereby different

approaches are possible, documentation in written form or with pictures, drawing or a mixed model. The second alternative of use is the creation and to care of knowledge pools (updating and care: adding of contents, changes/ renewing of existing contents). The wiki system also can be usable for contacting customers and for preparation of interacting with customers. Problem solving is one further alternative. In problematic situations or appearing of questions skilled workers can search in the wiki for answers or possible solutions.

Two more scenarios are possible, that are applied preferable for management positions in medium sized enterprises. The one is for the use of project management, where certain steps and groups have to be coordinated or the organisation of activities needs to be managed. Therefore a report of success, failures, experiences and useful references can make the project work perfect.

The second one is the use for organisation of meetings and conferences, which is more important the management level as well. The Wiki system can make a further contribution regarding to the organisation of discussions and meetings. While regularly information is communicated, e.g. by so-called news tickers or send by newsletter people can be invited or pointed to meetings, discussions, conferences etc. and the further procedure can be planned, coordinated and organised.

### **5.3 Handling**

#### Adding of new contents/ changes of existing contents

In the ideal way the skilled worker notes in a first step handwritten the information that need to be changed, corrected or to be taken up. If necessary the skilled worker draws a sketch or makes a significant photo that completes the notes in a suggestive way. According to the situation different processes are possible:

- a) On occasion the skilled worker enters the information directly into the wiki system (e.g. in a workspace). In order to ensure a quality control this can happen at first on a discussion platform. The positioned text then can be adopted into the content platform by a moderator who has proofed and edited it. Maybe an intermediate step is necessary, whereby the skilled worker adds and completes information by himself or after demand of the moderator.
- b) The skilled worker hands on his handwritten information to the moderator, whereas further information can be conveyed verbally and comprehension problems can be clarified in a direct dialogue. Subsequent the moderator enters the information into the wiki system.
- c) The skilled worker prepares the information medial for the wiki system by his own. Therefore he uses either a private computer or the company provides one. The prepared side will be proofed and maybe edited by the moderator before its activation.

## 5.4 Examples of Content

The page *examples of content*, contains a series of practical examples related to the use of the wiki in companies. In this case the following four sub-categories are indicated: “shift changeover”, “Who does what?”, “Experts” and “Other examples”.

