Methodological Pluralism in Business and Information Systems Engineering?

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1 Introduction

For some time now, the Business and Information Systems Engineering (BISE) research community in the German-speaking countries has continuously been concerned with the development of the field as scientific discipline. This may be attributed to several reasons. First, it is a natural and necessary process for a scientific community to self-critically reflect its own discipline from time to time, especially after growth phases of a young science or after changes in the objects of research caused by technological innovations. Another reason is the necessity of internationalization, which among others led to a discussion of methods regarding behaviorist oriented and design science oriented research approaches in BISE (Österle et al. 2010). Following this, concerns have been expressed that design-oriented approaches commonly used in German-speaking countries will yield to more behavioral approaches in the future due to the pressure to publish internationally, which would not only lead to a loss of identity of German BISE but also to a reduction of the methodological pluralism harmful to the relevance of the discipline. Furthermore, a discussion has recently begun in the community on which future contents and topics the focus will be laid. Issue 1/2014 of this journal will deal with "Research Areas in Business and Information Systems Engineering".[1] In a wide-ranging survey Peter Mertens identifies the "Grand Challenges" of BISE. In referring to initiatives in other scientific disciplines, a "Grand Challenge" is understood as a fundamental challenge and task whose solution shows significant social or economic progress, and which should be possibly applied in middle or long terms (Mertens and Barbian 2013). Finally, resulting from the ever increasing dissemination of IT in many economic and social areas, the need arises for a new relation to our reference disciplines. Computer science increasingly opens itself towards more applied research questions, in economics and management IT-based methods are considered original methods of their own field, e.g., in the fields of marketing and controlling.

For our community, which is under the obligation to position BISE as an independent and powerful research discipline compared to other research areas, the question arises on its current position in regard to the development and systematization of knowledge, research methods and aims, the evaluation of results, and consensus on controversial research artifacts. Against this background, during the conference "Wirtschaftsinformatik 2013" in Leipzig, a panel organized by Robert Winter discussed the issue of methodological pluralism in BISE, which has been the inspiration for the present discussion.[2] The invited scientists are to discuss various aspects of the pluralism of methods including the following questions:

- Does BISE need an identity of its own including a broad consensus on the methodological and theoretical orientation of the discipline to effectively develop scientific results, or does identity diffusion promote knowledge through competitive processes?
- Should procedures and instruments be developed for systemizing scientific knowledge within a knowledge base in our discipline? For example, "Medical Subject Headings" (MeSH) are used in medical research to classify and systematize research results.
- How important is a common research agenda for our discipline? Is it necessary to develop a common understanding of subjects and fields of actions in BISE, or would this be too restrictive towards an open and individualized research?
- The prevailing pluralism in regard to methods and procedures can lead to research results which are more difficult to compare, and that researchers need to justify themselves with respect to knowledge and research methods. Should we, therefore, institutionalize consensus and establish mechanisms in BISE, as is common, for example, in Medicine (National Institutes of Health 2013)? Or should we refrain from this to consciously promote the diversity of opinions and pluralism?

The following researchers have agreed to participate in the discussion (in alphabetical order):

- Prof. Dr. Ulrich Frank, University of Duisburg-Essen
- Dr. Matthias Goeken, Frankfurt School of Finance & Management
- Prof. Dr. Tobias Mettler and Prof. Dr. Robert Winter, University of St. Gallen
- Prof. Dr. Alfred Winter, University of Leipzig

In their contribution, Mettler and Winter demand that BISE should learn from

[1] Cf. http://www.bise-journal.com/?p=36.
[2] Cf. http://www.wi2013.de/.

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more established disciplines in order to increase the awareness for our discipline and to improve its standing when competing for funds with other disciplines. With respect to a joint research agenda, they see advantages despite the possible hazard of dogmatism. They particularly expect positive effects on the awareness for BISE. For a common system of conceptions and mechanisms for knowledge transfer and consensus they expect a positive impact on practice transfer of research results and the competitiveness of BISE.

