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Researcher Column 1:

On the Emergent Episteme of Knowledge Civilization Era

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This is a short summary of a part of conclusions of
our new book (Wierzbicki and Nakamori 2007).

In the era of knowledge civilization, the concept of *episteme* introduced by (Foucault 1972) cannot be restricted to historical studies, can be applied also to analyze the current situation and future developments. After the middle of 20th century, the episteme of industrial civilization era was disintegrating and three essentially different episteme of three cultural spheres developed divergently. This concerns the separate episteme of hard and natural sciences, the distinct episteme of technology, and the episteme of social sciences and humanities that is itself diversified, with some extreme versions represented by post-modern social philosophy. There is a need of a new integration of the episteme for all sciences, humanities and technology. This need was stressed, e.g., by social sciences, but we present here the arguments for such need from the opposite side, of hard sciences and technology, which might lead to different conclusions.

The episteme of technology differs considerably today from the episteme of hard and natural sciences. This is best illustrated by the findings of (Laudan 1984) concerning the question, whether the Kuhnian concept of a scientific revolution (Kuhn 1962) is applicable also to technology. The general conclusion was that this concept is not applicable, because technology values solving practical problems and thus is less paradigmatic and more pragmatic than science.

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Researcher Column 2:

Decision-making in the Real World

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Decisions in the real world are derived by underlying assumptions. The importance of assumptions has been stressed by many writers. Richard M Cyert, a behavioral economist and a key figure of the Carnegie School of organization decision studies, for example, warned researchers that ‘Theories should be as realistic as possible in their assumptions’. To practical managers, he said, ‘You have to deal with the real world – and the real world is messy and people make a lot of mistakes’. There are plenty of evidences: IBM’s failure to capture the PC market, Kodak’s late switch to digital camera, Marconi’s fatal ‘me-too’ ‘focusing’ strategy, NASA’s Challenger launch decision, Russia’s centrally planned and controlled

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On the Emergent Episteme... (con't)

Our comment, see (Wierzbicki 2005), is that technology values and follows in its everyday practice more the concept of *falsification* of Karl Popper than *paradigms* of Thomas Kuhn. Thus, the emerging episteme that we propose below must take into account also this difference. Other differences, e.g. to the episteme of social sciences, are better known.

We are also aware that the formation of a new integrated episteme will take its historical time; the following is just an outline of such episteme formulated from a technological viewpoint – to be criticized and modified by future research.

Let us start first with three basic principles that we believe will be decisive for the change towards the new episteme of the knowledge civilization era. These are the Popperian *falsification principle*, the *emergence principle* and the *multimedia principle*, described already in (Wierzbicki and Nakamori 2006).

We use the concept of falsification not in its early, rather naive sense of abandoning a theory after finding a counterexample (Popper 1934), but in a more mature sense, as explained in (Popper 1972):

Falsification principle:

the measure of validity of any hypothesis, theory, or a model is the number of either attempted falsification tests that they have successfully passed, or of critical discussion tests leading to an intersubjective agreement about their validity

This falsification principle applies not only to a hypothesis, theory, or a model; in technology, it applies also to tools and artefacts, while the falsification tests are either tests of practical adequacy or even destructive tests (if we want to build a reliable car, we must apply diverse, often destructive tests to the car prototypes). The inclusion of critical discussion tests is actually an extension of Popperian falsification, making it more open towards the needs of social sciences and humanities.

Technology distinguishes clearly between *prescriptive* and *descriptive* models or concepts: a prescriptive model might not correspond to actual practice, but expresses a recipe how things should be done. Thus, we agree with social science criticism of Popperian falsification principle (that

any creator of a new theory will rather look for data to support it than make experiments aimed at falsifying it), but only if we interpret this principle *descriptively*. However, Popperian falsification principle can be also interpreted *prescriptively*, explaining how things should be done – in order to attain reasonably objective knowledge¹. And in technology creation, this principle is not only prescriptive, but also describes an actual behaviour of technologists testing their artefacts in extreme conditions.