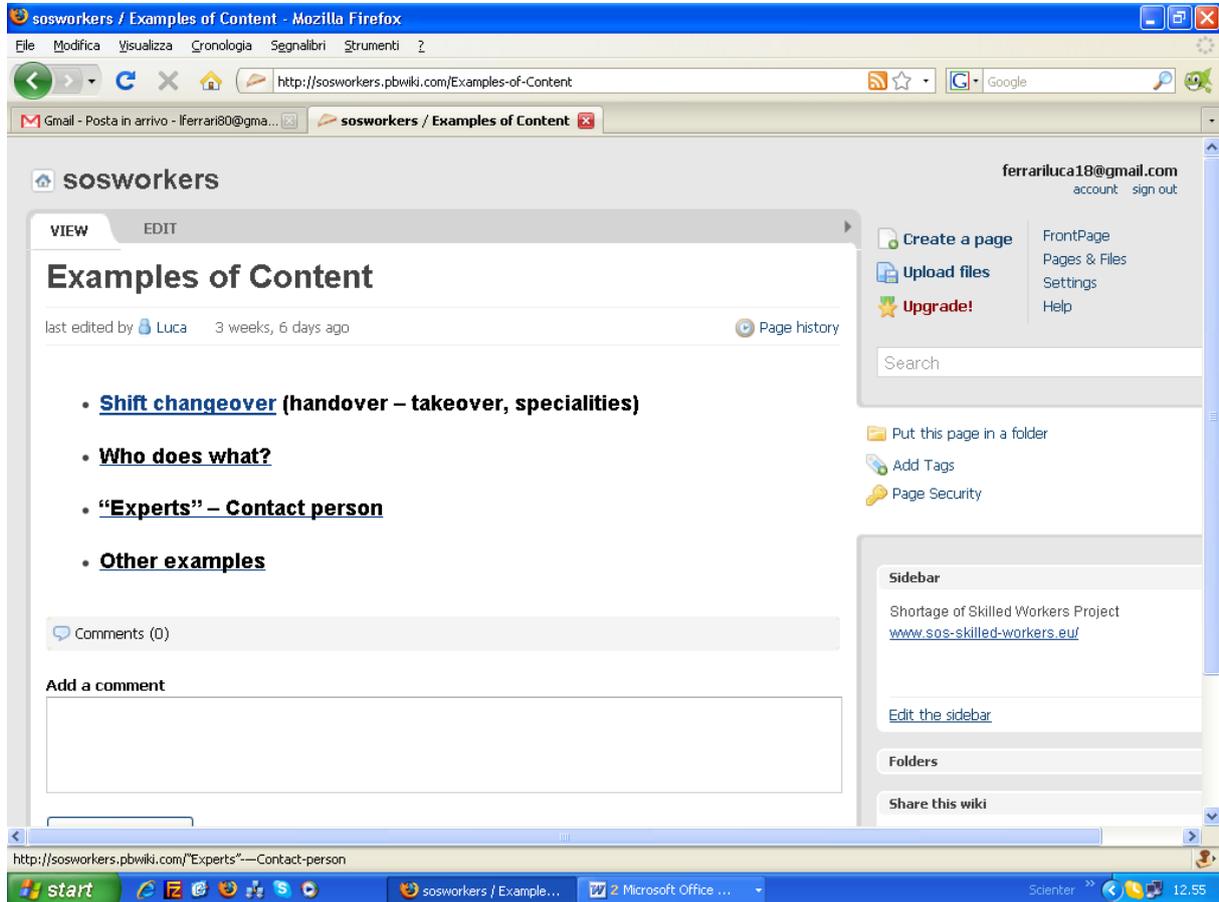


Figure 7: Screenshot “Examples of Content”

In the sub-category *shift changeover* information can be put in and shared about sections and domains of the stuff, e.g. from the morning to the late shift.

In the second sub-category *Who does what?* A grid or a list of can be put in, with which certain relationships become obvious, e.g. who is involved in which task, in which section. For instance, this section could be useful for the foremen/head of department during the work planning.

Within the third sub-section *experts* the opportunity is given to upload and share a list of professionals that is split up for sections/domains, positions and functions, names etc.

