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Can Science Be Agile?

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von

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Zusammenfassung:

Die vorherrschende Meinung, dass Forschung und Praxis in der Wirtschaftsinformatik stark von Moden beeinflusst wird, wurde bereits durch empirische Studien belegt. In diesem Arbeitsbericht wollen wir die Ursachen untersuchen, die dem Phänomen der Modenachahmung unterliegen. In der Literatur finden sich Beiträge, die mögliche Einflussfaktoren erwähnen, jedoch mangelt es an einer fundierten Analyse der kausalen Zusammenhänge im Forschungsprozess. Angeregt durch die Empfehlungen von Baskerville und Myers Forschung agiler zu machen, analysieren wir zunächst das Problem der Nachahmung und untersuchen im Anschluss die Übertragbarkeit des agilen Konzepts auf den Forschungsprozess. Abschließend leiten wir Vorschläge zur Optimierung des Erkenntnisprozesses im Bereich der Wirtschaftsinformatik ab.

Abstract:

The prevalent believe that Information Systems (IS) research and practice is strongly influenced by fashions, was recently circumstantiated by empirical studies. In our contribution we want to explore the causes that underlie the phenomenon of "fashion imitation". Some authors indeed mention several potential influencing factors; however, a substantiated analysis of the causal relationship in research processes is lacking in literature. Stimulated by Baskerville and Myers' recommendation for a more "agile research" we subsequently provide a solid analysis of the problem itself and examine the transferability of the agile concept to the research process. Afterwards we deduce suggestions to optimize the cognitive process in the field of information systems.

Schlagworte/Keywords:

Mode, Trends, Forschungsprozess, Wirtschaftsinformatik, Agilität.
Fashions, trends, research process, information systems, agility.

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1 Introduction

1.1 Fashions in IS

In the contribution of Baskerville and Myers „Fashion Waves in Information Systems Research and Practice" the authors respond to the long lasting debate about the relationship of IS research and practice through analyzing the discourse of four different IS fashion keywords.[1] They follow the definition of Abrahamson as they define IS fashions as a *"relatively transitory collective belief in IS research and practice, disseminated by fashion setters, that a technique or technology leads to rational IS innovation"*[2]. Baskerville and Myers bibliographic research shows, that IS research and practice are indeed influenced by fashion waves. They measure such "bursts of interests" by the volume of discourse about a particular fashion, precisely the number of articles published that refer to these fashions.

Moreover, Baskerville and Myers identify that topics in IS research as well as in IS practitioner literature arise very quickly, whereat the research waves are lagging the practitioner waves. In addition, the IS practitioners waves tend to decline more rapidly than the IS research waves do. These findings may lead to the interpretation, IS research literature is conceived as too unsteady, because it strongly parallels the IS practitioner literature. Otherwise it could be presumed that IS research literature is "outdated and irrelevant".[3] Hence the authors claim a more proactive engagement in the IS fashion-setting process. In favor of their findings they provide several opportunities how IS research could participate more directly at the beginning of the fashion-setting process.

1.2 Fashions in DIS

Even though our work is mainly inspired by ideas from Baskerville and Myers, who focus on the Anglo-Saxon IS, the issue of fashions is identified and discussed by researchers of the German-speaking sister discipline as well.[4] In this perspective it must be pointed out, that Anglo-Saxon IS builds upon a behaviorist approach which aims at the observation of the characteristics of both, information systems as well as users[5] and examines in particular cause-and-effect relationships for given systems. The European discipline (especially the German speaking research communi-

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[1] Cf. *Baskerville*, R. L. and *Myers*, M. D. (2009).

[2] *Baskerville*, R. L. and *Myers*, M. D. (2009): p. 649.

[3] Cf. *Baskerville*, R. L. and *Myers*, M. D. (2009): p. 659.

[4] Cf. *Mertens*, P. (1995); *Mertens*, P. (2006) *Steininger*, K., *Riedl*, R., and *Roithmayr*, F. (2008).

[5] Cf. *Österle*, H., *Winter*, R., and Brenner, W. (Eds.) (2010): p. 1; *Steininger*, K., *Riedl*, R., *Roithmayr*, F., and *Mertens*, P. (2009): p. 480.

ty) instead is design oriented. The design-oriented Information Systems (DIS) (respectively Business Information System Engineering (BISE), which is also considered as the English equivalent to the German term Wirtschaftsinformatik) is dealing with the design of information systems for organizations and individuals in society and economy, thus means-end relations.[6] The core of DIS represents its objects: people, technology, organizational concepts and their interrelation. It *"targets individuals and organizations that provide resources for the research and, in return, expect favorable results for themselves"*.[7] These differences point out that fashions may also have different implications for both disciplines. In the following we focus on the fashion phenomenon of German-speaking DIS research.

