A Complex Philosophical Oeuvre and Its Complex User Community: Reflections on the Past, Present, and Future Digitisation of Wittgenstein’s Philosophical Writings

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Abstract
This paper reports the results of a user survey conducted by the Wittgenstein Archives at the University of Bergen (WAB) concerning some of the digital research tools and resources it has developed over the past three decades. The authors’ analysis of the survey results is embedded within a broader discussion of the nature and history of the digitisation of Wittgenstein’s philosophical writings. It is argued that the special nature of both Wittgenstein’s philosophy—especially the later Wittgenstein’s conceptions of meaning, concepts, and philosophy itself—and its primary material sources (Wittgenstein’s “Nachlass”) inherently call for a variety of advanced digital tools and resources; for instance, a digital interactive edition of his works, such as WAB’s Wittgenstein IDP: The Nachlass in Interactive Dynamic Presentation, to complement static ones such as traditional print editions and other, non-interactive digital editions. For similar reasons, the authors argue, WAB’s ongoing and future development of digital tools and resources for the study of Wittgenstein’s philosophy must be closely coordinated with the evolving needs of WAB’s large and diverse user community.

Keywords
Digital humanities, philosophy, Wittgenstein Archives, interactive dynamic scholarly edition, research platform, semantic technology, ontology

1. Introduction

In this paper, we discuss the results and implications of a user survey we have conducted regarding the digital tools and resources provided by the Wittgenstein Archives at the University of Bergen (WAB). We argue that the nature of Wittgenstein’s philosophical oeuvre strongly requires the development of advanced digital tools and resources to serve as user interfaces, and that this development must be closely coordinated with users’ evolving needs.
WAB was established in 1990. It is a research infrastructure and project platform that brings together philosophy, editorial philology, text technology, and digital humanities. Its holdings comprise works by the philosopher Ludwig Wittgenstein (1889–1951). WAB is perhaps best known for the publication of Wittgenstein’s Nachlass: The Bergen Electronic Edition (Oxford University Press, 2000). Wittgenstein left behind around 20,000 pages of unpublished writings, his “Nachlass”. WAB’s research infrastructure includes digital and paper copies as well as transcriptions of the Nachlass, following Georg Henrik von Wright’s catalogue system from 1969 (see Wright 1982 and the reprint with an addendum in Wittgenstein 1993). Since the publication of the Bergen Electronic Edition, WAB’s digital tools and resources have undergone substantial further development. In particular, since 2012 WAB has offered Semantic Faceted Search and Browsing (SFB), and since 2014 it has produced new digital facsimiles of the Wittgenstein Nachlass, which are available open-access via Wittgenstein Source. Since 2016, WAB has enabled interactive open access to all its transcriptions of the Wittgenstein Nachlass using an Interactive Dynamic Presentation (IDP) tool. In addition, WAB has developed an advanced Nachlass search tool in cooperation with the Center for Information and Language Processing at LMU Munich: the FinderApp WiTTFind. Today, these and other resources are all easily accessible via the newly created portal wittgensteinonline.no.

WAB has an extensive and diverse user base, comprising researchers from disciplines such as philosophy, computational linguistics, digital humanities, philology, literary theory and criticism, art, graphic design, and musicology. Recently, we launched a user survey about WAB’s main digital tools and the resources available via wittgensteinonline.no. The survey asked users to evaluate the following digital tools and resources:

- **Wittgenstein IDP**: The Nachlass in Interactive Dynamic Presentation
- **Wittgenstein SFB**: Wittgenstein Resources by Semantic Faceted Search and Browsing
- **Wittgenstein Source**: The Bergen Nachlass Edition and Other Primary Sources
- **WiTTFind**: The FinderApp for Nachlass Text Search
- **Wittgenstein XML TEI**: The Nachlass in XML TEI Transcription
- **Wittgenstein OWL**: Wittgenstein Resources in Ontology Representation

The target user group for the initial phase of the survey was selected on the basis of long-term participation in the Wittgenstein research community and familiarity with WAB’s digital resources. The main goal of the user survey is to strengthen user-oriented development and to integrate users’ feedback into decision making processes.

