

Meta-Strategies to foster a Meta-Competence? Supporting information literacy at the workplace*

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Abstract

Modern information workers need information-related competencies. Additionally, they have to be supported – technologically and conceptually – by an information landscape appropriate to their information-based tasks and needs. This thesis paper introduces a workplace-specific model of the information process, its related competencies and its main influential factors, based on a literary review. Afterwards, first findings of an empirical study, analyzing the scientific information process at a major pharmaceutical business organization, are presented. Subsequently, strategies to foster the information process will be discussed.

I Information Overload – Information Literacy

Today's workplace demands a new kind of worker. Data is dispatched in picoseconds and gigabits and this deluge of information must be sorted, evaluated and applied. It is estimated that the average person spends 150 hours per year looking for information. (Alex Bennet, Information Literacy: A New Basic Competency. In CHIPS, Fall 2001)

The problem of human information processing and managing has been referred to in literature since the 1960s (Edmunds and Morris 2001). Much investigation has been conducted since in order to find applicable solutions, some of which have already been successfully introduced. Despite of this, the problem seems insoluble as scientific discourse continuously asks for innovative concepts and literacies: Our

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work and private life experience a growing overload of information that is characterized by a short lifecycle and an increasingly uncertain quality. Simultaneously, we are confronted with an increasing amount of technical tools to handle information. Information is nevertheless seen as the key for the success of governments, organizations as well as personal progress. Consequently, the required abilities of the information worker are constantly becoming more complex in our technology-based information society (Virkus 2003: 53, Kuhlen 1999, Edmunds and Morris 2001, Abell 2001).

There have been various efforts to define and teach these essential information handling abilities since the 1960s. Academic educators, information scientists and librarians, in the U.S., Australia and Europe, have conducted extensive research on information competencies and information management skills (Rader 1996-2000, Eisenberg 2004, Kuhlen 1999, Homann 1999). One outstanding concept is the information literacy movement that aims to enable the information worker to know “when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner” (CILIP in Ingold 2005: 15). This movement has often been referred to as a breakthrough within this field, attempting to combine the different approaches concerning information handling (Virkus 2003: 45). Various associations (AACRL, AASL, CILIP, NFIL, CILA, and SCONUL) have been formed with a common concern to find an appropriate, standardised definition of the concept and formulate information literacy competence standards. They developed learning objectives and information literacy curricula, embedding them in the general school and university curriculum at all levels. Starting in the U.S., this movement has “officially” just now reached schools and libraries in Europe, melting with the prevailing European concepts and initiatives (Virkus 2003: 45, Kuhlen 1999, Homann 1996/2002).

2 Workplace Information Literacy – a Problematic Transfer

Within the field of industry and commerce, information literacy is stated to be a comparatively new concept (Donnelly and Craddock 2002, Lloyd 2004). As a means to efficiently conquer the growing amount of information and knowledge, business organizations eagerly integrated the techniques and tools of “knowledge management”. Nowadays, they are realizing that without appropriate educated information workers “the effort can be wasted and costly mistakes made [by] adopting the practices without understanding the principles” (Houghton and Halbwirth 2002; cf. Kuhlen 1999). Lately, the field of industry and commerce shows a rising

interest in topics as usability, Web 2.0 applications and “information literacy” or rather “the people component of knowledge management” (Oman 2001) – as a means to integrate the so far forgotten user-oriented aspect into the business information landscape (Lehner 2000, Houghton and Halbwirth 2002, O’Sullivan 2002).

Current models of teaching curricula of information literacy are, however, mostly restricted to the mere implementation, analysis and teaching of the usage of the established technical applications. This shows the prevailing ambiguity and the need for an appropriate definition of the concept within the workplace environment: Information literacy is often confused with skill-based literacies as computer literacy, library literacy or research skills. What is more, information literacy models often integrate various well-used and established concepts as time management, information management, teamwork, data mining, or internet-experience (...). (O’Sullivan 2002: 10/11) Thus, companies do not recognize the difference of information literacy to these well-established soft skills. Besides, companies seem to take it more or less as granted that their employees have acquired certain basic literacy skills in higher education, not realizing that a transfer to the constantly changing workplace environment may be difficult or impossible (Lloyd 2004, Cheuk 2002). Furthermore, educational information literacy models are far too strategic concepts created and used by librarians and information specialists, with the aim to standardize required information skills. Thus, the transfer to the workplace context is problematic and an appropriate definition – let alone a curriculum for working professionals and concepts for its sensible integration into the business landscape – is still missing (Tuominen 2005: 330, Cheuk 2002).

