

## Digital humanities as third culture

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*This article examines collaboration in the digital humanities through a sociological lens, focusing on the social relations, including hierarchies, that form in the digital humanities. It argues that the digital humanities can be seen as a form of third culture (Snow, 1971) in which people from computing science and the humanities form new relationships and in some cases move towards an embodiment of third culture. While the humanities are still seen as largely driving the digital humanities, there is increasingly recognition of the importance of technology and programmers. Significant strides are being taken towards involving those with computing and technical expertise in the design and conception of the digital humanities although this transition is not always smooth or democratic.*

### Introduction

Collaboration is an integral and often essential element of the digital humanities. The very nature of the field requires expertise in the humanities as well as computing science, yet it is rare for one person to possess both of these skills. In addition, digital humanities projects are often large in scope, and sheer size requires cooperation between people from diverse backgrounds (Siemens, 2009; Warwick et al., 2008). Recent years have seen a surge of books, articles and blog posts examining the type of collaboration that occurs in digital

humanities projects. These are often written by digital humanists, who have a wealth of experience in the field, and they detail suggestions for best practices to make collaboration work (Deegan & McCarty, 2011; Siemens, 2009; Siemens et al., 2011; Warwick et al., 2008). This paper seeks to add to this body of work by taking a sociological approach to the issue of collaboration. Drawing on the theory of structuration (Giddens, 1984), it examines social and power relations, including hierarchies, within the digital humanities. This article argues that the digital humanities can be seen as a form of third culture, as imagined by C.P. Snow (1971), in which people from different cultures – the arts and the sciences – forge new relationships, and in some cases embodies third culture.

### Third culture

In 1959, C.P. Snow, who was both a scientist and an author, gave the annual Rede lecture at Cambridge University. This speech painted a picture of a society divided into two cultures that did not share a common language and were marred by incomprehension, distrust, and at times outright hostility. On the one side were scientists. On the other were what Snow called literary intellectuals. These two cultures were divided by “a gulf of mutual incomprehension...hostility and dislike, but most of all lack of understanding” (Snow, 1971, p. 15). This divide, he said, was devastating for a society that needed to draw upon the strengths of both. Snow’s depiction of the two cultures was by no means a new idea, but his timing was right. His speech tapped into the zeitgeist of the day and has had a lasting influence. In the 50 years since, his distinction between the two cultures has persisted and is now generally seen as a divide between the sciences and the humanities (Ashman & Baringer, 2001; Labinger & Collins, 2001; Lee & Wallerstein, 2004; Wilson & Bowman, 2001).

Some years after his original speech, Snow (1971, p. 70) spoke about his hope for a third culture in which the two cultures would be on speaking terms and engaged in an exchange of knowledge that would benefit everyone. He is vague about what exactly this third culture would entail, but it is evident that he is imagining people who occupy a middle ground. These are not necessarily scientists, but they are people who are interested in the social, economic and philosophical implications of science or scientific methods and are willing to adopt methods that scientists use. He identifies people in fields such as “social history, economics, government (in the American academic sense), psychology, medicine, and social arts such as architecture” as being concerned with what he calls the “human effects of the scientific revolution.” These are people concerned not with “legend” but with the “fact[s]” about how human beings live and have lived (Snow, 1971, p. 70).

Snow’s ruminations about third culture certainly portray a bias in favour of science. For instance, a scholar of literature would likely argue that they too are concerned with how people live and that literature is a way of knowing the world, of understanding how humans act and interact with each other. But what Snow attempts to describe – albeit perhaps not very eloquently – is that, in his vision for third culture, scholars would not ignore science’s

discoveries or methods but would instead take science seriously, either by adopting more scientific methods or simply by considering how science sees the world.

While some might argue that, when Snow refers to the sciences, he is specifically pointing to the natural sciences and that computing science or a concentration on digital technology does not belong to this culture, I disagree. That may have been the case in the original speech, but in his later revisions, he does not make a distinction between science and technology:

The more I have seen of technologists at work, the more untenable the distinction has come to look. If you actually see someone design an aircraft, you find him going through the same experience – aesthetic, intellectual, moral – as though he were setting up an experiment in particle physics. (Snow, 1971, p. 56)

Similarly, his narrow view of the ‘other’ culture as literary intellectuals has expanded and is now seen more generally as the ‘humanities’ in its many forms, generally defined as having an emphasis on qualitative research (Ashman & Baringer, 2001; Labinger & Collins, 2001; Lee & Wallerstein, 2004).

