



Digital transformation and opportunities for the humanities

17 October 2022



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Citing this article: José Manuel Cerda Costabal, "Digital transformation and opportunities for the humanities", Laboratorio de Humanidades, Universidad San Sebastián, 17 October 2022.

The state of the humanities around the world is dreadful and this is news to nobody. Every year, fewer students want to study degrees in the arts and humanities, numbers of university posts shrink, research grants accumulate in the natural sciences and more practical fields, the conditions of academics and researchers is increasingly fragile and impoverished, and the influence and leadership once exercised by intellectuals in the humanities has been greatly diminished, leaving that space for social scientists, especially in the fields of law, politics and economics. Schools and faculties have been shut down and job opportunities for humanities graduates have decreased, these being highly

dependent on the traditional paths offered by school and higher education, museums and heritage preservation, and highly competitive funding for research at centres and institutes.

But if the humanities are all about wisdom and prudence, creativity, critical thinking, tolerance and empathy, cultural conscience and historical perspective -among many other skills much needed today- why are the professional prospects for humanists so traditional, narrow and discouraging? How do we explain the lack of interest for studying the humanities as a professional choice meanwhile these disciplines gain ground in core curricula taught across all university degrees and deemed indispensable in tertiary education?

I. Humanists and innovation at odds?

In the last few decades, many humanists have questioned, contested, feared and resisted technology and the digital means, and the very word “innovation”. It has been suggested that the modern world with all its progress has meant a real threat to humanities and the computing revolution has turned our society against history, literature and philosophy. Consumed by insurmountable nostalgia, some have accepted the fast-approaching demise of these “useless” degrees as inevitable, while others have invoked collective contempt to any measure of adaptation or surrender to what is often identified as the totalitarian demands driven by market utility. In this world of ravaging capitalism, the humanities are considered valuable only as a means of production and profit, and not an end in themselves.

But are there reasons why humanities should face the rest of the 21st century with optimism and enthusiasm? Is the internet, the social networks and big-data software the enemies of humanities? Surely, we all love our graduations with centuries-old rituals, pageantry dressed in gown and intoning Latin hymns at university ceremonies. The smell of an old book as we turn its pages is still an experience without match, and we are thrilled when entering a Harry Potter-style library darkened in the inside by aged oak and protected in the outside by bricks covered with ancient ivy. As a medievalist, I can attest there are few experiences more sublime than working at an archive and engage with ancient parchments with wonderful seals attached and centuries-old codices so beautifully illuminated with decorations and miniatures.

But is all this truly at odds or incompatible with the digital world? Can the humanities survive or surf this overwhelming wave of information and constant changes? Furthermore, can the humanities not only keep their head over the water but also thrive in this roller-coaster and provide some guidance to disentangle and understand the complexities of this exhilarating environment? In the midst of so many questions for the humanities, Adela Cortina’s thoughtful work suggests that innovation should not be a bad word for humanists if it is understood as choosing to serve society from our disciplines without forcing our intellectual contribution into becoming priceable products.¹

Big data, machine learning, artificial intelligence and metaverse can be shaped for the benefit of humanity if properly led by critical thinking and perspectives which can only be offered by the humanities. The argument posed by Scott Hartley that as technology becomes more universally available and user friendly, the expertise of technicians will depreciate while humanities skills will be

recognised as irreplaceable by software, has gained a lot of ground in recent years among influential thinkers and decision makers.² This is not a corporate declaration expressed by a society of philosophers or a guild of historians, desperately trying to justify a “useless” trade in extinction. It is a conviction of venture capitalists as Hartley, heavily engaged with innovation and enterprising at Silicon Valley, and for whom “technology and the Liberal Arts are married to each other”.³ And this is not mere prediction posed by people disgruntled with technology, but it is a reality that some of the most cutting-edge companies are hiring bachelor of arts graduates to take leading positions and provide the wisdom that only results from studying the humanities.