3 Workplace Information Literacy – Current Definitions

Most prevailing definitions of workplace information literacy restrict it to a mere set of basic abilities of obtaining and using information effectively (Goad 1999, Abell 2001, Cheuk 2002):

[Information literacy embodies] a set of abilities for employees to recognize when information is needed and to locate, evaluate, organize and use information effectively, as well as the ability to create, package and present information effectively to the intended audience. (Cheuk 2002:2)

Additionally, the information literate individual is claimed to own a variety of meta-competencies, or rather a set of higher or related abilities. These meta-skills consist of personal and social competencies as well as a basic knowledge of the thematic environment (Mötsch 1997 in Kuhlen 1999, Stock 1998 in Kuhlen 1999).

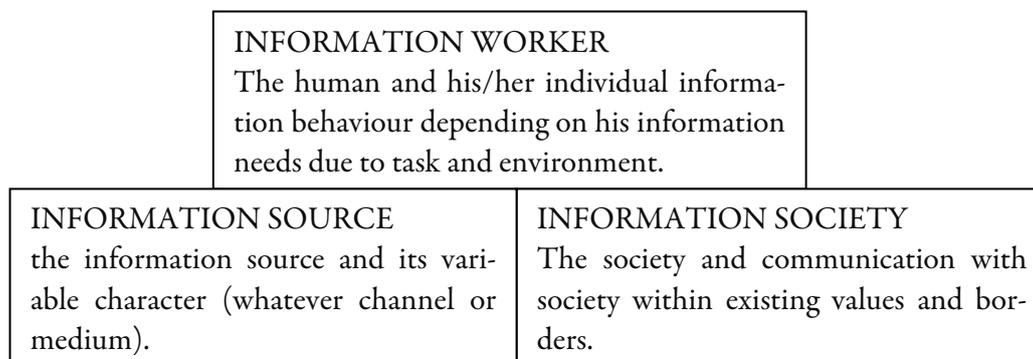
According to Bruce (1999) an information literate person has developed an information style, uses information technology and systems, has knowledge of the world of information and owns values which promote information use.

The combination of this set of meta-skills and basic skills enables an information literate person to approach information critically, implement information processes, conquer the information chaos, analyze and solve complex problems, create new meanings and share knowledge locally and globally (Kuhltau 1993 in Tuominen 2005: 335, Bundy 2004: 4, Bruce 1999, Kuhlen 1999, Stock 1998 in Kuhlen 1999, Tuominen 2005, Lloyd 2004). Thus, it enables an information literate person to become an independent, self-directed and self-sufficient learner, able to “make [his/her] [...] world rather than conforming [his/her] [...] world made by others” (Williams 2003 in Tuominen 2005: 335, Kuhlen 1999).

Webber and Johnston (2003) summaries the described characteristics in a general definition of workplace information literacy:

The adoption of appropriate information behaviour to obtain, through whatever channel or medium, information well fitted to information needs, together with a critical awareness of the importance of wise and ethical use of information in society. (Webber 2003: 6)

Their definition incorporates the main actors that coin information literacy:



The major influencing environmental components are, in their eyes, “information economy“, “organizational culture“, “specialist subject field/technical progress“ as well as “personal, social and cultural factors“. These factors can change over time and generate individual forms of information literacy (Webber and Johnston 2000: 385).

4 Workplace Information Literacy – a Dynamic Model

On basis on the literary review (see 3) one can assign four major dimensions that influence the information process and therefore information literacy: the basic skills

dimension (instrumental/basic skills), the dimension of the individual worker (personal/social competencies), the business organization dimension (environmental conditions) as well as the society and its changeability.