Wittgenstein’s Nachlass is enormously complex, in terms of its philosophical content, the diversity of materials it contains, the open-ended uses to which it might be put, and the sheer number of manuscript pages. Consequently, users’ participation in developing WAB’s digital resources seems vital, and this is something that has long been taken very seriously at WAB. Wittgenstein’s works represent a classic case of a humanities oeuvre that resists a generalised, mechanical structuring that lacks sensitivity to its subject-specific (in this case, philosophical) subtleties. As such, one can think of WAB as a constant work in progress, much like Wittgenstein envisaged his philosophy to be. Thus, the success of WAB as a knowledge base and research tool critically depends on its being appropriately dynamic, just like the works it represents and the kinds of use it is intended to enable; and so user involvement in the development
and maintenance of the resources is key to achieving this goal. In light of this, it is perhaps unsurprising that one piece of positive feedback that stood out in our user survey is that users especially appreciate the interactive features of certain resources, which allow them to adopt something like an editorial role for themselves.

In this paper, we shall first briefly introduce Wittgenstein’s life and works (section 2) and outline WAB’s project of digitising Wittgenstein’s works and some of the inherent difficulties it involves (section 3), before discussing some of the results of our survey and their implications for the future development of WAB’s digital resources (section 4).

2. Wittgenstein’s life and works

The philosopher Ludwig Wittgenstein (1889–1951) is widely considered one of the greatest philosophers of the 20th century. His work was exceptionally influential in the Anglo-American tradition, revolutionising what is known as analytic philosophy not once but twice, first with his *Tractatus Logico-Philosophicus* (1922) and then with the posthumously published *Philosophical Investigations* (1953/2009). Wittgenstein’s life and philosophical thoughts stand out for their uniqueness and authenticity. He was a brilliant, complicated thinker who refused to conform with traditional ways of living and philosophising.

Wittgenstein was born in Vienna on 26 April 1889 into one of the wealthiest families of the Austro-Hungarian Empire. As a boy he was deeply interested in engineering. In 1908, he went to Manchester to study aeronautics. But he became increasingly interested in the problems of pure mathematics, and in 1911 he travelled to Cambridge to meet Bertrand Russell, author of the monumental *Principia Mathematica* (with A. W. Whitehead; first published 1910). After meeting Russell, Wittgenstein abandoned his studies of aeronautics and devoted himself to logic and philosophy. At the outbreak of WW1 in 1914, he enlisted as a soldier in the Austrian army. He fought in many battles and was awarded several medals for valour. And yet, by the end of the war, he had managed to complete his first book, the *Tractatus*, which would remain the only philosophical book he would publish in his lifetime. He then took a hiatus from academic philosophy until 1929, when he returned to Cambridge. In Cambridge, he lived and worked at Trinity College supported by a fellowship and teaching work, eventually succeeding G. E. Moore as professor of philosophy in 1939. In 1947, Wittgenstein resigned from his chair at the Faculty of Philosophy and moved to Ireland. He died of cancer in Cambridge in 1951.

Wittgenstein’s philosophical work can be divided into two broad categories, the early Wittgenstein and the later Wittgenstein. The early phase of Wittgenstein’s philosophical thoughts and writings culminated in his *Tractatus*. The *Tractatus* was first published in German in 1921, but Wittgenstein despised this first edition. A translation into English, by C. K. Ogden (with the help of Frank Ramsey), was published by Kegan Paul in 1922 alongside the original German text. The work was significantly influenced by the intense discussions about logic and the nature of philosophy that Wittgenstein had had with Russell and Moore and the economist J. M. Keynes in Cambridge between 1911 and 1913.

The ambition of the *Tractatus* was to present nothing less than a comprehensive account of philosophy in general. We cannot go into the philosophical intricacies of *Tractatus* exegesis here. However, it is important to note the stark contrast between Wittgenstein’s early and later works,
because it is as a consequence of these philosophical and exegetical intricacies that a number of important issues arise for any attempt to prepare a digital scholarly edition of such material: that is, the oeuvre of an author whose philosophical thinking underwent a long period of revolution in the form of constant and profound self-criticism that is substantially reflected in his writings. Like most philosophical texts, Wittgenstein’s *Tractatus* has been interpreted in many different ways. In fact, the *Tractatus* is widely viewed as perhaps one of the most difficult texts to interpret in the canon of analytic philosophy. Notably, Wittgenstein himself thought little of the introduction that accompanied the 1922 bilingual edition, which was written by his friend and former teacher Russell. Wittgenstein thought Russell had fundamentally misunderstood the book. Later, in 1929, Russell and Moore were more than happy to pass the book as Wittgenstein’s PhD dissertation. At the conclusion of the official oral exam, Wittgenstein put an arm around both his examiners’ shoulders and said, “Don’t worry, I know you’ll never understand it” (see Wood 1957, 156).