Steininger et al. have carried out a comparative bibliographic research in which they investigate how IS and DIS are influenced by fashions and whether there are differences in the distribution of fashions between academic and practitioner journals.[8] In their document analysis they investigate the frequency of using specific terms as an index for fashions. According to them fashions are -at least for a short period- highly topical yet rapidly declining. In general a fashion does not substantially contribute to the field of information systems. Putting it differently, a theme is defined as a fashion if the discourse of a certain topic peaks at a certain point in time and declines after that. In general, the study from Steininger et al. shows that the DIS is more prone to follow fashions then the IS.
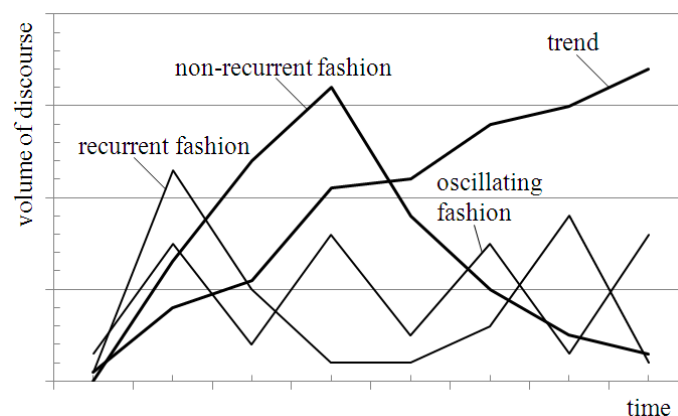
Figure 1: Idealistic Course

In consideration of the subcategories it is questionable to which extent they contribute to a theoretical outcome. For oscillating as well as recurring fashions with a positive tendency it can be assumed that they provide a proper level of scientific engagement culminating in gaining scientific insight. One can assume that non-recurrent and recurrent fashions with a negative tendency

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[6] Cf. *Bichler*, M. (2006).

[7] *Österle*, H., *Winter*, R., and Brenner, W. (Eds.) (2010): p. 3. Translated from German.

[8] Cf. *Steininger*, K., *Riedl*, R., *Roithmayr*, F., and *Mertens*, P. (2009).

in contrast bind valuable resources without sustainably supporting the knowledge process. Picking up a topic one or several times may indicate an insufficient recycling of knowledge already gained.

In addition, the term trend is mentioned in the paper of Baskerville, however, without giving a precise definition. According to Steininger et al. a positive trend differs in its developmental pattern: the course of the publication volume has an increasing regression line and is not declining for more than two data points in a row. This means that the members of a scientific discipline increasingly study the topic and establish a cumulative research tradition.[9] If a subject is processed in such a continuous manner, a sustained contribution to scholarly progress and in gaining insight can be assumed. Astonishingly Steininger et al. found that both disciplines are lacking real positive trends.

The tendency of both the DIS and IS being strongly affected by fashions seems problematic in different ways. One could cast in doubt if following fashions contributes adequately to scientific insight. Furthermore the question can be raised whether the impulses for fashions, which emerged from practice negatively influence the freedom of scientific research. At the same time it also provides a large range of different perspectives which is essential for cumulative research.[10] The issue of fashion is especially interesting in the light of rigor and relevance. Although the two directions IS and DIS are similar in their main scope, they differ in their scientific objectives' priorities. While IS research focuses mainly on rigor but not as much on relevance, the contrary applies for the DIS.[11] Thus, the diagnosis of a strong fashion-affection does not imply the same.

Given the circumstances of the field of DIS with its strong dependence on practice, a bias to consider topical and relevant themes seems reasonable. However, there is also the danger to lose track of essential theoretical research. Based on this area of conflict it is beneficial to examine the underlying process of research, intending to explain the rising of and focusing on research projects.

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[9] Cf. *Steininger*, K., *Riedl*, R., *Roithmayr*, F., and *Mertens*, P. (2009): p. 415-417,424.

[10] Cf. *Steininger*, K., *Riedl*, R., *Roithmayr*, F., and *Mertens*, P. (2009): p. 424.

[11] Cf. *Buhl*, H. U. (2009).

