does more than any other study in constructing a picture of an interdependent society where, at least during certain times of the year, different groups interacted.

Much like its production, the exchange of food offers myriad connections between different groups. Trépanier examines food exchange from a number of different angles to address the places where food and water were provided. In the absence of detailed sources on long-distance trade, the focus of his second chapter is on the smaller and more local interactions where food was exchanged. Some of these include discussions of urban markets which from *waqfiyyas* seem to be located in special sections of cities. His discussion of food consumption draws a great deal of support from hagiographic material. One of the most important aspects of his discussion of consumption and, to some extent, the rituals surrounding the consumption of food, is Trépanier's challenge to prominent paradigms about life in Sufi lodges. The idea that disciple hierarchies corresponded to their role in food preparation and production as well as other jobs within the lodge is, as he points out, based on nineteenth-century realities. Many of these hierarchical positions were made material though displays at the Mevlana Museum in Konya. These positions have been projected back onto the fourteenth century. In much the same way, he points out that our assumptions about early *samāʿ* performances rest on unchallenged assumptions that later practices were followed in the fourteenth century.

Trépanier's work is a unique addition to the study of medieval Anatolia. His meticulous examination of a large body of hagiographical sources will be particularly useful to students and scholars in a number of fields ranging from Ottoman history to the study of Sufism. This book has a great deal to offer the study of the fourteenth century. Aside from two useful appendices and some very thoughtful footnotes, Trépanier succeeds in producing a picture of a more textured, but sometimes strangely static, society. He displays an impressive skill with combining information from legal and literary texts with observations from archaeology and other fields. He also writes about Anatolia with a kind of humour and insight that results in a very readable and informative addition to the field.

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JOSÉ HARO PERALTA and PETER VERKINDEREN:
Jedli, version 0.1 (Computer program) Hamburg University, 2015. Available for download at www.islamic-empire.uni-hamburg.de.
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In the past fifteen years, many Arabic–Islamic heritage texts have been digitized and made available to the public (with or without infringement of copyrights). This digitization wave brings with it the huge benefit of fast and easy text search and the potential of computerized text analytics. The first products to exploit this potential were countless CD-ROMs of the Quran and the canonical *ḥadīth* collections, easy to browse and search. Soon such narrow-scoped applications moved to the web, while more advanced digital libraries were brought to the desktop. To this category belongs the tremendously popular *al-Maktaba al-Shāmila* (MSh; available at www.shamela.ws), containing, beside the Quran, over 6,500 titles from the fields of exegesis, tradition, Islamic law and jurisprudence, theology, history, etc. The program offers easy full-text search and the results refer back to printed editions of the texts. Now, thanks to two

researchers from the ERC research project "The early Islamic Empire at work – the view from the regions toward the center", there is a new alternative available, geared towards the academic world. I used MSh (version 3.61) and *Jedli* side-by-side for a month, and present the results of this comparison here. Both programs are only available for MS Windows, and were installed on a Windows 10 machine.

According to its user manual, "Jedli is designed with the texts of al-Maktaba al-Shamela in mind". In fact, *Jedli* uses the same text files as MSh but converted from .bok or .epub to .txt. The obvious advantage of this is that the first version of *Jedli* already comes with an enormous book collection, and new books found in online repositories intended for MSh can easily be added. This also means, however, that weaknesses inherent in MSh's collection are now also a part of *Jedli*. An outspoken Sunni bias is one example. Another drawback of the MSh corpus is the fact that many of the digital texts are copied from editions that do not meet academic standards of critical text edition, even when much better editions exist. A third shortcoming is the lack of independent verification. To some extent, these shortcomings may be bypassed by manually adding or editing texts, but managing the quality of a library worth of text is something one cannot do alone.