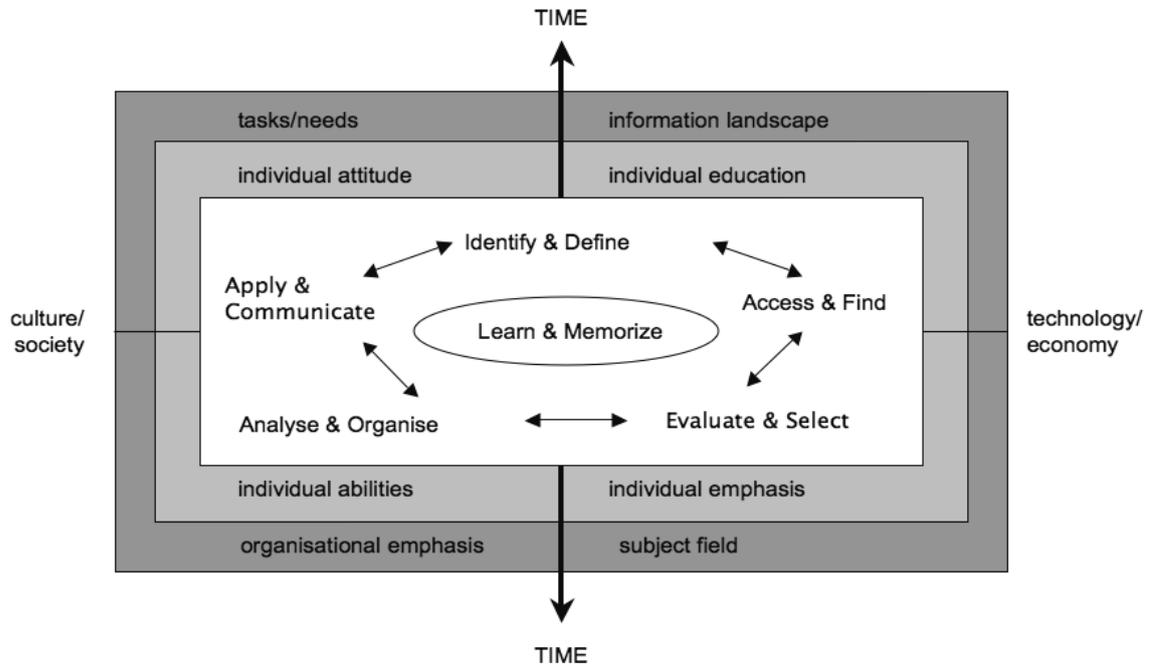


Figure 1: A dynamic model of information literacy and its main influential factors

The six steps of the basic skills dimension (white square in the center) are based on the established information literacy standards (Goald 1999, ALA 1989, Armstrong 2005, SCONUL 1999).

Step	Definition
Identify & Define	<ul style="list-style-type: none"> • Define an information need • Form the information need into a research question • Break the research subject down into parts • Analyze the relationships and hierarchies
Find & Access	<ul style="list-style-type: none"> • Develop a question list • Select multiple potential information sources (human, technical, physical) • Formulate adequate search strategies • Search effectively within information sources
Evaluate & Select	<ul style="list-style-type: none"> • Filter information while remaining focused • Evaluate quality of information • Select information appropriate to need • Review the research process critically
Analyse & Organise	<ul style="list-style-type: none"> • Interpret, analyse and synthesise information • Manage and classify information • Process and manipulate information • Record and store information

- | | |
|-----------------------------|--|
| Apply &
Communi-
cate | <ul style="list-style-type: none"> • Put information in a context • Apply information for problem-solving • Present and communicate information to adequate authorities • Communicate information considering economic, cultural, social, ethical and legal issues |
| Learn &
Memorize | <ul style="list-style-type: none"> • Continuously incorporate new knowledge into knowledge base • Contribute actively to the creation of new knowledge • Actively update knowledge regularly • Access and apply knowledge according to information need if necessary |

The order of the steps of the information process is not necessarily linear. People may e. g. refine the definition of their information needs after having accessed relevant information sources and having evaluated and selected relevant information. Just, as they may reorganise their information after its application and communication.

The “individual“ dimension (light grey square) incorporates four components which all have a major influence on the carrying out of the process.

Component Definition

- | | |
|-------------------------|---|
| Individual
attitude | Positive or negative feelings that people associate with the information process, e. g. regarding quality, benefit, expenditure and the task itself |
| Individual
education | Level of experience and training of people regarding the basic skills of the information process and related tools (search courses, tool courses, etc.) as well as thematic background and education. |
| Individual
abilities | Individual abilities and meta-competencies people own apart from the basic information skills. This includes e. g. critical awareness, level of knowing the information universe, problem-solving, decision-making, social responsibility, ability of communication, search skills, higher order analysis, organisational skills, creativity (etc.) |
| Individual
emphasis | Completeness and importance of the steps that people individually associate with the information process. This is closely related to their tasks as well as to their meta-competencies. |

The “organisational” dimension (dark grey square) incorporates the given tasks/needs, the subject field, the organisational focus regarding the process steps and the provided information landscape.

