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Digital Humanities and Information Systems: Innovating Two Research Traditions

Full Paper

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Abstract

According to the philosopher Wilhelm Dilthey the scope of the humanities is the experience of the world, the expression of these experiences and the understanding of these expressions. The Information Systems (IS) discipline deals with human experiences of computer systems as much as with the expressions of the world in the digital media and, therefore, can be seen as the humanities of the digital realm. Hence, it appears to be very fruitful to promote a closer cooperation between the two evolving disciplines of IS and the Digital Humanities, which aims to include the digital world in the humanities. The only barrier to such a collaboration lies in the relative unawareness of each other. This paper wants to make a contribution to change this. It postulates that both research traditions can be innovated by moving closer to each other and by collaborating on an interdisciplinary level.

Keywords

IS definition, Digital Humanities, Humanities of the digital realm.

Introduction

One of the basic but also most important tasks for a scholar of the so-called Digital Humanities (DH) is to translate and mediate between the world of information technologies and the humanities. A lot of problems that arise during teamwork between the two fields simply result from a different use of terms which are so clear to the individual disciplines that they just don't see the possibility that it could be understood differently. This leads to misunderstandings which could impede collaboration.

Just to give one example: In the humanities "ontology" is a discipline of theoretical philosophy, which deals with the nature of being (and not-being) as well as the basic structures of reality. In the eighties of the 17th century Gottfried Leibniz defined ontology in his introduction to a secret encyclopedia in the following way: "Ontologiam seu scientiam de Aliquo et Nihilo, Ente et Non ente, Re et modo rei, Substantia et Accidente." "Ontology or the science of something and of nothing, of being and not-being, of the thing and the mode of the thing, of substance and accident" (Leibniz, 1903/1961, p. 512).

In total contrast to this definition, "computational ontologies are a means to formally model the structure of a system, i.e., the relevant entities and relations that emerge from its observation, and which are useful to our purposes" (Guarino, Oberle, & Staab, 2009, pp. 1–2). It is quite obvious and far from being new that the terms diverge fundamentally, even though according to Guarino et al. (2009, p. 1) the IT term derives from the philosophical one.

This is just one example of why there is a need for mediators between the two worlds. Another example is found in Kruse & Tumbas (2016) who point out that digital technologies are changing research approaches in ethnography fundamentally; however, anthropologists must be convinced that digital ethnography is still valid ethnography, while the computing specialists are more interested in the technical aspects. The interaction between the two sides of the research is actually relevant for both parties and should therefore be addressed.

The problem of bridging the divide between traditional humanities disciplines and Information Systems (IS) leads us to a second question: Why should scholars in the humanities and information technology speak with each other and what is the mutual benefit to work in a transdisciplinary way in the evolving field of DH?[1]

When seeking answers to these questions, first of all a clear definition of the humanities is indispensable to get a better grasp on what DH could be. A next step for a fruitful understanding between the two fields of research is a closer view on information technology, a topic that – for the special purpose of this paper – is widened into IS,[2] the discipline that includes "IT, along with procedures and data" (Travica, 2014, p. 15). On the basis of these definitions the mutual relations of the two disciplines will be discussed.

What are the Digital Humanities?

Today the humanities are widely understood as an agglomeration of several academic disciplines, including arts, history, philology, philosophy, and religious studies. This clustering varies strongly and is often an arbitrary classification by universities, depending on historical and administrative decisions. There are broad discussions in how far jurisprudence, social sciences, theology and psychology belong to the humanities[3] and on whether the term is not to be replaced by cultural studies (Frühwald, Jauß, Koselleck, Mittelstraß, & Steinwachs, 1996). Such a pragmatical approach towards the humanities may have its benefits in an administrative setting (especially when it comes to budget cuts), but as a common ground for a consistent idea of DH, it is almost of no use. The lack of understanding of what the humanities actually are leads to a confusion when it comes to DH.

Klein and Gold (2016, p. ix), for example, describe the field of activities of DH as follows: "Along with the digital archives, quantitative analyses, and tool-building projects that once characterized the field, DH now encompasses a wide range of methods and practices: visualizations of large image sets, 3D modeling of historical artifacts, 'born digital' dissertations, hashtag activism and the analysis thereof, alternate reality games, mobile makerspaces, and more."