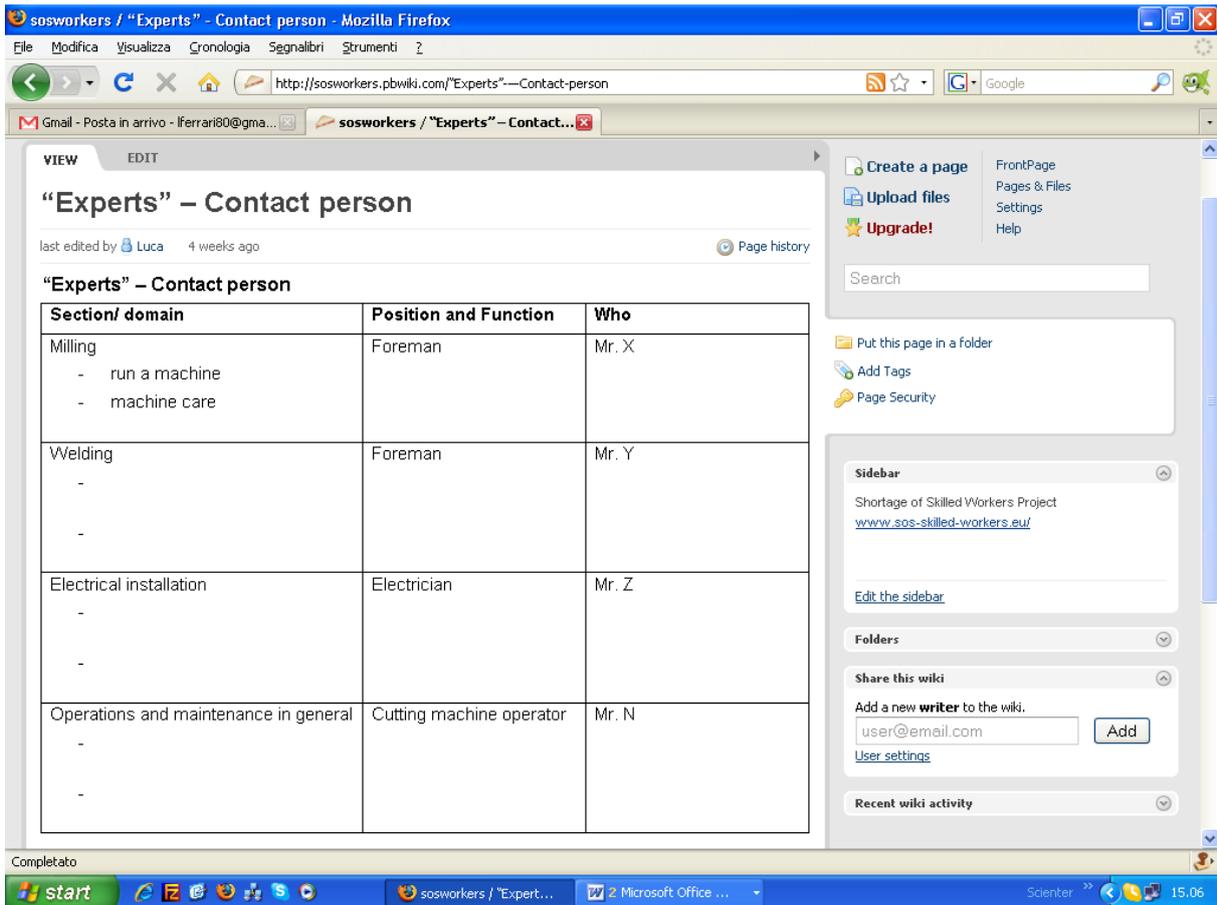


Figure 8: Screenshot „Experts“ - Contact Person

The last sub-section presents two others examples that contain a description to “Quality Assurance” and a configuration/list of specific content concerning the “shift change”.

## 6. Approach to introduction and realisation

A successful implementation of a Wiki-System in companies requires a comprehensive planning process and the consideration of different aspects. Figure 9 shows the implementation process:

