University of Augsburg
Prof. Dr. Hans Ulrich Buhl
Research Center
Finance & Information Management
Department of Information Systems
Engineering & Financial Management

Universität Augsburg
University

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Business and Information Systems Engineering: A Complementary Approach to Information Systems – What We Can Learn from the Past and May Conclude from Present Reflection on the Future

by

Hans Ulrich Buhl, Guenter Mueller[1], Gilbert Fridgen, Maximilian Roeglinger

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[1] University of Freiburg, Institute of Computer Science and Social Studies, Department of Telematics

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Hans Ulrich Buhl
University of Augsburg
hans-ulrich.buhl@wiwi.uni-augsburg.de

Gilbert Fridgen
University of Augsburg
gilbert.fridgen@wiwi.uni-augsburg.de

Günter Müller
University of Freiburg
mueller@iig.uni-freiburg.de

Maximilian Röglinger
University of Augsburg
maximilian.roeglinger@wiwi.uni-augsburg.de

Abstract

Although both communities share a common object of research, the Business and Information Systems Engineering (BISE) community from the German-speaking countries and the North American Information Systems (NAIS) community have developed quite differently. In our opinion, each community has the opportunity to learn from the other's strengths to mitigate its own weaknesses. The BISE community promotes connections with industry and draws substantial funding from there. BISE researchers' topics are attractive to students and ensure the practical relevance of publications. Due to various reasons, numerous BISE researchers struggle with strong contributions to theory, research quality, and publications in top-ranked journals. While this obviously is a strength of the NAIS community, we observe that the NAIS community struggles with its industry connections and enrollment numbers. What the global IS/BISE community needs is a more intense discourse that increases mutual understanding, creates awareness for the need to complement one another, and ensures that this opportunity is seized. Organized along the history of the BISE community's main publication outlet, this paper offers insights into the community's ability to fully engage with industry and how this ability was maintained over time. Based thereon, we as BISE insiders would like to give recommendations on how the NAIS community can mitigate some of its weaknesses. These recommendations are intended to complement the valuable hints already provided by NAIS scholars. They also intend to make insights into the traditional strength of the BISE community available when discussing the global IS/BISE community's future.

Keywords: *Information Systems, Business and Information Systems Engineering, BISE, Past, Present, Future, Critical Reflection, Industry Connections*

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1. The Need and Opportunity to Complement One Another

This is a story about complementarity. We explore what two particular, but in many respects different, communities that share information systems as an object of research can learn from one another. Although it may seem contradictory, the foremost task of one advocating complementarity is segmentation. This seems all the more contradictory if one considers that, in general, segmentation is unable to capture a complex spectrum of shades of grey – particularly if phenomena such as scientific communities are concerned. The reason, however, is simple: Without segmentation, differences remain opaque and rationales for complementarity cannot be justified.

The communities we focus on are the community from the German-speaking countries – that is, Germany, Austria, and Switzerland – and the community from North America. Both communities prototypically epitomize different characteristics because they have developed rather independently for a long time (Frank, Schauer, & Wigand, 2008; Junglas et al., 2011). These characteristics include sources of funding, teaching, predominating research paradigm, organizational structure of chairs, doctoral and post-doctoral qualification, and tenure criteria. In our opinion, focusing on the communities from the German-speaking countries and North America is not too reductionist. On the one hand, some researchers point to similarities between the community from the German-speaking countries and other communities from Europe and Australasia (Frank et al., 2008; Loos et al., 2010; Winter, 2008). On the other hand, the characteristics displayed in North America have been adopted by the vast majority of communities worldwide. A geographic segmentation seems appropriate because we are interested in the communities in their entirety and because any other set of segmentation criteria will result in oversimplification as well. Indeed, neither community is perfectly homogeneous. Some researchers from each community may feel closer to the other community in terms of their individual approach and environment.

Throughout this paper, we refer to the community from the German-speaking countries as the BISE community. The reason is that the journal *Business & Information Systems Engineering (BISE)/WIRTSCHAFTSINFORMATIK* has been the community's primary publication outlet for more than 50 years and, thus, is a mirror of its evolution. We refer to the North American information systems community as the NAIS community. Whenever addressing all researchers dealing with information systems as an object of research, we use the term "global IS/BISE community".

Comparing the BISE and the NAIS communities, many NAIS researchers appear to focus on investigating the transformational power of IT and its impacts on individuals, teams, or organizations (Agarwal & Lucas, 2005). They disclose general insights and document them as justified theories (Winter, 2009). Mainly adhering to the natural science paradigm, theories are used for explanation and prediction (Gregor, 2006; Lee, 2010). PhD programs are geared to scientific careers, which is why NAIS researchers tend to aspire to profound theoretical knowledge and an excellent command of research methods. They also are inducted into a strong publishing and reviewing culture (Lyytinen, Baskerville, Iivari, & Te'eni, 2007), and benefit from the global institutional foundation provided by the Association for Information Systems (AIS). In our perception, chairs in the NAIS community usually have a comparatively small number of PhD students who receive intensive research training from their supervisors. In line with the commitment to research excellence, journal publication is a primary consideration in the promotion and tenure decision for faculty in the NAIS community (Dennis, Valacich, Fuller, & Schneider, 2006). Not surprisingly, numerous scholarly journals originating from the NAIS community are reckoned standard setters with respect to methodological rigor and scholarly writing. Nevertheless, the NAIS community struggles with identity, legitimation, and industry connection (Gill & Bhattacherjee, 2009; Hirschheim & Klein, 2003; King, Myers, Rivard, Saunders, & Weber, 2010; Klein & Rowe, 2008; Myers & Baskerville, 2009; Somers, 2010; Taylor, Dillon, & van Wingen, 2010). Some say that NAIS researchers have a rather "hard time getting access to companies" (Frank et al., 2008, p. 407). Moreover, enrollment numbers have been falling and courses have been deleted from MBA programs at many universities during the 2000s (Firth, Lawrence, & Looney, 2008; Hirschheim & Newman, 2010; Navarro, 2008; Sabherwal, 2010).

