The Yellow Tool – Making Yellow Pages More Social and Visible

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Abstract: Yellow Pages, although a well established tool of Knowledge Management, in many cases do not fully exploit their potential as an instrument for Knowledge Identification and Networking: the entries (profiles) are not maintained as they should and not used as they could. Why is this the case and how could the Yellow Pages approach be further developed to provide higher benefits? In the context of our action research in the domain of Knowledge Cooperation, our approach for answering these questions has been to undertake the development of a Knowledge Management instrument for competence analysis, visualisation and interaction called "Yellow Tool", a simple but powerful *social tool* integrating (on a Moodle platform) a wiki, a knowledge map, a discussion board and a chat & phone facility. The Yellow Tool is constituted by three components: 1. *Yellow Pages*, a collection of competence profiles in a wiki; 2. *Yellow Map*, a knowledge asset diagram visualizing the competence profiles with a city map metaphor; 3. *Yellow Talk*, a moderated conversation event, for talking about the competence profiles both asynchronously on a discussion board and synchronously by means of chat and phone conferences. The main feature of our Yellow Tool is that it makes competence profiles more social and visible. By focusing on social orientation and visibility, the Yellow Tool creates an incentive and motivates people to get in contact with each other and we expect that this will lead both to a higher engagement in maintenance and to a more active use in daily work.

Keywords: Yellow pages, knowledge maps, competence analysis, knowledge cooperation, knowledge network, social software

1. Introduction

One of the major lessons that we learned in the past two decades was that success in Knowledge Management initiatives heavily depends on people networking with people. Unfortunately traditional organizational structures do not promote knowledge networking: we usually do not notice it, but by splitting organisations into divisions, departments, business units and even teams or by combining them through mergers and acquisitions we create structures that tend to isolate people and their knowledge. As a consequence, when cooperation, communication and knowledge networking across these structures are sub-optimal, the primary reason is not the usually alleged reluctance of the employees to cooperate nor a lack of motivation for sharing knowledge (Bettoni et al. 2003) but simply the fact that these organizational constructs implicitly require knowledge to be aligned and kept within their boundaries: the very system that is supposed to enhance people's productivity hinders them in connecting so that they *do not know who* to talk to, work with or ask for help (Collison & Parcell 2004 p. 178).

In order to overcome these structural limits many companies engaging in Knowledge Management began very early to develop pointers to expertise: *"The most immediate payback [for the KM effort] is through creating the navigation capabilities to put people in touch with people"* said Andy Michuda when he was Teltech's president and CEO (O'Dell 1998 p. 98). The systems providing these capabilities were and still are applications such as "knowledge directories" (KD), "expert locator systems" (ELS) or "yellow pages" (YP) that collect profiles of subject matter experts, project managers or interested parties. They often took – and still take today - the form of a searchable intranet repository through which all staff could search for people with relevant knowledge and experience (Collison & Parcell 2004 p. 173, Kübli 2003). Although technologically simple, the organisational aspects of these systems were and are not easy to design and implement: in fact, many KD, ELS and YP applications reveal an insufficient level of activities and do not deliver the expected results.

Failures are rarely made public in newsletters or research papers but many Knowledge Management researchers, consultants and practitioners reported in personal conversations that they never saw one of these systems being successful and that they *"often end up as out-of-date, glorified intranet telephone directories"* (Collison 2005). Why? Recent research found that information in the profiles was kept too much generic and superficial and that employees refused to contribute in creating and maintaining the profiles because they required a big effort (Reichling & Wirth 2006).

In a large pharmaceutical company the analysis revealed that the Yellow Pages did not work because they failed to consider the cultural issues (like trust, incentives, etc.). In a big logistics enterprise where the Yellow Pages system is part of the HR systems, the CKO reports (April 2007) that four years after its launch still only 25% of the target group have volunteered for creating their personal entries and many of the existing entries are not maintained. Other companies found Yellow Pages to be a very difficult concept to implement when they used the competence rating information available in YP profiles in a phase of downsizing: by firing people who were rated as 'beginner' they discredited the whole YP system. In this paper we present our Yellow Tool as a suggestion of how the Yellow Pages concept could be improved and further developed in order to make it more effective and efficient. We begin by sketching the context within which our idea of a Yellow Tool emerged, describe then its design and architecture and will finally explain in more details its 3 main components: 1. Yellow Pages, 2. Yellow Map and 3. Yellow Talk.