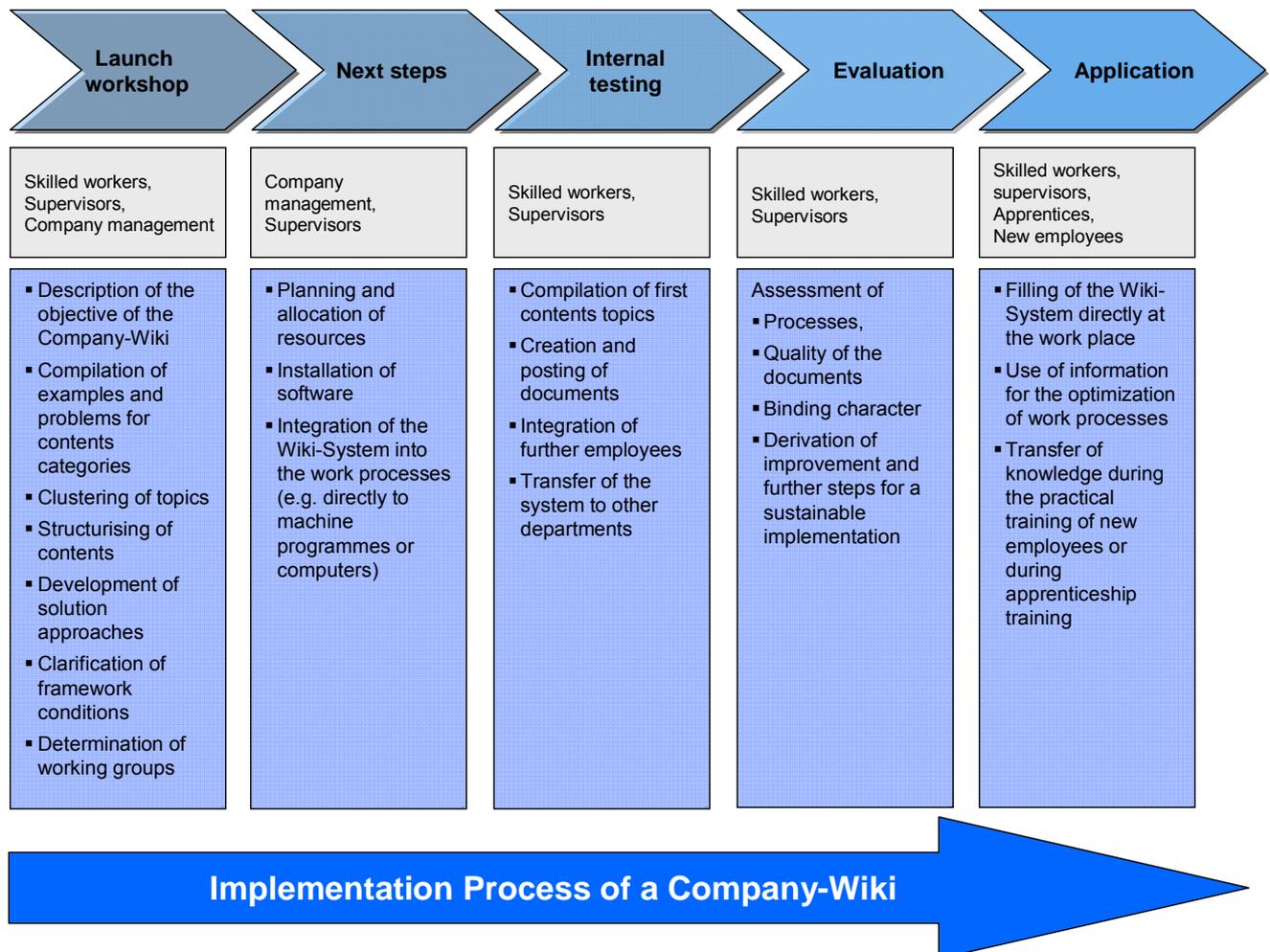


Figure 9: Implementation process of a Company-Wiki in the manufacturing sector

The first implementation step is a workshop aimed at the precise information of the company management, skilled workers and supervisors on the objectives and expectations of a Company-Wiki. This is very important with regard to the background of the importance and the sustainable implementation of the instrument. If the whole purpose of the implementation of this instrument is understood and tangible, this will have a positive impact on the acceptance by the employees and the later use of the system. This is why the skilled workers – the prospective users of the system – will be directly involved in the development and the design of the Company-Wiki. Furthermore examples and problems for contents categories will be compiled. The following topics could be used as contents categories:

- Handover of tasks on the occasion of changes of shifts and vacations,
- Given facts, problems and requirements for the handling of customers,

- Optimization of the work processes,
- Description of task processes and the operation of machines,
- Trouble shooting and problem solving strategies (cause-effect-analysis),
- Specific experience knowledge.

After the definition of contents categories, the indicated topics will be clustered, i.e. summarized and structured according to themes and contents. This facilitates the derivation of solution approaches to be developed later. It is very important to clarify certain framework conditions. For example: Who prepares which documents at what time and how can the benefits, the amendments, the differentiation and the updating of the Wiki-contents be ensured? Finally working groups will be assigned certain topics to deal with and will take care of the formulation of contents categories.

The company management and the supervisors must take care of the planning and must provide the necessary resources for the implementation process. This includes a sufficient number of personal computers and the direct integration into the work processes, e.g. via processing programmes of machines and plants. Additional supporting measures can be offered in the form of prepared information and via the Internet.

An internal test of the Company-Wiki will be carried through by the skilled workers and their supervisors. These groups of persons compile the first topics for the documents to be prepared and feed them into the system. After an initial testing phase, more employees of the company will be involved. They will be supported and instructed by the experienced users of the system. In this way the transfer of the system to other departments of the company can be accomplished.

The assessment of the system by skilled workers and supervisors is the next step of the implementation process. In this phase the individual processes and the quality of the documents are discussed and validated, as well as the binding character of the available documents. Ideas for improvement and further steps towards a sustainable implementation of the system into the company will be derived. The objective is to stepwise replenish the Wiki-System with contents.

Eventually the Company-Wiki will be used by all employees in the company, including the apprentices. The Wiki-System will be filled directly at the work place and this is where all required information is directly accessible. This ensures that the use of the system can directly contribute to the optimization of the work processes if necessary.

Such an implementation process requires a comprehensive planning effort and a permanent communication throughout the individual implementation steps. These are the prerequisites for a sustainable and successful implementation of a Company-Wiki.

## 7. Summary and Prospects

The Company-Wiki has been “tested” in four of the six countries that are involved into the project. On the occasion of the proving of the instrument field reports have been prepared, that give information about and an overview of several opinions in companies.

In Germany the Wiki-System was visualised and presented with all its specific characteristics, requirements, benefits and all necessary steps within a company in Southern Germany, in Baden-Württemberg. This company has been visited in the context of the case studies at the beginning of the project in order to analyse the skilled workers situation and practiced initiatives and measures to reduce the shortage of specialists. The proving has taken place with seven members of the company (work council, human resources manager, personnel specialist, head of apprenticeship and further training, trainer, IT and one co-worker of the domain quality assurance/knowledge management).