Wittgenstein had periods of intense reclusiveness throughout his lifetime. For example, he would sometimes retreat for weeks on end to an isolated hut he had erected for himself in the remote Skjolden fjord in central Norway, where he would ponder philosophical problems. The reason Wittgenstein withdrew from academic philosophy after the publication of the *Tractatus* was that he believed himself “to have found, on all essential points, the final solution of the problems” (1922, preface). He gave away all his inherited family fortune, and for several years pursued a variety of professions in his native Austria, including as a schoolteacher, gardener, and architect. He was eventually persuaded to return to Cambridge and academic philosophy in 1929, largely thanks to the efforts of British mathematician and philosopher Frank Ramsey (who, as noted above, had previously played a role in the translation of the *Tractatus*).

In many ways, Wittgenstein was his own best critic. For example, one of the fundamental ideas in the *Tractatus* is that philosophy is not a doctrine but an activity, and so cannot be treated dogmatically. But after his return Wittgenstein criticised his earlier work in the *Tractatus* for still being far too dogmatic. Subsequently, his thinking and method developed rapidly in a number of new directions. The culmination of the most radical changes can be found in his posthumously published *Philosophical Investigations* (1953/2009). This is the work generally taken to authoritatively represent the later Wittgenstein.

Between the early and later Wittgensteins, there is sometimes said to be a middle Wittgenstein (see, for example, Stern 1991). This “middle period” is said to have begun shortly after Wittgenstein’s return to Cambridge, during which his thought underwent several radical changes. In addition to his notebooks, there are several volumes of conversations, letters and lecture notes that record some of the intense philosophical exchanges he was engaged in during this time, including with colleagues in Cambridge and Vienna. It was then that he decided to circulate what is now known as the *Blue Book* (1958/1969), a dictated typescript that was partly born out of his frustration at being (or, at any rate, feeling) misunderstood by his peers, including in their published secondary accounts of his work. Moreover, many Wittgenstein scholars have argued that there is another, post-*Investigations* Wittgenstein, i.e. an incarnation that is later than the later Wittgenstein, who finally retreats from his anti-dogmatism and actually (and knowingly) advances philosophical theses (for instance, in the well-known posthumous edition published as *On Certainty*, 1969). On the present count, that would be a *fourth* Wittgenstein, but in fact this school of interpretation is commonly known as “the third Wittgenstein” (see, for instance,

Upon his death in 1951, Wittgenstein left behind a philosophical Nachlass of some 20,000 pages. In his will, he appointed three of his closest personal and philosophical associates—Rush Rhees, Elizabeth Anscombe, and Georg Henrik von Wright—as his literary trustees, with the instruction to publish from his Nachlass at their own discretion. The resulting body of posthumous publications, consisting of various editions of unpublished philosophical notebooks, manuscripts, typescripts, and dictations and spanning the period of 1913 to 1951, reveals not only Wittgenstein’s complex life work but also a fascinating and complex relationship between the work itself (the raw material) and its presentation to the general public, as shaped and coloured by the editors’ interpretative practices (for a historical overview, see Erbacher 2020).

### 3. Digitising Wittgenstein

#### 3.1. The Bergen Electronic Edition

The year 2000 saw the publication of Wittgenstein’s Nachlass: The Bergen Electronic Edition (BEE), a joint publication by the Wittgenstein Archives at the University of Bergen (WAB) and Oxford University Press. BEE was the result of more than ten years of focused research and editorial work (see esp. Huitfeldt 1994). In addition to containing sources and drafts of some of the most important book editions of Wittgenstein’s work, BEE made available a significant quantity of previously unpublished material.

Wittgenstein’s manuscripts contain many instances of overwriting, substitutions, and deletions (with the deleted parts occasionally illegible); there are also a significant number of spelling mistakes and passages written in code, as well as the occasional doodle. In addition to facsimiles, BEE makes all of these details available in both “normalised” and “diplomatic” transcribed versions. The diplomatic version is designed to represent the author at work, allowing users to chart the course of Wittgenstein’s thought as it progresses, and sometimes digresses, in writing. The normalised version is tidier: for example, deleted text is omitted, spelling is corrected, and decisions are made between alternatives (usually in favour of the variant that was last added). Thus, BEE consists of three sub-editions—the diplomatic version, the normalised version, and the facsimiles—and could therefore also be called a “combined edition” (Pichler and Haugen 2005).

BEE represents the earliest attempt to digitise Wittgenstein’s complex philosophical oeuvre. At the time of its publication, it provided Wittgenstein scholarship with an unprecedented, digital form of access to his Nachlass and so opened up new research possibilities (see also Meschini 2020). Simultaneously, it made the Nachlass available to a large readership across the world. Thus, BEE clearly demonstrated some of the advantages of a digital edition over a print one, especially for a body of writings as complex as Wittgenstein’s Nachlass, including giving users more flexibility in how they could access it (Pichler 2021). In general, BEE remains an invaluable resource as the record of a pioneering attempt to digitise one of the most complex philosophical oeuvres that exists.