1.3   Research Cycle

Impulses for a research project originate either from science or from practice. The DIS has an inherent dependency on practice and is therefore driven to meet their requirements and at the same time it has to achieve high scholarly standards. Figure 2 drafts the iterative cycle of a generalized research process.
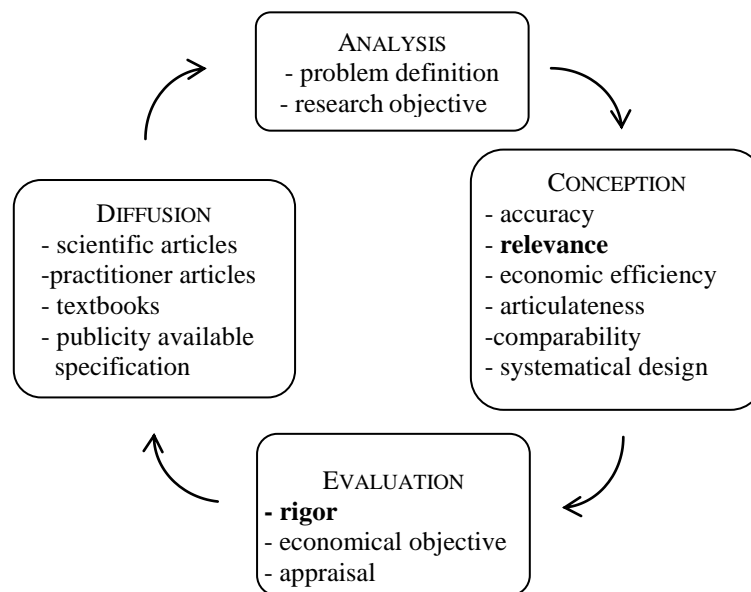

Figure 2: Research Process

At the beginning of the analysis phase it is essential that research builds upon relevant problems. This applies to a range of problems as for example failure of information system projects, high costs or lacking understanding of models. The established research objectives must be followed through accepted research methods. These methods conduce to the conception of artifacts (models, prototypes, action guidelines). As shown in Figure 2 the conception phase should be subdivided in different steps, following the guidelines of modeling. The demand for rigor must cause in evaluation of the employed research methods as well as in examining the economical benefit. An important role lies in the appraisal of scholarly publications, whereat it depends on the assessors' faculty of judgment. The research cycle closes and stimulates new research perspectives in the diffusion phase at the same time.[12]

As displayed in the figure, different steps must be taken when it comes to relevant research that meets the requirements of rigor. The main proposition of Baskerville and Myers, that IS research should participate more actively in the process of setting research topics, leads to the question which factors influence the motivation to follow a research problem in the field of DIS and

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[12] Cf. *Österle*, H., *Winter*, R., and Brenner, W. (Eds.) (2010): p. 13-16; *Becker*, J. (2008): p. 9.

whether on this basis a change in the DIS-research process is required as well. In the next section we investigate possible causes and impacts for researchers to create, follow or not follow a new topic.

2 Causal Research

2.1 Scope of Action

Before analyzing the mechanisms that lead to the strong focus on fashions, it needs to be clarified, which fundamental options scientists have. A differentiation can be made between:

- *Fashion setting*: an intervention on the general research agenda by creating and strongly supporting a new theme.

- *Fashion imitation*: taking up a fashion in someone`s own research work.

- *Long-term research*: conscious focus on a long-term research agenda, developed by individuals or a group of researchers, with the aim of creating stable and general theories.

In the literature occasional statements can be found on possible reasons why researchers choose especially the second option. The guesses range from obvious factors such as the dependence of DIS research on external funding to more provocative statements such as the diagnosis of a poorly marked ability of today's scientists to abstract from detailed questions to higher theories.

However, a complete picture of the various influences on the behavior of scientists in respect of imitation or creation of fashions is missing so far. This is an important issue when it comes to optimizing the research process and to ensuring sustainable gain of knowledge. On this basis, ideas to restructure the research process can be discussed, such as Baskerville and Myers' proposal of an agile research.[13] Therefore, we have made it our task to collect the *reasons for and against imitation and creation of fashions* mentioned in the DIS-literature, to produce an overview, and finally supplement this by our own findings.

To this end, we carried out a literature study. For the qualitative content analysis we took publications into account containing opinions according to scientific theory in the area of information systems. To expose the state of discussion we analyzed all articles of the journal "WIRTSCHAFTSINFORMATIK" respectively its simultaneous translation "Business & Information Systems Engineering" (BISE), which is perceived as the central organ of the German-speaking community, from the years 2006 to 2010. Out of cr. 400 articles the relevant were iden-

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[13] Cf. *Baskerville*, R. L. and *Myers*, M. D. (2009): p. 659.

tified by us through analyzing the titles and abstracts. From the resulting twelve articles (which are marked with * in the references) the statements related to the issue mentioned above were extracted. After analyzing the literature, the statements were classified in two areas of causes. We call them "Scientific Structures" and "Characteristics of DIS Research". In the following, the obtained statements are listed and related to each other.