The Humanities World Report 2015 detects the following research trends:

- "Digital collections, archiving and text encoding,
- Reading and analysing electronic texts,
- Geospatial and critical discursive mapping technologies,
- 'Big Data,' social computing, crowdsourcing, and networking,
- 3D immersive visualisation environments" (Holm, Jarrick, & Scott, 2015, p. 58).

Based on these descriptive attempts to handle the topic somehow, Klein and Gold (2016, p. ix) conclude that it is very difficult to determine the boundaries of the "big tent" of DH. Other scholars, like Alvarado (2012, pp. 50–51), go a step further, when they insist there is no definition of DH, no "agreement on theory, methods, professional norms, and criteria of evolution", but only "a genealogy, a network of family resemblances among provisional schools of thought, methodological interests, and preferred tools". Schnapp & Pressner (no date) claim in their Digital Humanities Manifesto 2.0: "Digital Humanities is not a unified field but an array of convergent practices" and Klein (2015) characterizes the humanities in general and especially DH as an interdisciplinary field of disciplines with a common history. If one pursues this line of argumentation further, DH will remain an ancillary applied science of the diverse academic fields, which will not lead a step further towards the foundation of DH as an independent discipline. All of these approaches miss out on the fact that the humanities are more than just an accumulation of disciplines and that there has been an extensive debate on the scope and the methodology of the humanities, as well as on the demarcation from the natural sciences since the 18th

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[1] For the latest definitions of transdisciplinarity in the newest literature see Bernstein (2015).

[2] The use of the word "widened" emphasizes the inclusion of the human factor.

[3] This paper uses the humanities in the broadest sense. This includes social sciences, theology and psychology, if they use the hermeneutic paradigm (see below).

and 19th century. To get a better understanding of what DH may be it can be fruitful to have a closer look at this debate.

What are the humanities?

The debate on the humanities can be traced back to the philosophical movement of German idealism of the 18th and 19th century and the formation of scholarly disciplines, especially in the natural sciences. In this context the question of a proper demarcation between 'Geisteswissenschaften' (= humanities) and 'Naturwissenschaften' (= natural science) arose (Diemer, 1973).

"The 'Geisteswissenschaften' debate was provoked by the emergence of a positivist account, which advocated reforming the human sciences on the model of natural science" (Anderson, 2003, p. 222). John Stuart Mill tried to rescue 'moral sciences' by generalizing the methods of the natural sciences. According to Mill (1843/1973, p. 877) the basis of the explanation of human behavior must be empirical, while the actions themselves can be described by causal laws.

This kind of positivism about human behavior was opposed even by representatives of the natural sciences like the physiologist and physician Hermann von Helmholtz. Influenced by Johann Gottlieb Fichte and Immanuel Kant, Helmholtz insisted on the distinction between 'Geisteswissenschaft' and 'Naturwissenschaften' by their topics. Therein he stands in a tradition of the pedagogue Ernst Adolf Eduard Calinich, who first made this demarcation, regarding the humanities as a philosophy of spirit in the Heglian sense of 'Geist' (spirit)[4] (Diemer, 1968, pp. 183–187). For Helmholtz, "lacking universally valid laws, the human scientist unifies her data into a scientific whole by deploying a refined ability to see the meaningful connections among cultural phenomena" (Anderson, 2003, p. 223). The basic idea behind this is that there are facts based on the different sources on the one hand and on the other hand connections between them, which are not depending on natural laws, but on the abilities of the researcher.

The Neo-Kantian philosophers Heinrich Rickert and Wilhelm Windelband described this with the distinction of nomothetic sciences, which aim to the build universal laws, compared to idiographic inquiry performed by the humanities (Rickert, 1896/1986; Windelband, 1894/1980). "This view emphasized the methodological autonomy of the human sciences from the natural sciences, at the expense of the difference between the subject matters of spirit (Geist) and nature" (Anderson, 2003, p. 224). A focus for Windelband as well as for Rickert lies in the 'Zusammengehörigkeit' (= the nexus or connectedness) of facts and the ability of the researcher to identify this historical defined structure (Rickert, 1896/1986, pp. 66–67 & 81-83), a thought that can be traced back to Barthold Georg Niebuhr and Alexander von Humboldt.[5]