Collini (2008, paragraph 55) calls Snow’s third culture “a rather feeble attempt to remedy an obvious omission in the original lecture,” namely people in the social sciences who can be classified neither as humanists nor as scientists but who instead occupy a middle ground. As others have noted, Snow’s two cultures overlooks these “hybrid disciplines” (Wilson & Bowen, 2001, p. 206) that cross boundaries and are caught between the sciences and the humanities (Lee & Wallerstein, 2004). However, Snow (1971) was also talking more generally about educating people in both the sciences and the humanities. For instance, he acknowledges that his conception of two cultures was profoundly influenced by his observations of the British university system at the time, noting that although the divide between the two cultures still existed in places such as the United States, it was not as deep. As an example, he points to science students at Yale, Princeton, M.I.T. and Cal. Tech. who “are receiving a serious human education” (p. 69). It is not just the new breed of social scientists that Snow sees as the third culture but, rather, a more vaguely defined person who defies boundaries and avoids becoming entrenched in either culture.

Snow’s characterisation of the two cultures has also been critiqued as too simplistic, overlooking the diversity that exists within these two broad areas of sciences and humanities (Freedman, 2009). Although it is commonplace to refer to them as entities unto themselves, as Collini (2008, paragraph 45) points out, these are problematic terms and “it has become a matter of lively debate whether we should even be trying to identify any one method of enquiry or one range of subject matter or one professional or cultural ethos as distinguishing ‘science’ from ‘non-science.’” Similarly, as Westfahl (2009, p. 1) describes, “These two purportedly monolithic cultures are in fact each splintered into scores of separate subcultures, some of them as antithetical to each other as the two broad groups that Snow discerns.” Different branches of the humanities, for instance, are specialised to the

point that they use very different languages. While to an outsider, it may seem as if humanities disciplines share commonalities, to the specialist, there are important and significant differences between subcultures (Collini, 2008). Similarly, the sciences are also heavily fractured into different disciplines (Freedman, 2009).

Lee and Wallerstein (2004, p. 203) make the point that the distinction between cultures is relatively new, only beginning in the 19<sup>th</sup> Century. Although this distinction has been “institutionalized in our universities and other intellectual institutions,” they argue that we need to question whether there really are two cultures or just one. In addition, while a belief in the ‘scientific method’ is often a marker that defines what science is, as Collini (2008) points out, there has been a movement in the sciences to accept methods that have been traditionally thought of as more ‘humanist’ than ‘scientific’, particularly an increasing role for imagination, metaphor, analogy and intuition in science. There is also a strong vein of scholarship that examines science as a cultural activity (Collini, 2008). Finally, as Westfahl (2009, p. 1) describes, it is not necessarily accurate to portray the two cultures as separate since the sciences and the humanities have often found “common ground” on issues, such as “efforts to stem nuclear proliferation” and “the looming threat of global warming.”

Despite these critiques, the terms ‘science’ and ‘humanities’ are still widely used to refer to two different ways of approaching the world or two different types of scholarship (Collini, 2008; Westfahl, 2009). As Collini (2008, paragraph 45) describes, “In practice, it is clear that we still find it convenient to go on using terms like ‘the humanities’ and ‘the sciences’, and for most purposes we roughly know what we mean by them.” Others argue that “most would concede that there is at least a degree of truth in Snow’s argument that there is a gap between these two cultures, and that this division has been and continues to be, a significant social problem” (Westfahl, 2009, p. 1).

This article proposes that the digital humanities are places where third culture exists as a manifestation of the two cultures coming together through common goals, assumptions and purposes. This is not always a happy, democratic merger, as there is sometimes friction as the two cultures negotiate new working relationships.