Today, the nature and complexity of Wittgenstein’s philosophical oeuvre, paired with the evolving and dynamic needs of the user community and the rapid development of digital
technologies, requires a digital humanities platform that offers more flexibility and more active
involvement from the user community than is possible with BEE. As crucial as BEE has been to
the project of digitising Wittgenstein’s Nachlass, it remains a static scholarly edition. Therefore,
after more than a decade of testing on a subset of the Nachlass—an early pilot was conducted
in 2004 (see https://wab.uib.no/sept1914/home.html; early discussion in Hrachovec 2000)—and
having obtained all required permissions, in 2016 WAB launched a complete, interactive edition
called Wittgenstein IDP: The Nachlass in Interactive Dynamic Presentation, which grants open
access to all of WAB’s transcriptions (available at wittgensteinonline.no).

3.2. Wittgenstein IDP: The Nachlass in Interactive Dynamic Presentation

There is a major difference between the editorial practices of BEE and IDP. In the case of BEE,
all editorial decisions were taken by the official editors, in particular regarding the precise level
and representation of detail (deletions, variants, section marks, etc.) in the diplomatic version.
But in the case of IDP, every user can adopt an active, editorial role for themselves and decide
how exactly they want the material to be presented in accordance with their own particular
preferences (Pichler and Bruvik 2014). According to our survey (reported in section 4 below),
IDP is the second most popular digital tool offered by WAB, after the Bergen Nachlass Edition
(BNE) on Wittgenstein Source.

The introduction and development of IDP was motivated by WAB’s recognition of a growing
and deeply rooted need in the user community, which was fuelled by the special character
of Wittgenstein’s philosophical practice and oeuvre. For instance, the dialogical character of
Wittgenstein’s philosophical practice and writing, especially in his later works, is partly a
function of his view that philosophy is a kind of intellectual therapy. As a consequence, he
took it to be his duty as a teacher and writer of philosophy that he and his texts should enable
others to work through their own individual problems and confusions. Thus, in Wittgenstein’s
own view his readers must be, and must be enabled to be, active interrogators rather than
passive recipients. This clearly already applies to the early Wittgenstein and the Tractatus, but is
especially true of the later Wittgenstein (see Sunday Grève 2015). More generally, it follows from
this that in order to be maximally faithful to Wittgenstein’s approach to philosophy, a scholarly
digital edition of his Nachlass should do more than adequately capture all of Wittgenstein’s
edits and revisions; in particular, it should also offer possibilities that go beyond any static
edition.

A useful example in this connection is Wittgenstein’s employment of section marks (of which
the Nachlass contains more than twenty thousand in total; see also Figure 1). A digital edition
that simply represents the relevant symbols on the page, even if placed in their precise location
and so on, misses the crucial point that Wittgenstein used these symbols for a reason: he wanted
to do things with the text sections he marked. Sometimes, he wanted to have a given set of
remarks dictated; in other cases, he wanted them to be copied, rearranged, or omitted. Thus,
Wittgenstein’s section marks express “action intentions” (Pichler 2021, 197).
So rather than merely receiving a visual representation of the symbol, the reader should be able to understand and explore Wittgenstein’s section marks as the action intentions that they are; indeed, they should be able to act those intentions out for themselves, for instance by grouping and displaying together remarks with the same section mark. This is precisely the sort of function that IDP was designed to offer.

Moreover, in the case of section marks, the reader’s editorial role is especially important for yet another reason. Since the meaning of some of Wittgenstein’s symbols is still only partially understood, the reader must be given the freedom to represent the text (arrange or omit sections, etc.) according to their own interpretation. Obviously, in order to provide the reader with this kind of freedom a scholarly digital edition must, at a minimum, provide the reader with the option to do so and, ideally, with the right kinds of tools in order to do so effectively. Again, this is precisely the sort of thing that IDP was designed to offer.

Thus, IDP exemplifies a progressive way of developing a digital tool for a complex philosophical oeuvre that closely follows—that is, both monitors and serves—the needs of the user community, and which no static edition could replicate.

