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Digital humanities (DH): Transforming the world of education and research

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Abstract
The fact that the predominant force governing most global activities in the 21st century is the hypertextual or cybernetic realm signifies that this digital domain has emerged as a potent regulator across various aspects of our lives. Essentially, it suggests that the hypertextual/cybernetic sphere represents the prevailing paradigm of our time. We've reached a stage where human-like intelligence is being simulated through Artificial Intelligence (AI) processed by machines. Diverse modes of thinking are significantly influenced by this tech-driven environment, giving rise to a new discourse where all narratives bear the imprint of technology. Even within the realm of humanities, there's no exemption from this pervasive influence. This paper examines the emergence of the Digital Humanities (DH) as a new Discipline and underlines how Digital Humanities (DH) has significantly transformed the world of education and research, suggesting that this mediation is gradually altering the very nature of research itself, influencing the epistemologies and ontologies that form the foundation of research programs.

Keywords: Digital Humanities (DH), hypertextual / cybernetic, artificial intelligence (AI)

Introduction
To say that most of the world's activities today in the 21st century are being regulated by the hypertextual world or cybernetic world, which has emerged as the powerful regulatory mechanism in the multifarious spheres of our life, is to say that the hypertextual/cybernetic world is the new order of the day today. We have reached the level of simulation of human intelligence which is being processed by human machines in the form of Artificial Intelligence (AI). Different forms of thought are also getting hugely influenced by the technology driven world which has resulted into a new category of discourse where all forms of narratives have had technological impact. The field of humanities is, therefore, no escape from this.

The emergence of digital humanities (DH) as a new discipline
The definitions and boundaries of digital humanities are still debated, to the point that defining DH can become a complex and never-ending challenge. The interaction between "digital" and the "humanities" is reciprocal, with each influencing the other. Just as traditional humanities research utilized print media and examined it through practices like book history and textual studies, computing serves as both a tool and a subject in digital humanities. Digital humanities practitioners not only use computers to study literature, art, or history but also apply humanities methods, insights, and research questions to the study of computing and digital media. While encoding, archiving, preserving, and analyzing historical documents from the eighteenth century remains a core activity, analyzing video games and other born-digital cultural objects through a combination of humanities and computational methods is also integral to the field. This creates a range of intellectually productive intersections between computing and the humanities.
Steven E Jones is of the view that the new-model of Digital Humanities grows out of the longer tradition and is continuous with it, but it also extends the tradition in new directions, to some extent, owing to the changed cultural contexts, which were, in turn, produced partly in response to material changes in networked technology. One key factor behind these changing contexts was the collapse of the dot-com bubble that began in March 2000. This event effectively signalled the end of the cyberspace era and the notion that technology was

an unstoppable, self-sustaining force - though some still cling to this idea. In the following years, particularly between 2004 and 2008, a range of new digital products and platforms emerged. These innovations, often introduced with a more cautious approach after the bubble burst, included new software, hardware, and cultural practices centered on practical applications of networked technology. Instead of the idea of a technological Singularity, there was a focus on social interactions; instead of immersive virtual reality, there were Web services and targeted mobile apps. Collectively, these shifts represented a significant transformation.

When experienced, this technological shift extended far beyond the so-called Web 2.0, which focused on Web services, social software, and crowdsourcing. Although these terms were used to describe the changes at the time, the shift was largely driven by the rise of social networking platforms. MySpace emerged in 2003, Facebook in early 2004, and Twitter by 2006, setting off a series of related changes in both commercial and non-commercial areas, often linked to these new social networks.

Furthermore, Stevenn E. Jones asserts that Google Books was launched in late 2004, which was particularly significant for humanists. GPS technology for mobile phones became practical in 2004, following the removal of selective availability of satellite data in 2000, and the Google Maps API, which enabled the creation of geolocative applications, was introduced in mid-2005. Twitter's introduction of microblogging to a wide audience came in mid-2006. The iPhone was previewed in 2006 and released in mid-2007, followed by Android OS and phones within a year. While 3D printing had been in development since the 1990s and was available in costly forms, the concept of affordable, DIY 3D printing as part of a networked media environment began around the same time as these other developments, with MakerBot, a key player in this area, being founded in 2009. Individually, none of these developments represented a major shift, but collectively and within a short period, they created a new context for understanding the network and exploring innovative uses of computers in humanities research.