## Collaboration in the digital humanities

Collaboration is often pointed to as one factor that sets the digital humanities apart from traditional humanities scholarship, wherein scholars typically produce single-authored work and have minimal direct collaboration with others (ACLS, 2006; Borgman, 2007, 2009; Cohen & Rosenzweig, 2005; Davidson, 2003; Hunyadi, 2012; Siemens, 2009). It should be noted that even those who produce single-authored monographs are part of a network of scholars and do, in a sense, work collaboratively. To be taken seriously, scholarly work must place itself within the literature produced by others. However, collaboration in the digital humanities is often different in that it involves active collaboration between two or more people. Some digital humanists are thinking about collaboration beyond academic

boundaries and seeking to include the public in their work through crowdsourcing and other forms of outreach (Causser, Tonra & Wallace, 2012; Hockey, 2012; Rockwell, 2012). Nevertheless, the focus of this article will remain on the type of collaboration that occurs in academic settings between those who deal with computing or technical issues and those who are primarily experts in the humanities in order to examine the complexities of these relationships.

Collaboration in the digital humanities is often born of necessity as a wide variety of skills, both in computing and the humanities, are needed to complete projects. It is rare for one person to possess them all. As Burdick et al. (2012, p. 15) state:

The field of Digital Humanities may see the emergence of polymaths who can “do it all”: who can research, write, shoot, edit, code, model, design, network, and dialogue with users. But there is also ample room for specialization and, particularly, for collaboration.

Furthermore, digital projects are often time and resource intensive, making teamwork essential.

In recent years, an expanding body of work has examined the benefits and challenges of collaboration in digital humanities projects (Deegan & McCarty, 2012; Siemens et al., 2011; Warwick et al., 2008; Warwick, Terras & Nyhan, 2012). The benefits often come down to bringing together diverse people with a range of knowledge that adds depth. As Siemens (2008, p. 5) notes, a large “network of individuals with a variety of skills and knowledge creates a richness of interaction and synergies that is often not found in solitary research.” Researching alone can be isolating, and bringing people together not only encourages sociability but also closes knowledge gaps. Collaboration has also been found to enhance productivity. The challenges often revolve around communication issues that crop up when bringing people with a technical background and humanities specialists together. For instance, Siemens et al. (2011, paragraph 35) find that there can be issues when team members from diverse backgrounds use different vocabularies, disciplinary methods and practices. Their recommendations include developing “strong communications practices” and finding people who can act as translators, “who can help navigate the language and culture gap between the various perspectives by understanding the discipline-specific culture, language, and methodologies.” Nelson (2012) describes his experience on a team that mixed computing with history as one in which the “technical team” and “subject-specific researchers” managed to learn to speak one another’s languages. However, it took active listening and communication. In terms of hierarchies, there is sometimes the assumption in the digital humanities that there is an unequal relationship between academics and technically oriented people, with the academics acting as visionaries and the technically oriented individuals implementing this vision (Bradley, 2012). However, Bradley (2012, p. 12) notes that his experience has been very different, and he extols the virtues of including “technical specialists” as important sources of ideas:

Of course, the best academic staff *are* a powerhouse of new ideas, but driving digital humanities innovation *solely* through the ideas of a humanities scholar misses out on other important sources for innovation and insight.

In a similar vein, in their study of digital humanities projects in the UK, Warwick et al. (2008) find that the most successful projects are those that have researchers with combined expertise in both technology and the humanities.

## Methodology and theoretical approach

A few years ago, Borgman (2009, p. 76) asked the following question: “Why is no one following digital humanities scholars around to understand their practices, in the way that scientists have been studied for the last several decades?” In keeping with Borgman’s call to research, this study seeks to add to the body of work on collaboration in the digital humanities by taking a sociological approach to examine how digital humanists negotiate their working relationships and practices. This approach draws in part upon the sociology of science. This research is based on semi-structured in-depth interviews with digital humanists in Canada and the United States. Thirty digital humanists were interviewed, including Directors, Professors, Research Assistants and Programmers. The participants were asked about their roles on digital humanities projects, the type of collaboration that occurs, and how much control they have over the direction projects take. As Hesse-Biber and Leavy (2006, pp. 119-120) describe, “researchers who conduct in-depth interviews are looking for patterns that emerge from the ‘thick descriptions’ of social life recounted by their participants.” This type of qualitative interview is “designed to get at ‘deep’ information or knowledge.” In the present study, a main interview focus was on collaboration and interactions between computing and the humanities. The interviews were semi-structured in order to allow participants to speak freely about subjects or topics that were of particular interest or particularly important to them. The analysis of the interviews consisted of a grounded theory approach, an iterative process in which data is coded for categories and concepts, which are then consistently reevaluated against new data throughout the analysis process (Hesse-Biber & Levy, 2006; Siemens, 2009).