Goeken explains the interaction between different research approaches in medicine that demonstrate both causal and statistical evidence and states that this interaction has been less applied in BISE so far. He therefore calls for an integration of different approaches. He wants more mutual development in order to get a better systematization of knowledge. In doing so, consensus could be achieved despite the diversity of methods, which may ultimately lead to a strengthening of our identity.

Frank sees the need to develop a common terminology within our research discipline as linguistic reference systems so far are available only rudimentarily and for restricted domains. Due to the considerable expense of such terminology development this should be accomplished as a joint research effort by combining resources. However, the development of the terminology should not be dogmatic. Furthermore, he advises caution in the adoption of the formula for success in other disciplines.

Alfred Winter discusses the issues from the perspective and with the experience of medical computer science. Criteria to create identity in this discipline arise from its aims and from ethics, but not from a canon of methods. In analogy, BISE could possibly derive these criteria from the application domain. He also sees the need for a common nomenclature in BISE. An institutionalization and a common research agenda is seen more positively by him.

If you would like to comment on this issue – or on any other article in BISE journal – please send your comments (2 pages maximum) to loos@iwi.uni-sb.de.

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2 Learning from Mature Disciplines as One Possible Starting Point to Sharpen the Visibility of Business and Information Systems Engineering

2.1 Introduction

In the last years the Business and Information Systems Engineering (BISE) community has dealt with the question if their epistemological foundations, which are based on a methodological pluralism rooted in real, formal, and engineering sciences, can match up with the seemingly homogeneous behavioral Information Systems Research (bISR) community and what consequences a harmonization respectively an adoption of the theoretic knowledge base and methods could imply for young BISE academics (Bernstein et al. 2011). In the international context of Information Systems research (ISR), the behavioral paradigm seems to be quite successful whereas in the United States the importance of bISR compared to other disciplines is rather moderate. At the same time engineering sciences, especially in many European countries, have a high – also political – visibility and a considerably high share in research funding.

Against the background of the growing competition with other research disciplines (especially computer sciences or classical social sciences) for visibility in society and for research funding, the question arises whether the BISE community is really less advanced regarding the development and systematization of knowledge as compared to other disciplines so that it is justified to classify it as "pre-paradigmatic" (Kuhn 1996; Simonton 2006).

According to various philosophers of science, the maturity of a discipline is characterized by (1) a common understanding with regard to the main research areas, (2) an existing nomenclature (see Chalmers 1990; Lakatos 1978), and (3) specific (consensus building) mechanisms for transferring knowledge, respectively for making the theoretical knowledge manageable for the real world (see Stokes 1997).

2.2 Does the BISE Community Need a Common Research Agenda?

In disciplines like medicine or physics a common research agenda is a widespread phenomenon. Joint research strategies are defined for the entire discipline (e.g., Innovative Medicines Initiatives 2013; Niels-Bohr-Institut 2013) as well as for single research areas (e.g., Jagsi et al. 2012; Siskin et al. 2011). Also in the ISR community analogous considerations related to a joint research agenda were made in the past. However, the idea was not consequently pursued (Bacon and Fitzgerald 2001).

Although it is certainly legitimate to criticize the fact that by creating a common research agenda a certain dogmatics is introduced, we think that considerable advantages may result from such a collective approach. Provided that the right (socially relevant) topics are anchored in this common agenda, the impact of ISR could be significantly enhanced. By creating specific programs and career options, the attractiveness for young researchers may additionally increase. One excellent example for the benefits of such a common research agenda is the European Organization for Nuclear Research (CERN) which is not only able to continuously disseminate outstanding research results but also has gained an exceptional reputation in society.

2.3 Does the BISE Community Need a Common Nomenclature?

Mature disciplines are characterized not only by a collective self-conception, but also by processes and tools to systematize their knowledge base. For example, in medicine there is the so-called Unified Medical Language System (UMLS). UMLS is a meta-thesaurus to map the biomedical nomenclature consisting of various domain-specific vocabularies (e.g., SNOMED, MeSH, ICD). The distinct single vocabularies are used in different contexts. Researchers use MeSH (Medical Subject Headings) to classify their work in order to support other researchers in conducting literature reviews and meta-analyses – one further tool to both systematize and develop knowledge (US National Library of Medicine 2013). Similarly in biology and biomedical sciences the use of ontologies has been well established to classify findings and to formalize the knowledge base (National Center for Biomedical Ontology 2013).