2.2 Scientific Structures

2.2.1 Financing of Research by Third-Party Funds

Research must be increasingly financed by external funding.[14] In Germany for example, the proportion of funding from the private sector ranges about 24% of the total budget of the universities.[15] In addition to the basic necessity of external funding there is, in the context of performance-based granting of funds, also a dependence from public funds on the amount of third-party funds, according to the Matthew effect: „For to all those who have, more will be given". At the same time, the ability to attract external funding is a criterion for the individual academic career of scientists. The requirement for „practical knowledge on third-party fund raising for research projects" is already standard in job advertisements. This means that researchers need to cultivate a kind of entrepreneurship in order to promote their own work.[16] In such cases, the well-directed use of "buzzwords" may serve to simplify complex issues. Therefore, especially in attracting funds from the private sector, the classification of the research topic in a fashion theme can be tempting.[17] Accordingly self-defined, new subjects are much harder to "sell". At the same time such dependence is mentioned as a reason why researchers drop their thematic focus when it does no longer contribute to achieving desired goals, like attracting third-party funds.[18] In contrast, in the solicitation of public external funding -which is usually focused on fundamental research[19]- evidence of the scientific quality of the project becomes more relevant. [20]

In sum, an influence by the sponsors may be expected mainly for applied and result-oriented contract research. This means that the likeliness of influence increases the more the sponsor has a direct interest in the outcome of the project.

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[14] Cf. _Scheer_, A.-W. (2009): p. 78.

[15] Cf. _Statistisches Bundesamt_ (2010): p. 27.

[16] Cf. _Scheer_, A.-W. (2009): p. 78.

[17] Cf. _Lange_, C. (2006): p. 24; _Steininger_, K., _Riedl_, R., _Roithmayr_, F., and _Mertens_, P. (2009): p. 423.

[18] Cf. _Steininger_, K., _Riedl_, R., _Roithmayr_, F., and _Mertens_, P. (2009): p. 422.

[19] Cf. _Winter_, R., _Krcmar_, H., _Sinz_, E. J., _Zelewski_, S., and _Hevner_, A. R. (2009): p. 192.

[20] Cf. _Winter_, R., _Baskerville_, R., _Frank_, U., _Heinzl_, A., _Hevner_, A. R., and _Venable_, J. R. (2007): p. 404.

2.2.2 Publication Process

Scholarly research projects are complex and take a long time to plan and conduct. The related processes of scholarly publication extend over a longer period. In respect to the three options mentioned above, the question is which strategy a researcher chooses at the initialization of a research project if he is aware that the research results will be published or even applied strongly delayed in time. For Baskerville these are main reasons why researchers do not actively take part in setting fashions.[21] This raises the question whether this means in reverse, that it is rather likely that fashion imitation is the consequence. It could also be possible that this stimulates long-term research agendas. Several statements in interviews with renowned researchers and witnesses of the research field in 2006, suggest such a trend.[22] If one considers it desirable, that scientists participate in the fashion setting process, a dilemma of late-breaking results and time-consuming reviews must be mitigated.

Publications in practical journals can conduce the diffusion of research results into practice.[23] In their response to the article by Baskerville and Myers, Gill and Bhattacherjee point out, that scholarly and commercial publishing institutions are driven by entirely different forces. While the authors of academic journals focus on the reviewers and editors when choosing issues, the success of commercial journals depends largely upon matching the content with the interests of the readers.[24] In the latter, fashion exaggerations should emphasize the relevance of a new idea and are used for marketing purposes. In addition, such exaggerations are supported by software manufacturers, who want to maximize the turnover of related software solutions as long as the subject is "in fashion".[25] It is therefore necessary to consider how the requirements of scholarly publications can be reconciled with practical publications.[26]

However, even academic journals are not immune to the temptation of discussing hot topics. Straub lists the characteristic „It hits themes that are popular" as one of ten reasons why a top journal accepts a submitted paper.[27] In his opinion, reviewers are open-minded about new topics in principle, but only as long as they are not too radical or new. His indication, that one can find a relation from almost any subject to a popular theme, illustrates the incentive for researchers to classify their own work in fashion themes.

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[21] Cf. *Baskerville*, R. L. and *Myers*, M. D. (2009): p. 652.
[22] Cf. *Lange*, C. (2006): p. 22.
[23] Cf. *Österle*, H., *Winter*, R., and Brenner, W. (Eds.) (2010).
[24] Cf. *Gill*, G. and *Bhattacherjee*, A. (2009): p. 668.
[25] Cf. *Mertens*, P. (1995): p. 26.
[26] Cf. *Loos*, P., *König*, W., *Österle,* H., *De Marco,* M., *Pastor* J. A., and *Rowe,* F. (2010).
[27] Cf. *Straub*, D. (2009): p. 5.