This study draws upon sociological theory, particularly Giddens’ (1984) sociological concept of structuration and Braverman’s (1974) sociological analysis of workplace hierarchies. Structuration draws attention to the complex relationship between the individual and social structures, particularly how the individual is both constrained by and influences social structures such as social norms, traditions and moral codes. This relationship is complex and recursive (Giddens, 1984). As Layder (2006, p. 164) notes, Giddens’ theory of structuration emphasises how “human beings create meaning and social reality from within social settings, and therefore social forms such as institutions and structure have no existence apart from these activities they embody.” Mosco (2009, p. 186) describes structuration as essentially a contemporary rendering of Marx’s belief that “we do make history,

but not under conditions of our own making.” Structuration is a useful starting point from which to examine the agency of digital humanists within their projects as well as how digital humanists are changing one of the norms of humanities research – namely, the focus on single-author work. Braverman’s (1974) sociological analysis of work focuses on the distinction of conception from the execution of labour. Conception, or the imagining, planning, and designing of work, Braverman argues, is often separated from the execution, or the actual carrying out of the work. Conception is usually in the hands of a managerial class while execution is the realm of workers. This separation can lead to unequal power dynamics. In extreme cases, this can result in intense monitoring of the workplace, where workers are expected to perform set tasks in precise, orderly and time-managed ways. Braverman’s insights will be used as an entry point for examining what (if any) hierarchies exist in the digital humanities and how labour is divided.

## Findings

The two skills sets required in the digital humanities have been described in different ways: for example, “subject expertise” versus “knowledge of digital techniques or ‘technical skills’” (Warwick et al., 2008) or “technical-oriented” versus “academics” (Siemens, 2009). In this study, I will make the distinction between programmers and humanists. This distinction comes from the participants, who largely identified these two types of work in the digital humanities. Programmers work primarily with technology, and their work involves various levels of programming, potentially including the design and development of websites, web-based tools, and search engines. Programming can range from involving complicated manoeuvres such as constructing algorithms to relatively simple website coding and design. Humanists, on the other hand, are the people who have expertise in the humanities, the subject matter in question. One programmer describes the difference between programmers and humanists in this way: “We build the tools. They fill the tools up with stuff” (Programmer 1). Most participants align themselves with doing primarily one type of work or another. However, over the course of the interviews, it became apparent that there is a large degree of overlap. In addition, complex power relations are at play so that, even if humanists take the lead on projects, programmers can wield a great deal of power.

## Humanist/programming hierarchies

The prevailing theme among all the participants is that the humanities are the driving force behind what they do. Although much of the focus of the digital humanities is on using and experimenting with digital and computer technology, the work is driven by research questions from the humanities. As one programmer who works on digital history projects says, there is an unwritten policy where he works that puts “history first.” “That’s what our main focus is on, doing good history. And then doing good history with new technology” (Pro-

grammer 2). Similarly, a humanist who works on a literary history project says, “The idea was always a women’s literary history. That was the idea. And when we went electronic, the idea simply was that there was this new medium and we ought to make use of it” (Humanist 1). Having the humanities at the forefront is seen as a major strength of the project.

The obvious implication of putting the humanities first might appear to be that technology is placed in the service of the humanities. In a sense, it is. As mentioned above, the research questions and interests of the humanists are the driving forces behind experimenting with digital technology. However, a second, equally prominent and overarching theme that emerged was that experimentation with digital technology and computing is one of the most exciting things these digital humanists were undertaking. Although the humanities provide the foundations, technological innovation – using digital technology as a catalyst for change to push the humanities in new directions – is integral to their work. As several participants point out, it is vital to have programmers involved from the very start of the planning stages because their expertise is important for the overall design. As one humanist says of her project, “the team planning group couldn’t function without the actual computer scientist in the group” (Humanist 2).

### **Programmers, agency and control**

Despite unanimous agreement on the importance of programming, there are, however, mixed feelings about programmers’ agency and control. Several participants doubt that this sense of value actually translates into power and control. Some programmers say that although there is some latitude, most programmers have little agency over deciding what work they are going to do and what projects they will work on. For instance, as one programmer states, he does not “have the final voice of authority in anything” (Programmer 3). That said, several programmers report that they find there is some room for them to contribute ideas and to create new projects from the ground up. However, they also concede that they often do not have the final say on many projects of which they are a part.