In this regard there are first approaches in BISE which, however, only address limited domains or specific artifact types (e.g., European Research Center for Information Systems 2013; Fettke and Loos

2002; Goeken and Patas 2010; Gonzalez Vazquez 2012). Again, the question arises whether a unilaterist approach is constructive or – as mentioned above – a joint development (which is anchored in a common research agenda) is more likely to be successful. Last but not least a widely accepted nomenclature would not only facilitate (cumulative) research within the discipline, but also promote a simpler transfer into practice and to groups outside the IS community (e.g., researchers of other areas, funding bodies, students).

2.4 Does the BISE Community Need Extended Mechanisms for Knowledge Transfer and Consensus Building?

In addition to a common research agenda and nomenclature, mature disciplines *directly* address the transfer of theoretical and empirical findings into practice. Depending on the discipline this can take on different forms. For example the American Psychological Association (APA Practice Organization 2013) offers its members various possibilities for continuous education. The proof of advanced training after the initial degree is mandatory in the United States, e.g., as requirement of a psychologist's professionalism.

In medicine so-called consensus conferences are organized in order to develop general guidelines for clinical practice (see National Institutes of Health 2013; Sabir et al. 2006). Hereby, controversially discussed research findings are harmonized. The guidelines developed have become a fundamental cornerstone for practice, for instance, in the treatment of certain diseases or the performance of certain surgeries (see Clavien et al. 2012). Similarly, consensus building processes and methods are applied for the future direction of the common research strategy (SIR Foundation 2013).

To our view, the knowledge transfer into the disciplinary practice is approached with little enthusiasm in the ISR community. Instead of a broad consensus regarding the knowledge base and methods as well as the treatment of practice-oriented questions, there are different "schools of thought" in the BISE and bISR communities, respectively (and even within these communities). These differ not only in terms of research methodology, but also regarding terminology and objectives and categorically disapprove of each other. As a consequence, in research evaluations the scientific outcome provided by ISR is often regarded as being inferior to the propagated results of other disciplines. Hence, only relatively few major ISR research proposals are successful on the competitive "arena of research funding". Considering the growing competition for the funding of research projects and the increasing political and social demand for contributing to the solution of societal issues, the ISR community should be more focused on making an effort to increase the visibility of their research, both in society and practice, rather than being concerned with an internal epistemological dispute.

2.5 Conclusion

By publishing a community journal for more than 50 years, by addressing the entire research community in frequent large scale conferences, by having a high level of organization (about 95 % of the German-speaking IS university professors are engaged in the WKWI) and by increasing the visibility of ISR on a European and global level (conferences ECIS, ICIS), important preconditions are met regarding the visibility and competitiveness of BISE. Instead of an aggressive (internal) competition between research centers and "schools of thought", the BISE community should rather focus on developing common research agendas, consensus building processes, a common nomenclature and an enhanced consideration of socially relevant topics (e.g., aging population, job preservation/innovation, skills shortage, permanent education) in order to leverage its potential and to promote its achievements outside the field. From our point of view, medicine – rather than business research and social sciences – seems to be a suitable role model for BISE.

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3 Learning and Adapting Methods from Evidence-Based Medicine

Each of the four themes that were proposed to discuss the topic "Methodological Pluralism in Business and Information Systems Engineering" seems to express an antagonism:

I. Own identity or diffusion of identity?
II. Systematization and institutionalization of the research discipline or intentional "laissez-faire"?
III. Joint development and evolution of the discipline or individualistic research?
IV. Consensus or deliberate diversity of opinion?