3.3. Wittgenstein SFB, WiTTFind, and OWL

At the same time, the project of developing an adequate and comprehensive digital platform for an oeuvre as complex as Wittgenstein’s will clearly need to go further still. Today, such a project must also provide at least a minimal semantic framework. Semantics, in this connection, is the battlefield where digitisation truly runs up against the challenge that lies at the heart of all digital humanities research: the digitisation of meaning. Since 2012, WAB has therefore also provided Wittgenstein SFB: Wittgenstein Resources by Semantic Faceted Search and Browsing, which, just like all other current digital tools provided by WAB, is now also available via the recently created portal wittgensteinonline.no.

The term “faceted” (the “F” in SFB) simply refers to the properties and relations (“facets”) in terms of which the domain’s objects (i.e. text) can be classified. Thus, in SFB text and metadata are combined. SFB still needs a lot more development (see, for example, Pichler 2021). But it is already a powerful tool for implementing metadata, such as dates of composition, which works or individuals are being referred to, and which published edition of Wittgenstein’s works a
given remark was published in. However, Wittgenstein’s ideas, use of expressions, and spelling changed over the course of his lifetime; a state of affairs that is perhaps to be expected in the case of any complex philosophical oeuvre. As a consequence, digital semantic technology such as SFB requires a lemmatised lexicon. In the case of SFB, this is currently a work in progress, as the WiTTFind lexicon (Röhrer 2019; see also Hadersbeck et al. 2020) is still in the process of being implemented.

For similar reasons, building a computational ontology is crucial for proper digitisation of a complex oeuvre such as Wittgenstein’s. WAB currently offers a pilot version of a computational ontology on Wittgenstein OWL: Wittgenstein Resources in Ontology Representation (“OWL” stands for Web Ontology Language).

Wittgenstein’s philosophical oeuvre remains one of the most semantically dynamic and interpretatively contested in history. In particular, the Nachlass itself contains a large number of competing knowledge claims. At the same time, however, Wittgenstein’s philosophy also suggests possible ways forward in building a suitable ontology. In the Investigations, the later Wittgenstein introduces the notion of “crisscross” conceptual structures and methods of enquiry (see Pichler 2016). In the course of developing the notion of a language-game, he insightfully lays bare the difficulties in finding properties that are common to all games, before concluding:

… And the upshot of these considerations is: we see a complicated network of similarities overlapping and criss-crossing: similarities in the large and in the small.

67. I can think of no better expression to characterize these similarities than “family resemblances”; for the various resemblances between members of a family – build, features, colour of eyes, gait, temperament, and so on and so forth – overlap and criss-cross in the same way. – And I shall say: ‘games’ form a family. (1953/2009, secs 66–67; see also the preface)

Wittgenstein argued that not only the concept game but many of our most fundamental concepts (language, number, meaning, knowledge, etc.) share this crisscross-type structure. This account of concepts has profound implications for the digitisation of Wittgenstein’s philosophical writings, and potentially for computational ontology in general. For Wittgenstein’s account shows at least that it is not necessary, neither practically nor theoretically, that all entities subsumed under a general term of a natural language must have something essential in common by virtue of which they are so grouped.

Wittgenstein’s analysis thus raises the question of how general terms may be thought to work instead. What determines whether a particular general term is applied correctly to a given case or not? What is it that unites the things that are subsumed under a general term such as “game”? Here the notion of language-games comes into play (see Sunday Grève 2018). Wittgenstein writes:

The word “language-game” is used here to emphasize the fact that the speaking of language is part of an activity, or of a form of life. (Wittgenstein 1953/2009, sec. 23)

The meanings of words in our natural languages, and with them the structures of the concepts that correspond to them, evolve organically in the dynamic situated contexts and environments
in which they are used by the members of a given linguistic community. For example, children learn the meanings of words by learning what to do with words on the basis of examples and on particular occasions. In this way, children are initiated into the linguistic practice of their community, which they inherit. If this is how meaning and conceptual structures are constituted at the level of linguistic tradition, then no one in a given community of speakers of a natural language need be able to formulate the rules according to which the words of the language are to be used; moreover, there need exist no fixed rules that could be formulated (except perhaps in the most abstract way, if we froze time and surveyed all present and past facts about usage); on the contrary, the nature of meaning and concepts will be essentially dynamic, open-ended, and evolving (see Sunday Grève forthcoming). Wittgenstein thought that using language in general resembles the kinds of games that young children are taught to play during the early phase of natural-language acquisition, and so he coined the term "language-game" to refer to virtually all kinds of language use.