2. Context: The CoRe Project
At the Swiss Distance University of Applied Sciences (FFHS) the need to develop a resource which would help people connect with people emerged in the context of our effort for improving the link between teaching and research by means of a Community of Research (CoRe), a knowledge network of academic staff and students organized as a community of practice (Bettoni & Bernhard 2007). The general concept and design of CoRe is based on Etienne Wenger's social theory of learning (Wenger 1998) and on his international online workshop "Foundations of Communities of Practice" (Wenger 1998-2007). Viewed as a social structure CoRe is constituted by seven basic social elements, seven interaction and cooperation areas which correspond to aspects of community life. The individual elements are: 1) Community, 2) Practice, 3) Domain, 4) Leadership, 5) Individual, 6) Connections and 7) Resource Development. The first three of these elements – community, practice and domain - combined together constitute the necessary central framework of the structure: it is here where the main part of CoRe activities takes place and it is this triad of areas that needs to be cultivated first.

3. Design
The vision of our Yellow Tool is that its use will generate 1-to-1 conversations which will act as catalysts for further knowledge interactions among people doing research at FFHS (academic staff, students). How to design our instrument for reaching this goal? Knowing about failures has been a good help for understanding what to avoid in our design. Another useful set of ideas came from analysing successful implementations like *'KN Yellow Pages'* and *'Connect'*. *KN Yellow Pages* is a tool for knowledge networking used at Siemens Information Communication Networks (Sales Germany), a combination of an expert locator system with a knowledge base (Trillitzsch & Klostermeier 2002 p. 239; Jonczyk 2005). *Connect* is a knowledge directory created at BP in 1998 that seven years after its launch was still perceived as successful (Collison & Parcell 2004, Collison 2005). Which are the success factors of design and implementation in these cases? Based on our conception of Knowledge Management as "Knowledge Cooperation" (Bettoni et al. 2006a, 2006b; Bettoni & Borter 2007) we see the following four characteristics as the key factors for creating a sustainable Yellow Pages system:

- *Ownership*: ensuring that control over the information which is volunteered lies with the individuals is essential. Why? Because making the own profile public requires a degree of disclosure which contradicts the established organisational conceptions and practice.

- *Informality* (not an HR system): the system can integrate contact details, work and training histories or other entries from HR databases but should remain clearly separated from HR applications or control. Why? Because it needs to become a far broader representation of the person with a more informal and deeper cultural reach than in formal, standardized HR records.

- *Personal disclosure*: the profiles should express the less formal side of people's professional and personal life. Why? Because knowing this makes it much easier to establish rapport, trust and working relationship.

- *Negotiation of meaning*: the system must allow for and promote the negotiation of meaning. Why? Because we need engagement in using and maintaining the system but we also need this to be entirely voluntary in order to respect people as people. And this kind of human engagement "is first and foremost a process of negotiation of meaning" (Wenger 1998, p. 53).

By analysing in the light of these 4 categories those pointer system initiatives that went wrong one can easily see that these principles were not at all or not enough taken into consideration. Our approach was to use these same principles as the essential set of attributes that is needed in order to make Yellow Pages more social and visible. The Yellow Tool is constituted by the following three components: 1. *Yellow Pages*, a collection of competence profiles in a wiki; 2. *Yellow Map*, a knowledge asset diagram visualizing the competence profiles with a city map metaphor; 3. *Yellow Talk*, a moderated conversation event, for talking about the competence profiles and more informally by sharing personal details both asynchronously on a discussion board and synchronously by means of chat and phone conferences.

4. Yellow Pages

For designing our Yellow Pages component we focused on three essential issues: firstly a new competence profiling model that would be consistent with the principles of Knowledge Cooperation and allow a broad and deep representation of the person, secondly a way of collecting the profile data that would guarantee a high response rate and thirdly a way of storing the profiles that would ensure ownership by the individuals.