In addition, Steven E. Jones contests that a new form of Digital Humanities began to take shape around the same time as these technological advancements. The term "digital humanities" was firmly established through a collection of essays released online in 2004 and as a printed book in 2005 (Blackwell's Companion to Digital Humanities). In 2006, the National Endowment for the Humanities (NEH) launched a digital humanities initiative, which led to the creation of the NEH Office for the Digital Humanities in 2008.By 2009, the large Modern Language Association (MLA) conference featured several high-profile meetings that prompted both the media and academic circles to recognize digital humanities (DH) as "the next big thing."

The rise of the new-model Digital Humanities between 2004 and 2008 did not represent a paradigm shift in the sense that Thomas Kuhn describes, where competing models within a discipline lead to a new dominant framework. Instead, it was more like a "fork" in humanities computing - a field already known for its interdisciplinary nature - that gave rise to a new "branch," a concept akin to version control terminology used by many DH practitioners. Alternatively, DH didn't emerge as if from a "primordial soup," but rather "into the spotlight." This emergence resulted from a shift in focus driven by new contexts, which drew attention to a variety of new activities. These new forms of DH developed alongside and often in response to cultural changes, particularly shifts in how people perceive and interact with the digital network, a phenomenon William Gibson refers to as the eversion of cyberspace.

Putting Digital Humanities (DH) into a "Historical" Perspective: Susan Hockey in the essay entitled' The History of Humanities Computing' divides the history of Humanities Computing (Digital Humanities) into four phases: Phase Iis entitled Beginnings: 1949 to early 1970s where he argues about how humanities computing has had a very well-known beginningin 1949with an Italian Jesuit priest, Father Roberto Busa's monumental task of making an *index verborum* of all the words in the works of St Thomas Acquinas which resulted into *Index Thomisticus*. Busa set very high standards for his work. His volumes are elegantly typeset and he would not compromise on any levels of scholarship in order to get the work done faster. He has continued to have a profound influence on humanities computing, with a vision and imagination that reach beyond the horizons of many of the current generation of practitioners who have been brought up with the Internet. By the 1960s, other researchers had begun to see the benefits of working with concordances. This period also saw the establishment of computing facilities in some major language academies in Europe, principally to assist with the compilation of dictionaries. Although a lot of effort during this period was focused on creating concordances as standalone goals, one particular use of these tools started to develop independently. The application of quantitative methods to analyze style and authorship existed before the advent of computing. Work from this early period is frequently described as being hindered by technology, where technology refers to character sets, input/output devices, and the slow processing speeds of batch systems. Despite these challenges, researchers managed to address some of these issues, though their solutions were often awkward. More importantly, many of the fundamental problems they identified persist today, such as the need to analyze "words" beyond just their graphic representations and to effectively handle variant spellings, multiple manuscripts, and lemmatization.

Phase II was entitled as Consolidation: 1970s to mid-1980s. During this phase, an increasing number of people began adopting the methodologies developed during the early period. More electronic texts were being produced, and new projects utilizing these methods were initiated. Awareness of the possibilities had gradually disseminated through regular academic communication, and as more people encountered computers in their daily lives, they started to consider the potential benefits of computers for their research and teaching. A review of the publications from this period reveals that many papers were based on vocabulary studies produced by concordance programs. These studies were primarily valuable for stylistic analysis or linguistic research. The application of increasingly complex mathematics to vocabulary counts often left scholars from the humanities feeling excluded. Aside from this, there was little that was truly innovative or exciting in terms of methodology, and there was perhaps less critical evaluation of methods than would have been ideal. Key developments during this time were more related to the

support systems created by increased opportunities for dissemination (such as conferences and journals) and the growing recognition of the need for standardized software and proper text archiving and maintenance. Dissemination was largely confined to humanities computing venues rather than mainstream humanities publications, suggesting that computer-based work in the humanities had not yet achieved full academic respectability, leading scholars to publish in forums where they were more likely to gain acceptance.