The BISE community is characterized best by its ability to fully engage with industry. Cultivated throughout the last 50 years, this ability became an essential component of the community's self-conception. Peter Mertens (2011), one of the BISE community's founding fathers, is a fine example. He postulates that researchers prove themselves in a decathlon of objectives where almost half of the objectives require boundary spanning between academia and industry (e.g., conducting applied research projects, supporting start-ups and spin-offs, and raising funds from industry). The vast majority of BISE researchers directly participate in solving business problems in line with the strong engineering tradition in the German-speaking countries and the sciences of the artificial paradigm (Simon, 1996). BISE researchers draw substantial funding from industry (Avgerou, Siemer-Matravers, & Bjorn-Andersen, 1999; Frank et al., 2008; Gill & Bhattacherjee, 2009). Consequently, their chairs are comparatively large (Schauer, 2007). As all levels of academic education are linked with industry, the BISE community offers attractive degree and doctoral programs. This earns BISE researchers well-respected positions in many schools. Most doctoral students participate in industry projects and intentionally seek management careers after finishing their doctorates. Doctoral programs, therefore, emphasize analytical and project management skills, while training in research methods and writing skills has been secondary for a long time. Although theoretical contributions and publishing receive increasingly more attention, the community's primary objective still is to create utility for industry (Frank et al., 2008; Wissenschaftliche Kommission Wirtschaftsinformatik, 1994; Wissenschaftliche Kommission Wirtschaftsinformatik, 2011). In recent years, however, industry connection is at risk. While tenure criteria have long allowed for different qualification portfolios, universities and funding organizations nowadays offer incentives as well as assessment and tenure criteria that are increasingly based on publications in top-ranked journals. In addition, the BISE community is exposed to severe criticism. Some say its research borders perilously on consulting, trails technological fads, has a sloppy reviewing and article quality culture, and lacks a long-term research agenda. Others criticize the still substandard output of theoretical contributions and publications in top-ranked journals.

Against this backdrop, we cannot help thinking that the BISE and the NAIS community have to initiate changes. The good news is that they have the opportunity to complement one another. Each community can learn from the other community's strengths to mitigate its own weaknesses. In particular, the BISE community can learn from the NAIS community's strong orientation toward research excellence, yielding stronger contributions to theory, higher research quality, and more publications in top-ranked journals. The NAIS community can learn from how the BISE community interacts with industry, resulting in more practical relevance and stable enrollments. In our understanding, complementarity does not require that either community abandon its traditional strengths or that both communities become identical. The bad news is that, so far, only a couple of authors look beyond their own community's nose (some examples are Baskerville, Lyytinen, Sambamurthy, & Straub, 2011; Frank et al., 2008; Gill & Bhattacherjee, 2009; Junglas et al., 2011; Lyytinen et al., 2007). In our opinion, information about the other community seems to be incomplete and inspired more by anecdotes than by facts. What both communities need is a more intense discourse that increases mutual understanding, creates awareness for the need to complement one another, and ensures that the opportunity is seized. A common vision has to be conceived that enables the global IS/BISE community to make strong contributions to theory and industry.

When reasoning about the global IS/BISE community's future, no single sub-community can be expected to have an understanding deep enough to conceive a vision on its own (Baskerville et al., 2011; Gill & Bhattacherjee, 2009; Lee, 2010). In line with our personal involvement, we provide recommendations from the BISE community's perspective. These recommendations are intended to complement the valuable hints already provided by NAIS scholars. They also intend to give insights into industry connections, which are the traditional strength of the BISE community, as a cornerstone to discuss the global IS/BISE community's future.

In line with Hirschheim and Klein (2003), the remainder of this paper is structured chronologically. We start with a reflection of the BISE community's history, revealing the close linkage with industry

(Section 2)[1]. Biased and incomplete as such an overview has to be, we draw on the four-staged history of the *BISE* journal and triangulate multiple sources of evidence such as ground-breaking papers, contemporary witness testimonies, and our own experiences and interpretation. Subsequently, we show where the BISE community stands today. We then refine our critique of the aforementioned characteristics and discuss current trends (Section 3). Based on the insight that the BISE and the NAIS communities have the opportunity to complement one another, we then discuss what might happen if this opportunity were not seized (section 4). Being clearly in favor of a complementary solution, we conclude with recommendations from the BISE perspective (Section 5).

2. From Past to Present: History of the BISE Community

2.1. 1959 to 1970: Elektronische Datenverarbeitung (Electronic Data Processing)

The technological developments during the "Wirtschaftswunder" (economic miracle) of the 1950s and early 1960s enabled companies to increasingly adopt electronic computers. Most companies, in fact, had no idea of how to employ programmable machinery to really support business objectives. It was sometimes "en vogue" just to have a mainframe on the premises – even if it were not used at all. Driven by these changes in industry, the *BISE* journal's progenitor *Elektronische Datenverarbeitung* (Electronic Data Processing) was founded in 1959 by Hans Konrad Schuff, executive manager of the first European software house Mathematische Beratungs- und Programmierungsdienst GmbH (mbp). The journal had a clear application-oriented focus and intended to provide the emerging community with reports on corporate automation, descriptions of new computers, and guidance on how to use them. Therefore, the editorial board included editors from academia and industry (Hasenkamp & Stahlknecht, 2009).

Whereas most parts of the community thought in terms of hardware and programming, some visionaries anticipated the need for an interdisciplinary approach and a management perspective (Diebold, 2009; Kettner, 2009). In the 1960s, more and more companies recognized that employing computers would be necessary to stay competitive, but would only make sense if the early visions were adopted and if academically founded principles for solving application-oriented problems were used. As neither business administration departments nor the predecessors of computer science departments were able to meet the growing demand for "academically trained […] information specialists" (Grochla, 2009, p. 89), the BISE community was born (Lange, 2006).

2.2. 1971 to 1989: Angewandte Informatik (Applied Computer Science)

During the 1970s and 1980s, the software industry developed extraordinarily well in German-speaking countries. Research and development focused on the "design of […] effective and efficient application systems" as well as on the handling of heterogeneous and large amounts of data (Szyperski, Mertens, & König, 2009, p. 8). More and more companies emerged whose business models focused on the application of IT in business and public administration. For example, Software AG was founded in 1969, SAP in 1972. The demand for BISE experts and academic support rose even further.