However, one can discuss whether these contradictions should be interpreted as mutually exclusive alternatives or if the perceived antagonisms create the tensions that might bring forward a discipline. Due to the fact that Business and Information Systems Engineering (BISE) cannot be seen as a uni-paradigmatic discipline (Krcmar 2009), I adhere to the second interpretation. But since I do not expect, e.g., identity and consensus to arise by themselves, it is necessary to apply sensible (research) methods to deal with the tension.

With research methods, another aspect comes into play: In addition to the four themes it was asked as to whether methodological pluralism might contribute to sharpening the knowledge base and the set of methods of BISE, and, furthermore, if BISE could learn from medical research in this respect. I assume that it is not promising to simply copy successful approaches from other disciplines, e.g., from "Evidence-based Medicine". However, what might be promising is to learn from its history, its philosophical origins, its paradigmatic orientation, and the resulting research methods (Baskerville 2009; Baskerville and Myers 2009; Goeken 2011).

According to some scholars, traditionally medicine has been considered an art rather than a science, but, interestingly enough, the discipline has successfully accomplished the transformation from art to science (Hiatt and Goldman 1994). What made the difference was among other things the way in which the evidence of therapies and procedures was more rigorously reviewed and rated. In this context, also the way of coping with pluralisms in research methods seems of interest to our discipline. This will be shortly outlined in the following.

(1) In the 'design-oriented' medical research stream, there is the development of, for example, new drugs or surgical procedures. This requires profound knowledge about anatomy, biochemistry, or pathophysiology. (2) Empirical research in turn is used in the evaluation

of these drugs and procedures. This requires knowledge of study design and the application of statistical methods, for example in so-called randomized controlled trials. (3) Finally, if there are several trials on a topic, the findings are compared, rated, and maybe integrated. For this purpose, research in this third stream performs systematic reviews and meta-analyses, which are the domain of statisticians and epidemiologists.

It is worth noting that each of these research streams requires different methodological knowledge and methods, and generates different types of evidence. Whereas the first stream mainly deals with "veridical evidence" (evidence based on causality, explanatory connections, or functional explanations), the streams (2) and (3) base the evidence on probability ("potential evidence") (see Achinstein 2010). However, the different streams complement each other and work together towards the common goal of figuring out "what works". In addition, it is thus possible to structure the body of knowledge and to consolidate results into medical guidelines. This also promotes the translation of research findings into practice. Furthermore, within science, systematic reviews and meta-analysis are utilized to detect where research is missing and to define research agendas.

What is missing in IS and BISE is a similar complementary interplay of the various streams: Design-oriented researchers develop a plethora of innovative artifacts, e.g., modeling methods or methods for systems development. But, even though the importance of a sound evaluation of a proposed artifact is known, far too often the evaluation falls short (Peffers et al. 2007), and, in addition, comparative evaluations of how well different methods work are rare. As a result, there is frequently no robust evidence on the methods' efficacy or advantageousness. Therefore it remains difficult to decide which one of a class of methods is most effective and efficient in real life, both in general and depending on a particular context. Furthermore, there is a lack of cumulative research and a lack of systematic reviews, even though IS scholars believe that there is much knowledge to be gained from collating existing research (Webster and Watson 2002; Markus and Saunders 2007).

I assume that it might be sensible to work towards the integration of the different streams. This could yield an improvement in the translation of scientific findings into practice and could help with defining and refining research agendas. Furthermore, it might reconcile the competing paradigms of empirical/behavioral science and design science in IS by structuring their interplay, pointing out their respective contribution, and, in doing so, emphasizing the complementary roles of both and the "integration of the competing approaches" (Fitzgerald and Howcroft 1998) instead of deepening the dichotomy.

It is important to mention that against this background all streams are essential. In design-oriented research, without deep knowledge of causality and functional explanations (Baskerville and Pries-Heje 2010) innovation is not possible; on the other hand, the examination of what works for whom in what circumstance cannot be based on functional explanations or veridical evidence but requires evaluation, comparative analysis, and the review of existing research findings.