'Zusammengehörigkeit' is also one of the pillars for Wilhelm Dilthey's methodological considerations on the distinction of human studies and natural sciences[6], which he presented in 1910 in "The formation of the historical world in the human sciences" (Dilthey, 1910/2002). The distinction between natural sciences and human studies lies in the task. While natural sciences are concerned with natural laws, the humanities deal with lived experience, its understanding and its embeddedness in history. "Dilthey emphasizes the role of psychology because it provides the fundamental concepts (e.g. thinking, willing, feeling) in terms of which the directly given inner world of lived experience can be understood. Lived experience and its products form the proper subject matter of the 'Geisteswissenschaften'" (Anderson, 2003, p. 224). This includes studies of history, economy, art, social and cultural studies, law, religion as well as languages, because all of these experiential approaches, as well as the understanding of someone else's experience, judgments and terms, try to express lived and understood issues (Scheuermann, 2016, p. 59). Despite the individuality of these approaches, for Dilthey the objectivity of knowledge of the topic remains in "the behavior of the mind, which, in difference to the natural scientific cognition, is the topic of

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[4] Calinich uses the Heglian term without an explicit postulate on the philosophy of history.

[5] For a more detailed discussion on the *Zusammengehörigkeit* in the founding of the humanities as a discipline see Dickey (2012).

[6] For a detailed introduction in Dilthey's understanding of human studies see Rickman (1979, 1988).

human science. Humanity, construed on perception and cognition would be a physical fact and as such the topic of natural science. It only becomes a topic for the human studies, when human being is experienced, the experience comes to expression in manifestations of life, and these manifestations again are understood" (Dilthey, 1910/1970, p. 98 - translated by the authors)[7].

So, for Dilthey the objective of the humanities is neither reconstruction or retelling of reality as such, nor a simple antiquarianism, but the ordering of the experienced world, the revealing of 'Zusammenhang' via these three steps of the hermeneutic interpretive method – experience, its understanding and expression, which then forms again the basis of experience and understanding. From that he develops a procedure, which on his account builds the common ground for the humanities. "The hermeneutic method approaches holistic cultural meanings by its famous circular procedure: first, the interpreter projects a hypothesis about the meaning of the whole, which she uses as background for understanding each part in turn; but the initial hypothesis is only tentative, and the interpreter allows her gradual discoveries about the meanings of the parts to influence her hypothesis about the whole, revisions of which, in turn, once again affect the way she sees the parts" (Anderson, 2003, pp. 228–229).

The method of hermeneutics is in fact not an invention of Dilthey, but it stands in a long tradition of text exegesis (especially Bible exegesis) of the antiquity and middle ages.[8] The theologian and philosopher Friedrich Schleiermacher appears to be the father of modern hermeneutics as a method (Palmer, 1969). He established hermeneutics as an art of understanding and as a universal discipline, designed for exegesis, which must not rely on any kind of divine inspiration. It always includes two tasks, one linguistic and the other psychological. While the linguistic interpretation focuses on the use of words and the shared language, the psychological one is distinctive to the author. The interpretation in itself, however, must be holistic and may not remain separated in the two parts. Its result is the hermeneutic circle, already described above, that iterates between the interpretation of the pieces and the text as a whole (Schleiermacher, 1838/1998). Dilthey, who published an extensive study in 1860 with the title "Schleiermacher's Hermeneutical System in Relation to Earlier Protestant Hermeneutics" (Dilthey, 1860/1996, pp. 33–227), took Schleiermacher's principles and adopted them to a much more general method for the humanities as a holistic interpretation of human perception and understanding of the world.

A continuation of this line of argument can be found in the works of Martin Heidegger's phenomenology (Heidegger, 1925/1993, pp. 143–177), as well as in the work of Hans Georg Gadamer (Linge, 1973) and Paul Ricoeur (2010), but that would lead too far for the specific question of this paper,[9] because, as Anderson notices correctly, "they were less concerned to account for the scientific status of distinctive human sciences, and more interested in the suggestion that humanistic enquiry might offer a philosophically richer and deeper kind of access to truth of being than science (increasingly understood to mean only natural science) could ever" (Anderson, 2003, p. 232).