The necessity for the introduction and conversion of a knowledge management system were supported by all participants. Due to the own experiences of the enterprise mainly critical points and difficulties were discussed with the conversion. Up to now the company failed with the conversion, because they tried to document quite complex processes and elements of knowledge. This happened on the middle level in the enterprise. During the discussion it becomes apparent that the level of skilled workers was not located in the focus so far. To give reasons the difficulty of the knowledge transfer from older co-workers were indicated, which have a specific know-how, as well as a marginal acceptance of the platform. Together with all participants first ideas and domains were identified, which could be interesting for a Company-Wiki. The emphasis was to put on of simple processes in the company that can be implemented more easily. Resulting from that, it can be recommended to start the construction of a Company-Wiki with simple processes in the company. Before an implementation can take place into all domains the proving and introduction should occur first in separate divisions.

Apart from the consideration of many aspects and the answering of numerous questions in the company, a more “sensitive “and integrating handling/introduction and a good communication work to implement a Wiki system in a company appears to be necessary. From there it is important to identify and integrate further aspects that enable the Wiki-System to be accepted and so contribute to success.

In the Netherlands the Wiki has been tested in two companies (in a sheet metal plating company with 1000 employees and its own company school and another metal company for cutting and shaping metal, with about 45 employees).

In both companies the Wiki-System has been evaluated as a suitable and effective

tool for the use in companies, although for one company it seems to be safer to use the intranet only for transportation of information.

In the sum the visited companies would think about the implementation of such an instrument, but already a few questions have to be answered before. Further on the Wiki-System has to be filled with some content in order to show the character and to make it easier for the users to practice with it. Additionally a list with hints (not too long) which can be viewed to see if there are aspects that need attention for the specific situation can be a suitable solution. The list can be indexed e.g. to material and machines that are used, the size, production specifications etc. It was added by the interviewed companies that a section with field and experience reports of the use of enterprises would be a good addition. But nevertheless the aspect of motivation has to be considered in a special way in order to think about incentives for the users to keep in practice. A full description of the instrument and its certain steps has to be prepared or rather to be customised.

The results of the testing in Slovenian companies led to the same arguments as the two described above. Although the four interviewed countries, contacted for the case studies in the beginning of the project, were of good feedback, there are some critical aspects. So it has been mentioned that this instrument will hold a lot of benefits, but some expenses concerning time and a detailed planning were expected. Slovenian countries already use intranet-based systems for the information of employees that contents several costs. But this is not perceived as barrier to companies, the cost of software is negligible in comparison to all other expenses of introducing such a system. These companies will choose reliable software that can consider also various aspects and needs:

- Engineer Portal (technical information, standards and technical legislation),
- The offer of education for employees, calendar of courses,
- Forum for new ideas and opportunities,
- Definition of technologies which are implemented in a company,
- Presentation of company business,
- Bureaucracy (forms, samples of documents which are used in a company etc),
- Internal acts, standards and regulations,
- Instructions for training of apprentices,
- Research (what research is in progress at the company, reports, articles etc).

Companies that already use this kind of software do not want to change it. Otherwise the possibility of introducing another system is given, but usually intranet and intranet-based instruments are maintained and restricted for a narrow circle of authorized employees who are responsible for publishing all contents in the intranet.

Roles and functions are regularised to certain groups of employees, skilled workers are not involved in the utilisation.

In Italy the validation and evaluation of the Company-Wiki is focused on two aspects, the technical framework and the content. Against this background the wiki has been treated as an useful and efficient instrument. An involvement of employees in the manufacturing sector as target group will permit to adjust the wiki system according to their requirements and features, in particular linked with their daily work.

Considering the technical framework some concrete conclusions can be made. They can be entitled as:

- User friendliness,
- A slew of plugins,
- Traceability,
- Amount of memory,
- Template.

To improve the content that is lodged, the following recommendations can be specified:

- Adding a list of competencies/skills with the aim to create a sort of job profile, according to the capacities for each role and function;
- Adding of safety aspects;
- Adding of a guideline for the workers how to write down their notes;
- More detailed and clearer description of examples in order to help employees; models and templates would help to conceptualise the roles, profiles and required skills of the users;
- Clarification of responsibilities concerning the content, the function of each user and the roles; establishing of a small focus group that test and learn to practice with the instrument;
- Clarification of structuring and organisation of the knowledge management in companies (possibility of the guaranty the efficiency of the work); familiarisation of a moderator (“knowledge moderator”) in order to take advantage of the inputs, to categorise the knowledge material and to provide it.

These four national summaries of feedback clearly show the possibilities of the introduction and implementation of a Company-Wiki as well as its necessary improvements. But considering the aspects mentioned this instrument is suitable for practice to collect, structure, manage and transfer the certain knowledge domains.