However, several programmers argue that their expertise lends a certain degree of authority. For example, one programmer is adamant that programmers actually have more power than the humanists because they have specialised skills that cannot be replaced. In addition, this programmer says that people who work primarily on content may not completely understand what programmers are doing, which affords programmers a certain degree of freedom in that they are largely left alone and trusted to complete their tasks.

The other issue with programming is that the amount of work involved in a seamless design is not always apparent. One programmer says that although his work may be recognised as important, the *amount* of work he does is often not recognised because good programming means hiding the complexities of the underlying code and making the interface easy for users to deal with. While this may be beneficial for the user, it can appear to the uninitiated as if the work behind the interface is not that difficult.



A lack of understanding by humanists as to the amount of work programming can involve sometimes leads to tension within teams. As one programmer describes, there are often situations in which humanists want something built that may be technically possible but does not make practical sense from the point of view of a developer. “Usually, it’s not necessarily impossible. It’s usually what we call technically possible but not going to happen. Because [we have] limited resources in some ways. Mostly time-wise” (Programmer 4). Similarly, another programmer says there has been conflict when humanities scholars fail to understand how technology works or realised that the technology is unable to do what they imagined. Conversely, conflict also arises when programmers do not understand the goals of humanities scholars. One programmer describes the conflict as one that has philosophical roots that need to be overcome: Is technology a means to an end, or is it an end in itself? In her experience, humanists often see technology as a tool while programmers often see technology as its own entity and the content as secondary. As will be discussed below, however, while the research questions of humanists are the impetus for digital humanities projects, digital humanists see experimentation with technology as vital to what they do and in some cases hope that digital experimentation – rather than humanist research questions – will guide projects.

### **Hierarchies, time constraints and institutional structures**

Most interviewees align themselves as primarily humanists or programmers, though with others, it simply becomes clear in the course of the interview that their work focuses primarily on one area or the other. One programmer, who works primarily in programming but also is working on an advanced degree in the humanities, notes that even if though there is significant encouragement and goodwill to have people involved in both programming and the humanities where he works, the reality is that the division of labour occurs out of necessity and is reinforced by limited resources. He describes his time as at a premium; there are simply too few hours in the day to complete the amount of work that needs to be done, so dealing with the humanities aspect of a project is not always possible. This programmer would like to do more humanities work and has even brought this up at job reviews, but because there is a high demand for his programming skills, it is not usually possible.

In cases in which digital humanists work on large projects, participants – both humanists and programmers – note that hierarchies develop, often out of the necessity of organising a large group. In addition, hierarchies are reinforced when digital humanists work in university settings, which are often extremely hierarchal environments that insist on titles and divisions between disciplines. For instance, several participants mention that despite a lot of talk about dissolving hierarchies in the projects on which they are working, when applying for grant applications, it was important to have a principal investigator identified as the lead on projects. As one programmer says:

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I used to find it interesting when we were applying for grants, like SSHRC grants or CFI, they would talk about...how one of the goals of this project is to get people from all areas of the academy working together. But then when it came down to the actual application, they want CV's from people who had PhDs. The [other programmer] and I used to chuckle about this. We used to joke about the fact that they talk this big talk, but when it comes down to it all they want to know about is the PhDs. (Programmer 5)

## Third Culture

This study found few people who are highly skilled at both programming and the humanities. The one person interviewed in this research who considers himself highly skilled in both cultures remarks that he does not know of many others who have the same types of abilities. However, digital humanities has developed in such a way that it tends to attract people who are interested in navigating both worlds. What became clear in the interviews is that most digital humanists, whether they associate themselves with programming or the humanities, have an interest in both. As one humanist, who works on digital history projects, says:

I don't know anybody here who cares not at all about the history. Or who cares not at all about the technology. I think you could take that as sort of an article of faith that everybody here is interested in some sort of marriage of the two themes. (Humanist 4)

Another humanist, who also works on digital history projects, states that they look for programmers who are also invested in history, people who understand how historians 'think'. As this humanist says, it is a strength when programmers have an interest in the humanities:

We're trying really consciously to build tools and software that make sense to humanists. And that solve problems that humanists have. And so, it is somewhat easier for us to pursue development on that path, working with people who actually intimately grasp those problems. (Humanist 5)

It should be noted that there were exceptions. Although most participants express an interest in both the humanities and programming, one programmer who works on high-end programming says that he does not have an interest in the humanities. Instead, his interest is in building systems. Another programmer, echoing this statement, says she has worked with programmers on digital humanities projects who are invested in the programming but not the content; their interest lies in getting systems to work properly rather than in the content of the system.