This section is, therefore, rather concluded with short notices on Ernst Cassirer's continuation of the Neo-Kantian argumentation, which, due to the specific issue of this paper, cannot be covered to its whole extent. In his studies on "Philosophy of Symbolic Form" Cassirer (1923-1929/1964) introduces a combination of systematical and historical methods through which he analyses language, myth and religion, as well as modern scientific knowledge. He reunites nomothetic and idiographic procedures into a universal philosophy of cultural science. In this philosophy the forms of world views are in their specific ways equal, which means that the symbolic forms cannot be reduced into each other, but have the same legitimacy as long as they are in themselves consistent. "Just as the genetic conception of knowledge is primarily oriented towards the 'fact of science' and, accordingly, takes the historical development of scientific knowledge as its ultimate given datum, the philosophy of symbolic forms is oriented towards the much more general 'fact of culture' and thus takes the history of human culture as a whole as its ultimate

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[7] The German edition of "Aufbau der Geschichtlichen Welt in den Gesisteswissenschaften" by Suhrkamp from 1970 contains texts not included in the modern English version. Therefore, that version was used for this citation and translated by the authors.

[8] For a detailed introduction in the historical foundation of the modern hermeneutics see Detel (2011).

[9] For a detailed introduction in contemporary hermeneutics see Bleicher (1980).

given datum" (Friedman, 2016). Cassirer's view is the last attempt for a solution to the problem of the *Geisteswissenschaften*, which is the distinction from the natural science, and at the same time keeping their status as sciences.

So in summary of this historical overview, it becomes clear that the approach of hermeneutics as well as the Neo-Kantian idiographic inquiries and Cassierer's facts of culture, based on objective different sources depending on the domains of the independent disciplines, as well as the idea of 'Zusammenhang', comprise fundamental demarcation criteria of the humanities understood as human studies (also called human sciences). Its objective is to understand the experienced world instead of explaining it. "The question is not whether there are special sciences of art, history, political economy, linguistics, etc., each with its field of research, but rather, whether these sciences share some special mode of cognition, some set of methods and pattern of concept formation, which is proper to the human sciences, but not the natural sciences. Thus, the logical/methodological demarcation is more fundamental than the difference in subject matter" (Anderson, 2003, pp. 232–233).

A definition of the Digital Humanities

Taking the proposed definition of the humanities for granted, the next step must be to point out the impact for DH as a discipline. There are two different fields resulting from the presented:

- The question of sources, their acquisition and their digital representation and

- The question of the 'Zusammenhang', the nexus between the sources, as well as the process of uncovering it.

Both topics form the common ground of the discipline of Digital Humanities. There are fields of DH that are more concerned with the collecting and representing of the data, for example, data modeling and encoding, and others that focus on the nexus, like GIS, the analysis of Big Data or social computing, but in the end both always have to be concerned with the two sides. So DH is not "an array of convergent practices" (see above), nor digital antiquarianism, with only the objective to collect all historical data, propagated last by Lauer (2013), nor the excessive collection and juxtaposing of all data existing, which then shows history "as it has been" as in Frederic Kaplan's vision of the "Venice time machine"[10], but a discipline concerned with human experience as well as the understanding of someone else's experience, judgments and term, which themselves try to express lived and understood issues in digital media. The big challenge for DH therefore is to bring together the wide range of data, tools and practices in one environment to allow the researcher to combine them freely in a documented genuine digital hermeneutic process.[11]

What is Information Systems?

After the defining of DH as a whole, a next step must be to give an insight in IS as a discipline. This paragraph will not contain revolutionary news, but will provide an understanding of the discipline, to form a basis on which the mutual relationship of the two disciplines can be analyzed. So, what is IS?

To answer this question, Hirschheim and Klein (2012) published a paper called "A Glorious and Not-So-Short History of the Information Systems", in which they outlined the development of the discipline from the 1950s until today. They divide their studies in four epochs, i.e. (a) the era of centralization; (b) the era of the PC with a focus on management and the user; (c) the era of decentralization and outsourcing; and (d) the era of distributed and internet technologies. The debate on the essence of IS continued through all four eras, but there has always been a strong focus on software issues in the realm of business and organization, as well as on societal issues related to computing. This paper tries to make another contribution to the discussion of the self-conception of IS as a discipline.