As a result of all these changes, the early BISE community shifted its focus from hardware and programming to a more integrated approach including software support and the software industry. This development is characterized best by the paper "From hardware to software – A change in importance" that the German computer pioneer Heinz Nixdorf (1982) contributed to the journal's 25th anniversary issue. At this time, the BISE community adopted Popper's definition of science because it created generalizable and transferable knowledge (Gattei, 2008). In line with the discipline's widening scope and increasing academic self-conception, tenure criteria became both more diverse and oriented

[1] Readers who are interested in more comprehensive information about the BISE community's history and are familiar with the German language are referred to Ardelt and Heinrich (2011).

toward publications. Diversity in this context meant that BISE researchers could get tenured with different qualification portfolios including a rather exclusive orientation toward industry or research.

To provide a platform for adequate publications, the journal was renamed to *Angewandte Informatik* (Applied Computer Science) and opened itself to a wider range of topics including the "economical, technical, and social impact" of computing machinery (Hasenkamp & Stahlknecht, 2009, p. 18). The journal's founding editor, who died prematurely in 1968, was succeeded by two editors-in-chief with academic and industry relations.

In line with Scheer's "Business and information systems engineering links science with entrepreneurship" (2009, p. 75), some professors founded "academic consultancies". To name the most prominent examples: IDS Scheer was founded by August-Wilhelm Scheer in 1984. It evolved into the global market leader of business process management solutions and was sold for more than 900 million euros to Software AG in 2009. The Information Management Group was founded by Hubert Österle in 1989 and sold for a nine-digit amount in euros with about 650 employees at 27 branch offices in 2007. Other professors supported former research assistants in the foundation of spin-offs whose business models had been theoretically elaborated in doctoral theses. The intention of these professors was to strengthen their relations with industry, to foster knowledge transfer, to raise funds for future research assistants, and to participate in solving business problems. The last point highlights the willingness of BISE researchers to not only be external observers or be driven by industry, but also to drive and improve industry. This is typical of the engineering tradition in German-speaking countries and still shapes the BISE community today.

2.3. 1990 to 2008: WIRTSCHAFTSINFORMATIK

Since the 1990s, networking has been a key driver of business, academia, and society. At first, there was competition to find the best way to connect computers. The success of the Internet and the advances of the World Wide Web sped up the commoditization of IT (Müller, 2009). Later on, the focus shifted toward "thematic networks"; for example, virtual connections of actors who collectively develop pharmaceuticals, construct automobiles across complex value networks, and bundle market power in procurement networks (Szyperski et al., 2009). IT advances also facilitated the exchange of knowledge beyond local borders within industry and academia.

At the same time, the BISE community, which had mainly interacted with local industry, became increasingly acquainted with the research culture of the NAIS community where there was a much stronger focus on methodological rigor, theoretical foundation, and publishing. Against this backdrop, the journal – in the meantime published under the name *WIRTSCHAFTSINFORMATIK* – introduced double-blind reviewing and raised its rigor criteria, learning from NAIS standards (Szyperski et al., 2009). As a consequence, the rejection rate reached a level comparable to that of NAIS top-tier journals. To ensure continued exchange with industry, the journal launched sections geared to practitioners (e.g., profiles, literature reviews, surveys, web reviews, and reports on innovative products) (Szyperski et al., 2009). Moreover, review panels were required to include reviewers from industry to keep an eye on the practical relevance of research papers.

Both the BISE community and the *WIRTSCHAFTSINFORMATIK* journal benefited from this development. At its peak, about 2,000 of the journal's 4,000 subscribers were from industry. Some publications were exclusively authored by practitioners (e.g., Kagermann, 2009). The journal became one of the very few originating from the German-speaking countries that received an impact factor from Thomson Reuters. It also became the highest ranked German-language journal in the official ranking of the German Academic Association of Business Research, through which more than 1,600 international journals are evaluated. It is the authoritative source referred to in promotion and tenure decisions in most resident business schools.

2.4. Since 2009: The BISE Journal's Strategic Realignment – One Topic, Three Journals

During the 2000s, universities and funding organizations had increasingly begun to base their budget and tenure decisions on publications in top-ranked journals, adopting the criteria already applied in the NAIS community. Nowadays, journal publications serve as a gateway hurdle for being invited to tenure procedures in an increasing number of schools. Only those applicants who are able to jump over this hurdle in the first step can distinguish themselves via industry experience in the second step. Consequently, in a highly competitive field, young researchers who have a strong focus on industry often have fewer chances to compete for tenure compared to those who primarily focus on publications.

In our opinion, the reason for this shift in tenure criteria has nothing do with industry's dissatisfaction with the BISE community's services. The fact that BISE researchers continue to raise substantial industry funding supports this opinion. Nevertheless, there are some attempts at an explanation that appear plausible to us: First, rankings, in general, and the quantitative assessment of researchers' performance became more and more popular worldwide during the 2000s. Second, publications can be counted easily, and data is widely available to almost everybody. Third, in line with the increasing importance of internationalization ,the normative effect of North America, in general, and the NAIS community, in particular, must not be underestimated. Fourth, such assimilation has already happened in other areas of managerial research (Pfeffer, 2007, p. 1340), leading to conflicts in business schools where differences between the NAIS and BISE disciplines are less and less acknowledged. In some cases, BISE's success in industry funding is even discredited, and BISE researchers are discouraged from seeking funding.

BISE researchers reacted differently to the changes in tenure criteria and the journal market (i.e., *WIRTSCHAFTSINFORMATIK*'s increased rigor standards). Already tenured scholars had an option to publish in lower-ranked journals and present at conferences and workshops that focus on knowledge transfer to industry. Others – numerous young researchers among them – aimed to publish in NAIS journals. A very simple reason for this is language. That is, if a paper written in English gets rejected, the large NAIS journal market offers much more high-quality alternatives than the comparatively small German-language journal market. More important, many NAIS journals satisfy the ranking requirements. Researchers tended to adopt the natural science paradigm and related research methods because they remained the "gold standard" for most of these journals (Frank et al., 2008, p. 399). To some extent, this adoption by BISE researchers shows parallels to the era where NAIS researchers intended to increase their "legitimation in the eyes of business school colleagues" (Frank et al., 2008, p. 404).