While searching for the causes, researchers are also attested to represent a "deficient ability to abstract".[28] This deficiency cannot be resolved with a change of the research process, but has -in the case of actual existence- its origins in the selection process of academics. This includes a proposal of Osterloh and Frey, to exercise more care in the socialization of young researchers.[29]

2.3 Characteristics of DIS Research

2.3.1 Practical Relevance

The practical relevance of their research is a central element in the self-conception of the DIS.[30] Therefore it is obvious to address issues raised by practice with regards to relevance.[31] According to Rautenstrauch, this is misused as a legitimation to adapt fashions as mission statements.[32] In contrast, Baskerville imputes scientists „an antipathy or ambivalence toward engagements with practice".[33] This ivory tower mentality would have a negative impact on the creation of own fashions. This conclusion differs from the general belief, that researchers are also characterized by their intrinsic motivation to explore[34], which should promote the active development of new themes. Accordingly, in the literature, there is also the opposite estimation: the basis for focusing on new fashions in the research fields DIS and IS, is the ability and willingness to respond quickly to developments in business practice.[35] At the same time, information technology is a key element of DIS. A constantly evolving information technology is leading to a permanent adaptation of research topics.[36]

2.3.2 DIS is a Young Science

Through the examination of the research issues of the DIS it is observable, that fashions are often just „old wine in new skins". As reason is given that DIS research is prone to unreflectively adopt Anglicism and promotional terms from business practice and insufficiently refer to topics which are already covered by the scientific community.[37] This may be due to the fact that the DIS -because it is a relatively young research field- is still developing a stable common terminology.[38] Schryen found that such a consistent terminology -which is a prerequisite to establish a

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[28] Cf. *Steininger*, K., *Riedl*, R., and *Roithmayr*, F. (2008): p. 1549; *Heinrich*, L. J. (2005): p. 110.

[29] Cf. *Osterloh*, M. and *Frey*, B. S. (2010).

[30] Cf. *Österle*, H., *Winter*, R., and Brenner, W. (2010).

[31] Cf. *Winter*, R., *Krcmar*, H., *Sinz*, E. J., *Zelewski*, S., and *Hevner*, A. R. (2009): p. 150.

[32] Cf. *Rautenstrauch*, C. (1999): p. 187.

[33] Cf. *Baskerville*, R. L. and *Myers*, M. D. (2009): p. 652; *Scheer*, A.-W. (2009): p. 78.

[34] Cf. *Nola*, R. and *Irzik*, G. (2010): p. 190.

[35] Cf. *Steininger*, K., *Riedl*, R., *Roithmayr*, F.; *Mertens*, P. (2009): p. 423.

[36] Cf. *Steininger*, K., *Riedl*, R., *Roithmayr*, F.; *Mertens*, P. (2009): p. 411.

[37] Cf. *Mertens*, P. (2006); *Steininger*, K., *Riedl*, R., *Roithmayr*, F.; *Mertens*, P. (2009): p. 412.

[38] Cf. *Steininger*, K., *Riedl*, R., *Roithmayr*, F.; *Mertens*, P. (2009): p. 411, 418.

cumulative research- has not been extensively investigated in research papers in the past.[39] To-gether with the strong partitioning of online literature databases[40] it is almost impossible to cap-ture the entire state of research of a specific topic within the DIS.

As well as the terminology, the scientific foundation of DIS is still emerging. This complicates building upon already gained insight which would help to avoid the replication of existing themes. Research in the field of DIS appears primarily descriptive and formative rather than ex-plaining, predictive and accumulating theory. Beside others, the proposals for the theoretical foundations range from (mechanical/ electrical/ civil) engineering via computer science to orga-nizational theory[41] but until now the DIS is lacking a holistic construct of theory, a "theory of information systems"[42]. This deficiency exists, according to Picot, because the development of theories, especially the reference to organizational theory, has been given too little attention.[43]

However, it is discussed whether the inherent connection to technological progress makes it even possible to build a robust construct of theory. The field DIS progresses at different rates and with different dynamics than the field of organization theory. Hence, it may sometimes address an issue for which the theoretical underpinnings are yet to be established.[44] Theoretical foundation, however, would be a fundamental requirement for new technology development to better assess and identify the key objectives of a knowledge problem. Otherwise there is the danger of follow-ing a trend blindly and arbitrarily applying technologies[45] which prevents researchers to use their resources efficiently.[46]

2.3.3 Lack of Vision

Besides the practical relevance and its young age, the DIS is characterized by the fact that it has no common visionary research objective (comparable with the vision of a "disease-free society" in medical science) and has even little approaches to the creation of a vision.[47] This is denounced as a deficiency in practice as well.[48] In the past, two Delphi studies attempted to answer the ques-tion of the central themes for the future in the field of business information systems.[49] However,

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[39] Cf. *Schryen*, G. (2010): p. 235, 241.