Component Definition

- | | |
|----------------------------|--|
| Tasks/Needs | The needs of the business organisations and the related tasks of the information worker. |
| Subject field | The thematic field in which the information process is carried out. |
| Organisational
emphasis | Completeness and promoted importance of steps that the business organisation associates with the information process and therefore supports technologically, organisationally and psychologically. |

Information landscape Supportive technical devices and applications (information sources, etc.), social interaction (team, colleagues, personal network, etc.), time & money resources (workplace conditions) provided by the business organisation within the limits of the technical development and social and financial barriers.

The society dimension (surrounding white area) embodies the coining and adaptation of the process and its related skills by economic, social, cultural and technological conditions and changes due to time (time axis).

The level and requirements of information literacy are therefore dependent on the characteristics of the different dimensions and the environmental influences as e. g.:

Organisation: The model – and therefore the requirements – for employees working at a law firm may differ from employees working in a car company regarding subject field, organisation support/emphasis and information landscape, basic skills (etc.).

Task: The model for a secretary and a lawyer working at the same company may differ e. g. regarding attitude, educational background, tasks/needs, basic skills and provided information landscape (etc.).

Society: The model for a secretary in Germany may differ from that of a secretary in India regarding attitude, basic skills (etc.).

In conclusion, the model is not to be used to test or classify information workers concerning their level of information literate competence. It is rather a means of a context-, human-, and time- sensitive analysis of the information process and individual strategies to support information-based workflows.

5 Workplace Information Literacy – a Concept of Analysis

Attempts to analyse information literacy at the workplace are mostly based on interviews. Researches are rarely mentioning the employment of standardised methods, empirical proof or methods of analysis. Furthermore, established standards how to analyse the requirements and problems of information literacy at the workplace do not yet exist. Oman (2001) gives a rather informal recommendation: She suggests assessing the information infrastructure, the demographics of employees, the information process, and individual information literacy competencies. Additionally, she strengthens the great importance to define what information literacy means for the individual organization, workplace and tasks.

In the course of a doctoral thesis an analytical and empirical case study is conducted at a major pharmaceutical company. The aim is to define problematic areas and general applicable strategies to analyse and advance the scientific information process in business organisations. The workplace information analysis is carried out according to the introduced model of information literacy.

Information process – basic skills

- Step 1: Identify & Define
- Step 2: Find & Access
- Step 3: Evaluate & Select
- Step 4: Analyse & Organise
- Step 5: Apply & Communicate

Information worker

- Attitude
- Individual emphasis
- Education
- Meta-competencies

Business organisation

- Organisational emphasis
- Subject/Field
- Information landscape
- Tasks & Needs

Information Society

- Cultural aspects and changes
- Technological aspects and changes
- Economical aspects and changes

The four dimensions are being investigated from three different point-of-views in order to prevent a singular view on the situation:

	Analysis	Information process	Information worker	Business organisation	Information Society
Expert interviews (information professionals)		X	X	X	X
Information worker interviews		X	X	X	X
Independent expert analysis		X	X	X	X

6 Workplace Information Literacy – a Case Study¹

6.1 Interviewing Information professionals – First Findings

The first part of the analysis in the course of the doctoral thesis consists of unstructured information professional interviews. Participants are eight employees of the scientific information department of a major pharmaceutical organisation. The scientific information department consists of the scientific research partners, the library and the intranet and scientific database unit. They are responsible for the provision, research and management of scientific information and work closely together with the scientists. The dynamic model of the information process was shown to the participants as a basis of the discussion. One interview lasted approx. 45 Minutes.

¹ This is only a small part of the findings of the empirical study as the study is still in progress.

The identified problems regarding the information worker, the business organisation and information landscape are presented in relation to recent studies regarding problematic areas of information literacy.