The emergence of new concepts and properties on higher levels of complexity was noticed for a long time in philosophy. But a clear formulation of emergence principle evolved first with the empirical evidence of the concept of punctuated evolution in biology; then it was rationally reinforced by the concept of order emerging out of chaos; parallel, it was pragmatically substantiated by technology, in the hierarchical systems theory, as well as in the concept of seven layers of telecommunication protocols, see, e.g., (Wierzbicki and Nakamori 2006).

Thus, the reduction principle of the industrial episteme – that the behaviour of a complex system can be explained by the reduction to the behaviour of its parts – is valid only if the level of complexity of the system is rather low. With very complex systems today, we should use instead:

Emergence principle:

new properties of a system emerge with increased level of complexity, and these properties are qualitatively different than and irreducible to the properties of its parts.

It is a fundamental conceptual change. Even if it might seem that emergence principle logically results the *principle of synergy* or *holism* - that *the whole is more than the sum of its parts* - this is not necessarily a correct interpretation. The principle of synergy or holism does not say that the whole should have essentially different properties than its parts. Thus, sciences of the 20th century, accustomed to the atomistic or sub-atomistic reasoning of physics, continued to believe in reductionism: a whole might be slightly greater, but is still reducible to its parts. This is precisely

¹ Full objectivity is obviously – after the relativism of Einstein and the indeterminism of Heisenberg, followed by diverse philosophic debates – not attainable, but technology at least tries to be *as objective as possible*.

how post-modern sociology of science attempts to reduce objectivity to power and money. However, information technology provided a counterexample to such reasoning already in the middle of 20th century. Only its importance has not been widely noted: this is the distinction of *software* from *hardware*. Software cannot function without hardware, but its functions cannot be explained by analysing hardware; it is simply a quite different level of complexity. Thus, the emergence principle stresses that with an increased level of complexity, the concepts of synergy and holism still are applicable; however, the whole is then not only greater, but qualitatively different and irreducible to its parts. In this sense we are saying that *the emergence principle expresses the essence of complexity* and means much more than synergy or holism.

It is also a fundamental intellectual challenge, because through all industrial civilization era the legacy of reductionism persisted in our thinking and much what was written in the second half of 20th century needs to be critically evaluated or even revised precisely from the perspective of the emergence principle.

The third fundamental principle is related to an evident trend in web communications and in recording our intellectual heritage: to include more multimedia messages and records. An understanding of the full significance of this trend is related to the rational theory of powerful but fallible intuition (Wierzbicki and Nakamori 2006). This theory explains why visual and generally preverbal information is much more powerful than verbal: images require at least ten thousand times more processing capability, human mind has such capability but it is suppressed to subconscious by verbal reasoning and, for the lack of words to describe it, is called intuition. The multimedia principle combines these arguments:

Multimedia principle:

words are just an approximate code to describe much more complex reality, visual and generally preverbal information is much more powerful and relates to intuitive knowledge and reasoning; future records of the intellectual heritage of humanity will have multimedia character, thus stimulating creativity.

This is perhaps even more fundamental conceptual change than the emergence principle, since almost all philosophy of 20th century attached a great role

to words, concentrated on communication to that extent that it tried to reduce humanity to discourse. This is also a great intellectual challenge: we must learn to speak about intuition (contrary to classical advice of Wittgenstein), that is, we must devise new concepts that will enable us to analyze intuitive aspects of knowledge and knowledge creation.

The multimedia principle is perhaps even more important than the emergence principle, also more important than other trends such as digital intelligence (which was originally understood only in verbal sense) and implies that we should use as much multimedia content as possible in order to stronger stimulate creativity. This will have impacts comparable or exceeding the development of printing technology, thus becoming the essence of the new civilization age.