4.1 Competence profiling model

According to Eric Krauthammer's theory of business success (Krauthammer & Hinterhuber 2005), the road to success of an individual person is always a combination of his/her acquired competences, motivation and actual job tasks. If you have competences and motivation for a certain activity, but no job task for that – you will never do any work on it. Also if you have to perform a task for which you are motivated but not competent enough, you will require some learning activities in order to fulfill a good job. The same is true for having a job task and all necessary skills, but no motivation for doing it. Think of three overlapping circles, where each circle stands for competence, job task or motivation (Fig. 1). This situation produces 4 overlapping zones, the middle zone (Fig.1, Zone 1) with all intersections offers the optimal configuration. Also the other 3 crossing-zones are interesting, because they can be pushed in the middle with minimal effort.

The following story illustrates a nice application of the action circles of figure 1: The Kremer prizes are a series of monetary awards, established in 1959 by the industrialist Henry Kremer, that are given to pioneers of human-powered flight. Several teams tried to solve the challenging task of crossing the English Channel, but it took 20 years until the team led by Paul B. MacCready was successful. MacCready's team built the "Gossamer Albatross" as part of the NASA Lang-ley/Dryden flight research program (Nasa 2000). In 1979 the human-powered "Gossamer Albatross" flew over the English Channel in 2:49 hours. How could MacCready solve this problem? The key-factor to success was not technology or any other common method of project management, it was the new way he organised his team. Instead of giving assignments to people, he defined a list of job tasks and asked each person of his team to choose his/her preferred tasks. In other words: MacCready and his team successfully reached zone 1 via crossing-zone 4.

In order to find out as much as possible in the areas of competence, job task and motivation, we constructed the following relations:
- competence: will be defined by skills of former and actual working activities
- job task: will be defined as the actual situation of working activities
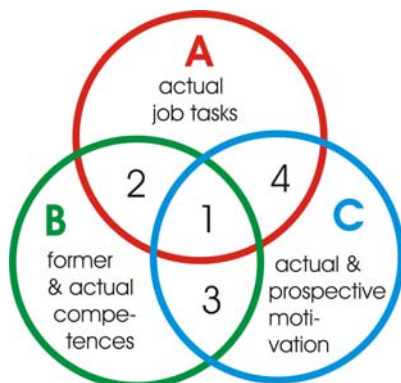- motivation: will be defined as themes and activities of actual and future working activities.

Figure 1: Action circles (A,B,C) and their overlapping zones in terms of activities:

(1) optimal conditions
(2) lack of motivation
(3) lack of job tasks
(4) lack of competences

Based on this competence profiling model, we constructed a questionnaire with only 3 main-questions and 2 side-questions to assure that people get easily involved, because it doesn't take too much time to fill it out. For formulating the three main questions we defined the following guidelines: one of the main questions must be related to former activities because this will give us information about acquired skills, one question must ask for the actual job-situation and another question must demand for themes and activities the person is motivated to do in future.

4.2 Surveying by email

The next important decision to make was how to collect the answers from our target group. One idea was to use a web survey developed with a survey software (like surveymonkey.com); another option we evaluated was to put our questions directly in the Yellow Pages and ask the individuals to answer them there; finally a third idea was to send an email with the questions and ask the receiver to write the answer directly in the email. We selected this third solution because it allows the user to stay within the same, daily-used technology and gives us the opportunity to make the first entries in the Yellow Pages more formally consistent across all the profiles. The email survey that we launched had the following five questions:

1) *Personal information:* first name, surname, date of birth, occupation, email and homepages, actual employers and domicile. This is primary information and good for getting in touch with the person.
2) *Question about actual working themes and activities:* This question focuses mainly on the actual job tasks and skills to achieve the daily work. This information is also good for involving the person in projects respecting same working themes and activities. We can assume that the person can immediately cooperate and take part in given projects.
3) *Question about former working themes and activities:* This question allows to respect earlier acquired competences, which are eventually not included in the actual working situation. This is an important source, if you are looking for specific qualifications, which are not part of the daily business.
4) *Question about further working themes and activities:* This question gives us a hint about the person's motivation for further activities. It does not matter, if the person already has the necessary skills in order to take part in this activity. It is useful information, if you plan new projects and are looking for people to get involved.
5) *Other interests/additional information:* Collaborative interests connect people and facilitate people to get in contact. Hobbies are also interesting, because motivation is often led by a lot of skills. Especially if you want to change, adapt, discover or invent new working themes, which provide new and innovative activities, you will need to deal with the information about former and future activities.

