

Innovative Capability - Current Insights and Future Challenges

Results of four Expert Groups of
the Project International Monitoring



R&D Project International Monitoring (www.internationalmonitoring.com)

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The project on which this report is based received funding from the Federal Ministry of Education and Research (01XZ11001) and the European Social Fund. Responsibility for the contents of this report lies with the authors.

IMPRINT

Editors: Prof. Dr. Sabina Jeschke, Dr. Frank Hees

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PREFACE

Within the context of the BMBF program “Working – Learning – Developing Skills. Potential for Innovation in a Modern Working Environment” the IMO project at the ZLW/IMA & IFU of RWTH Aachen has been tasked with the “international monitoring” in support of the program. One goal of monitoring is observing, identifying and evaluating national and international trends, socio-economic dilemmas, as well as suitable approaches for solutions around the topic of innovation. To support this project, a “National Expert Working Group” made up of labor and education researchers was established on May 23, 2008 as a source for national expertise. Goal of the National Expert Working Group was working on four selected current topics, for each of which a field of action was created:

MANAGEMENT OF UNCERTAINTY –
KEY TO INNOVATION

DEVELOPING SKILLS, WORK SYSTEMS,
WORK PROCESSES – AN INNOVATIVE
CHALLENGE

INNOVATIVE CAPABILITY AND
CHANGE OF WORK

INTELLECTUAL CAPITAL

Within the four fields of action, a thorough interdisciplinary exchange took place on issues of innovative capability in a modern work environment. Over a two-year joint research and communication process, topic-centered research communities were established. In their dialogs, 19 individual expert reports were generated and discussed dealing with selected issues and problems. In addition, open research questions and future challenges, as well as approaches to solutions allowing a different type of research result transfer were identified, using the program as a learning tool, and as a complement for its original funded research emphases.

As a result of this two-year research and communication process within the four fields of action, there are now a number of summary papers reflecting the interdisciplinary nature of the approach and the diversity of the different work and research methods. These summary papers sketch the state of the art in current research, deducing specific research needs regarding new ways of fostering innovative capability. In addition, the need for potential research and implementation formats has been pointed out, as well as new forms of interdisciplinary cooperation between different subject matter groups (actors'/activists' groups and communities).

During their work on the topic areas, all the experts involved have shared their expertise with great commitment in order to provide a contribution on the topic of developing innovations as a service to society. We would like to thank all those involved at this point for their excellent productive contributions.

Dr. Sigrid Busch and Sven Trantow
Aachen/Berlin, September/October 2010

SUMMARY PAPER

MANAGEMENT OF UNCERTAINTY – KEY TO INNOVATION

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“Management of uncertainty: New ways for fostering Innovative capability”

Sketch of a research and design field

1. Preamble

Modern industrial societies – contrary to traditional ones – have given rise to the idea that it is possible to transform uncertainty into certainty and thus, to eliminate the former. This is what science, organization, technology and their related planning and control focus on; particularly in the field of industrial production.

And increasingly, planning and control are also focusing on innovation (in the form of innovation management). Much points to the fact that one of Germany’s special strengths has been its strategy for eliminating uncertainty. There is, however, a risk that this strength might now turn into a critical weakness. Despite great successes in conquering uncertainty, so much is clear: uncertainty can never be eliminated completely; it will always emerge again in new ways, which is particularly so due to the progress made in science, complex organizations and technological systems. This is particularly true in the case of innovations. Here, uncertainties are not a deficit, but instead, a structural characteristic. Consequently, the efforts to eliminate uncertainties also include a risk that instead of fostering innovations, they will be hindered or even completely prevented.

Promoting innovations will require a new way of handling uncertainty. It will be necessary to accept uncertainties and to make productive use of them. Such a way of dealing with uncertainty will be located somewhere between a strategy of elimination on the one hand, and helplessness on the other. A fitting description here seems to lie in the term “overcoming uncertainty.” This shall not replace the effort to conquer uncertainty, but instead, complement it - as an expansion in the meaning of a “both...and.”

As a recent development, research approaches to reorienting our ways of handling uncertainty have arisen in different scientific disciplines. They focus on expanding the traditional motto of rational/structured action by taking a close look at situational action, implicit knowledge, sensual/physical perceptions, as well as subjective opinion and associative thinking as crucial elements of professional action.