Besides recent trends such as enterprise architecture, design science research and big data analysis, the debate regarding the identity of IS is ongoing. Becker, Vom Brocke, Heddier and Seidel (2015) conducted

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[10] For a critical discussion on Kaplan's "vision" see Scheuermann (2014).

[11] For the implementation of genuine digital hermeneutics see Scheuermann (2016).

a study about the grand challenges of IS. The issues of discipline identity, theory and methodology were still under the top ten challenges identified. For example, Goes (2013) states that the scope and methodologies of IS have broadened over the past decades. Although the formulation of a single identity and paradigm has eluded the IS research community so far, it is actually fast developments in the field which necessitate interdisciplinary work and create limitless opportunities for agile, relevant research. Power and Hadidi (2015) call for contributions to the Journal of the Midwest Association for Information Systems (JMWAIS) by saying that the journal would like to promote scholarship of IS against the background of the ongoing debate of the field's identity and research agenda: "Please help us understand our new data-driven world and help us impact the humanizing of information technology." Hassan (2016) proposes the concepts of informatizing and systematizing as the essence of IS research that provides the necessary coherence (that has been lacking in the past) to validate the field as a discipline. We have to understand information much more as a cognitive act in which data is understood rather than the product of this process,[12] which could be described with the term knowledge (Hassan, 2016).

What does this mean for IS? The scope of this discipline is information understood as a process, the processing of data, at least in the mind. This has of course to include the data that is processed, as well as the technical devices used for the process, and the social, psychological, educational and similar background of the actors which all together form a system, that enables information. The perspective goes towards a smooth process of decision making in a specific situation or environment as well as towards the impact of such systems on a user, a group of users and up to the level of society.

IS is a historically grown discipline, deriving from management and established in the information sciences, that includes the human perspective, the experienced world, into information technology. From this relationship two basic issues are arising: the impact of human experience in computer-based systems, understood as a unity of technology, processes and people, and on the other hand, the impact of the technology on individual human experience, including groups as well as the society in general. Since the beginning of IS the theoretical and often philosophical foundation was an essential part of these studies.

On the relationship of IS and the DH

So far this paper discussed the scope and definitions of DH and IS, two emerging disciplines, which even show similarities in their quest for an understanding in their self-concept. The objective of DH is the experienced world in all its facets in digital media.

On the other hand, IS was defined as a discipline that focuses on the information side of information technology. Furthermore, information was defined as a process of translation of experience into data and data into knowledge. The scope of IS, therefore, also covers the experienced world in digital media. The two disciplines, deriving from different historical backgrounds therefore share actually the same subject, without being aware of another. The special scope of IS is the decision-making process, especially in management and business, while DH addresses a wide range of cultural and social studies, so IS can be understood as part of the humanities in general and DH in particular.

In the next few paragraphs the following aspects regarding interdisciplinary work between DH and IS will be explored: need; feasibility; approach; relevance; and implications for both fields.

In recent IS literature there are indications that leaders in the IS field are realizing that the traditional focus of the discipline on business and organizations has to be broadened by looking at greater societal issues. Winter, Berente, Howison, & Butler (2014) point out that the scope of IS should not be restricted and encapsulated in a single organisational 'container'. Recent discussions addressed "IS scholars and policy" (Applegate, Beck, Clarke, King, & Majchrzak, 2015). In this era different disciplines are converging, creating a melting pot of disparate ideas (Kallinikos, Majchrzak, & Riemer, 2016). Majchrzak, Markus, & Wareham (2016) confirm the awareness that the traditional organisational outlook of IS research has become outdated, and they call for "a more nuanced representation of how ICT impacts social phenomenon [sic]". In a recent call for papers for a special edition of MISQ on the role of IS in chronic disease management, the editors emphasize the interdisciplinary focus that is needed to find

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[12] Information in this sense also comes very close to its Latin etymology "in-formare", which means to bring something in a form.

software solutions that could address urgent needs in the treatment of chronic diseases (Bardhan, Chen, & Karahanna, 2017).

Although concepts from the social sciences have been used extensively in IS, the discipline is impoverished by not using more relevant concepts from DH. Winter et al.'s (2014) proposal that IS should move out of its organisational 'container' fixation could be extended even further by exploring issues from these fields. On the other hand, DH research foci could be amended by borrowing ideas from IS regarding the study of the social impact of software systems on organizations, including academic guilds; in fact, DH can be seen as an example of "upward causation", since it emerged as a new discipline from earlier activities by scholars to digitize traditional humanities research approaches (cf. Winter et al., pp. 260, 263-264).