4.3 Implementation as a Wiki in CoRe

The results of this survey have been settled as a wiki-text on CoRe Square. This allows the individual person to change their data whenever needed. In this way, the personal information can change and develop over time, and is therefore not hammered in stone for eternity. Especially the question about the desired future activities cannot be answered easily by most people and therefore requires more time. In order to get to know a person, we also attached additional information into the wiki: links to current teaching assignments, project work, favourite websites and other. But all this textual information lacks the person's gesture, facial expression, voice and motion attitudes of a person. For this reason, we allowed each person to present him/herself in a short video. Supported by a young film-maker (Denzler 2007) each person plays the role of the film director and actor, and is completely free regarding the content of his individual video portrait. The idea is that seeing the persons, what they say (rather than sentences about competence) could give a kind of incentive to make contact, a starting point.

5. Yellow Map

The competence profile of each individual person provides a lot of information about the person itself, but shows nothing about commonalities within other colleagues. The participants of the Yellow Pages generate an unmanageable amount of working themes. If you read a list of these themes, you will not be able to clearly understand key issues and its interrelations to other themes. It's only a list of very different themes. In order to show the scope of work in a clearly structured way, the Yellow Map was invented.

5.1 Competence Analysis of the profiles and their mapping using a city metaphor.

The idea behind the Yellow Map is, that you can handle "chameleonic" information in a way that everybody understands at first sight (chameleonic meaning complex and versatile information about each individual participant in this map). For this reason, a city metaphor has been used: a map of areas of operation of the people involved. In addition to the Yellow Pages, a map of former-, actual- and future activities has to be constructed. This provides an overview of the extensive amount of individual competences summarised in a visual structure that can be easily picked up. This section describes how the actual Yellow Map was constructed.

The Yellow Map consists of theme *areas*, theme *houses*, theme *ways* and *residents*, all of which are common things that can easily be understood as individual items. For each individual working theme of a person, an allocation or association to one to three main working themes have to be made. These main working themes are called the map's theme areas. It is important, that these theme areas represent the actual working theme in at least one property. For example: the working theme elearning corresponds to the three working areas internet, knowledge and learning. In other words: elearning really needs the area of internet, but this is not enough. It also corresponds to the area of learning as well as to the field of mediating knowledge.

To find the corresponding theme areas you have to use the method of the best of one's knowledge. You need a broad understanding in order to assign meaningful theme areas. It can happen that a working theme corresponds to between one to maximum three theme areas. Assignments to more than three theme areas increase the complexity of the map and are therefore not advised. Practical experience shows, that it is also not adequate to assign more than three theme areas. The assigned working themes of a person are the houses of the corresponding theme areas, and the owners of the working themes are the residents of these houses.

The ways in the map connect the corresponding theme areas of an owner's theme house. In the example above, a theme way connects the theme areas internet, knowledge and learning. The size of a theme area in the map is proportional to the amount of theme houses it owns. The same is true for the theme ways, the more houses it connects, the wider it is. Because of the large numbers of theme house combinations, a computer program was developed in the programming language Simscript, in order to find the ways and dimensions of the map.
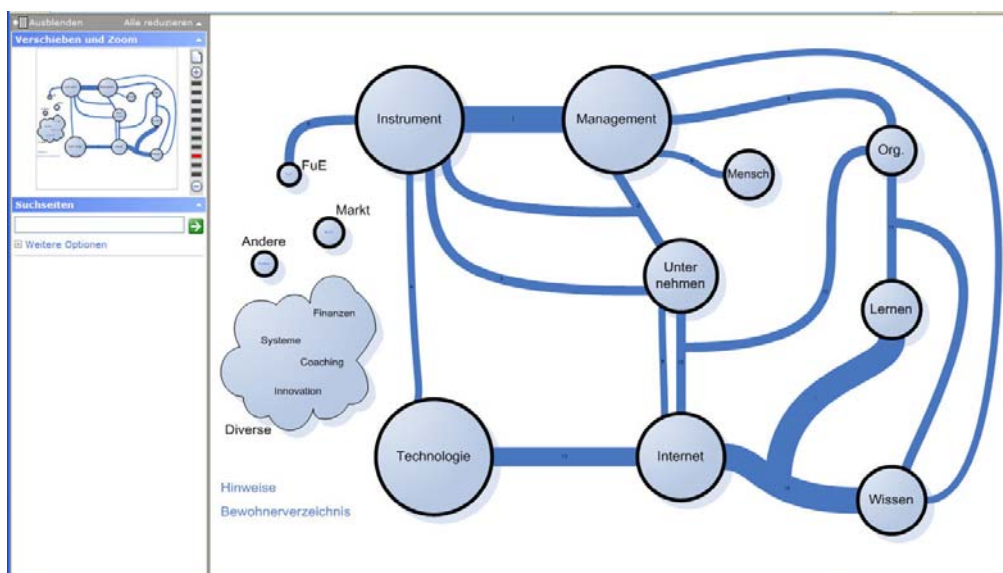