Against this backdrop, the call for finding a new way of handling uncertainty in innovation processes is not mere utopia or wishful thinking. But so far, the various research approaches and directions regarding the new way of handling uncertainty have not (yet) been linked systematically, nor have they been utilized or advanced to foster innovation processes systematically. In the different disciplines in which they have been created, they predominantly (still) have a marginal existence. Advancing and anchoring them will require focused promotion, since a change in thinking will be required not only in day-to-day work, but also, and especially so, among scholars.

2. Specifying the need for research

Within the BMBF research and development program “Working – Learning – Developing Skills. Potential for Innovation in a Modern Working Environment” with its focus of “Promoting innovation beyond traditional management,” the Ministry has provided a new orientation and new impulses for expanding existing, prevailing concepts of innovation management. This has resulted in an actual need for research in this new field. The need for researching the innovation-friendly handling of uncertainty has arisen on three levels: Individual, Organization, and Technology.

The basis here will be developing a structured system by means of which uncertainty can be identified and assessed as a structural characteristic and potential in innovation processes.

Here, in principle, a broad understanding of the term innovation (technology, organization, etc.) with input from all actors shall be assumed.

A call for a new way of handling uncertainty in innovation processes.

The Individual

Overcoming uncertainty will require special ways of acting, skills, and forms of learning.

Research approaches regarding the expansion of the structured/rational action model – such as situational, experience-based, intuitive and improvising action – should be looked at and related and linked to each other and advanced for handling uncertainty in innovation processes.

It must be studied how individual resources – in particular, for fostering resilience and salutogenesis – are effective as a basis for skills that foster innovation, and how they can be utilized and advanced. Here, new risks and stresses resulting from overcoming uncertainty shall also be taken into account.

For overcoming uncertainty, learning while working must be recognized as an essential learning environment, and advanced in the direction of a comprehensive, job-related learning and innovation culture.

The Organization

Overcoming uncertainty requires special forms of organization and organizing.

The special potential of approaches for informal and fluid organizations, cooperative cultures, self-organization, as well as the opening-up of organizations for conquering uncertainty in innovation processes must be studied and developed.

Project organization shall receive special attention. New approaches referring to the limits of plannability and linking the structural and action levels, as well as constellations of actors, must be studied. Examples are concepts of agile, virtuoso, explorative project management.

It must be determined how organizational routines and the requirement for process safety can be productively integrated with the new organizational styles for managing uncertainty, and what new problem areas may arise from this.

Technology

Overcoming uncertainty will result in special requirements for the design of technology. In addition to risk assessment, there will be environmental uncertainty as an opportunity for innovation, creating new usage needs and expectations both at the individual and societal levels.

The requirements resulting for technology, and which technical systems are suitable to support individuals and organizations in overcoming uncertainty must be assessed.

An examination of the consequences resulting for human/technology interaction must take place, especially since technology itself is becoming increasingly uncontrollable. In particular, it must be studied how a reflective technology that takes into account potential uncertainty, can be designed.

Of special import is the question in what way technology itself can be focused on overcoming uncertainty (e.g., through self-teaching systems, robotics, open innovation).

In all of these research fields (The Individual, The Organization, and Technology), new models must be developed, and it must be studied to what extent there are already practical approaches that are effective in overcoming uncertainty, but that have not been recognized, communicated and systematically used as such yet.

München, June 17/18, 2010

SUMMARY PAPER DEVELOPING SKILLS, WORK SYSTEMS, WORK PROCESSES – AN INNOVATIVE CHALLENGE

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“Genesis and value of work that fosters learning as a prerequisite for innovative capability”

Sketch of a research and design field

1. Introduction

In the context of international monitoring for the program “Working – Learning – Developing Skills. Potential for Innovation in a Modern Working Environment,” national working groups were established. One of these working groups was dedicated to the topic area “Developing skills, work systems, work processes – an innovative challenge.”

The central focus of this working group was on taking a topic that has characterized the entire history of the program, from the original program “Humanizing Work” to the current program, reflecting it critically, and advancing it. The connection between work system and job design and learning in the working population – or in short: the extent to which working conditions foster learning – has always been at the center of humanizing work or, to quote Winfried Hacker, the extent to which personality is fostered by work.