Based on these three fundamental principles, we can give now a detailed description of an epistemological position that might be called **constructive evolutionary objectivism**, closer in fact to the current episteme of technology than to that of hard sciences:

- (1) *People are not alone in the world*; beside other people, there exists other parts of *reality* or of *nature*, although part of this reality has been converted by people to form human-made, mostly technological systems. There are parts of reality that are local and multiple, there are parts that are (more or less) universal.
- (2) People developed both language to communicate with others, and tools to convert various aspects of nature according to their needs; humanity can be defined only when taking into account both these basic human faculties.
- (3) According to the *multimedia principle*, language is a simplified code used for describing much more complex reality, while human senses (starting with vision) enable people to perceive much more complex aspects of reality. This more comprehensive perception of reality is the basis of human intuition; for example, tool making was always based on intuition and a more comprehensive perception of reality than just language.
- (4) People have an innate curiosity about other people and nature, thus they *construct hypotheses* about reality, while *creating a structure and diverse models* of the world. Until now, all such hypotheses turned out to be approximations only; but we learn evolutionary about their validity following the

falsification principle. Since we perceive the reality as more and more complex, thus devise concepts on higher and higher levels of complexity according to the *emergence principle*, we shall probably always work with approximate hypotheses.

- (5) *The origins of culture are both linguistic*, such as stories, myths, symbols, *and technical*, such as tools and devices used for improving human life. Both these aspects helped in a slow development of *science* – by testing, abstracting and accumulating human experiences with nature and other people, testing and refining corresponding models and theories. This development is evolutionary and, as in any punctuated evolution, includes revolutionary periods.
- (6) The accumulation of human experiences and culture, of *meaning of the world*, results in and is preserved as the *intellectual heritage of humanity* (or the *third world* of Popper) with its *emotive, intuitive and rational*² parts, existing independently from human mind in libraries and other depositories of knowledge.
- (7) Human thought is imaginative, has also emotive, intuitive and rational components and develops out of perception, sensory experiences, social interaction, tool making, and the interaction with the intellectual heritage of humanity, including interpretive hermeneutic processes.
- (8) Objectivity is a higher value that helps us to interpret the intellectual heritage of humanity, select its components that more closely and truthfully correspond to reality, or are more useful either when constructing new tools or when analysing social behaviour of people.
- (9) A prescriptive interpretation of objectivity is the *falsification principle*; when faced cognitively with increasing complexity, we apply the *emergence principle*; the sources of our cognitive power are related to the *multimedia principle*.
- (10) While above general principles are equally applicable to hard and natural sciences, social

² *Emotive heritage* consists of explicit part such as *products of arts* (music, paintings, literature, movies) as well as of tacit part: *collective unconsciousness, archetypes, myths and instincts of humanity*. *Intuitive heritage* contains, e.g., *a priori synthetic judgments* of Kant, not necessarily true but nonetheless very powerful in stimulating scientific creativity. *Rational heritage* contains all recorded experience and results of rational thinking of humanity - non-fiction, sciences in their broadest sense. See (Wierzbicki and Nakamori 2006).

sciences with humanities, and technology, they might be differently interpreted by them: hard and natural sciences search for theories that are universal, calling the *laws of nature*, and are thus influenced by *paradigms, exemplars* of such theories; social sciences and humanities concentrate on local and multiple aspects of reality, thus follow multiple paradigms; technology is most pragmatic, motivated by the joy of creating technical artefacts, and is following in its everyday practice more the principle of falsification than paradigms.

We are aware that the contemporary differences between the episteme of the three cultural spheres of social sciences and humanities, of hard and natural sciences, and of technology are very great, thus the acceptance of the principles listed above might take a long time. For example, modern history valued objectivity, believed that we shall report history following Herodotus principles or *wie es eigentlich gewesen war* (as it actually happened). However, post-modern philosophy attacked that belief and promoted the slogan *winners write the history*. We believe, on the other hand, that this slogan is ethically wrong: we cannot permit that our intellectual heritage is polluted; our descendants should know the history written possibly most objectively. In general, we must take care to preserve and protect the intellectual heritage of humanity against possible pollution (which might be an outcome, e.g., of a rash privatization of knowledge).