	<i>Problematic Areas – information process (basic skills)</i>	<i>Cheuk</i> ²	<i>D&J</i> ³	<i>W&J</i> ⁴	<i>M</i> ⁵
1	Unable to determine the nature and extent of information needed	X			
2	Unable to retrieve effectively from information systems due to a lack of basic information skills and strategies	X	X	X	X
3	Difficulties in locating information/ lack of knowledge of range of internal databases and external information sources available/only using established standard tools	X		X	X
4	Unable to evaluate and filter information	X			
5	Unable to manage the information and email overload	X			
6	Unable to exploit technology to manage information	X			
7	Unable to relate information creation and use to a broader context	X			
8	Unethical use of information	X			
9	Unable to evaluate the costs and benefits of information management	X			
10	Lack of awareness of the importance of information literacy	X			X
11	Difficult communication between information research professionals and knowledge workers				X

	<i>Problematic Areas – business organisation</i>	<i>Cheuk</i>	<i>D&J</i>	<i>W&J</i>	<i>M</i>
1	Unable to recognize information needs		X		
2	Unable to locate and access information		X		
3	Unable to organise, apply and communicate		X		X
4	Unable to synthesis and create/No clearly organised information landscape		X		X
5	Lack of comprehensive training programme	X	X	X	X
6	Lack of awareness of importance of information literacy		X	X	X
7	No clearly organised information landscape (e. g. Intranet)				X
8	Difficult handling of Information search tools				X
9	Growing amount of information sources complicate adequate selection and usage				X

² Cheuk (2002: 3-5).

³ Donnelly and Craddock (2002: 2).

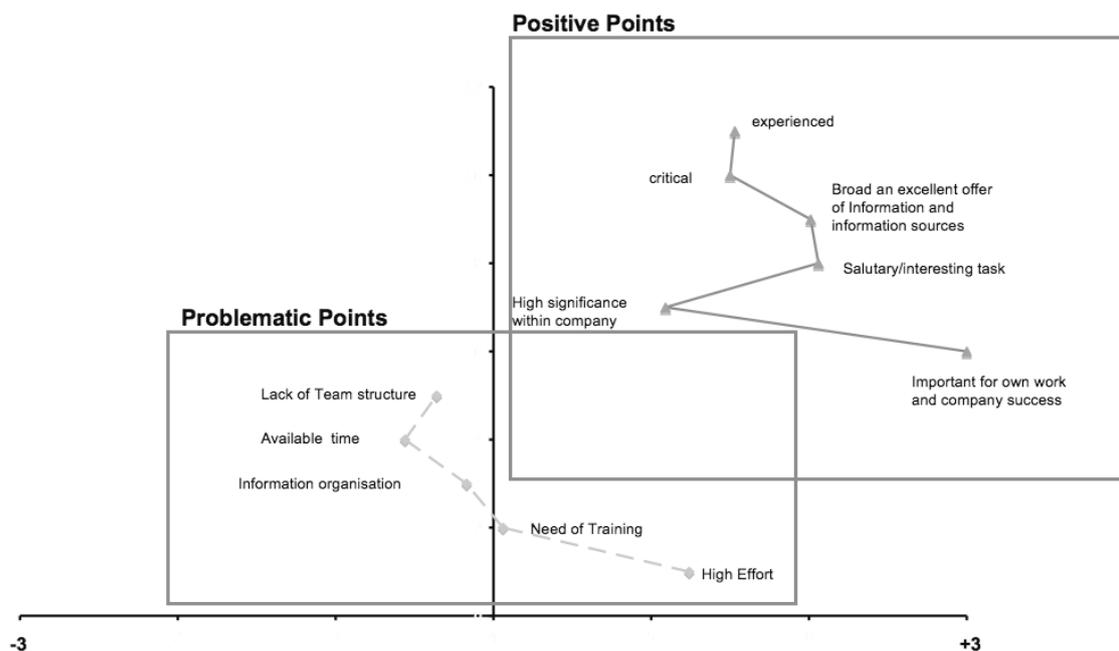
⁴ Webber and Johnston (2001: 12).

⁵ Mühlbacher expert interviews 2006.

6.2 Interviewing Information Workers – First Findings

The second part of the analysis consisted of structured information worker interviews. The aim was to identify the main problematic areas participants experience in the course of the information process. Participants were 78 scientists working in the research and development unit of a major pharmaceutical company. The interview took approx. one hour.

The participants show a very positive attitude towards the scientific information process and their own competencies regarding this process. They see themselves as experienced and critical information workers. Furthermore, they experience scientific information work as an interesting and informative task which broadens their mind and their knowledge. The company itself attaches, in their eyes great importance on scientific information work. This is supported by the broad and excellent offer of information and information sources within the business information landscape.