However, despite these exceptions, the digital humanities are developing what I have characterised as 'bridge' people who are comfortable in both words although perhaps not at a high level. Many of the programmers were pursuing advanced degrees in the humanities, and all of the interviewed humanists were technically competent to some degree. That

said, there is a wide range of technical competency, ranging from ‘technically literate’ (able to understand programming languages) to ‘technically functional’ (able to program). For instance, people who work primarily with content are often knowledgeable enough to talk to programmers about technical issues such as the limitations of HTML or CSS, but they do not necessarily have high-level coding skills. One programmer likens this to having a basic understanding of a language versus knowing how to speak and write it fluently. While on the surface, this might not seem like a problem, it can manifest itself in misunderstandings concerning the amount of time and resources it takes to complete a project. However, several participants point out that, while they may have experienced conflict earlier on in their work due to this type of misunderstanding, conflict between humanists and programmers is occurring less and less as humanists become more knowledgeable about the capabilities of the technology. As one humanist says, her team has a real focus on making sure that everyone is, at the very least, technically capable of understanding and manipulating the technology they use and, at higher levels, of being able to assist in project planning. While the junior members of her team have a “fairly confined technical vocabulary,” those who are involved in planning and design “speak a fairly common language” (Humanist 6).

As this humanist alludes to, digital humanists are also seeking to involve people with a variety of areas of expertise – from both computing science and the humanities – into high-level project planning. One programmer believes the project she is with has succeeded in bringing the two cultures together, due in large part to the mix of skills among the senior members of the team, who come from different backgrounds, including English literature, humanities computing, and computing science (Programmer 6). Another humanist says that, on her project, it was the project leader who made the difference in bringing together the humanities and the sciences: The leader did not position herself as leader of the humanities or computing science but instead as leader of the project as a whole (Humanist 7)

It also became clear that although digital humanities projects begin with research questions driven by the humanities, much of the focus is on creating innovative digital and computing work. As one humanist says, although they were trying to figure out how to use technology in the service of the humanities, they were also “experimenting with the computing side in a way that hadn’t been done before” (Humanist 8). Another humanist says that there has been an evolution in how they do things: While the first iteration and design of their project came from the humanist scholars, they became more interested as the project evolved in how technology could lead their project and where it could take them. As this humanist says: “Now the technology will be leading us, will be taking the lead in lots of ways” (Humanist 9).

## Summary

Collaboration is arguably a defining characteristic of the digital humanities. As Burdick et al. (2012, p. ix) state, “at its core” the digital humanities are “profoundly collaborative.” Digital humanists work in teams by both necessity and desire. Since the digital humanities require expertise in both computing and the humanities, it is rare for one person to possess all of the necessary skills. In addition, many projects are large and complex, requiring more than one person. In terms of structuration, the digital humanities are changing a traditional structure, or norm, of the humanities by emphasising collaboration over individual research. Because teamwork is essential, digital humanists find themselves fostering a new norm of collaboration. Most participants in this study describe a collaborative environment and maintain that, on a day-to-day basis, their ideas are heard, and they possess a degree of agency over their work. They play active roles in shaping their working environment and the form that collaboration will take. All interviewees acknowledge the strength that comes from collaboration between people from different disciplines. One consistent theme that emerged was that programmers and humanists are working hard – with a degree of success – to understand each other’s languages. Working collaboratively is something that all interviewees acknowledge as integral to their jobs.