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Decision-making in the Real World... (con't)

reform, America's recent war on Iraq, and so on. Times and again, costly mistakes are less due to lack of goodwill, commitment, resources or operational skills, but because of problematic, hidden and unquestioned assumptions. Such assumptions can take many forms: industry recipe, dominant design, institutional logic, ideology, routine, group-think, 'normal science', 'best practice', just to name a few.

It is thus imperative for managers, policy-makers and researchers to ask ourselves: (1) based on which assumptions and adopting what models are we doing our projects and research, (2) how are our assumptions and models related with the 'real world', (3) how do our assumptions influence our decisions, (4) how realistic and effective are our decisions, suggestions and policies?

Social, organization and management theorists have explored diverse, even conflicting, assumptions upon many issues that surround and shape decisions. For example:

Rationality. Some assume that people make decisions rationally and that irrationality can and should be overcome if proper information, incentives and decision tools are available. Others suggested that our decisions and actions are intendedly rational but inherently bounded, selective, contextual and adaptive, due to limited cognitive capabilities and biases, as well as vested interests.

Preference. Some assumes that actors' preferences are clear, stable, consistent and consciously followed in decision making. If this does not happen, then it is a problem to be sorted out. Others argue that in reality decision makers' preferences are usually ambiguous, fuzzy, ill-defined, inconsistent, changed over time. And when making decisions, time and again, actors ignore or suppress their preferences for purpose. They see this as the real pattern in which decisions are actually made. If you demand that these 'problems' are sorted out beforehand and/or in the process, you can never make decisions.

Information. Some assume that, in principle, information is fact-based, neutral, equal and available to everyone, that more efforts and better tools will supply more and better information, and that you should collect all necessary information before making decisions, let alone taking actions.

Others found that information is inherently incomplete, subjective, asymmetrically distributed and costly to acquire due to real world complexity and uncertainty, human cognitive limitation, different organizational positions, diverse educational backgrounds and working experiences.

Communication. Some assume that the gap between decisions and actual outcomes is due to misunderstanding in communication, and that misunderstanding can be cleared by better communication technologies and multiple channels. Others think that human communication is inherently unfinished, uncompleted, non-determined and reciprocal. A decision or policy is merely a gesture calling for responses, which is picked up, interpreted and acted upon by different actors differently due to different local situations. In this later view, we should expect many surprises in policy consequences and should exploit differences and diversity for novelty and innovation.

Human nature. From the very ancient time, in the West as well as in the East, human nature has been considered inherently good, bad, both of good and bad, not good nor bad, and so on. This has raised interesting issues and debates: the Hobbesian jungle, the tragedy of commons, the free-riding problem, opportunism, and so on. It also raises practical questions: in making decisions, in conducting business transactions, in search for common goodness, in governing organization and society, shall we rely on the character of the 'good guys' or on socially devised institutions, what kind of institutions?

Human interest. Are human beings and decision makers fundamentally economic man, social man, or political man? Neo-classical economics is said to be based on the assumption of the economic man, Confucius is outstanding for his teaching of the social man, and Aristotle famously suggested that man is a political animal. Some take a broader view. For example, Habermas presents that as humans we have three differentiated 'cognitive interests': technical, practical and emancipative, and that ideal organizations and societies are those that function to nurture all three human interests rather than allow one to dominate or 'colonise' the other.

Environment-events. Can we, in principle, comprehend the world, plan for the future and control our action? Some believe the world being sufficiently orderly, stable and more or less

manageable. Others, for example Taoism and the 'new complexity sciences', contend that the world is largely uncertain, chaotic, emerging, self-organising and hence difficult to fit into prescriptive models or sophisticated plans. There are debates upon whether the social world is objectively given, subjectively enacted or intersubjectively negotiated, upon whether 'embedded' actors really have decisions to make, have choices to make, have alternatives to select from. Some further consider that management decision counts little because, like species in Nature, organizations and policies are disciplined and selected by 'the market'.