As far as the *WIRTSCHAFTSINFORMATIK* journal is concerned, the aforementioned changes led to a decrease in submissions. At the same time, higher scientific standards made papers cumbersome to read for practitioners so that the subscriber base began to dwindle. Against this backdrop, the editorial board decided to increase the journal's international visibility and reputation, to win back lost authors from the BISE community, and to raise the number of submissions of NAIS scholars who conduct research in line with the sciences of the artificial paradigm. Moreover, it was thought that knowledge transfer to industry should be strengthened. Therefore, the journal adapted again.

On the occasion of its 50th anniversary, *WIRTSCHAFTSINFORMATIK* implemented a strategic realignment and is henceforth complemented by the English-language e-journal *Business & Information Systems Engineering* (*BISE*). The editorial board was extended to include, among others, some of the experts from the NAIS community who are boundary spanners between both communities. Departments were established and staffed with editor teams from both communities. Editors from industry were kept as well. As there was consensus that a single journal cannot simultaneously satisfy the needs of international researchers and German-speaking practitioners, the *Wirtschaftsinformatik & Management* (*WUM*) journal was launched to maintain knowledge exchange with industry – analogous to *MIS Quarterly Executive*. *WUM* inherited the practitioner-oriented sections of the scientific journals, developes them further, and provides management summaries of

research papers. The connection between industry and academia has been further strengthened by the fact that subscribers have access to all online archives no matter which of these journals they obtain in print.

Indeed, the strategic realignment would not have been possible without the close connections to industry. The editors managed to raise more than 700,000 euros in industry funding. Although the strategic realignment was implemented not so very long ago and there is still room for improvement (e.g., by means of impact factor), it is bearing fruit: In 2010, *WUM* was awarded best newcomer by "German Business Media", which represents the interests of 420 affiliated publishers with 3,800 titles. From a scientific perspective, the *BISE* journal was announced as an AIS Affiliated Journal in 2010. Its downloads in 2011 went up by about 300 percent compared to 2009. Overall, the downtrend in terms of the amount of both submissions and print subscribers was stopped and the turnaround was accomplished.

3. Present: The BISE Community's Status Quo

As shown by using the history of the *BISE* journal as an example, the BISE community has been closely linked with industry since its beginnings. It also has invested heavily during the last 50 years to maintain this connection. Many of the features that characterize the BISE community today have been determined or at least influenced by its industry connections. To draw a picture that captures the BISE community's status quo, we now refine the characteristics outlined in the introduction and shed light on how funding, teaching, and research are linked with industry. We also address in passing current trends and other characteristics such as the organizational structure of chairs, doctoral and post-doctoral qualifications, and predominating research paradigms. Throughout this section, we use the identifier BISE not only to characterize the community from the German-speaking countries at large, but also to refer to resident degree programs and chairs as well as to the research results of resident researchers.

3.1. Sources of Funding: Think Tanks as Pillars of Industry Connections

A typical BISE chair consists of one professor and two to four research assistants, i. e., doctoral students or post-doctoral fellows, who are permanently funded by the respective school. This increases to eight to 10 research assistants depending on the chair's overall reputation and the contributed share of the school's duties in teaching and administration. Most BISE chairs additionally employ an arbitrary number of research assistants funded by grants or applied research projects with industry. Approximately 44 percent of the research assistant positions examined by Frank et al. (2008) are funded by industry. Throughout its evolution, the BISE community maintained its focus on solving business problems. The consequences became manifest in its sources of funding.

As for funding by schools, it is important to know that in the German-speaking countries, computer science and engineering schools are usually better equipped than business schools. Two reasons are that research at engineering schools requires more expensive technical equipment and that teaching requires smaller groups because many courses in their respective degree programs are organized as projects. Moreover, as the German-speaking countries are renowned worldwide for their competence in engineering, it is a logical matter of science policy to foster disciplines that align with these traditional strengths. As a consequence, BISE chairs located at engineering and computer science schools receive about the same funding as engineering and computer science chairs. Even BISE chairs located at business schools often receive equivalent staffing and funding as though they were located at a computer science or engineering school, and thus better equipment than their colleagues from business administration. In addition to the aforementioned general reasons for higher funding by computer science and engineering schools, there are two specific reasons why business schools – at least so far – reward BISE chairs better than other business faculty: (1) BISE chairs raise more funds than typical business administration chairs, and (2) BISE degree programs are highly attractive for students (see next section).

As for funding by industry, many BISE professors conduct applied research projects in order to participate in solving business problems. In a survey conducted by Avgerou et al. (1999), about 65 percent of the interviewees from German-speaking countries indicated that they received funds from industry. Frank et al. (2008) report on an anonymous BISE peer who estimated that about 90 percent of the BISE researchers maintain close cooperation with industry. Some professors form academic consultancies or spin-offs while maintaining their university relationships. On this foundation, numerous professors have expanded their chairs to "scientific think tanks" of more than 20–30 research assistants that do both fundamental and applied research. In some cases, several professors team up to form research centers. In line with the fact that most business problems are interdisciplinary in nature, think tanks and research centers typically employ research assistants with different qualification portfolios. Due to their size, they are capable of conducting multiple research projects at the same time, sustainably raising funds, and offering lectures in their own degree programs as well as in other disciplines and schools. All this enables think tanks and research centers to build up research and project management capabilities in an environment where most of the staff drops out after 3–5 years. They also are robust enough to subsidize research topics with future relevance for industry. In sum, think tanks and research centers constitute the pillars of the BISE community's industry connections.

3.2. Teaching: The BISE Community Educates Offspring for Research and Industry

In line with the BISE community's constitutive mission to educate "academically trained … information specialists" (Grochla, 2009, p. 89), all levels of academic education are linked with industry, ranging from degree programs to post-doctoral qualification.