Beyond this humanizing aspect, it has been clear for a long time that fostering learning is closely linked with the innovative capability of organizations. This applies in particular if one addresses not just qualification in the narrow sense of the word – the aptitude for fixed, existing working conditions – but competence, seen as an ability to reorganize oneself and develop in different and dynamically changing work environments.

This link between the development of skills and innovation exists in two ways. For one, (subject-matter) competence and learning ability are direct prerequisites that allow innovations of a technical or organizational nature to be

handled in and integrated into an actual organization (absorptive capacity). Secondly, the capability to critically reflect on existing work systems and processes – a core characteristic of competence – is itself a prerequisite for bottom-up innovation.

Exploiting the potential for fostering innovation through learning on the job.

This potential for promoting innovation through learning on the job is currently hardly being utilized at all. Among other issues, the following obstacles are responsible for this:

- > The fact that learning and working are institutionally and functionally separated, and assigned either to educational institutions or (business) organizations.
- > The separation of the functional areas – based on Taylorism – responsible for personnel development and for job design in companies.
- > In parallel with this separation, the traditional understanding of personnel development, which is focused on measures outside of a person's immediate job.
- > Organizational standardization (e.g., process standardization, standardized production systems, standardized ERP¹ systems).

In the context of the challenges presented by demographic changes, a special obstacle that must be pointed out is a traditionally youth-centered labor market and labor policy focus at the organizational and societal levels. At least implicitly, these policies were – and still are – directed at recruiting skilled young employees, “exploiting” their skills for a defined period of time and – due to their earliest possible factual retirement – replacing them in turn by new, young graduates of the educational systems. Against this backdrop, managing skills sustainably by continuously developing skills on the job has been seen as unnecessary.

¹ Enterprise Resource Planning

The more these policies must appear dysfunctional, given the demographic change, the more attractive concepts of sustainable skills management have become, at the core of which lies job design that fosters skills

2. The state of the art

The long history and the volume of research on working conditions that foster learning and skills seems to suggest that there are hardly any gaps left to research. And indeed, a comprehensive theoretical and empirically founded knowledge about characteristics of work that fosters learning does exist. Standardized measuring methods that meet the usual requirements of testing theory are available for determining this potential for fostering learning and (with limitations) also skills.

Much less well known is under what kinds of conditions work systems² arise that foster learning and skills, as well as the actual development processes they create. In specific research and development projects for job design that fosters learning, different approaches and methods from organizational development and design have been used. But such projects tend to be rare when it comes to thorough and sustainable design of real work systems. In addition, these projects also allow very few conclusions as to the actual job design in companies.

It must be assumed that in real job design processes, complex interactions between different groups of actors are essential. Among these groups are – depending on the industry and type of company – plant planners and industrial engineers, IT organizers, technical planners, organizational experts for special applications, various management and leadership levels, and also employee representatives. In medium-size and particularly, in small companies, job design is less of an expert task than rather, a result of communication and cooperation between experts and leaders with “all-around qualities.”

Some of the groups of actors listed possess specific professional standards and quasi-standards that refer more or less directly to job design. So for example, in industry, REFA and MTM, among service providers the IT Infrastructure Library (ITIL) as a quasi-standard for IT service management, and in the area of cross-industry standards, ISO9000 ff. and ISO 15000.

² Work systems include personal, technical and organizational components.

On the significance of these and other standards, as well as methods regarding the potential of work to foster learning and skills, there are well-founded justifications in some cases, as well as a few empirical findings. But there is by no means a systematic or comparative analysis from the point of view of fostering learning and skills. This also applies all the more for the non-codified, experience-driven processes by which actual job design is characterized beyond such formalized approaches, especially in KMU.

Beyond these aspects of the genesis of work systems that foster learning and skills, the putative relationship between work fostering learning and organizational potential for innovation have hardly been analyzed systematically. This poses the question for operational use and operational value of work fostering learning with regard to innovation and other organizational and/or economic value categories.