Returning to the four themes triggering the discussion, I argue that

- attaching greater importance to organizing the interplay of different research streams – as evidence-based medicine does –, which means an extension of the research agenda of BISE and IS, might be a step towards more joint development and the integration of individualistic research (III);
- this would result in a better systematization of the knowledge base, which would also cover the improved evaluation, rating, and accumulation of research findings (II);
- following on from that a consensus building could take place in research areas, where conformity becomes apparent within the diversity of opinions, (IV); and
- probably as a consequence of this process, a distinct and specific identity could emerge (I); this, however, would happen indirectly without a deliberate search.

What is needed overall is the development and application of research methods aimed at systematization and consensus building. Such methods exist in other disciplines – for example, in medicine – but their specific suitability needs to be further investigated.

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4 Between Canonization and Differentiation

This discussion is motivated by a certain dissatisfaction with the status of Business and Information Systems Engineering (BISE). The perception and appreciation of the discipline in society are far from satisfactory. They absolutely do not correspond to the key role of BISE in shaping future patterns of work and of life in general. This is quite surprising, since the extremely important role of IT and the innovative action systems enabled through it should be undisputable. One might be inclined to see the unsatisfactory condition of social acceptance of a scientific discipline solely as an expression of a lachrymose mood of its representatives. Such an assessment, however, would be insufficient. If one accepts the assumption that the differentiated analysis and evaluation of the potential of information and communication technologies for future social and economic developments are of outstanding importance and one assumes at the same time that the complexity of the subject matter requires dedicated scientific research, one may surely find functional reasons for the inadequacy of both the prestige and the impact of BISE. At the same time, there appears to be evidence for a realistic background with regard to the concern about the significance and status of BISE. For instance, BISE has not been represented in the structure of subjects of the DFG (Deutsche Forschungsgemeinschaft; engl. German Research Foundation) so far. Instead, one finds a considerable number of subjects that are much smaller, some of which are known as not being particularly research-intensive. Within boards of large companies, BISE graduates are apparently underrepresented – even if I am not aware of any study providing evidence for this assessment. Moreover, we must assume that the majority of outstanding high school graduates are not striving for a degree in BISE. The consequences of this limited visibility and appreciation are obvious. The discrimination of BISE by the DFG has the consequence that the promotion of fundamental work, which is of central importance for the development of a scientific discipline remains far behind that of other fields. For the social position of a discipline also graduates are required who represent their field convincingly but also clearly visibly in business practice. And finally, re-

search is mainly dependent on outstanding individuals developing new questions and ideas with high commitment and perseverance.

Against this background, the question obviously arises on what could be done to promote BISE's significance and impact. First, it is required not to just complain about in many ways unfavorable conditions in order to retain credibility. Instead, this also calls for a self-critical analysis whether focus and conception of research in our field are appropriate. The considerable variety of research topics in BISE, which has been described in numerous publications, does not contribute to a coherent profile. Moreover, such diversification is hardly appropriate to encourage highly visible research results. Do we therefore need a common research strategy? Before I turn to this question, I first consider the question of whether the observed diversity of research topics is fundamentally problematic. Science is the place in society where the idea of freedom is particularly valued and cared for. This freedom first includes the freedom to choose a research topic – rather than to defer to a predefined research agenda. At the same time, science is also committed to the progress of knowledge: freedom of choice is not to be set equal with arbitrariness, but must always be connected with the aim to develop results that are appropriate to convince responsible scholars in terms of originality and justification. This includes a sophisticated professional discourse. The prerequisite for such a discourse is a collectively elaborated and differentiated professional terminology. The terms used must be able to structure the object of focus for certain analyses in a more suitable way than the conceptual frameworks of other disciplines or the terminologies that are popular in practice. The variety of discourses which are carried out in BISE raises doubts about the fact that the conceptual systems used always fulfill the highest requirements of the respective disciplines – such as computer science, sociology, or psychology. This does not mean that the scope of the topic would not require certain specializations. However, in order to claim scientific independence and to convey its pragmatic competence to experiences practitioners, BISE requires a well-established core terminology, including among others central concepts for the analysis and design of information systems and corresponding action systems. In addition, the consideration of conceptual systems in BISE serves a specific purpose: Its central subject matter, business information systems, is a linguistic construction, i.e. it is based on concepts that enrich formal system structures with meaning. Only if we manage to develop conceptual systems which satisfy a variety of domains, an effective contribution to cross-organizational integration and reuse can be achieved.