The above is just a taste of the diverse and usually conflicting assumptions around decision making. There are many more. Based on and around these assumptions, researchers reveal a wide range of decision making patterns and propose many decision making models and tools. For example:

Rational: systems/social engineering, strategic planning, decision tree, simulations, road maps, formal methodologies, strategic choice, structural contingency model ...

Natural: muddling-through, logical-incrementalism, emergent strategizing, garbage-can decision-making ...

Political: power game, language game, agency theory, resource-dependence, decoupling efforts ...

Institutional: 'iron-cage – coercive, imitative, normative isomorphism', path-dependence, lock-in effect, competence trap, lid on the garbage-can ...

Fatalist-pessimistic: organizational ecology, 'Decisions do not matter' ...

Interactive: gesture-responses, evolutionary game, strategic ambiguity, 'Good managers do not make policy decisions' ...

The list can go on and on. Given this diversity and complexity in underlying assumptions and decision models, the questions to managers and researchers are: where do we stand, what kind of assumptions do we feel comfortable, how to make assumptions transparent, how to justify our assumptions, how to share our assumptions with others? Perhaps, at the first instance, we need to ask ourselves whether we realise that we indeed make decisions and take actions based on

assumptions of a certain sort. Humans have tried many efforts to tackle hidden assumptions. For example, in the East, we have the Chuang-tzu Taoist 'forgetting' and the Zen Buddhist 'enlightening'; in the West, we have methods like 'strategic assumption surfacing and testing' and 'soft systems methodology'.

Another question is what to do with the diverse assumptions and models. Some warm hearts prefer an ideal world. They consider the 'dark side' in assumptions and models of the political and institutional sort as too negative and pessimistic. If we emphasis too much on the 'dark side' and the 'negative aspects', they will become self-fulfilling prophecies. For example, if everyone adopts the 'political man' assumption, then each of us comes to the office in the morning calculating how to mobilize and manipulate colleagues in order to exploit emergencies for personal interests, the organization and society will become a very ugly and stressful place to live in. These warm hearted people – they can be managers and researchers – propose subsequently that good leadership is to transform human stupidity and errors, nurture trust and care, shape positive behavior, via means of good organizational cultures, etc. Others dismiss such an attitude as too romantic. After all, we are living in a real world and therefore should be realistic in decisions and actions. We may not like the 'dark side' and the 'negative aspects', but they are always here to stay with us, they will not disappear simply because we do not model them in, there are limits of what we can do with them, and we have to face them when making immediate decisions. Some take a positive view of the 'dark side' and 'negative aspects', suggesting that effective leadership is not to assume the 'dark side' and 'negative aspects' away but to exploit them so as to get things done, to achieve unique competitiveness. They call this 'technology' and 'intelligence' of 'foolishness'.

Perhaps, I suppose, a more promising and more realistic approach lies in idealist pragmatism, which is close to what Professor Nonaka, the Founding Dean of the Knowledge School, recently calls 'distributed phronesis'.

Pragmatism can be understood as a theory of knowledge and a methodology for action. It is an inherent intellectual and cultural sensibility in the Confucian tradition which is shared by, among many others, the Chinese and the Japanese, as well as in indigenous American thought. It had been caricatured by some for a very long time as

anything-goes, as being distasteful of any theory, as an instrumental kind of thinking, distinctively non-intellectual, altogether uninformed and unrefined. However, a genuine pragmatic sensibility is to me featured by a refusal to entertain ideas and actions as disjunctively related, a rejection to ‘the spectator theory of knowledge’, a commitment to endows experience with learning rather than seeking ‘truth’, a willingness to take action without knowing how things might unfold in the future, a readiness to embrace uncertainty and surprises, an eagerness to capitalise on the unanticipated and unexpected, a conviction that validity of knowledge should be sought based on the consequences of acting upon it, an enjoyment in conversation with situated agents about possibilities for change, a proposition viewing temporal conversations in a community, not any extra-historical Archimedean point, as our only sources of guidance for action, and a belief that participative consensus, if ever achievable, are often achieved at the aesthetic and cultural levels rather than with regard to the claims of Reason.