At the heart of both programs lies the search functionality. Here, *Jedli*'s advantage over MSh may not be as great as I expected it to be, but it is clearly there. Both applications allow easy selection of titles to perform the search in, including selecting all works of a certain category or genre, e.g. all *ḥadīth* compilations. Both allow the user to save such selections for later use. With MSh's collection editing tool one can quickly (re)categorize a title, for instance if you want Mālik's *Muwaṭṭaʾ* to appear under *ḥadīth* as well as *fiqh*. But doing the same in *Jedli* requires manually editing a spreadsheet. In *Jedli* one can define a virtually endless list of search terms, each with a selectable Boolean operator (AND, OR, NOT). MSh's setup, with up to five AND search terms and up to five OR search terms, will suffice in most cases, but when it falls short *Jedli* is the way to go. However, there are other reasons too. MSh offers the choice either to allow prefixes and suffixes or not. Jedli has the same option, but it is smarter and more versatile, allowing the user to choose between four levels of prefix (strict, all allowed, nominal, verbal) and suffix (likewise) restriction. Additionally, the user can manually define pre- and suffixes. So when looking for the word *ṣūra*, for instance, a non-strict search in MSh will also return *maqṣūra*, whereas *Jedli*, with the right amount of prefix restriction, will return *al-ṣūra, wa-bi-ṣūra*, and so on, but not *maqṣūra*. Similarly, in MSh one can choose to ignore the distinction between final *hāʾ* and *tāʾ marbūṭa*, final *yāʾ* and *alif maqṣūra*, and *alif* and *alif-hamza*, whereas in *Jedli* these options can be set independently. More importantly, through the use of regular expressions (regex) *Jedli* allows the user to search different words or variants of a word at once. The right search term (*kt?b*) will not only find *kitāb* but also *kutub*, a huge advantage when dealing with an Arabic corpus. One feature offered by MSh but not by *Jedli* is the option to limit search results to instances where the search terms occur in the user-defined order, so that searching for *Muḥammad* AND *ʿAlī* will return *Muḥammad b. ʿAlī* but not *ʿAlī b. Muḥammad*. A major drawback of MSh is that it uses the page as a meaningful unit of text, which it is not. The result is that the same search will not return *Muḥammad b. ʿAlī* if it is split across two pages. Jedli's "context search", on the other hand, only takes the (user-definable) distance between two words into account, not the page on which they occur, so it will return results split across pages. Overall, *Jedli*'s advanced search capabilities surpass those of MSh greatly.

Where *Jedli* has not quite reached the level of MSh is in the user interface. MSh is not aesthetically pleasing and takes a while getting used to, but it is also highly

customizable and does a lot of things right that *Jedli* does wrong, or not at all. Take, for instance, the way in which search results are displayed. In MSh every search returns a table of results showing the title of the book, the chapter, and the volume and page. Clicking on a search result displays the page in question, with the search terms highlighted, after which one can easily go back or forth a page. Irrelevant items can be deleted, the list can be saved and recalled later, and a new search can be performed *within* the search results. Users can keep notes on certain titles, authors or search results, and at any time, a button can be clicked to retrieve bibliographical information about the text and the print edition on which it is based. Finally, there are two special display and search modes tailored to biographical and *tafsīr* works, of which especially the latter is a great addition to the program.

Jedli, on the other hand, offers three search "tools". Each uses an internet browser instead of a built-in reader to display the results. The "Index it!" function renders a list of pages on which one of the search terms occurs – indeed, it ignores any AND operators, and effectively does an OR search. "Highlight it!" shows the full text (all volumes) and highlights each search term in a different colour. It allows one to see the search results in their context, but scrolling long texts is cumbersome compared to flipping pages and one-click search result browsing, as MSh lets one do. "Context search" is undoubtedly what most users want, as it only lists results where the search terms entered by the user appear in the vicinity of each other. Unfortunately, it displays results as small fragments of text in which the search terms are highlighted, so that browsing or reading the wider context is not possible. Other minor glitches include the fact that Arabic text is sometimes aligned to the left instead of the right, a rather annoying effect of which is that long book titles, for instance, are cut off at the beginning instead of the end.

Whatever *Jedli* lacks in user-friendliness it makes up for by its superior search capabilities. In addition, being designed by academics for academics, *Jedli* does not impose legal restrictions on its users, whereas MSh's user agreement states "it cannot be used to publish anything that conflicts with the ways of Sunni Islam". One can only hope, therefore, that future versions bring new features and a better interface. There is reason to be hopeful: *Jedli* was written in the accessible programming language Python, released under the Apache 2.0 licence (which allows the redistribution of modified versions on condition of a disclaimer and copyright notice), its source code will be published, and the development team welcomes contributions from others. A more fundamental question is whether the developers will keep their product tied in with the MSh corpus, or in other words, to what extent the developers plan to address issues inherent in this corpus. For now, they seem to be less invested in maintaining a corpus than in creating a toolbox for text mining.

Finally, a remark on that last point is in order. Since the rise of (and increased funding for) the digital humanities, buzzwords such as "text mining" are in vogue, and are more often than not used for something they are not. Text mining implies analytics in addition to heuristics, relies on any combination of statistical, linguistic and machine learning techniques, and is achieved by building and calibrating a model on a set of texts and validating it on an independent set of texts. The result would be a tool that analyses the text and as a result produces information not readily available in, but distilled from, the texts. Contrary to claims on its website and in its user manual, that *Jedli* is a "text mining" and "data mining tool box", the program does none of that. Nonetheless, it is a very good text search tool that has the potential greatly to enhance the Islamicist's workflow.

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