This provides a starting point to address the above-mentioned question on the need for a common research strategy again. If BISE strives for research results attracting attention in practice, there appear to be a number of arguments for the development of linguistic reference systems, such as domain-specific (modeling) languages, conceptual reference models or reference architectures, and corresponding implementation approaches. In this way, the high scientific standards which are required when developing powerful and convincingly founded abstractions would involve considerable benefits for business practice. However, the effort necessary for the development of comprehensive reference models for selected domains exceeds the capacity even of large chairs. Impressive results can at best be expected if it is possible to combine resources and to pursue common research goals. However, I would not go so far as to demand a common research agenda since this would violate the postulate of scientific freedom. At the same time, success depends not only on the quality of the artifact, but also on the effectiveness of its transmission into business practice – this refers to the question on suitable mechanisms for knowledge transfer. Traditional publication media are hardly capable to accomplish this. Here, directories could be considered that would provide an access especially customized to the needs of potential users, as well as an early cooperation with pioneer users.

However, both the eminently reasonable efforts for the standardization of reference systems and the orientation of research on common goals lead to a conflict which basically applies to science in general but especially holds true for BISE. This is the quasi dialectical conflict between standardization and differentiation. A common language is a prerequisite for scientific progress in many ways. At the same time however, it also allows for competitive offers of scientific knowledge, which are essential for scientific progress. This competitiveness goes along with the pursuit of differentiation, realized through the development of new conceptual frameworks, and thus going contrary to unification. Business practice is faced with a similar problem. On the one hand, the positive economic effects of standards are indisputable. On the other hand, widely distributed standards often mean that outdated technologies are kept in use too long. Research has to put up with this conflict. In this regard, I see two complementary approaches. The first concerns a basic requirement for the design of scientific constructs. Terms should be selected based on possibly invariant abstractions. Here, it is particularly important that specific technical terms are highly independent from concrete technologies and associated particular usage patterns but at the same time are suitable to distinctively describe them. Second, it must also be noted that the one and only best suited system – "*the* order", as Wittgenstein calls it – hardly exists. On the one hand, this relates to the fact that the usefulness of terms also depends on the – linguistically marked – *perspectives* of the addressees. While, for example, one person highly argues in favor of a system-theoretical approach, another may not consider the associated perspective to be useful at all. On the other hand, the emergence of new phenomena may result in the required abolishment of even quite carefully designed abstractions with the possibly succeeding consequence of paradigmatic changes of conceptual frameworks. Given the diverse and complex subject of BISE, in my opinion it therefore would be reasonable to maintain a certain variety of perspectives and conceptual systems associated with them. This concerns not only competition and differentiation, but also the knowledge that is created by the "accumulation of different perspectives" (Berger and Luckmann 1966, p. 22). In addition, a system of concepts should not be maintained in a dogmatic way. Instead, we should ask ourselves from time to time if we are not trapped in webs of our own creation (Morgan 1986, p. 196), and if we were not well advised to overcome them. Even if this kind of paradigm shift may be painful, we as scientists have the freedom to change terms for allowing new insights and perspectives in contrast to most decision makers in practice.

Finally, I would like to comment on the exemplary role of established disciplines.

In my opinion, it is not questioned that it is necessary to look at structures, successes, and failures of other disciplines from time to time. That certainly and particularly applies for those disciplines having a long history. However, I think it is wrong to copy possibly appropriate recipes for success from other disciplines without conducting a thorough discussion and investigation about the characteristics of the research object, its research culture, and its historical background. Although one may find a number of parallels, e.g., to medicine, there are also significant differences.

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5 Business and Information Systems Engineering from the Medical Informatics Point of View

5.1 Introduction

Even in medical informatics questions arise regarding its identity, the systematization of its own discipline as well as of the conflicts between individual and joint research, and between consensus and diversity of opinion.