Phase III was entitled New Developments: Mid-1980s to Early 1990s. This period witnessed notable advancements in humanities computing, largely due to the emergence of two key technologies: the personal computer and electronic mail. Additionally, other developments occurred as a result of the growing use of these technologies and the need to minimize redundant work. Initially, there were various competing brands of personal computers. Some were designed for gaming, some functioned solely as standalone word processors, and others targeted the educational market rather than general use. Over time, IBM PCs and models built on the IBM architecture began to become the dominant choice, while Apple Macintoshes also gained considerable popularity, particularly for graphics applications. In addition to significant advancements in personal computing, networking, and the Text Encoding Initiative (TEI), the humanities computing activities from the 1970s continued to evolve, with an increase in users and projects. Over time, specific application areas emerged from humanities computing, developing their own distinct culture and methods of dissemination. The topic of "computers and writing" quickly faded, but a more notable impact on humanities computing was the shift of certain aspects of linguistic computing, especially corpus linguistics, to specialized conferences and meetings of its own.

Phase IV was entitled as The Era of the Internet: Early 1990s to the Present. During the 1990s, one development far surpassed all others in impact: the advent of the Internet, and more notably, the World Wide Web. The introduction of the first graphical browser, Mosaic, in 1993 marked a significant milestone. Today, the Internet is an essential component of academic work. A whole generation of students has grown up with it and instinctively turns to it as their primary source of information. Initially, some long-time practitioners of humanities computing, much like Microsoft, struggled to understand the potential impact of the Web. Those involved with the Text Encoding Initiative (TEI) viewed HyperText Markup Language (HTML) as a limited markup system that continued the issues of word processors and appearance-based markup. The Web was observed with curiosity but was not initially seen as a serious tool for humanities research, rather just a means of accessing certain types of information. This situation presented an opportunity for institutions and organizations considering entering the field of humanities computing for the first time. They recognized the Web as an excellent platform for publishing scholarly results and for promoting their activities to a broader audience. Thus, a new group of users emerged.

The evolution of digital humanities has been deeply influenced not only by the rapid development of technologies that have reshaped practices and research approaches, but also by the emergence of organizations and infrastructures. The history of the field can be explored from various perspectives. One angle highlights the technological advancements that have significantly affected research methods and practices. Another key factor is the impact of individual projects that have driven progress in digital humanities. Furthermore, institutions and infrastructures have played a critical role in the field's expansion by fostering researcher collaboration, granting access to data, hosting conferences, and often providing educational tools.From the year 2000 onwards, researchers and scholars started referring to their works in creating and analyzing digital texts, images, and sounds as "digital humanities." Some scholars contend that digital humanities is a crucial component of humanities research, as it has expanded the field's reach, improved access to sources, and transformed the nature of scholarly work.

Transforming the World of Education and Research

Digital humanities gained significant attention from academic departments, university administrators, and the general public when it was featured in The Chronicle of Higher Education and The New York Times as "the next big thing" and "Humanities 2.0," shortly after the establishment of the Office of Digital Humanities (ODH) at the NEH. Since then, the rapid rise in interest has led to speculation about a DH bubble, suggesting that it might be driven by start-up hype and inflated expectations. While there is some hype involved, and this may eventually diminish or collapse as such trends often do, digital humanities is not merely empty hype. It is a socially constructed field, like any academic discipline or intellectual movement, but it represents more than just ephemeral excitement. As a set of strategic practices - which will be explored further in this book, especially in the final chapter - DH is likely to persist beyond the current wave of enthusiasm. Additionally, the current popularity of DH is an extension of a longer-standing tradition.

The new digital humanities (DH) evolved from and remains connected to a long-standing tradition of humanities computing, which began over 60 years ago with lexical and linguistic research on mainframes in the mid-20th century. This tradition continued through the emergence of the Internet and the World Wide Web at the century's end, emphasizing the need to digitize our cultural heritage and aggregate archives. This ongoing work has accelerated with the growth of datasets and requires the involvement of specialists. Teams of textual scholars and computer scientists are needed to develop well-considered digital texts and tools for their study, ranging from simple viewers and collation software to advanced quantitative methods. These methods include applying techniques such as data mining, topic modeling, and text analysis to large collections of texts and archives. These approaches are extensions of the earliest practices in humanities computing, such as creating concordances and conducting experiments in stylometric and authorship attribution.

The mass digitization of Google Books occurred alongside a surge of other transformative material technologies. This included the rapid advancement of mobile computing and cellular communications, GPS and GIS, social networking software on the Internet, and augmented reality (AR) replacing the earlier focus on virtual reality (VR). Additionally, new media experiments, particularly in video games, both reflected and stimulated these changes. Collectively, these developments marked a significant shift in how people experienced the Internet and related

technologies during the early 2000s. This change in perception of the network - what William Gibson terms the eversion of cyberspace, or its transformation - happened concurrently with the rise of the new digital humanities, which gained increased visibility and funding as an academic field. Both these transformations began around 2001 and became more defined between 2004 and 2008, suggesting a significant connection between the emerging field and the broader technological and cultural shifts occurring outside academia.