[40] Cf. *Knackstedt*, R. and *Winkelmann*, A. (2006): p. 47.

[41] Cf. *Winter*, R., *Krcmar*, H., *Sinz*, E. J., *Zelewski*, S.; *Hevner*, A. R. (2009): p. 151.

[42] Cf. *Heinrich*, L. J. (2005): p. 110; *Steininger*, K., *Riedl*, R., *Roithmayr*, F., and *Mertens*, P. (2009): p. 426.

[43] Cf. *Picot*, A. and *Baumann*, O. (2009): p. 62.

[44] Cf. *Picot*, A. and *Baumann*, O. (2009): p. 67.

[45] Cf. *Picot*, A. and *Baumann*, O. (2009): p. 63.

[46] Cf. *Szyperski*, N., *Mertens*, P., and *König*, W. (2009): p. 10.

[47] Cf. *Mertens*, P. (1995): p. 25 ff; *Mertens*, P. (2006).

[48] Cf. *Heinzl*, A. (2008): p. 319; *Steininger*, K., *Riedl*, R., *Roithmayr*, F., and *Mertens*, P. (2009): p. 423.

[49] Cf. *König*, W., *Heinzl*, A., and von *Poblotzki*, A. (1995); *Heinzl*, A., *König*, W., and *Hack*, J. (2001).

only a weak link could be found between the results of the study and the actually realized research content afterwards.[50] Hence, the qualification of Delphi studies as guidelines on research agendas is worth discussing.

A common vision should not be underestimated for profiling such a young and dynamic science like ours. Rolf is attesting visions a meaningful and action-guiding force.[51] One of the few proposals, namely the "reasonable full automation"[52], was only briefly discussed and seems already outdated. Instead, just those themes find supporters, which are characterized by a mixture of current problems; ambiguity and vagueness of the solution and for this reason are only fit for short-term mission statements.[53] Thus the observed herd behavior in fashion themes could also be derived from the desire to join a "big idea".

3 Solution Statements

3.1 Agile Concept

Based on the assumed reasons for the strong focus on fashion topics, possible solutions can be discussed. Baskerville claims the requirement of greater agility in scholarly IS research to advance its role to enforce or mitigate fashions. Because the agility concept has its roots in the field of IS research his advice is to transfer it to research methods such as "agile action research" or "agile design research".[54] Unfortunately in the literature none of these recommendations can be found. As we support this interesting idea we start a first attempt and apply the original concept of agility to the research process.

The Latin origin "agilis" stands for "quick" or "mobile". In the development of information systems this mobility is to be achieved by little bureaucracy and the existence of only a few rules. The guiding principle is: The more you are working as planned, the more you get what you have planned, but not what you need. Thereby, agile development forms a sharp contrast to traditional approaches such as the V-model. In the year 2001 the Agile Manifesto was formulated by several researchers.[55] The basis constitutes four agile values, these are:

Value 1: **Individuals and interactions** over processes and tools

Value 2: **Working software** over comprehensive documentation

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[50] Cf. _Heilmann_, H. and _Heinrich_, L. (2006).

[51] Cf. _Rolf_, A.(1999).

[52] Cf. _Mertens_, P. (1995): p. 48; _Mertens_, P. (2006).

[53] Cf. _Kieser_, A. (1996).

[54] Cf. _Baskerville_, R. L. and _Myers_, M. D. (2009): p. 659.

[55] Cf. _Beck_, K. et al (2001).

Value 3: **Customer collaboration** over contract negotiation

Value 4: **Responding to change** over following a plan

The bold values on the left are weighted over the values on the right. Upon these values twelve different principles are built which can be understood as guidelines. They are in close relation to the agile methods, which are being used for software development (e.g. pair programming, test-driven development, story cards etc.). Altogether, agile values, principles and methods form the agile process.

It can hardly be denied that some parts of scientific research are already characterized through non-linear processes, iterations and feedback, so that they already are -in the simple sense of the word- "agile" or at least should be. This is reflected in the research cycle discussed in section 1.3. For a fairly long time in the field of software project management there exist established approaches, which are referred as being agile to a much more nuanced sense.[56] In the following, it should be shown that many characteristics of these agile approaches can be found in scientific research, hence that agile research exists.