3. Research needs

From the state of the art, a number of questions arise:

- > How do work systems come into being? Can types of creation processes be distinguished, e.g., by industry, type of innovation, or type of company?
- > Are there connections between the process types discussed above and the potential of work to foster learning and skills? Which types of processes are more likely to result in work that fosters learning?
- > Where in these creation processes are there points of intervention with regard to focused design along the lines of a potential for fostering learning and skills?
- > What types of standardized job design methods can be distinguished? Are there correlations with the potential for fostering learning and skills?
- > What kind of options for intervention are there with regard to the different groups of actors, depending on differentiating aspects such as discipline, operational function, industry, type of company?
- > Can correlations between the potential of work to foster learning and skills, and innovation potential as well as actual innovation be proven? Which specific correlations exist between work fostering learning, and organizational potential for innovation with regard to the individual and organizational genesis of skills and economics of skills?
- > Which other organizational values – or disadvantages – correspond to the potential of work to foster learning? To what extent do these value aspects play a role in the design processes?
- > What is the significance of the potential of work to foster learning as an economic factor beyond business management (aspects of labor market economy and education economy)?

Actor groups and communities

Research and design projects regarding the questions described above will require interdisciplinary cooperation between different subject-matter groups. In addition to the disciplines that have traditionally worked on labor research, this will apply particularly to research and educational institutions as well as professional organizations connected to the groups of actors involved in actual job design. This includes institutions and organizations in industrial engineering, service management, IT organization and process design, and other groups of actors yet to be determined.

4. Potential research and design formats

The research and design projects required for a better understanding of the genesis and value of work with the potential to foster learning and skills can be assigned to different formats:

- > Exploratory (pre-)projects identifying the groups of actors involved in the actual design of work systems and processes in different industries and organizational types
- > Retrospective analyses of actual work systems and process design processes
- > Comparative analyses of the effects of different genesis process types on the potential of work to foster learning and skills
- > Comparative analyses of the actual uses and value of work with a potential to foster learning and skills, for innovative capability, innovation and other value categories.
- > Design projects for identifying and designing points of intervention in job genesis projects.

- > Intervention projects focusing on advancing the professional development of the groups of actors identified with regard to work with a potential to foster learning and skills.

5. Excursus: Reference to the problem of transfer

An often addressed but little analyzed problem is the transfer of successful design solutions – with regard to the potential of work to foster learning and skills – from the organization where the beneficial conditions were found or generated, to other organizations.

One reason it is difficult to effect successful transfer, or to show it, may lie in the fact that the generating processes of such working conditions with a potential to foster learning and skills have been neglected.

From a system theory point of view, transfer presupposes knowledge of the target system; i.e., in this case, of the organization that is supposed to absorb the results. However, ultimately such absorption can only take place through processes the target organizations use for creating work processes and systems. The ability of the work systems and processes to foster learning and skills would have to be integrated into these processes as an additional defining characteristic. Such a transformation of processes internal to an organization is anything but trivial.

It can be assumed that a more systematic knowledge of these job genesis projects – resulting from research and design work as described above, can provide essential information regarding the potential and limits of transfer, and on intervention points depending on the different process types and actor configurations.

From a point of view of scholarship, this would realize additional value for transfer research; in practical terms, it would create conditions for effective and efficient – as well as realistic – transfer processes for good practices.

Berlin, July 2, 2010

SUMMARY PAPER INNOVATIVE CAPABILITY AND CHANGE OF WORK

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“The change of work and innovative capability”

Sketch of a research and design field

1. Introduction

The term innovative capability has many facets and points of reference. When the term innovative capability is used, it is usually in the context of the social and institutional prerequisites for successful (usually, technological) innovations. Here, the debate on national and regional innovation systems focuses primarily on the structural, political and institutional conditions for innovative capability at the national and regional levels. Here, the “Working – Learning – Developing Skills. Potential for Innovation in a Modern Working Environment” program’s interest centers especially on management- and work-related aspects of innovative capability. Terms of paramount interest here are organization, qualification, technology, and health.