It's a matter of recognizing that DH emerged, not in isolation, but as part of larger changes in the culture at large and that culture's technological infrastructure. The changes that have been enumerated above and that Gibson has called the eversion were themselves intertwined with culture, creativity, and commerce - just as the emergence of DH was. It should not be surprising that the emergence of the new academic field and the larger cultural shift in relation to the network were themselves intertwined events. In the words of Steven E Jones:

But cultural norms both inside and outside the walls of the academy often work against such recognition. In recognizing the importance of the changes Gibson calls the eversion, I assume that today's network is significantly different in various material ways from the Internet of the 1980s–1990s, in terms of scale, speed, access, and ubiquity. Some of the key differences were instituted 2004–2008. The most important effect of these differences is in the way people experience the network every day - in material terms, yes, as they use smartphones and cloud services and expect to be always connected, for example, but also emotionally and imaginatively, and this aspect of their experience is often revealed in metaphors, figures through which they think about and represent their experience. Those metaphors are collectively constructed and experienced, as they're shared and altered in the sharing. So I take seriously the effects of these new collective *perceptions* of the network's eversion, as well as perceptions that a new form of digital humanities has emerged as an academic field of study. Such perceptions are real things in the world, and they're worth understanding.

The initial phase of Digital Humanities research in the late 1990s and early 2000s primarily concentrated on large-scale digitization efforts and the development of technological infrastructure. In contrast, the current phase, often referred to as "Digital Humanities 2.0," is highly creative and generative, producing. This shift varies across disciplines and research agendas, with some fields relying more heavily on digital technology than others. However, it is uncommon to find an academic today who does not use digital tools in their research activities. While library catalogues represent the most basic way for scholars to access books and research articles without a computer, the gradual disappearance of card indexes (Baker 1996, 2001) [2, 74] has left non-digital scholars with increasingly limited options for conducting research in contemporary universities (Berry, 2011) [3]. Additionally, the widespread use of email, Google searches, and bibliographic databases has become essential, especially as more of the world's libraries are digitized and made available online. However, these tools also introduce specific challenges, such as overwhelming researchers with vast amounts of articles, texts, and data now easily accessible at their fingertips (Berry, 2011) [3].

The digital humanities are on the verge of expanding from a specialized field to one that influences research and teaching across the broader humanities. However, merely integrating into the mainstream should not be our ultimate goal. To make a significant impact, the digital humanities should also aim to take a leadership role. Currently, this leadership could involve advocating for the humanities, especially as they face increasing defunding from governments, states, and universities. By helping the humanities navigate the realm of networked and social public knowledge, demonstrating its unique value, and fostering interdisciplinary partnerships, the digital humanities can offer substantial support.

Liu quotes

"Humanities is a site created by the international community of digital humanities scholars and educators to assist in advocacy for the humanities. Government and private support for the humanities - for research, teaching, preservation, and creative renewal in such fields as literature, history, languages, philosophy, classics, art history, cultural studies, libraries, and so on–are in decline. But the humanities contribute the needed perspective, training in complex human phenomena, and communication skills needed to spark, understand, and make "human" the new discoveries. In the process, they themselves discover new, and also very old, ways to be human. They believe that society will be poorer, not richer, without the humanities to help us grasp, and evolve, what it means to be "human" and "humane" in today's complex world."

"Humanities began because the digital humanities community - which specializes in making creative use of digital technology to advance humanities research and teaching as well as to think about the basic nature of the new media and technologies–woke up to its special potential and responsibility to assist humanities advocacy. The digital humanities are increasingly integrated in the humanities at large. They catch the eye of administrators and funding agencies who otherwise dismiss the humanities as yesterday's news. They connect across disciplines with science and engineering fields. They have the potential to use new technologies to help the humanities communicate with, and adapt to, contemporary society."

Computation and the media capabilities of software are undeniably influenced by culture. This relationship underscores the significance of engaging with and comprehending computer code. In fact, computer code can be seen as a reflection of broader cultural contexts. For instance, digital humanities could explore how different programming languages correspond to cultural practices and possibilities - like associating HTML with cyber-culture or AJAX with social media. Similarly, one might map 'editing' software to the emergence of new forms in film, music, and art, or even apply cultural criticism within the framework of digital humanities.