Figure 2: A Yellow Map showing theme areas and theme ways.

legend german/english: 1.Instrument / Instrument; 2. Management / Management; 3. Unternehmen / Enterprise; 4. Mensch / Human Resources; 5. Org. / Organisation; 6. Lernen / learning; 7. Wissen / Knowledge; 8. Technologie / Technology; 9. Markt / Market; 10. FuE / R&D; 11. Andere / Others; 12. Diverse / Miscellaneous; 13. Hinweise / Details; 14. Bewohnerverzeichnis / List of residents; 15. Finanzen / Finance; 16. Systeme / Systems

Fig. 2 shows a Yellow Map of 36 residents including over 150 working themes, grouped in 13 theme areas which are connected via 13 theme ways. The visible theme ways are only shown at a certain width. In this case, 3 or more residents are necessary in order to build a visible theme way and 9 or more theme houses are needed for a visible theme area. The cloud-shaped area comprises more than one small theme area.

Themenweg Internet - Lernen - Wissen

Beteiligte Themenhäuser	Beteiligte Bewohner (ID)
WBT	6
CoP	33
Blended Learning	18,20
Communities of Practice	2,3
e-Learning	2,3,4,6,20

Figure 3: Theme houses and residents of the path Knowledge - Learning - Internet

legend german/english: 1. Beteiligte Themenhäuser / Theme houses; 2. Beteiligte Bewohner / Residents; 3. WBT / Web-based training; 4. CoP / Communities of practice; 5. Themenweg / Theme way; 6. Lernen / Learning; 7. Wissen / Knowledge

5.2 Map implementation

The software Visio-3 was used for the construction of the map. The software allows saving the map as a website, where the theme areas and theme ways work as hyperlinks to its theme house information. There is also a search-field included, which allows to look for residential specific theme areas and theme ways. All features can be used with a common browser-interface. A quick analysis of the map shows collective activities in the theme areas of management, technology, instruments and internet. There is also a strong relation between management & internet, learning & internet & knowledge as well as internet & technology. The Yellow Map also matches the respective knowledge map quality criteria of Eppler (2001), with the dimensions of a) functional map quality, b) cognitive map quality, c) technical map quality and d) aesthetic map quality.

6. Yellow Talk

The competence profiles, the video portraits, the links connecting the profiles to related resources and the competence map constitute a rich set of knowledge artefacts implementing three of the four key success factors defined in our design concept: ownership, informality and personal disclosure. How to implement now the fourth factor, the negotiation of meaning? Wenger (1998, p. 53) introduces the notion of *negotiation of meaning* as "the process by which we experience the world and our engagement in it as meaningful". His model distinguishes two constituent processes: 1) a process embodied in human operators, called *participation;* 2) a process embodied in artificial operands (artefact), called *reification*. The human *operators* contribute to the negotiation of meaning by their histories of interactions in the practices of a community. The artificial *operand* contributes to the negotiation of meaning by reflecting aspects of the practice of the community (histories of transformations). Thus the negotiation of meaning takes place as a convergence of two histories, that of the human operators and that of the artificial operands.