Basically, one can agree to the four social and cultural key values of the Agile Manifesto from the perspective of research. Nowadays value 1 gains importance in respect to team-oriented research. Research must not be hindered by too rigid, restrictive rules and process models. Rather the involved researchers and their teams with their abilities and motivation take the center of attraction. The responsibility of the results and their competence depends on the researchers and they are not absolved from their responsibility through the strict system of rules.[57] The early development and providing of preliminary research outputs (value 2) is also highly valuable. The partial results should be evaluated in terms of its value by itself and in synergy with respect to the overall project, which is the case in teams but also important for individuals. Customers in software projects (value 3) are in research projects for example the funding institutions, the academic teacher, editor, or the researcher in person. In respect to the content of a project contract negotiations are of secondary importance. It is almost inherent to the curiosity and creativity of researchers to face changes and amendments concerning requirements as well as targets (value 4), to actively and enthusiastically follow the emerging new research paths. In addition, the twelve agile principles can be transferred to the research process fairly well. Instructions as "self-organization" or "welcome changing of requirements" which accompanies a constant "reflection

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[56] Cf. *Oestereich*, B. (2008); *Abrahamsson*, P., *Warsta*, J., *Siponen*, M.T., and *Ronkainen*, J. (2003); *Augustine*, S., *Payne*, B., *Sencindiver*, F., and *Woodcock*, S. (2005).

[57] Cf. *Oestereich*, B. (2008): p. 19.

and adjusting" of the own work, may be retained completely and are already standard in the daily work of scientists. A further principle is "environment for motivated individuals" which is just as important in relation with research. It supplements value 4 mentioned above: it is indispensable to provide adequate support in personnel and material for a further increase of motivation.

When looking at a research process which is directly linked to practice, even more principles apply. The principle "delivery of valuable software" targets the customer satisfaction maintained through early and regular supply of functional software. The transferability has already been positively assessed (as in value 2); however, the priority should be lower. The principle "face to face communication" is also met by the research process in general. In practice linked contract research -where especially the requirements of the ordering party should be precisely clear- personal exchange must be consciously promoted.

Agile processes promote sustainable development. Value orientation and the twelve principles aim at that direction. Agile research is eager to learn in depth, to experiment, to create prototypes, to evaluate them in practice environment and to give feedback to confirm or correct the main theses, models and concepts. Hence it includes a research cycle. This will, if necessary, go through several iterations, with one or with successive research projects. The statement of Oestereich that most agile methods are "structured frameworks with disciplined discriminatory rules and principles within which or from which then can be proceeded agile"[58] may be -from our point of view- well transferred to the field of research. Oestereich provides a detailed procedure for agile project management[59]. It is a three-leveled, sophisticated loop hierarchy that on the upper levels applies well on the research processes. The lowest level delivers executable versions, but, in respect to research processes, is too detailed, too prescriptive for free, creative research, e.g. regarding the required strict compliance with time even if there is insufficient progress.

3.2   Sustainability

The comparison of the agile approach with the general research process has shown that research is already agile. To avoid the negative effects of a strong fashion-affected research, further efforts are needed. Recapitulating our findings of the factors that influence the researchers' motivation, several issues come to the fore. An important fact devolves to the external financing of research through third-party funds. The dependency on donors poses a problem, if their influence threatens the freedom of research and jeopardizes long-term gain in knowledge by focusing on

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[58] Cf. *Oestereich*, B. (2008): p. 19. Translated from German.

[59] For more detailed representation see *Oestereich*, B. (2008): p. 19.

fashions. The risk lies in a too strong orientation on the requirements of practice and therewith diluting the own research base. It must therefore be ensured that also the establishment of fundamental research is aspired.[60]

Considering the publication process there must be a stronger focus on instructing young academics on how to attain proper scholarly publications. Osterloh and Frey argue for a change in the review process. They require fewer peer reviews and academic rankings, which should lead to greater freedom of research, and therefore a more rigorous selection and socialization at the beginning of academic careers.[61] According to Osterloh autonomy may lead to voluntary commitment in the long run. As mentioned above, one of the key characteristics of the DIS is its reliance on practice. Regarding the engagement of researchers in the setting of new topics a healthy equilibrium must be found. Researchers have to find a balanced extent of monitoring practice and thoroughly deciding when to interfere and also identifying new and relevant topics. Another characteristic of the DIS is its relatively young academic past and the still enduring building of a consistent terminology. A stable common terminology as well as the establishment of a holistic construct of theory is the basement for every science and still an area to emend in DIS. The lack of a common vision completes the understanding of the partial volatility of topics in DIS and a discussion about the necessity of a vision and potential proposals would help to align our common research objective. To be contemporary would be a long-term goal, based on the basic strategies of the economy, such as the goal of sustainable development. Such a vision could be developed in dialogue with practice.[62]

Since fashions cause efficiency losses, it appears as an important task of DIS research to mitigate these fashions, both the level and the frequency of the "eruptions".[63] According to Heilmann this must not only be accomplished through the researchers on their own, but demands support and incentives of the science policy.[64] The development of a stable long-term research must be the objective of a science. This long-term research contains the cycle of building upon sustainable results of other researchers and therewith promotes the field of science.[65] Sustainability is long term oriented action with respect to economic, ecological and social values. The aim is sustainable development that meets the needs of people today without compromising the satisfaction of needs of future generations.