In the context of the “Innovative capability and change of work” action field, the focus of attention was on work-related aspects of innovative capability. Here, work research has early on focused on the idea of a comprehensive interpretation of the term innovative capability, based on the field’s long-term experience such as it is reflected in the programs “Humanizing Work,” “Work and Technology”, as well as “Innovative Work Design - the Future of Work.” It is especially in its analysis of the complex interaction between social and technological innovation processes in companies that work research has provided important impulses for a comprehensive understanding of innovation. Here, the focus was especially on the social and “human side of innovation” emphasizing the great significance of human work in innovation processes. Despite the tremendous changes in the work environment and the resulting problems, work remains the most important resource in handling innovation processes, particularly in a knowledge and service society.

The focus of the work in the action field was on three dialog-oriented action field meetings, as well as five expert reports authored by members of the action field presenting the state of the art for selected topics and listing current research questions.

2. Basic theses and topical foci

The point of departure for the expert reports submitted are common fundamental beliefs regarding central development trends in the work environment. So for example, all experts assume fundamental changes for the work environment as it moves from an industrial to a knowledge and service society. In the course of these developments, there will be a transition to a “digitalized, increasingly globalized economy and society” (cf. Stieler-Lorenz expert report). This will direct the focus on new industries, such as ITC, multimedia, medical technology, but also new services such as E-commerce, consulting, fitness and wellness, etc. (cf. Trier expert report) resulting in changing requirements for employees. These changing requirements will, however, not remain limited to these industries, but they will also increasingly permeate other sectors of the economy.

The development trends described will not automatically result in the creation of a “beautiful new work world” – instead, they will be associated with a number of contradictory effects on employees. So for example, as a central trend, an increase in psycho-social stresses can be detected (cf. Stieler-Lorenz expert report) that will continue to characterize the work situation of many employees going forward.

The requirements for job design are increasing. The tension between humanization and efficiency, between organizational requirements and those working people have of “good” or acceptable work will generate new contradictions under these changed circumstances. The lines of compromise will have to be renegotiated. This will be made more difficult by the increased segmentation and heterogeneity of the new work environment (increase in atypical employment forms, increased segmentation of employees along their existing qualifications and skills, etc.).

Here, the new work and employment forms will not only bring risks for employees, but also opportunities. Modern work needs modern structures and regulatory forms so that people can develop their potentials. The willingness to tread new paths has grown even among management.

In the course of these developments, the innovative capability of companies and entire societies is becoming increasingly important. At the same time, however, the conditions for maintaining innovative capability are also changing. While traditionally, innovation primarily aimed at the science- and engineering-oriented generation of new products and processes, in future, the focus will be more strongly on social innovations (cf. Howaldt expert report). Here, the human factor and its work will be especially significant. Despite the tremendous changes in the work environment and the related processes, work will – especially in a knowledge and service society – remain the most significant resource for tackling innovation processes. The society of the future will be a “work society.” Maintaining and developing skills in a definitely dynamically changing work environment (cf. Trier expert report) will increasingly be an essential prerequisite for maintaining the competitiveness of companies. At the same time, maintaining the potential to foster learning will become a central condition for the capability to innovate. Against this backdrop, the high-tech strategy of Germany’s federal government must be complemented by a high-skills strategy. The traditional continuing education structures must be expanded into new learning cultures (cf. Sauer expert report).

3. Future research questions and fields

Against the backdrop of these basic assumptions, the existing expert reports describe the different states of research in certain topical areas and define open research questions and fields.

In the area of changed stresses and strains related to digitalized and globalized work it will, according to the Stieler-Lorenz expert report, be necessary to continue current research both in its depth and breadth, “not least, the existing knowledge and methods for an economic evaluation of innovative and integrative approaches of the BGF have not been sufficient by far. For this, too, new approaches will be necessary that capture both

economic parameters and soft factors regarding the effectiveness of interventions. The definitive research question regarding this topic is, however, whether and in which manner the contradictory trends of stresses – strains and organizational and individual coping – identified for the ITC industry also exist in other areas of the economy with ITC-based knowledge work, and/or if there are different contradictory trends prospectively and sustainably leading to additional new challenges there.”