As for degree programs, companies usually get involved both financially and as part of the curricula (e.g., project seminars, guest lectures, jointly supervised bachelor or master theses) to get acquainted with future graduates at an early stage. BISE researchers, who also serve as lecturers, typically offer courses that reflect their research interests. This feature sometimes is referred to as unity of teaching and research. Hence, courses deal with topics of practical relevance, include cases from applied research projects, and are enriched by the researchers' practical experience. In sum, BISE degree programs enjoy high attractiveness – not only for students, but also for other disciplines and schools. In Germany, for instance, annual BISE enrollments doubled from 2000 to 2010. Moreover, graduates have excellent job prospects. Overall, 42 percent of the almost 350 companies that participated in a survey by the Staufenbiel Institute were specifically looking for BISE graduates, whereas only 51 percent of these companies were looking for business administration graduates (Giesen, 2009). Moreover, 61 percent of the companies looking for graduates from business schools as well as 76 percent of the companies looking for graduates from computer science schools were looking for BISE graduates (Giesen, 2008). Compared to the much higher number of graduates in business administration and computer science, BISE graduates are in high demand. Almost all universities in German-speaking countries offer dedicated BISE degree programs. Most computer science and business administration programs offer majors in BISE. BISE professors also play important roles in the degree programs of other disciplines and schools (e.g., business administration, computer science, industrial engineering).

BISE doctoral students usually work as research assistants. They are paid a regular salary comparable to entry-level jobs in industry for their duties in teaching, research, and administration. As research assistants typically participate in applied research projects during their doctoral studies, they gain practical experience before taking their first jobs in industry. Due to the unity of teaching and research, research assistants are likely to get the opportunity to continue to work on the topics that fascinated them during their studies. After the doctorate, most research assistants seek management careers in industry. Some continue to collaborate with their former doctoral supervisors or their former doctoral colleagues. Others serve as guest lecturers. Many graduates deliberately decide on the option to complete a doctorate before going into practice because BISE doctoral programs usually offer the possibility to improve hard and soft skills and to gain practical experience. As a consequence, the German-speaking countries feature a much higher percentage of doctors in top

management or top consulting positions than, for example, the U. S. About 55 percent of the Chief Executive Officers of companies listed in the German Stock Index DAX (Schild & Herrendorf, 2008) and about 60–75 percent of the consultants at senior partner level hold a doctor's degree (Jochmann, 2009). Pointedly, while in many countries the main driver on the way to upper management is to get into a graduate program at a renowned university, in the German-speaking countries, it is to complete a doctorate at a renowned chair, think tank, or research center.

As for post-doctoral qualification, only few research assistants stay with a chair for a "habilitation". Another few stay as independent "junior professors", which is similar to an assistant professorship. With some exceptions, "Dr. habil." or equivalent accomplishments are necessary for getting tenured. During this time, academic offspring take an advanced focus on research and teaching, where they learn how to "run" a chair. The section BISE of the German Academic Association for Business Research suggests building up practical experience during this time as well (Wissenschaftliche Kommission Wirtschaftsinformatik, 2008). Involving post-doctoral fellows in applied research projects has various advantages: First, they get the opportunity to establish their own industry networks, gain experience in raising respective funds, and develop a feeling for topics of practical relevance. Second, they are able to improve their project management skills, as they often serve as project leaders and negotiate with contracting authorities from companies. Third, it provides a fallback option for young academics who are denied habilitation or tenure. Fourth, involving young researchers with industry prevents the situation where the professor is the only person in an auditorium who has never seen a company from the inside. Practical experience also fosters the unity of teaching and research that makes BISE degree and doctoral programs so attractive. For tenure, young academics have to switch to another university – so the culture and standard rules. While waiting for this option, some of them take jobs in industry. Thus, they may intensify their industry connections and continue to collaborate with the companies in which they were employed after gaining tenure. As tenure and promotion committees still appreciate practical experience, this has the added advantage of offering a better negotiating position compared to academics who have only worked at the university after earning their doctoral degree. In German-speaking countries, getting tenured after having gained experience in industry has for a long time been typical for engineering disciplines (Mertens, 2011).

3.3. Research: High Practical Relevance, but Troubles with Methodological Rigor

BISE researchers mostly have no problem with practical relevance. They are inspired by the business problems they encounter during their applied research projects. First, they solve these problems to satisfy customers by drawing on their academic background. After that, they try to generalize and publish. A common critique of the BISE community, however, is its substandard output of publications in top-ranked journals and contributions to theory. Even the explanation of this weakness is rooted in the BISE community's orientation toward solving business problems. In the following, we provide some reasons as a foundation for better mutual understanding.

First, systematic training in research methods and writing skills has been secondary in BISE doctoral programs for a long time, as business problems require pragmatic solutions as well as analytic and project management skills. Admittedly, this still holds true for numerous BISE doctoral programs. Moreover, reporting generalized solutions to business problems – for example in lower-ranked journals, conferences, and workshops – requires different skills from those required when publishing in top-ranked journals. The former usually emphasize knowledge transfer to industry. Top-ranked journals, in contrast, reward thorough theoretical foundations, extensive literature work, and rigorously applied research methods. Although we perceive an improvement, numerous BISE researchers are unable to meet these standards. There are even voices from within the BISE community that indicate that papers are frequently written without an adequate review of the literature, clear research questions, clear arguments, and appropriate methodology. Indeed, there has for a long time been no external pressure to publish in top-ranked journals.

Second, most top-ranked journals originate from the NAIS community, where theories are mostly used for explanation and prediction in line with the natural science paradigm. In the BISE community,

the focus is on artifact construction. Generalized solutions to business problems rather resemble theories for design and action in line with the sciences of the artificial paradigm (Fischer, Winter, & Wortmann, 2010; Gregor, 2006, Gregor & Jones, 2007; Lee, 2010). Consequently, the results of BISE research sometimes do not fit the orientation of top-ranked journals.

Third, BISE research used to be published in scholarly books such as monograph dissertations (e.g., for describing generalized solutions to first-of-a-kind business problems). Consequently, most BISE researchers still strive for "giant leaps" to boldly answer relevant research questions no man has asked before. "Generating any text that includes all necessary arguments about the definition and assumption space, amasses all related research into multiple points, as well as makes all central points, results in long and intricate papers" (Lyytinen et al., 2007, p. 320). In contrast, top-ranked journals value "incremental articles [that] focus on a single question based on an assumption ground that has been established elsewhere" (Lyytinen et al., 2007, p. 320).