Nevertheless, the participants identified some major problematic areas within their information work. They especially criticised the current conditions for team working within this process. They experience a growing development towards solitary work. One reason for this is the lack of organised and sensible platforms to communicate, especially internal knowledge. Current technologies do, in their eyes, not fit the task or are neglected for the high effort of maintenance.

Due to the technological development more and more information sources become available. Consequently, it gets more difficult to choose the best source for one's task. Participants state that they usually rely on 2-3 information sources. However,

they do have little time and interest to work with new applications. As there do not exist common standards for search possibilities within information sources, they fear that it costs too much effort to learn the handling of new applications. Additionally, they state that the growing amount of available information leads to an information overload and chaos, making it difficult to evaluate and select reliable information. Equally, there seems to be little time, but great need for further training regarding information skills. Because of the shifting of administrative and bureaucratic tasks from responsible departments to the individual workplaces, their time for research and the scientific information process shrinks constantly. Furthermore, the scientific information process requires high effort to guarantee its quality. Keeping up-to-date regarding current developments in literature shifts continuously into a weekend-hobby.

7 Strategies to Support Workplace Information Literacy

Supporting information literacy is not a simple task. On the one hand, the information worker is continuously in need of training and adapting his skills to the changing information landscape. This affords a comprehensive, ongoing and user-oriented training curriculum, integrated in the business landscape. Furthermore, new information sources and technologies and their benefits are to be marketed via intranet and seminars in order to keep the information worker up-to-date. On the other hand, the information workers as well as the companies have to be made aware of the necessity of information skills. This requires the promotion of the importance of the task as a critical business skill. In order to activate the information worker advance his information skills, it is recommended giving tangible reward as an encouragement to acquire these skills (see Cheuk 2002: 8; Donnelly and Craddock 2002). Thus, the basic strategies to support information literacy are:

<i>Advancing information literacy at the workplace – Step 1</i>	
Information worker/Information Process	Training
	Promotion
	Reward

However, as information literacy is a meta-competence, influenced by various factors, these three steps may be important but are certainly not sufficient. In order to advance the information skills at the workplace more effort is needed.

First, the information landscape needs to be adapted to the user needs: This means clearly organised platforms (as e. g. the intranet), easy accessible and usable standardized tools and a greater support of internal communication.

<i>Advancing information literacy at the workplace – Step 2</i>	
Business Organisation/Information landscape	Clearly organised information landscape
	Easy-to-use and easy-accessible information sources
	Supporting communication and organisation of internal knowledge

Second, fears and prejudices regarding the communication of information need to be dissolved. This may be a long-lasting process, which should actually be started at school. Additionally, time schedules should be relaxed to ensure the quality of the information process, that requires high effort and therefore time. Last but not least, administrative tasks should be directed back to the responsible departments; scientists should stay scientists rather than becoming clerks. It is a fact that Bureaucracy is a cultural problem disabling the creativity and innovative ability (see Grether 2005).

<i>Advancing information literacy at the workplace – Step 3</i>	
Information society/Cultural aspects	Dissolving of prejudices against sharing of information
	Downsizing of Bureaucracy
	Speed culture versus Quality

8 Conclusion

Literary research as well as empirical study has shown that the concept of information literacy at the workplace slowly but surely takes shape. It crystallizes that a model for information literacy at the workplace has to be a meta-concept that unites different competencies and considerate various influential factors. Due to this flexible characteristic, methods of analysis as well as strategies to support information literacy cannot be singular. A successful analysis of information literacy at the workplace requires a definition of a workplace-specific model of information literacy. This model should be based on the analysis of four dimensions: the information process, the information worker, the business organisation and the information society. Furthermore, external influences changed by time as social and cultural development and conditions as well as technical and economical progress and conditions have to be considered. This model helps to detect deficiencies and problems without trying to classify human beings. On basis of the results of the described analysis, supporting meta-strategies can be established regarding the different dimensions. These meta-strategies include training and education of the information worker, promotion of the importance of information work for personal and company success by appropriate promotion and incentives. Furthermore, the informa-

tion landscape has to be adapted to the user needs and user abilities. Last but not least, cultural, organisational and personal barriers, e. g. to share information, to give time to do a task (etc.) need to be identified and dissolved.

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