Thus, Wittgenstein’s account of the nature and structure of meaning and concepts provides a framework within which an appropriate computational ontology may be conceived, especially perhaps for Wittgenstein’s own complex oeuvre and others in a similar mould. However, the detailed theoretical conception and practical development of this envisioned framework, not to mention its concrete implementation, remains a major challenge (see Pichler et al. 2021). The pilot currently available on Wittgenstein OWL employs the RDF (Resource Description Framework) data model in an attempt to organise the entire Wittgenstein domain—not only the Nachlass but also other sources (including scholarly secondary literature)—under three top classes: Source, Person, and Subject (Pichler and Zöllner-Weber 2013). However, faithful representation and implementation of Wittgenstein’s philosophy in the form of a computational ontology—especially if it is to respect Wittgenstein’s own account of crisscross conceptual structures—will require novel approaches in ontology design itself. The first step is to try to render an ontological framework that may be capable of fully representing the continuous evolution of meaning, competing knowledge claims, and multiperspectivism that is characteristic of Wittgenstein’s work.

To date, such an ontology remains an unattained ideal, but WAB’s pilot is a proof-of-concept project. In particular, the aim is to show how in principle to digitally map a rich body of multi-cultural humanities knowledge within a computational ontology environment that incorporates competing structures (meanings, concepts, knowledge claims, etc.) into a single model.

4. WAB and its users

Today’s challenges of digitising Wittgenstein’s philosophical works are not merely a consequence of the material and intellectual nature of the works themselves, but are intimately bound up with the user community too. Of course, certain characteristics of any given user community can be predicted with a fair amount of certainty. However, it should be equally obvious that the user community of a complex philosophical oeuvre such as Wittgenstein’s, including associated modern digital resources such as those offered by the Wittgenstein Archives at the University of Bergen (WAB), is itself no less complex an animal, and one which could develop in all kinds of unforeseen directions.
For this reason, we have recently started systematically surveying users about their views on and experiences with WAB’s current main digital tools and resources, available via wittgensteinonline.no. WAB’s user base is a large and diverse group, including students and scholars of philosophy, computational linguistics, digital humanities, philology, literary theory and criticism, graphic design, and musicology. However, the target users during the initial phase of the survey, results from which we present in this paper, belong to a small group of experienced scholars who were selected on the basis of their long-term participation in the Wittgenstein research community and their high degree of familiarity with WAB’s digital resources.

The survey asked users to evaluate the following digital tools and resources, which are available (open-access) via wittgensteinonline.no.

- Wittgenstein IDP
- Wittgenstein SFB
- Wittgenstein Source
- WiTTFind
- Wittgenstein XML TEI
- Wittgenstein OWL

The survey was conducted using Google Forms. It consisted of the following 18 questions. Questions (15) and (16) were designed to give participants the option to remain anonymous.

1) How did you first hear about WAB resources?
2) Which of the following digital tools are you familiar with or have you used? IDP, SFB, Wittgenstein Source, WiTTFind, Wittgenstein XML TEI, Wittgenstein OWL.
3) Which digital tool do you use the most?
4) Do you easily and usually find what you are looking for when visiting WAB resources?
5) What, if any, are the challenges you face when using WAB resources?
6) Are there any other online Wittgenstein resources, other than WAB, that you use? If yes, please specify.
7) For what research question(s) or research project(s) have you used digital tools or methods? Please specify the digital tool used.
8) Briefly describe the advantage(s) of using a digital tool in your research. Did it allow you to ask different research questions? Did it allow you to complete a research process more quickly or efficiently? Did it help in some other way?
9) Are there any other digital tools that do not yet exist that would be helpful to your research? Please describe the proposed digital tool and how it would help your research.
10) How likely is it that you would recommend WAB resources to colleagues? Please answer with a number between 1 and 10. (10 – extremely likely. 1 – not at all likely)
11) If you recommend WAB resources to your colleagues, which of the following would you recommend? Please choose from the following list in order of preference: IDP, SFB, Wittgenstein Source, WiTTFind, Wittgenstein XML TEI, Wittgenstein OWL.
12) How likely is it that you would recommend WAB resources to your students? Please answer with a number between 1 and 10. (10 – extremely likely. 1 – not at all likely)
13) If you recommend WAB resources to your students, which of the following would you recommend? Please choose from the following list in order of preference: IDP, SFB, Wittgenstein Source, WiTTFind, Wittgenstein XML TEI, Wittgenstein OWL.

14) How likely are you to follow WAB on social media such as Facebook, supposing that, amongst other things, this would provide a community platform for discussion of practical and theoretical research questions? (10 – extremely likely. 1 – not at all likely)

15) What is your first and last name?

16) What is your email address?

17) What is your field of research or study? e.g. philosophy, linguistics, digital humanities, text technology, information technology etc.

18) Any other comments/feedback on WAB resources?