Fourth, the existence of numerous accepted fields of activity from which BISE researchers may draw legitimation and personal satisfaction has not only earned them a reputation as "happy souls" (Junglas et al., 2011, p. 2), but has also increased the risk for their energies to become dissipated. Thus, some conduct research that is neither relevant enough for industry nor rigorous enough for top-ranked journals. They seemingly busy themselves with topics of doubtful current relevance and pursue technological fads instead of long-term research agendas. Only a few researchers manage to simultaneously run a scientific think tank in a self-governing academic ecosystem, educate students and research assistants, conduct applied research projects, and publish results in top-ranked journals.

3.4. Current Trends

Actually, there are some trends in the BISE community that put its strong industry connections at risk. To save governmental funds, well-equipped chairs and tenured faculty are currently being replaced by an increasing number of less equipped professorships with extensive duties in administration and teaching or even by low-paid lecturers. Furthermore, universities in these German-speaking countries are beginning to allocate budgets for doctoral programs exclusively focused on research. These programs compete with the scientific think tanks for young academics. As they exclusively focus on research careers, they put much less emphasis on project management skills and the capabilities necessary to lead scientific think tanks. If this trend continues, the title "doctor in BISE" may lose its branding in industry and become less attractive for young academics. With more and more research assistants joining purely research-oriented doctoral programs, scientific think tanks would also lose the size and diversity needed to engage in large-scale applied research projects. In addition, sticking with the rigor criteria of top-tier NAIS journals and filling the gaps related to the command of natural science research methods restrains researchers – most dangerously, non-tenured young researchers – from establishing and maintaining industry connections. While the strategic realignment of the *BISE* journal has been a first step to provide BISE researchers with an internationally visible platform for research results that are based on applied research projects with industry partners and comply with the sciences of the artificial paradigm, the journal still has a long way to go and certainly is not sufficient as a single publication outlet. Consequently, there is a lot of discussion and even fear among BISE researchers who expect the community to lose its traditional strengths and the achievements of the last 50 years. This may explain some of the emotions surrounding the publication of "Memorandum on Design-Oriented Information Systems Research" (Österle et al., 2011, p. 7).

4. From Present to Future: What May Lie Ahead?

So what is the consequence in light of all strengths, weaknesses, and trends? On the one hand, Lyytinen et al. (2007) argue that replicating the NAIS system would lead to more publications in top-ranked journals for BISE researchers. Indeed, some current trends in the BISE community push in this direction. Nevertheless, replicating the NAIS system would mean breaking away from the BISE community's traditional strengths. This is definitely at odds with our understanding of complementarity. Even NAIS scholars argue that "if European researchers are tempted to move away from their practice-informing activities […], that does not bode well for the European model" (Gill &

Bhattacherjee, 2009, p. 224). Hence, replicating the NAIS system is not sensible. It seems even more unlikely that the NAIS community would replicate the BISE system.

From our point of view, the preferable alternative would be a complementary solution, where the BISE community learns from the NAIS community's orientation toward research excellence without abandoning its industry connections. Likewise, the NAIS community would learn from the BISE community's interactions with industry at different levels while keeping its strong research orientation. Neither community would have to abandon its traditional strengths. If both communities continue to work on intensifying communications with each other, the global IS/BISE community would definitely be able to increase its contributions to both theory and industry.

The following "gedankenexperiment" demonstrates the potential consequences of the two communities not seizing the opportunity to complement one another. The elaborations are intentionally provoking, described in an exaggerated way, and do not necessarily reflect our own opinion. However, we feel that they help emphasize the necessity of working toward a complementary solution. One consequence might be a split within both the BISE and the NAIS communities. There would be distinct sub-communities – probably not balanced in size. One would follow the BISE community's tradition. The other would follow the system of the NAIS community. Over time, business schools would preferably tenure NAIS-style scholars. Computer science and engineering schools would tenure BISE-style scholars. Journals and universities might decide on their affiliation as well. On the one hand, there would be purely publicly funded, research-oriented universities with a faculty that has excellent publication records (e.g., in theoretical physics, mathematics, social sciences, or business research). However, neither the researchers nor their students would make contributions to industry; "business school-based research" would even (continue to) be "destroying good management practices" (Ghoshal, 2005, p. 86). On the other hand, industry-oriented universities with a high fraction of private funding would have strong computer science and engineering schools with high practical relevance, but without scientific reputation. Surely, any individual scholar could be happy, as everything has a place. Nevertheless, no community would mitigate its weaknesses. Academia and industry would become increasingly estranged. Theory would develop models far from reality, and business would substitute gut feelings for methodologically well-founded decisions. Neither model would be appealing for young academics who seek rigor and relevance as well as jobs at the intersection of industry and research. The opportunities for academic offspring to become acquainted with the other perspectives would be rare. Today's open-mindedness would be lost. All this cannot be our objective!

5. Recommendations

Being clearly in favor of a complementary solution, we provide some recommendations from the BISE community's point of view. Most of them are informed by the insights into the BISE community's evolution and present reflection. They address different stakeholders of academia at large. Some recommendations may have short-term impact, others may be considered as long-term strategies. As they are unidirectional, we welcome all recommendations from the NAIS community's point of view on how the BISE community can overcome its weaknesses.

5.1. Sustainable Win-Win Relationships with Industry – or "The Missionary Ends Up in the Cooking Pot"

A sustainable connection with industry is difficult to achieve for academics. Even staying in touch with individual companies requires continuous investments. Receiving data from businesses and analyzing them as an outside observer is not enough in most cases. According to basic economic principles, companies must gain added value from their activities with acadmia, especially if these activities require funding. Anything else is goodwill and cannot be counted upon in the long run. To offer added value, academics have to build sustainable win-win relationships with their industry partners. Many BISE chairs were able to build these relationships in the past. In most cases, such successful relationships include academic advisory services.

Practitioners usually have a clear understanding of their business – at least they are convinced they have. Most certainly, their expectations regarding academics are biased as well (Hirschheim & Klein, 2003). Thus, the worst thing academics seeking industry collaboration can do is to be missionaries preaching their theoretical results.

To use an example for clarification, look at curriculum design. Many academics tend to design curricula that include the topics and methodologies they consider most important. If their graduates have issues finding jobs, they try to convince practitioners that those graduates actually have important skills. As we perceive from the BISE community's history, it makes much more sense letting practitioners participate in curriculum design due to their knowledge of industry needs. In addition, they cannot argue against a product they helped design.