5.2 Defined Identity or Identity Diffusion

It has repeatedly been established that medical informatics actually is an independent scientific discipline (Protti et al. 1994; van Bemmel 1996; Haux 1989; Moehr 2006). This independence is associated with a clear identity which counteracts identity diffusion by means of comprehensible criteria.

Medical informatics gains its identity primarily from its description and mission. In their joint ethical guidelines the German associations dealing with medical informatics describe their discipline as follows: "Medical informatics is concerned with the systematic processing, storage and transmission of information in medicine and health care" (Winter et al. 2008, Chap. I).

The mission of science in general and therefore also of medical informatics was already formulated by Francis Bacon in 1600: "One should not strive for science for the sake of the mind, but in the service and for the benefit of life" (translation of a quote by Haux 2003). The aforementioned ethical guidelines have taken this up and expect every member of the supporting organizations "through his or her professional actions to support the healthy and the sick as well as the medical professionals and researchers in order to prevent, cure and alleviate illness and to better understand their causes and effects" (translation of a quote by Winter et al. 2008, Article 1).

This provides identity criteria for defining medical informatics which are based neither on a specific range of methods nor on formal affiliations with institutions. Perhaps an analogous approach for Business and Information Systems Engineering (BISE) would make sense.

One commonality of our disciplines is informatics. It "deals with the representation, storage, transmission and processing of information" (Gesellschaft für Informatik eV 2006). According to the definition quoted above, medical informatics is informatics in the domain of medicine and healthcare.

Does it make sense to define BISE in an analogous way as informatics in the domain of economics? Does the medical term pair "disease"/"health" possess as an economic analogy in the pair of terms "poverty"/"wealth"? If so, an identity and mission for BISE could also be derived from this analogy: information systems should support consumers/producers and employee/employers as well as economic researchers in preventing poverty and creating wealth and in better understanding the causes of poverty and the effects of economic activity.

If identity of BISE is defined in this way, then methodological pluralism is not a problem but necessary and part of a solution. Analogous to medical informatics, it would be mandatory to always select the most appropriate methods from different disciplines in order to create more wealth (more health) through information processing systems. Furthermore (in both disciplines!) the design-oriented research as well as the behaviorist approaches have their place (cf. Österle et al. 2010). Only if information processing is designed systematically and on a scientific base and if designed artifacts are also systematically evaluated, sustainable "benefit for life" in the sense of Bacon can be expected.

5.3 Systematization and Institutionalization or Intentional "Laissez-Faire"

Systematization requires common terms. On the one hand medical informatics endeavors to promote systematization in medicine by means of clear conceptual systems such as nomenclatures and classifications for diagnoses and procedures (Haux et al. 2007) and additionally through a "unified medical language system" (UMLS) (US National Library of Medicine 2013). On the other hand, medical informatics must admit that it is not always a good role model in its own discipline. A lot of confusion of terms (Prokosch 2001) has not been remedied until today.

Science also requires institutions such as institutes or associations. Moreover, membership in specific faculties is helpful. However, no guilds should arise. For example, institutes for medical informatics at German universities mostly are part of the medical faculties. However, at the Technical University of Braunschweig such an institute is part of the same faculty as the institute for BISE. Furthermore, it is good practice that major contributions come to BISE from institutes for medical informatics (e.g., in the area of information management) and that institutes for BISE make important contributions to medical informatics.

This diversity is not "laissez-faire" in the sense of arbitrariness. But the plurality should be restricted and directed by the disciplines' identity as described above.

5.4 Joint (Further) Development or Individualistic Research

For attracting funding, public perception and competitiveness are supported by a joint research agenda. In medical informatics, there are approaches that take the form of predictions (Haux et al. 2002) or a transdisciplinary Memorandum (Winter et al. 2012) – by the way compiled jointly by medical informatics and BISE researchers.

5.5 Consensus or deliberate diversity of opinion

Perhaps consensus in the formulation of a mission and thus of an identity for BISE is exactly the framework which allows for diversity of opinion in problem solving and methods development.

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