Pragmatism has significant practical implications for decision making practice and research. To practice, pragmatism means sensitivity to contexts, willingness to take action, focus on consequences, and openness to uncertainty, comfortable with paradoxes, skilful in ambiguity, keen on flexibility, good in language games, caring for common goodness, playing with emerging possibilities and using available resources to find workable solutions. What differentiate good decisions from bad ones are situated sensitivity, inspiring envisioning, timely political judgements and social

skills that are appreciated and shared by the community.

To research, pragmatism does not promise integration, synthesis or transcendence of diverse and conflicting assumptions and models because it recognises that while each and every assumption/model is partial and limited, each and every one is unique and therefore cannot be subsumed or reduced into one or the other. Pragmatism hence values different assumptions and conflicting models because, properly connected and juxtaposed, skilfully compared and appreciated, differences, diversity and contradictions provide us with richer perspectives, deeper insights and fuller understandings of the world, of ourselves and of our decisions.

To pragmatism, good science is good conversation, not talking to ourselves but carefully listening to the other. We need critical spirit and engaging conversations in our communities, not pretended agreements or trained indifference. We need intellectual division of labour and focuses in research, but, to phrase it in economics jargons, specialisation is good only when accompanied by subsequent trade – looking into and buying in what other theories/models produce and offer. In the end, it is difference, diversity, pluralism, tolerance and dialogue that make our assumptions transparent, make ‘group think’ and ‘trained incompetence’ less likely, and hence are good for knowledge creation and innovation, as well as for decision-making in the real world.

Guest Column:

Cooperation between the School of Knowledge Science of JAIST and the Department of Innovation and Technology Management, Kassel University, Germany

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Introduction

According to post-modern philosophy communication is a necessary precondition for being in a social environment. “Indeed I cannot exist in everyday life without continually interacting and communicating with others” (Berger/ Luckmann 1967, p. 23). This is nothing new for a scientific environment since science has been always based on communication and sharing ideas.

Such a process of interaction evolved between the School of Knowledge Science of JAIST and Kassel University, Department of Innovation and

Technology Management (iTM) after getting to know each other at the IFSR Conference in Kobe in November 2005. Now, the first exchange of ideas took place with enjoying high attention in a joint meeting at JAIST in September 2006. All expectations were exceeded. A next meeting is planned to take place at Kassel in January 2007. The exchange between JAIST and iTM started with the issues of the emergence of knowledge management and the cultural influences on knowledge management. Meanwhile, the topic has been extended to the research on the issues of "Gender, Women, Couples, and Careers" as well as "Aging Society". But a set of research topics is still evolving. The scope of our cooperation is set by the domain of both partners: the consideration of knowledge, innovation and technology from a holistic perspective.

The mission and objective of the Department of Innovation and Technology Management

The department of Innovation and Technology Management is led by Mrs. Prof. Dr. habil. Marion Weissenberger-Eibl. The primary objective of the department is education and research on the intersection of economics and technology. This implies an interdisciplinary character of the department considering technical, ecological, political-social and ethical-cultural aspects.

Our research focuses on innovation management, maintaining and improving products, services, technologies, processes, structures, strategies and social systems. In the sense of a comprehensive management interpretation, our purpose is to identify and analyze the strategic, organizational and methodological questions. Following this, we also aim to enhance the cognition and scientific derivation of organizational design and activity recommendation for industry and service enterprises.

Our educational task is to provide students with a well-founded scientific education, which also includes the challenges of real business. Hereby we use innovative concepts and methods to encourage scientifically and critically thinking as well as responsibly working and acting.

The point of the future development of iTM

The key objective of the activities of the iTM department is to answer the following questions:

- ◆ How future business between technology and economy will look like?

- ◆ How this question can be answered in the general case?

To answer these questions, many different endeavours covering a broad range of research activities are involved. But the main focus of the interest is forecasting technologies as well as management of knowledge concerning this issue.