With regard to the vast available research and literature on skills development it would make sense, from the point of view of Matthias Trier’s expert report, to further look into the changes in living and working conditions resulting from the rapid social change and their effects on skills; e.g., in the face of the current global financial crisis with their consequences for the actual economy, “Skills and crisis, as well as dealing with crisis, are urgent topics. What must also be studied are the consequences for skills from globalization and worldwide inter-cultural networking of employment and employees, as well as for skills and skills transfer in case of changing employment in different cultural and social environments. Scientific/technical progress must be analyzed with regard to its contradictory effects on skills development by limiting and freeing jobs in ‘old’ and ‘new’ industries. An ongoing issue is the training of coming generations for skillful work: How can independence and autonomy be developed in practical work? And not least, due to the increasing instability of employment, an analysis of the skills potentials in non-standardized employment will remain an important topic.”

Johannes Sauer’s expert report additionally points to central fields of action in the context of developing a high-competence strategy, which is deemed necessary, “The planned high-competence strategy shall provide a complex contribution toward the goal of increasing the capability for innovation, and thus, the optimization of learning cultures. In the context of skills development and self-organization, learning culture stands for the network of different forms of learning and the victory over Taylorism in working and learning that still characterized industrial society.”

While there is well-founded research at the BMBF in the area of skills development and operational prevention research, and the focus here is on identifying gaps in research and expanding research into other areas of the economy (Stieler-Lorenz, Trier), as well as developing actual strategies for actions (Sauer), the other topics have so far been researched insufficiently (Howaldt) or hardly at all (Münch).

So for example, in the area of work-related mobility research, research issues with regard to measurable and noticeable correlations between mobility and innovation can be identified.

Social dimensions in innovation processes.

At the same time, this information also provides new perspectives on more traditional industries that are repositioning themselves in the light of new requirements.

“The efforts of the program will, however, not be sufficient for promoting the innovation potential of the German economy and society, and for advancing innovative capability research further. A central challenge lies in transferring the insights from this program and its underlying comprehensive definition of innovation (as well as the related research concept) to other high-tech strategy programs. In particular, the questions regarding the social conditions required for successful innovation processes, including the meaning of work as an essential driver of innovation, would have to be integrated into other programs and projects, which are often biased towards technology. It will be especially important to make social innovations as such – and not just as a prerequisite and parameter for successful technological innovations – more of a subject of research and development programs. In this sense, the required stronger emphasis on ‘social innovations’ as a topic is closely linked to the question of the independent character of service innovations. For – as has been explained already – social and service innovations are closely networked in terms of content and from the point of view of their genesis, and of growing economic relevance, given the increasing significance of the service sector.”³ (Howaldt expert report)

This overview of the questions resulting from the expert reports simultaneously also points out a certain selectivity of the topics selected. This results both from the described division of labor into four fields of action with their specific choices of focus, and from the conscious

³ Cf. the trend study generated in the context of the IMO project by Jürgen Howaldt and Michael Schwarz “Social Innovation: Concepts, research fields and international trends” (http://www.internationalmonitoring.com/fileadmin/Downloads/Trendstudien/IMO%20Trendstudie_Howaldt_englisch_Final%20ds.pdf).

choice of the participants of the field of action to focus the topics studied on an examination of the complex “Innovative capability and change of work”. This was a choice of topic that, based on the underlying goals of the overall project as well as with regard to the synergies with other fields of action, seems to make sense. Thus, the participants of the field of action have been able to focus on working on conflicting priorities “Customer orientation and innovation,” “Time for learning processes and increasing time pressure,” “Increasing pressure to change and insecurity,” and “Innovation potential and increasing cost pressure.”

The participants agreed however that research on “The change of work” should not be solely limited to these questions in future either.

As a complement to the topics suggested here, which strongly focus on company-oriented research, questions regarding the societal dimensions of a changing work environment should not be neglected either. In particular, the changing segmentation lines of the work world should receive more attention. In addition the phenomenon of the exclusion of a growing number of people – particularly those who are “educationally disadvantaged” – should not be forgotten as a societal challenge.

At the same time, the question regarding a humane, sustainable design of jobs as an independent topic for work-related research will be of great significance going forward. The quality of work is not only a factor that makes a difference regarding a company’s or region’s competitiveness, but it is also an important indicator of a society’s state of evolution.