In general, academics should listen to what the market demands and offer corresponding services. Even in applied research projects, industry partners appreciate quick and pragmatic solutions more than sophisticated analyses that fulfill academic standards. To gain a positive reputation in industry, academics have to accept this reality. This strategy is certainly not without risk: Applied research projects sometimes border perilously on pure consulting. It is the responsibility of senior researchers to ensure integrity and independence.

Gaining a reputation in industry, however, opens up new opportunities: The better the reputation, the more trust and freedom. If practitioners know that researchers truly understand their businesses, are capable of providing value added, and have already provided value added, it is easier to build upon academic standards and to participate in research projects. The BISE community's history has shown that researchers first need to let themselves be driven by the market before they are able to drive the market.

What type of research environment provides fertile soil for building industry connections as described? In the following, we list recommendations for some stakeholders.

5.2. Universities and Tenure Committees

Several NAIS researchers have suggested adjusting doctoral programs to the needs and talents of practitioners or encouraging hybrid academic-practitioner doctoral programs – thereby following the traditions of the BISE community (Gill & Bhattacherjee, 2009; Klein & Rowe, 2008, Myers & Baskerville, 2009). We strongly agree that this initiative would increase knowledge exchange between industry and research with positive effects on both sides.

Nevertheless, one has to bear in mind that such doctoral programs have to be incentive-compatible for scholars. Time spent with industry decreases time spent with publishing! If tenure and promotion committees rely on publications in top-ranked journals and tend to neglect achievements in industry and teaching, a hybrid academic-practitioner doctoral program is interesting neither for young academics nor for tenured professors.

The BISE community's history shows that actively influencing business schools' tenure and promotion committees according to the community's objective system is feasible – at least at schools where BISE researchers are strong players. "Information schools" or "Information Systems Schools", which are comparatively new in the NAIS community, are designed to be interdisciplinary. At least from our experience, they should be more open-minded to innovative objectives and incentive systems and, thus, bear a great opportunity for change.

5.3. Publication Outlets and Editorial Boards

Regarding the publication of scientific results to foster industry connection, particularly the following three questions need to be answered: "What?" in the sense of offering methodical rigor but still offering relevance for industry; "When?" in the sense of publishing timely results; and "Where?" in the sense of interplay between scholar-informing and practitioner-informing journals.

Journals may follow different specialization strategies: design-oriented, explanation-oriented, economic, strategic, or organizational in focus. Some may focus on rigor, while others focus on relevance. First and foremost, publication outlets should make their targeted portfolio of articles transparent and measurable. Moreover, they should compare their target portfolio to the status quo of published articles from time to time. Papers within the current backlog that fit the required adjustments could be advanced. Publishing underrepresented article types would become fast and more attractive. Lyytinen et al. (2007, p. 325) roughly judge that "the top journal review process weights […] 2.5 % practical relevance". While they propose to adjust the journals' norms for weights of innovativeness to 20 percent, theory to 35 percent, methodology to 35 percent, and practical relevance to 10 percent, we would allow journals to implement different strategies where a stronger focus on innovativeness and practical relevance is possible as well. Community organizations like the AIS may negotiate a target list of top-ranked journals and conferences that together consider the entire community's contributions to theory and industry. Blindly sacrificing "hard-won academic legitimacy" is certainly not a good idea (Myers & Baskerville, 2009), but careful adjustments could be fruitful. Second, while all strategies have their pros and cons, we recommend an integrative strategy for each publication outlet: publishing different streams of research, beginning with proposals for new artifacts and ending with inquiries that deliver suggestions for further improvements and better designs as well as theoretical knowledge about the artifact's impact on individuals, teams, and organizations. Each editor and reviewer needs to be open-minded toward innovative approaches different from the main stream. A core team of (senior) editors and reviewers would not only accompany a single paper from its initial submission to publication; the same team would also accompany the whole stream of papers within the same journal and be accountable for a balanced ratio of rigor and relevance within this stream. To assure quality, the review panel would have to include respective experts in each phase.

In our fast moving domain, methodologically sound results and especially innovative theory-ingrained artifacts have to be published early in order to contribute to industry at large. "Indeed, professionals do not and cannot wait for the development of a theory for explaining and predicting before they act […]. Design and action have the option of applying, but need not be held up by the absence of theory for explaining and predicting" (Lee, 2010, p. 345). New artifacts will be adopted by early innovators (Gill & Bhattacherjee, 2009), which will allow for going the last mile to the proof of concept, proof of value, and proof of use (Winter, 2010). Moreover, it is more difficult to explain the relevance of an incremental advance to a practitioner than it is to explain the relevance of a "giant leap". Sticking to incremental advances, no one would ever have invented the car. We would still be improving the horse carriage. On the one hand, we must not sacrifice methodical rigor. On the other hand, spending years on explanation and optimization and then informing industry is obviously not acceptable, as academia would be systematically outrun by industry (as it happens for most management innovations, see Pfeffer, 2007).

With the *BISE* journal and *WUM*, we experience benefits from a coordinated strategy concerning science as well as business practice. In our opinion, journals should incentivize articles to be released in affiliated outlets dedicated to informing practitioners on the current status of research (as, e.g., also implemented by *MIS Quarterly Executive*). A more revolutionary approach would make it the norm to write an article for those affiliated outlets for each scientific paper that is accepted for publication in the respective main outlet. The papers would reference one another, so an interested practitioner could obtain the detailed scientific paper. In some way, this would incentivize researchers to think about the relevance of their research in the first place. Affiliated outlets dedicated to informing practitioners are not only of benefit to industry. They also can be used by researchers to call for support regarding data or prototypic implementations. They can serve as a marketing platform for industry collaboration. However, for business and research to keep in touch, it is necessary to retain a certain readership of qualified practitioners for the scientific journals and to retain a certain readership of open-minded scientists for the business journals.

5.4. Politics and Funding Organizations

Politics tends to create short-term success, which becomes manifest in the explicit funding of the integration of industry and research. This makes applied research attractive. In contrast, funding organizations like the National Science Foundation, the European Research Council, or the German Research Foundation often follow a "strong-theory-will-lead-to-practical-implications" principle, as it is called by Lyytinen et al. (2007, p. 324). This makes fundamental research attractive.