Especially, knowledge management is challenged by the complex character of this endeavour, since relevant knowledge and information about the future is distributed over a very large area. Bringing a huge quantity and complexity of knowledge from different people, companies, countries, cultures, systems and media together requires a sophisticated approach. For establishing successful knowledge transfer within a certain scenario, all influencing factors have to be considered. Thus the department maintains an interdisciplinary and integrative character and employs sociologists, computer scientists, economists, business economists, engineers as well as political scientists. The developed scientific concepts and research results are also taken to a real company context.

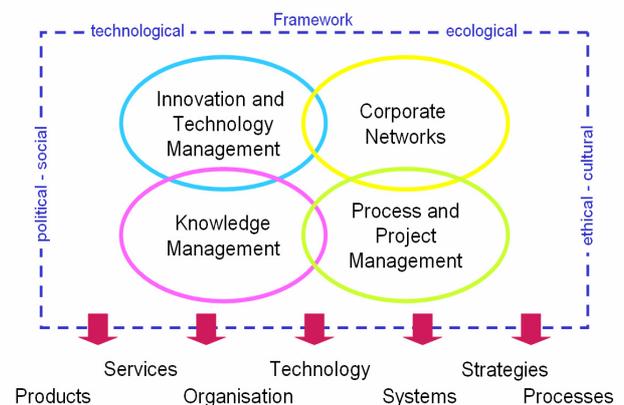


Fig.1 Research activities of the department of iTM

Research project (in preparation): knowledge transfer via internet

Information Society becomes a frequently used metaphor over the past decade. It draws the image of a society, in which knowledge and information are the most important resources. In contrast to tangible assets, these intangible assets require a different treatment, which is also indicated by the proverb "knowledge is the only resource that grows with use and share". Over the past years information and communication technology has produced a special impact on the exchange of information and knowledge by boosting the global communication as well as enabling fast, world

wide and knowledge-based cooperation. National and international information and knowledge networks have emerged.

With the continuous growing of the amount of electronically available information, nearly every “knowledge worker” (Nonaka and Takeuchi, 1995; Drucker 1960) faces the problem of finding the desired information. Within some organizations, search-time becomes a significant share of the daily office hours. Davenport and Prusak (2000) point out: “volume may be the friend of data management, but it is the enemy of knowledge management – simply because humans have to shift through the volume to find the desired knowledge” (Davenport and Prusak, 2000). The objective of this proposal is to reveal the interdependencies between information and knowledge. The right understanding of this question would enable knowledge to automatically elicit knowledge from information streams.

According to the underlying concept the user can not search for information, but information tries to reach the user. This information – formed as agents – could interact and exchange content to increase its “value”. They are “rewarded” by the user. In consequence a market for the agent’s information accure and the information organizes themselves by competition. The resulting principle of information management will be similar to “survival of the fittest”. The substantiality of life (connection to reality) is introduced by information containing the context via a representation of real world phenomena.

Operative goal of the project is to specify and evaluate the concept. The design and testing of information agents as well as the elicitation of boundary conditions are considered. The question “does knowledge emerge?” will be answered. The contact person of this project is Mr. Dipl.-Inf. Carsten Borchers (carsten.borchers@uni-kassel.de)

Research project: Gender, Women, Couples, and Careers

Our main objective of the research project in the field of gender, women, couples, and careers is to bring more high potential females in managerial and specialist jobs. In many Western European countries young women and men are finishing grammar school and further schools in equal proportions. That applies today also to the numbers of female and male students at universities and even applies for the first high qualified jobs. But an increasing gendered differentiation can be observed when high potentials “climb the career ladder”. This differentiation looks like the decreasing proportions of women. We think that the traditional male career model doesn’t fit with the expectations of females on their career and with their duties to their families. Our research projects try to find out different kinds of models to bridge this gap. One opportunity is to develop a promotion model that includes schooling programs at universities and personal development methods of enterprises. This will help to fit the imparted skills by university schooling programs with the requirements of managerial and specialist tasks. In that way, we will break the glass ceiling for women in today’s enterprises to get more high qualified females into the positions of managers, chief executive officers or to the board of directors. We will also develop different kinds of career models that fit women business and family interests. The contact person of this project is Mrs. Dipl.-Soz. Selma Kölbl (selma.koelbl@wirtschaft.uni-kassel.de)