Dortmund, September 7, 2010

SUMMARY PAPER

INTELLECTUAL CAPITAL

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“Intellectual capital – societal areas of conflict and approaches to solutions by means of a knowledge-based strategy”

Proposal for a research and development focus within the program “Working – Learning – Developing Skills. Potential for Innovation in a Modern Working Environment”

Even though a critical public within the ‘Education Republic’ of Germany – shocked by the results of the PISA studies and sensitized by the fragility of the classical industrial sectors – has increasingly been emphasizing the relevance of the “mind” and “intellectual capital,” approaches to capturing and managing this new production factor are still relatively rare. While the federal government ratified the Declaration of Lisbon in 2000, according to which “the EU is to develop into the most competitive and dynamic knowledge-based economic region of the world” (Lisbon Agenda), not much has happened since then, and the old industrial “wisdom” seems to win out according to which in times of crises, the belief in intangible investments (education, research and development) decreases, particularly because the economic crisis and the resulting distancing from the actual economy spawns a deep longing for tangible values. But how are we identifying, assessing and managing the intangible values that have increasingly come to dominate the value-added process at all levels?

10 years after the Lisbon Agenda was passed, and 10 years before the end of the “Europe 2020” program, the “Intellectual Capital” working group has drawn an interim conclusion by providing an overview of the current approaches and discussions in expert reports and talks. They assume a paradigm change in our value and evaluation fundamentals and are not afraid to resurrect the connection between the mind and money/wealth. Here, an analysis of the strategic aspects of the permanent failure to aim high enough in educational policy and economy was necessary. This has resulted in a contribution that helps overcome the dilemmas in the knowledge and educational arenas pointed out accurately in the IMO project without stopping short at the usual appeals for more attention and money for these topics.

During this search for traces of a paradigm change in evaluation methods and approaches, developments and current approaches for capturing and handling intellectual capital were described at three levels – organizational, regional/communal and societal.

The current economic crisis has clearly shown that approaches for company evaluation that reduce their arsenal to monetary parameters do not provide sufficient reliability for forecasting the medium-term and thus, sustainable development of companies. Calls have been heard for new evaluation methods focusing more on sustainability instead. The correct, sustainable handling of immaterial resources increasingly decides whether an organization will be successful, or even, survive. Consequently, handling knowledge correctly must be moved center-stage in management activities going forward. A detailed analysis of how these immaterial resources are handled, in conjunction with established retrospective and prospective approaches, will thus provide a good judgment of a company's future potential, and thus, the sustainable development of its value.

To sum it up: Entrepreneurial thinking and strategic action must be based more strongly on company-specific options and scenarios of knowledge- and skills-based competitive differentiation. Companies must establish structures and processes that develop their employees' and partners' creative potential, and consolidate themselves in such options. Practical approaches for such a sustainable company development based on intellectual capital statements have been described and discussed elsewhere and are being studied by the authors within the context of a countrywide study on the use of IC strategies in companies. At the same time, we also regard IC as skills capital. The point here is also, according to the Bologna Study, to make the transition from an input-oriented system to an output-oriented one a reality. However, this process must not neglect aspects of cultural education that do not have an immediate economic reward, for their long-term effects are considerable – also, economically.

When looking at regions and communities, we found a number of approaches that focus on IC with regard to a region and to cities. In an interview the IMO-project did with IC pioneer Leif Edvinson (Pawlowsky 2010), he pointed out Ragusa (today's Dubrovnik) as an early example. The city's wealth can essentially be traced back to strategic intelligence (Edvinson 2004, p. 4, paper presented at the Italian Innovation Week, Nov. 22-26, 2004, <http://www.eucluster.net/files/>). In the Europe of regions, there is also increasingly competition between regions and communities today. "This competition is multi-faceted. It refers both to

the quality of a location, as well as to the competition for investors and companies, for qualified and creative people, and for national and supra-national funding. The regional intellectual capital statement approach closes the gap between the national and the company level.” (Nagel/Mauch 2009: Regionale Wissensbilanz Ortenaukreis). The examples of the Wissensbilanz Ortenaukreis and the Wissenregion Rhein-Main clarify the site relevance of the intangible factor “knowledge” and its networking within a region.

Intellectual capital management with a view towards sustainability.