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[60] Cf. *Winter*, R., *Krcmar*, H., *Sinz*, E. J., *Zelewski*, S., and *Hevner*, A. R. (2009).
[61] Cf. *Osterloh*, M. and *Frey*, B. S. (2010).
[62] Cf. *Heinzl*, A., *König*, W., and *Hack*, J. (2001): p. 321.
[63] Cf. *Mertens*, P. (2006); *Heilmann*, H. and *Heinrich*, L. (2006).
[64] Cf. *Heilmann*, H. and *Heinrich*, L. (2006): p. 107.
[65] Cf. *Loos*, P., *König*, W., *Österle*, H., *De Marco*, M., *Pastor* J. A., and *Rowe*, F. (2010): p. 251.

Fashions portray a possibility for the application oriented science DIS to convey content from and to practice. However, it is important to question which intentions and interests are linked with the discussed issues and what the main scientific objective is.[66] Researchers have the duty, to distinguish between hypes and scientific challenges. Some researchers seem to accept this challenge. An opposing trend to the current fashions represents the developing of long-term research agendas of individual departments, which take up fashion issues only if they are consistent with their own research agenda.[67] On the other hand, it must be assured that research must provide value for the economy and society as well, and shouldn`t concentrate too much on itself.[68] This depicts the delicate undertaking of developing a common vision which only goes so far as it doesn`t affect the principle of academic freedom.[69]

To carefully review the state of research is a necessity. Therefore it is utterly important to investigate if a topic has already been examined in the past. However, more future research is needed to analyze the relationships of preceding and succeeding terms.[70] Literature reviews offer a methodology to discover unnoticed fields of research. This is an important step for systematically identifying relevant literature and providing a conceptual based illustration of the results. The meta-literature study of Schryen shows that there are still areas of research which are not covered through reviews yet.[71] A more intense engagement in this perspective seems recommendable. Another interesting proposal comes from Szyperski and addresses the development of a reference framework. The idea is to create a platform to save scientific contents of papers and gray literature and therewith follow the progress of a scientific area.[72] The idea of Steiniger et al. follows the same direction as they propose detailed frameworks and classifications, where the diverse topics are condensed to their essences.[73]

Comparing the sister disciplines IS and DIS leads to further possibilities of gaining insight. Lately the DIS research has shown the ambition of internationalization[74] whereon the increased number of empirical work can be traced back[75] and it is also increasingly aligned to its sister discipline IS. Furthermore it is observable that IS tends towards Design Research. Hevner calls it "a

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[66] Cf. _Rolf_, A.(1999).

[67] Cf. _Lange_, C. (2006): p. 22.

[68] Cf. _Loos_, P., _König_, W., _Österle_, H., _De Marco_, M., _Pastor_ J. A., and _Rowe_, F. (2010): p. 252.

[69] Cf. _Steininger_, K., _Riedl_, R., _Roithmayr_, F., and _Mertens_, P. (2009): p. 422.

[70] Cf. _Steininger_, K., _Riedl_, R., _Roithmayr_, F., and _Mertens_, P. (2009): p. 424.

[71] Cf. _Schryen_, G. (2010).

[72] Cf. _Szyperski_, N., _Mertens_, P., and _König_, W. (2009).

[73] Cf. _Steininger_, K., _Riedl_, R., _Roithmayr_, F., and _Mertens_, P. (2009): p. 422.

[74] Cf. _Loos_, P., _König_, W., _Österle_, H., _De Marco_, M., _Pastor_ J. A., and _Rowe_, F. (2010): p. 244.

[75] Cf. _Wilde_, T. and _Hess_, T. (2007): p. 285.

natural evolution" of the IS research and points out that synergies come especially from combining design and behavioral methods.[76] It seems that a lot of potential lays in the merging of the sister disciplines, especially in taking over research insight.

4   Conclusion

Empirical studies show that IS and DIS are strongly driven by fashions, the latter even more. To avoid the resulting negative effects Baskerville and Myers require a more agile research for the IS. We tried to transfer this idea to DIS-research. The comparison of the DIS-research process with the concept of agility points to a strong congruence between the both. Furthermore our causal research, which reflects the current state of discussion, depicts the need for more sustainability, a vision, a common terminology and a construct of theory in the field of DIS. From our perspective the Memorandum edited by Österle, Winter and Brenner is an important milestone on this way. One can ascribe great potential to it to advance the alignment of DIS-research. In sum we belief that a stronger focus on value-driven rather than plan-driven research is needed. For that purpose further discussion about potential values and visions is required. The present contribution is a first step in this direction.

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[76] Cf. *Winter*, R. (2009): p. 126,127.

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