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The Bird's Eye Report of the International Conference KSS2006

As the world declared entering into an era of knowledge economy, the significance of developing knowledge has grown to a level where it is coming to dominate other socio-economic factors. The recent developments challenge many of institutions to understand the nature of knowledge and its role in applications, to effectively utilize the knowledge for improving the corporate competitive advantage and national comprehensive power, as well as establishing development of knowledge sciences. The First International Symposium on Knowledge and System Sciences was held in Ishikawa, Japan in 2000 to start some endeavors of confluence of different ideas and opinions, methods and technologies, schools and disciplines, theorists and practitioners, which arm to develop knowledge science from systemic perspective and may be regarded as somewhat practice of meta-synthesis system methodologies toward complex problem solving. After 7-year work, the 7th International Symposium on Knowledge and System Sciences (KSS2006) took place in Beijing on September 22-25 to show some new achievements and prospects for continuous thinking and studying, especially to

observe the power of synthesis for knowledge creation.

During the conference, a total of 49 papers have been presented. The participants came from 12 countries and regions including Australia, Austria, Canada, Czech, Ireland, Japan, Korea, Russia, Slovenia, United Kingdom, Taiwan of China and China mainland. Those papers are roughly grouped into 9 categories, knowledge science, knowledge creation and support systems, knowledge systems engineering, data mining and text mining, complex system modeling and analysis, knowledge management, knowledge management practice, complex networks and complexity research, system thinking and methodologies, which cover the highlight topics of theory and practice of knowledge and systems sciences, and reflect the continual thinking and understanding about the scope of knowledge science.

At the end of the gathering, the audience has greatly accepted the generous offer from JAIST to organize the next International Symposium on Knowledge and System Science scheduled for 2007.

Faces in the conference



Prof. *Jifa Gu*



Prof. *Yoshiteru Nakamori*



Prof. *Andrzej P. Wierzbicki*



Prof. *Zhichang Zhu*

COE Center News

- ◆ *Dr. Totok Hari Wibowo* left the Center and came back Indonesia as of September 2006.
- ◆ *Dr. Jing Tian* joined the Center as postdoctoral researcher as of Oct 1, 2006.
- ◆ *Mr. Hiroyuki Asano* joined the Center as researcher as of Oct 1, 2006.
- ◆ *Dr. Zhichang Zhu* from the University of Hull Business School (UK) was a research professor at the COE Center from Oct. 25 to Nov. 21, 2006.
- ◆ *Dr. Zbigniew Król* from the Institute of Philosophy and Sociology of the Polish Academy of Sciences was a visiting researcher at the COE Center from Nov. 7 to Nov. 28, 2006.
- ◆ JAIST Forum on Knowledge Creation and Social Innovation was held in JAIST, Ishikawa, Nov.10 - 11, 2006, with the following program:

Akio Makishima (Vice President, JAIST): *Opening Address*

Yoshiteru Nakamori (JAIST): *A Brief Introduction to the School of Knowledge Science and a COE Program*

Andrzej P. Wierzbicki (JAIST): *Knowledge Sciences and Nanatsudaki Model of Knowledge Creation Processes*

Robert Kneller (The University of Tokyo): *Knowledge Creation and Application in a Local Context: Creation of New Components and Increased Cooperation with Local Industry.*

Nico Stehr (Zeppelin University): *Worlds of Knowledge and Democracy: Is Civil Society a Daughter of Knowledge?*

Michael C. Jackson (The Business School at Hull): *Reflection on Knowledge Management from a Critical Systems Perspective*

Ikujiro Nonaka (Hitotsubashi University): *The Strategy of a Knowledge-Creating Company: Management by Distributed Phronesis*

These lectures were followed by a day of discussions of detailed projects of the COE Program. We will publish the main content of these lectures in the next issue of COE News.

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