In the opinion of the working group, the societal level reflects that participatory knowledge-based development processes are not sufficiently developed in the areas listed. Maybe there is a lack of courage to question the very structures of how knowledge is organized, the interdependencies of and between the very diverse actors in the knowledge society, and to define their share in our insufficient future-resilience. In this regard, here too, a political discourse on the sustainable handling of intellectual capital is urgently needed. The unconscious slide into the greatest economic crisis, as well as its so far insufficient discussion also point to a crisis in management and communication of intellectual capital. It is meanwhile no longer in doubt that irresponsible handling of IC management has determined actions with a ubiquitous focus on short-term goals. There are calls for sustainability-based management of IC. However, hardly any actual changes in attitude and strategy can be detected in politics and society. The urgently needed anchoring in the political sphere; e.g., by establishing Future Centers for a dialog with citizens, which the federal government’s current coalition treaty provides for without any more precise stipulations, is discussed as a perspective, based on the ACSI established in Finland (Aalto Camp for Societal Innovation: a new dialog-based learning platform for supporting societal innovations through highly qualified experts and political entrepreneurship).

In order to also anchor the trifecta of topics “IC society – IC policy – IC economy” within the public’s awareness, and especially that of political decisions makers, as a framework for a policy program, the working group presented and discussed starting points.

From this multi-level analytical and discussion process of IC perspectives, a number of research questions relevant for the future can be deduced:

- > What kind of geopolitical position does a country have with regard to knowledge? E.g., the type of networking and cooperation within a region / the continent, design of global networks.
- > What goals and standards shall we set for our own IC policy so that we do not need to chase third-party benchmarks and ratings (e.g., rating agencies)?
- > What formats and infrastructures (organizational, societal, political, geographical) are suitable as catalysts for the intra-company and inter-company establishing of knowledge-based options for innovation and competitive differentiation?
- > How can the relationships between science, business and society be made more active and like a dialog?
- > How can IC management contribute to more competent political decision-making?
- > How can the new emerging work models of knowledge workers (entrepreneurial worker [Arbeitskraftunternehmer], new self-employed people, temp project employees, etc.) be designed to be attractive and efficient? Who will represent their interests?
- > How can knowledge be used as a resource for international development cooperation? What global responsibility do we have, what IC rights do we demand for developing countries?
- > How do IC competition and the free exchange of knowledge go together? E.g., open source vs. protecting intellectual property.

- > How can new developments of the WWW (consequences of Web 3.0, semantic networks, cloud computing, ontologies) and the corresponding possibilities for E-skills development, but also the limitations and losses new developments bring with them, be designed within the context of IC approaches?
- > How do we ensure the opportunity to participate in the IC society by means of fair access to knowledge for all societal groups – youth, seniors, educationally disadvantaged strata, minorities, men/women, etc.?
- > How do we mitigate the new social gap between those advantaged in terms of education and the disadvantaged (knowledge divide)?
- > How do we increase the readiness and motivation of citizens to take risks with new things?
- > How can more competent and ethical conduct in politics, business and the citizenry with regard to potential risks of scientific innovations be achieved?

The working group thinks that these questions should be addressed holistically by means innovatively linking the following project modules:

- > Kick-offs addressing political decision makers at the national, regional and local level according to the round table model of the New Club of Paris whose primary purpose it is to effect “the setting of a knowledge-policy agenda” and that is usually followed by projects for concrete measures, such as regional intellectual knowledge statements, or establishing a Future Center after the ACSI model (Aalto Camp for Societal Innovation).
- > Opening up a continuous public dialog in the context of Future Centers after the Finnish ACSI and within spin-off initiatives such as decentralized, citizen-centric knowledge cafés. Here, societal actors and experts could meet not only in form, but also in substance in projects relevant for a knowledge society.

- > Media-based units on IC topics that can serve as a trip through the “Country of Ideas” or the “Country of Knowledge” for general orientation and visualization of existing or growing ‘thinking places’ in Germany. The change toward a knowledge landscape that is already taking place, as well as the related communication problems require mediation and moderation. In conjunction with different mediation channels (film, idea parks, etc.), a pragmatic picture of a knowledge-oriented society should be created.
- > Promotion of and additional expert dialog by processing and analyzing a current representative survey “WM2010” on the handling of the “knowledge” resource in the German economy; with German businesses, associations and educational institutions (this survey will allow a countrywide idea of how the production factor “intellectual capital” is handled, for the first time ever.)

Chemnitz, September 21, 2010

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