Although a substantial body of work exists that uses humanities concepts in IS regarding, for example, the philosophy of IS and the application of hermeneutical approaches to study business texts and text analogues (Myers, 2013, pp. 36-47, 182-195; Boland, Newman, & Pentland, 2010), little work has been published that focuses on DH and IS, for example Oates's (2006) contribution regarding computing art and Kruse and Tumbas's (2016) discussion on digital ethnography.

The synergism between DH and IS can be achieved by focusing on the theoretical and practical applications between the two disciplines. Four main research themes are: (a) How can DH theories enrich IS? (b) How can IS theories enrich DH? (c) How can DH enrich IS on an practical level? (d) How can IS enrich DH on a practical level? These themes could be addressed, for example, by the following interdisciplinary projects:

- Using digital exegetical methods to analyze business data in narrative form – digital exegesis has been used to explore the history of economic thought (Knight, [ca. 2012]).

- Exploring the implications of digital hermeneutics for IS research that often uses the hermeneutical circle as an interpretive strategy for the analysis of organizational documents and text analogues (cf. Rafael, 2010:39).

- Applying digital history technology that creates virtual worlds making history more accessible (Lercari, 2016) to simulate IS research and organizational environments to prepare IS students for their careers in industry or academia.

- Learning from the role of educational games as tuition tools (Botha & Herselman, 2016) to enhance the teaching of and curiosity about DH.

- Considering the facilities of internet radio and other social computing services to improve networking between members of dispersed or isolated communities (cf. Zhao & Qi, 2014; cf. Vyas & Choudrie, 2013).

These research possibilities show that the benefits of closer collaboration for IS are only one side of the coin. Beyond the classification of IS as part of the humanities, the discipline can be described as the "humanities of the digital realm". Taking up again the definition of IS (i.e. studies on the impact of human experience in computer-based systems, understood as a unity of technology, processes and people and, on the other hand, the impact of the digital technology on individual human experience, including groups as well as the society in general), a wide field of studies arises regarding the analysis of DH. This opens up a whole new transdisciplinary research field for DH-IS, namely to explore the human aspects of DH systems. Currently the basic design approaches for computer-based information systems in DH are data- and not experience-driven. DH could largely benefit from the advanced methods developed in IS. Furthermore, the research on the impact of DH on the scholarly community, as well as society, is a topic, which, even though it is recognized in DH, can benefit by expert knowledge from IS.

Consequent benefits for IS could be the use of the already existing theoretical framework of the humanities (for example philosophy or sociology), which they are actually already doing, as shown impressively by Hirschheim and Klein (2012). Beyond this IS could profit from the wide range of methods and applications, used in the particular subdomains of DH, for example the encoding and analyzing tools for texts, audio and video. There is a vast reservoir of resources almost unknown in the information sciences. These new ventures may inform the analysis and design of software and eventually lead to a reassessment of our concept of the socio-technical aspects of IS, its theories and the discipline itself (cf.

Oates, 2006:618-9). Similarly, the nature of DH may be modified by extending its scope beyond the technical aspects to include critical analyses of the effect that DH has on the discipline and on communities that are affected by it.

Conclusion

This paper tried to contribute to the debate on the essence of IS by adding a new dimension to proposals regarding the broadening of the scope of the field to look further than the traditional business and organisational perspective. Some initial suggestions have been made on how DH can be used to enrich the scope and methodology of IS research, and vice versa. The authors plan to deepen this contribution in future by more detailed discussions on and examples of the reciprocal relationship between DH and IS. They also hope that other IS researchers and students will see and take up new opportunities to grow IS by implementing and testing some of these suggestions.

In summary, closer cooperation between IS and DH is a desideratum and would add value to both disciplines. Currently, the major obstacle lies in the lack of mutual knowledge and a common language, but this could be overcome by the initiation of special interest groups on both sides, as well as joint conferences, publications and consequentially collaborative projects. The implementation of the proposed transdisciplinary research between IS and DH is a field of its own which has to be explored further in future projects.

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