4.1. Discussion of survey results

In this section, we will briefly discuss results from the initial phase of the survey, in which we surveyed a small target group of users. This target group consists exclusively of experienced scholars whom we selected on the basis of their long-term participation in the Wittgenstein research community and high degree of familiarity with WAB’s digital resources. To date we have received a total of 26 responses. We should stress that we are only reporting a subset of our survey results that we consider to be of special interest, and that we are planning to continue surveying WAB users in this way for the foreseeable future. The survey responses we report in this paper come from participants in a wide range of disciplines, including philosophy, digital humanities, text technology, linguistics, artificial intelligence, philology, literary theory and criticism, learning technologies, information technology, book design, and musicology. The majority of the respondents (21 out of 26) identify their primary research field as being philosophy, often more narrowly qualified as, for instance, philosophy of text, philosophy of artificial intelligence, or philosophy with digital humanities. Overall, the respondents’ profiles reveal the wide-reaching impact of digitising Wittgenstein’s works.

Answers to question (1), “How did you first hear about WAB resources?”, reveal an active interest amongst respondents in searching online for digital Wittgenstein resources. Several respondents said they first came across WAB’s digital resources as a result of Google searches. We did not ask these respondents what specific search terms led them to WAB, but this question will be included in future surveys. Other respondents said that they first heard about the WAB resources through presentations at academic events that mentioned WAB or its digital resources.

We will discuss the answers to questions (2) and (3) in more detail.

Question (2) was “Which of the following digital tools are you familiar with or have you used? IDP, SFB, Wittgenstein Source, WiTTFind, Wittgenstein XML TEI, Wittgenstein OWL.” Answers to this question indicate that the respondents tend to be especially familiar with IDP and Wittgenstein Source. Twenty-five respondents said that they were familiar with at least one of IDP or Wittgenstein Source. Specifically, 18 said they were familiar with IDP, and 17 that they were familiar with Wittgenstein Source.

Wittgenstein Source provides open access to primary sources. In particular, it includes the Bergen Nachlass Edition (BNE), which is the latest digital “combined” static edition of Nachlass facsimiles and transcriptions. IDP, on the other hand, provides a complete digital interactive
edition. In section 3 above, we argued that IDP represents an important step forward in the digitisation of Wittgenstein’s works. The survey responses to question (2) support this claim, insofar as they indicate the relative popularity of IDP amongst leading experts.

Regarding the semantic tools, 18 respondents said they were familiar with WiTTFind; 16 were familiar with SFB; and nine were familiar with Wittgenstein OWL.

Question (3) was “Which digital tool do you use the most?” Answers to this question indicate that a relatively large number of surveyed users are familiar with the semantic tools but do not actually use them. Twelve respondents (i.e. 46.2%) said they used Wittgenstein Source the most, compared with eight (30.8%) for IDP, four (15.4%) for WiTTFind, one (3.8%) for SFB, and one (3.8%) for Wittgenstein OWL.

3. Which digital tool do you use the most?

Figure 2: Responses to question (3), “Which digital tool do you use the most?”

This distribution of responses does not come as a surprise to us. Users with purely philological interests may often only require access to a particular facsimile, and this need will be best met by Wittgenstein Source. In addition to Wittgenstein Source being perhaps the most basic resource, it also contains the Bergen Nachlass Edition (BNE), an edition that is very similar to the Bergen Electronic Edition (BEE). So another plausible explanation for the relative popularity of Wittgenstein Source amongst expert users, as indicated by the reported answers to question (3), is the natural conservative tendencies to keep using the tool that has worked well for you in the past (or at least something that closely resembles it) and not to try using new tools or doing new things. Moreover, in the case of a tool such as the RDF pilot on Wittgenstein OWL, these tendencies may be exacerbated by the amount of technical knowledge that its use currently requires. (Notably, Wittgenstein Source, IDP, SFB, and WiTTFind are reportedly easy to use; see also the responses to question (4) below.)

Of course, users familiar with IDP who wish to work with some specific filtering or sequencing of Nachlass text, for example, can currently only use IDP for this purpose, not Wittgenstein Source or any other digital tool currently available; so users with this kind of need will naturally go and use IDP. Similarly, users familiar with IDP who appreciate its interactive character, by contrast with editions (such as BNE) that offer a static combination of normalised and diplomatic transcription, will naturally tend to use IDP. In general, we expect that research and teaching needs amongst experts will develop in such a way that IDP’s relative popularity amongst this
group, compared with its static-edition competitor, will continue to grow.