As some have noted (Bradley, 2012), there have tended to be hierarchies in the digital humanities, ranking programming as secondary to the humanities. However, this study has demonstrated a more complex relationship, with the humanities largely being regarded as the driving force behind the digital humanities yet with the impetus to use digital technology to explore the boundaries of the humanities being seen as equally important. What emerged from interviews with digital humanists who have been involved in the field for decades and come from a humanities background is an ongoing shift. Some acknowledged that, in the beginning, they did see programming as secondary, as an addition to their core work, but that their thinking concerning technology has evolved. It was evident in all of the interviews that efforts are being made to involve both the humanists and programmers from the conceptual stages through to project. Significant efforts are being made to back away from the divisions that Braverman (1974) noted between conception and execution and to involve both programmers and humanists in all aspects of projects. This is not always a smooth and democratic process. Many programmers note that they do not feel as if they have complete control over the work they do and that they are happiest when they feel like they are included as an integral part of the team and have a say over the direction of projects. Programmers also often cite time constraints, recognising that they possess the necessary expertise to execute projects and thus cannot be as involved in other aspects of project design as they would like. For some, this expertise provides a sense of power and agency, in that they are indispensable. However, programmers also at times express frustration when humanists make demands that are either beyond the technology’s capabilities or not possible due to time constraints. Nelson (2012, p. 130) describes a similar situation in which there can be “tensions between the historical researchers’ ambitions and the techni-

cal team's funded time." However, most programmers say that humanists are becoming more technically literate and that this has eased tensions considerably.

## Discussion and conclusions

This study is not designed to offer a set of best practices for collaboration. Rather, the purpose of this study has been to examine the power relations at play in the digital humanities and suggest a way of seeing the digital humanities as a new form of culture. There has been much discussion about what exactly the digital humanities are; how they should be defined; whether it is a unified field and, if so, what defines its essence (Berry, 2012; Gold, 2012; Hayles, 2012). These are important questions involving identity, and the ways in which they are answered will serve to guide the future directions of the field. The purpose of this paper is to suggest that one way in which digital humanists might identify themselves is as a form of third culture, as envisioned by C.P. Snow. Although there are divisions in the types of work that occur in the digital humanities, there is an ongoing shift towards 'bridge' people who are, if not completely competent in both cultures, then 'bilingual' in that they are able to speak the languages of both cultures. Furthermore, many of the programmers in this study, whose programming skills were largely self-taught, are pursuing advanced degrees in the humanities and in short order will have credentials as humanists as well as advanced programming skills. The bridges identified in this study will continue to exist, but in coming years we will likely see digital humanists who embody third culture in both language and practice.

Dichotomies can be contentious and problematic ways of dividing the world, and Snow was accused of being simplistic in this approach. In response, he acknowledged that there are issues with dividing society into two cultures. As he writes, "Of *course* [italics in the original] there is sub-division after sub-division within, say, the scientific culture" (Snow, 1971, p. 67). However, he insists that his characterisation of the two cultures should not be dismissed since scientists nevertheless share a "scientific process" (p. 67) and since literary scholars, like scientists, share "common attitudes, common standards and patterns of behavior, common approaches and assumptions" (p. 64) that constitute culture. It is perhaps unfair to paint either culture as having narrow interests. There are, for example, numerous examples of scientists who are also accomplished musicians and writers. In addition, the term 'science' itself is a living term with multiple definitions that have changed over time. For instance, as Rosenbloom (2012, paragraph 3) writes, "I have come to accept the notion that any enterprise that tends to increase our understanding of the world over time should be considered essentially scientific, and thus part of science."

However, while the dividing line between science and art can at times be porous or perhaps even non-existent, Snow's description of the two cultures is by no means passé. In everyday life and as part of popular culture, many people identify as either being primarily interested in – at least in terms of the jobs they do – the arts or the sciences. The physicists,

biologists, mathematicians, and computer scientists, though tackling vastly different subjects, are seen as belonging largely to one culture. The historians, classicists, philosophers, and artists are seen as belonging to another.

In the technologically saturated environment of the 21<sup>st</sup> Century, the digital humanities have emerged as places where computer science and the humanities meet, bringing together technology and the arts. This merger, I argue, can be seen as a form of the third culture for which Snow hoped. While it may not be practical or possible, in terms of time, to develop expertise in both computer science and the humanities, this research shows that it is possible for people to straddle both worlds and become functionally literate in the other culture's language to the point where fruitful mergers occur. In addition, this research suggests that, in the near future, we will see many more digital humanists who can function at a high level in both cultures and who will come to embody a third culture.

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