Within this system, both academics striving for applied research and academics striving for fundamental research are able to get public funding. The development over the past years reveals that this system bears the risk of splitting the community. If politics weighs practical relevance over rigor and if public funding organizations only count publications in top-ranked journals, only a few researchers will be able to bridge the gap between fundamental research and its application in industry.

Consequently, politics as well as public funding organizations should rely on assessment criteria that consider achievements in both applied and fundamental research. This way, they avoid fostering a risky monoculture.

5.5. Individual Scholars

To seize the opportunity to complement one another, we need to intensify the exchange on all academic levels. This is definitely possible: There are many occasions that showcase open-mindedness toward each other. For instance, many BISE colleagues join the editorial boards of international journals and vice versa.

Senior scholars have to define a common objective system for the global IS/BISE community that encourages strong contributions to theory and industry. An "AIS subcommittee drawing representatives from North America, Europe and Asia-Pacific schools" could be the right agency for defining such an objective system (Gill & Bhattacherjee, 2009). Guidelines and discussions about "grand challenges" would prevent young scholars from opportunism and help them find a sensible research agenda.

Today, many young BISE researchers recognize the value of an exchange with the NAIS community: They publish in international journals, serve on respective editorial boards, attend international conferences, and co-chair tracks of these conferences. Young BISE academics are also encouraged to spend a few months abroad collaborating with renowned NAIS researchers. We are sure that many established BISE colleagues would welcome young, open-minded NAIS academics and introduce them to our approaches for industry collaboration. As they will be the ones designing the community's future for the next decades, implementing an increased open-mindedness toward different approaches will make an intensified exchange between the BISE and the NAIS community sustainable. Exchanges of tenured faculty also foster mutual learning. On the one hand, they can be-come acquainted with decision makers from industry who could help them expand their networks. On the other hand, they can multiply their experiences by passing them on to succeeding generations of researchers.

When implementing these recommendations, both the BISE and the NAIS communities have to face the challenge of not losing influence in their respective environments. In the end, we all are authors, reviewers, editors, or members of committees and organizations. Each of us has to internalize and multiply the vision that the BISE and the NAIS community complement one another. We will only succeed if each community is willing to make an effort.

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About the Authors

Hans Ulrich BUHL is full professor of Business and Information Systems Engineering (BISE) at the University of Augsburg (Germany) where he built up BISE as a discipline. He also chairs the FIM Research Center Finance & Information Management as well as the Fraunhofer Project Group BISE. Since 1993, Buhl has been editor of the journal *BISE/WIRTSCHAFTSINFORMATIK*, since 2006, editor-in-chief. From 1994 to 2000, Buhl was (deputy) chairman of the special interest group BISE of the Gesellschaft für Informatik (German Computer Science Society). In 2009, he was appointed Fellow of the Gesellschaft für Informatik. Before his academic career, Buhl gained practical experience at IBM from 1983 to 1990. Today, Buhl is highly involved in applied research projects with industry partners, linkage projects (e. g., funded by the European Regional Development Fund), and fundamental research projects (e. g. funded by the German Research Foundation). He publishes in leading academic journals such as *Academy of Marketing Science Review*, *BISE/WIRTSCHAFTSINFORMATIK*, *European Journal of Operational Research*, *Journal of Business Economics* (*Zeitschrift für Betriebswirtschaft*), *Nature Materials*, *Public Finance Analysis*, and *Schmalenbach Business Review* (*Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung*).

Günter MÜLLER is full professor of Business and Information Systems Engineering (BISE) at the University of Freiburg (Germany) where he also chairs the Institute of Computer Science and Social Studies. Müller is regular visiting professor at the National Institute of Informatics in Tokyo (Japan) and a regular consultant to Japanese IT industry. Since 1996, Müller has been editor of the *BISE/WIRTSCHAFTSINFORMATIK* journal, since 2009, department editor. From 2007 to 2011, Müller was (deputy) chairman of the section BISE of the German Academic Association for Business Research. Before his academic career, Günter Müller gained practical experience at IBM where he inter alia founded the European Networking Center (ENC) in Heidelberg. In 2009, Müller was appointed Senior Fellow of the Association for Computing Machinery (ACM). In 2010, he received the Austrian "Cross of Honor for Science and Art, First Class" as well as the Medal of Honor of the University of Vienna (Austria). In 2011, he received an honorary doctorate of the Technical University of Darmstadt (Germany) and was appointed friend of the University of Zagreb in Croatia. Müller publishes in academic journals such as *BISE/WIRTSCHAFTSINFORMATIK*, and the *Communications of the ACM*.

Gilbert FRIDGEN is post-doctoral fellow and head of the research group "Strategic IT Management and Green Information Systems" at the FIM Research Center, University of Augsburg (Germany), where he earned his PhD in BISE in 2010. Since October 2011, he also serves as Interim Associate Professor for business engineering at the Institute of Materials Resource Management and is actively involved in the set-up of the Fraunhofer project group Business and Information Systems Engineering (BISE). He gained practical experience as head of applied research projects for example with A.T. Kearney, Fujitsu Technology Solutions, Hilti, and McKinsey. His research was published in various conference proceedings and international journals, and was awarded the Bavarian Cultural Award 2010.

Maximilian RÖGLINGER is post-doctoral fellow at the FIM Research Center Finance & Information Management at the University of Augsburg (Germany) where he heads the research group on business process management. In October 2011, he was appointed Interim Associate Professor for Business and Information Systems Engineering (BISE) at the Institute of Materials Resource Management at the University of Augsburg. From 2007 to 2010, Röglinger was a member of the *BISE/WIRTSCHAFTSINFORMATIK* editorial staff and involved in the journal's strategic realignment. He publishes in journals like *BISE/WIRTSCHAFTSINFORMATIK*, *Business Process Management Journal*, and *Journal of Business Economics*. Röglinger gained practical experience as (co-) project leader of applied research projects for example with Infineon Technologies, Radeberger Group, and Siemens. He earned his PhD at the University of Augsburg and holds a Diploma in BISE from the University of Bamberg (Germany). His research was awarded the Fugger Research Award in 2010.