There is the view today that the computational technology has become the very condition of possibility required in order to think about many of the questions raised in the humanities today. For example, Schnapp and Presner (2009) [27] explained that,

The first wave of digital humanities work was quantitative, mobilizing the search and retrieval powers of the database,

automating corpus linguistics, stacking hypercards into critical arrays. The second wave is qualitative, interpretive, experiential, emotive, generative in character. It harnesses digital toolkits in the service of the Humanities' core methodological strengths: attention to complexity, medium specificity, historical context, analytical depth, critique and interpretation (Schnapp and Presner, 2009) [27].

Presner (2010) further argues that the first wave of Digital Humanities scholarship in the late 1990s and early 2000s tended to focus on large-scale digitization projects and the establishment of technological infrastructure, [while] the current second wave of Digital Humanities - what can be called "Digital Humanities 2.0" - is deeply generative, creating the environments and tools for producing, curating, and interacting with knowledge that is "born digital" and lives in various digital contexts. While the first wave of Digital Humanities concentrated, perhaps somewhat narrowly, on text analysis (such as classification systems, mark-up, text encoding, and scholarly editing) within established disciplines, Digital Humanities 2.0 introduces entirely new disciplinary paradigms, convergent fields, hybrid methodologies, and even new publication models that are often not derived from or limited to print culture (Presner 2010: 6).

Berry (2011) [3] observes that first-wave digital humanities was the building of infrastructure in the studying of humanities texts through digital repositories, text markup, etc. Whereas second-wave digital humanities expands the notional limits of the archive to include digital works and so bring to bear the humanities own methodological toolkits to look at born digital materials, such as electronic literature (e-lit), interactive fiction (IF), web-based artefacts, and so forth.

I am of the view that we should continue to delve deeper into both the first and second waves of digital humanities while beginning to outline a potential trajectory for a third wave. This new wave should center on the inherent computational nature of the forms within a digital medium. In other words, this approach examines the digital aspect of digital humanities through the lens of medium specificity, exploring how changes in the medium influence shifts in knowledge production. It builds on recent advancements in digital humanities while also considering the role of general computability as enabled by particular platforms. We might argue that third-wave digital humanities reveals how digital technology brings to light anomalies within humanities research projects, prompting a re-evaluation of the underlying assumptions in such research - such as close reading, canon formation, periodization, and liberal humanism. As Presner (2010: 10) suggests, we are at the outset of a change in the criteria that dictate acceptable problems, concepts, and explanations. We are also experiencing a transformation in the institutional and conceptual conditions that affect how knowledge is created, shared, accessed, and preserved.

The digital humanities have an intriguing history, initially emerging as "computing in the humanities" or "humanities computing." In the early stages, this field was often viewed as a technical support role, assisting the work of "traditional" humanities scholars who led the projects. This phase was characterized by the application of computers to humanities disciplines, a practice described as treating the "machine's efficiency as a servant" rather than recognizing its potential to actively contribute to critical analysis (McCarty, 2009) [50].

As Hayles explains, the shift to the term "Digital Humanities" was intended to indicate that the field had evolved from its low-prestige role as a support service into a legitimate intellectual pursuit, complete with its own professional practices, rigorous standards, and stimulating theoretical explorations (Hayles 2011) [11]. Ironically, as projects grew in size and complexity and began to incorporate computational techniques as a core aspect of the research process, technically skilled researchers started to view computation as an integral component of conducting research within the humanities itself.

Conclusion

For many, the shift to Digital humanities has become a framework for envisioning the contemporary state of the humanities. It not only offers a perspective on what could be achieved but also provides an established support system within which these activities can be pursued. Digital Humanities seeks to understand what it means to be human by exploring various aspects such as art, governance, technology, and more. Both digital humanists and traditional humanists are focused on studying human interactions and their relationship with the environment. Digitalization covers a wide range of areas, including economic growth, inclusive development, job creation, and effective information management. Berry is right in arguing that few would argue against the idea that digital technology is fundamentally transforming the research process. It's becoming increasingly clear that research is now predominantly mediated by digital tools. Many suggest that this mediation is gradually altering the very nature of research itself, influencing the epistemologies and ontologies that form the foundation of research programs.

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