According to this model, our experience of meaning is viewed as a duality, as an interplay of participation and reification with the following implications: a) when you understand one, you should also understand the other; b) when one is given, you should wonder where the other is; c) when you enable one, you should also enable the other; d) one comes about through the other, but they cannot replace each other. Transferred to Knowledge Management, this conception has led to our model of Knowledge Cooperation (the theoretical foundation of CoRe) which defines knowledge practice as consisting of two cross-coupled learning loops that activate and sustain one another: "cultivation of knowledge" and "participation in knowledge" (Bettoni et al. 2006a). In the light of this approach we interpreted our Yellow Pages and our Yellow Map as *reifications* and began to look for ways to implement

the second component of the duality, *participation*. In Wenger's model p*articipation* is conceived as: a) the social experience of living in the world in terms of membership in social communities; b) active involvement in social enterprises. How to provide opportunities for shared experiences and interactive negotiation in our Yellow Tool? How to organize participation around our competence profiles, maps and videos?

The third element of our Yellow Tool, called "Yellow Talk", is our proposal for answering these questions. A Yellow Talk is a moderated conversation event, for talking about the competence profiles both asynchronously on a discussion board and synchronously by means of chat and phone conferences. The objective of this event is to provide opportunities for connecting people with people by facilitating conversations about research projects, working activities, skills etc. but also more informally about personal details. In line with our model of Knowledge Cooperation the Yellow Talk allows to promote an informal process of socialisation among researchers (tacit to tacit knowledge conversion) which is complementary to the more formal process of defining and maintaining explicit competence profiles. A Yellow Talk event is a regular event with a community member as "guest" that helps to "anchor" the CoRe community around issues of individual competence. The point is to engage in an in-depth discussion that benefits both the audience and the guest. Our plan is to repeat it in a monthly rhythm: on one side this should make it frequent enough to become familiar and on the other side it allows to make it not too frequent in order to respect the time availability of members. In the current pilot stage we are experimenting with two basic formats, a Yellow Talk that lasts two weeks and one that lasts one week. The two weeks event begins on Wednesday as a moderated conversation in an online forum: the facilitator opens a new discussion thread, presents a previously selected community member as the guest of the event that will be available in the forum for questions about her competence profile and provides a link to the guest's Yellow Page. To start the conversation the facilitator will also post some previously arranged seed questions, a document, a link to a web-page, a quotation or a statement on which the guest would like to talk. One week later, on the next Wednesday, a one hour phone conference (the main part of the event) moderated by the facilitator will allow all members to talk directly with the guest and continue the conversations that were started in the online forum. After that the guest will remain available for another week in the online forum. The one-week event would have the same format, but begin on Monday in the online forum, have the phone conference on Wednesday or Thursday and close the forum conversation on the following Monday.

7. Conclusion

If ownership, informality, personal disclosure and negotiation of meaning really could make the difference for making competence profiles more social and visible, what about their current state of reification in our implementation? The Yellow Tool ensures that *ownership* over the information which is volunteered lies with the individuals by using a wiki tool for creating, storing, visualizing and maintaining the profiles. *Informality* is given through the competence profiling model and the profile questions, as well as through the style of the conversations that our facilitation approach wants to promote. A further contribution to *informality* and *ownership* comes from guidelines in which we specify the relations between the HR department and the system by stating for instance that exporting the profiles to an HR-system must be avoided because it would discredit our tool. *Personal disclosure* is supported through the Yellow Talk by means of an appropriate facilitation that uses the Yellow Map for helping with the orientation over all the profiles and looks for common ground, shared experiences, social similarities and emotional challenge in the conversations. Finally the *negotiation of meaning* is enabled by means of a combination of all the three elements: the profiles, the map and the talk. Thus we are confident that our implementation can really create an incentive and lead both to a higher engagement in maintenance and to a more active use in daily work.

Will this be enough to realize our vision of generating 1-to-1 conversations which will act as catalysts for further knowledge interactions among people doing research at FFHS? We think that a fifth factor related to social influence will play an essential role: *cumulative advantage* (Watts 2007). The question here is: will CoRe members like our Yellow Tool? Since people almost never make decisions independently the long-term success of the Yellow Tool will sensitively depend on the decisions of early adopters whose choices are subsequently amplified by the process of cumulative advantage. To better address these issues, in the next version of the tool we plan to experiment with a design framework (Smith & Trayner 2005) that introduces a "phase change" in the sequence of online and phone interactions by means of face-to-face collaborative encounters: the "YellowAct".

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