In order to understand these survey results correctly, it is important to note a few more details about the individual histories of the digital tools offered by WAB. For example, users with advanced requirements in terms of combining text strings and semantic search functions, or faceting Nachlass text in relation to metadata, will often find that SFB cannot yet fully satisfy their requirements. The development and dissemination of WAB’s various tools followed different timelines and strategies. As it happens, substantial components of many tools became available online in some form or other in quick succession: Wittgenstein Source around 2009, IDP around 2010, WiTTFind around 2011, and SFB around 2012. However, their relative stages of development differed quite significantly. For example, Wittgenstein Source matured relatively early, while SFB took longer to mature than the other tools.

The following statistics may be useful in this context. Google Analytics has recorded over 30,000 Wittgenstein Source users since 2013; over 8,000 IDP users since 2017; and more than 2,000 SFB users since 2017. This comparison confirms the impression that WAB’s semantic tools are relatively little used. We believe that this mainly reflects a lack of acquaintance with these kinds of tools amongst users at present, as well as user demand for more sophisticated semantic tools. We have not seen any evidence that would suggest that users are in principle not interested in using digital semantic technologies.

We will conclude our discussion in this section by briefly noting some of the other survey responses.

Question (4) was “Do you easily and usually find what you are looking for when visiting WAB resources?” Twenty-four respondents (92.3%) answered “yes”.

Question (5) was “What, if any, are the challenges you face when using WAB resources?” Of the 17 respondents who mentioned some challenge or other, seven indicated that WAB resources were not well presented online, and in particular that it would be better to have a comprehensive landing page with a clear overview of all available resources. WAB has since tried to satisfy this demand by launching its new portal wittgensteinonline.no.

Question (8) was “Briefly describe the advantage(s) of using a digital tool in your research. Did it allow you to ask different research questions? Did it allow you to complete a research process more quickly or efficiently? Did it help in some other way?” Nineteen respondents said that using a digital tool in their research improved efficiency, with the advantages of general searchability being the most commonly cited reason. One respondent wrote: “Digital tools are immensely helpful to identify Wittgenstein’s treatment of certain concepts at certain times or periods in his work. By using them one may accomplish research results more quickly and efficiently.” Another wrote: “Excellent for searching manuscripts & typescripts and comparing to the edited volumes.” Yet another wrote: “Chronological and other sorting as well as filtering of data are only reasonably possible with encoded digital resources; I use IDP and SFB a lot for that.”

Question (10) was “How likely is it that you would recommend WAB resources to colleagues?” Of the 26 respondents who answered this question, 22 (84.6%) gave a score of 10 (extremely likely).

Question (12) was “How likely is it that you would recommend WAB resources to your students?” Of the 24 respondents who answered this question, 14 (58.3%) gave a score of 10 (extremely likely). The contrast between the responses to questions (10) and (12) is perhaps not
that surprising. Respondents who gave a score below 10 for the question about students also gave plausible reasons for that score, such as wanting to encourage students to focus on key texts first (especially the *Tractatus* or *Philosophical Investigations*) or the fact that many of their students lack proficiency in German. WAB has been exploring various options for integrating translations into its digital tools, and it is expected that more resources will be made available in English in the future. In future surveys, we plan to collect more data about the use of WAB’s digital resources by students, and we plan to include additional questions about teaching-related user needs.

5. Conclusion

In previous sections, we discussed the nature and history of, and future directions for, the digitisation of one of the most complex philosophical oeuvres of modern times. In particular, we discussed how and why the digitisation process conducted at the Wittgenstein Archives at the University of Bergen (WAB) has been informed, and in many ways fundamentally driven, by the complex needs of its user community. The growing complexity of user needs is largely a function of the complexity of the texts and a growing awareness of the potential of digital humanities. Wittgenstein’s philosophical oeuvre, much like the man himself, resists being fitted into any standard intellectual or technological mould. It therefore presents some unique opportunities and challenges, which may be used to explore new directions in digital humanities.

WAB’s development of digital resources over the past three decades illustrates various ways in which digital resources can be superior tools to traditional paper editions for research in the humanities. WAB has thus helped to establish a large and growing global community of students and scholars of Wittgenstein’s philosophy. Today, this community’s needs for digital tools and resources are becoming increasingly complex. These evolving needs must guide WAB’s ongoing and future development of digital tools and resources for the study of Wittgenstein’s philosophy.

We would like to end by acknowledging some of the encouraging responses to question (18) of our survey: “Any other comments/feedback on WAB resources?” Responses included “Thank you for [the] great service”, “The WAB resources are wonderful in every way”, “Where would we be without them?”, “Love the archives online”, and “Keep up the great work!”

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