The list of humanities graduates who have become daring entrepreneurs and made a profound impact in technology and digital innovation is impressive. Medievalist Carly Fiorina was a director of Hewlett-Packard; philosopher Stewart Butterfield is the cofounder of Flickr y Slack and another philosophy graduate, Reid Hoffman, is cofounder of LinkedIn; executive director of YouTube, Susan Wojcicki, studied literature and history.⁴ Elena González-Blanco is Global Head of Digital for Wealth Management and Insurance at Banco Santander, but her university studies are mostly in medieval literature and Spanish philology. These are not people who renounced their university education or buried “useless” humanities degrees to spend the rest of their lives doing something practical and worthwhile. Their contribution to social networks and digital transformation bears witness to how humanities skills are vital to lead important changes outside academia and in a variety of fields.

Philosopher Vincent Hendricks has gone far beyond in this appeal to humanists, when suggesting back in 2014 that “in the information age, humanities is turning into a whole new beast. It’s time to stop defending the field as though it needs our help and show the world that it really can’t live without us”.⁵ He argued that only the humanities can assess the immense amount of information available in the internet, an undertaking that requires analytical skills and critical thinking.

Humanists should be encouraged to conquer new spaces and lead the way instead of simply reacting to the challenges of this digital age. For Pilar Carrera, Vice-president of Communication and Culture at Universidad Carlos III, innovation is so inherent to the humanities that they are not so oriented to solve problems as much as to generate crises by asking precise questions to the *status quo*.⁶ The natural sciences also raise hypotheses by asking questions that have led to paradigmatic changes, but without the unique contribution of the humanities, those changes have lacked long-term direction, or worse, they have turned against humanity.

Humanists are not only called upon to drop their resistance to modernity, but lead the way. In doing so, we ought to ask not only how can the humanities influence in but also be influenced by technology and business by embedding creativity, innovation and enterprise in what only the humanities can offer our digital age. Humanities have changed the world, why could they not embrace and even lead the changes the world is experiencing right now? At IE University they have understood this so well that for decades they have implemented STE(A)M (including the “arts”) programs with humanities courses at the very heart of each one of their professional degrees, much like the core curricula long established in places such as the MIT and other universities which are now driving innovation.

“The digital revolution has shaken up our understanding of narrative, but there are new technologies that could help us recontextualize rather than decontextualize”,⁷ writes Tim Gorichanaz. The following

study will point only to a few of the many possibilities in which digital means are already serving the purposes of the humanities and how can humanists develop a very friendly engagement with technology so to achieve fascinating and hitherto unthinkable outcomes for their teaching and research.

II. Digital Humanities: a new epistemology of data

For some, humanities will be digital or they will not be,⁸ while others have questioned the very existence of Digital Humanities (DH) as a discipline or a new epistemology, suggesting instead that it is only the application of computing to a field of study, just as data mining has been functional to psychology, economics or political science. However they may be defined, digital humanists have made a significant contribution over the last few decades in the fields of deep mapping and georeference, network analysis, text encoding for electronic search and stylometric data processing, key for detecting literary styles and even authorship. Some of their work has been seminal for the development of the spatial turn, an interdisciplinary movement which has assigned digital geographical analysis a central place in the study of society, history, philosophy and literature.⁹

Timothy Brennan argued in 2017 that “the digital humanities is a wedge separating the humanities from its reason to exist” and that its intellectual contribution to academia has been minimal, creating “a framework for lucrative tech deals in classrooms with the promise of the vast automation of teaching”¹⁰. Quite on the other side is Franco Moretti, one of the most influential digital humanists, who has suggested that DH is not simply a computing toolkit or a fancy new methodology, but an entirely new epistemology that leads to findings that could not be reached otherwise, thus shifting the paradigm of knowledge production.¹¹

Beyond the discussion on the definition and existence of the DH, many humanists today have never heard of them and most who have, may not have a clue what they are or where to begin should they be willing to explore this field. But whether the future of humanities is tied or not to the digital world, they should be fully aware that DH have been around since the 1960s and have made so much progress in the last decade that its impact on teaching and research in our disciplines will be very significant and that substantial changes in our fields of study seem inevitable.

But again, who is now doing teaching and research as it was done only 20 or 30 years ago? Who can now write a paper for a scientific journal without consulting the internet or can step into a classroom without Wi-Fi connection? DH is not the first nor the last revolution the humanities will experience. Just remember what the invention of the book (*codex*) or the printing press meant not only for the culture of readership, but for humanism as a whole. DH are no longer a threat when understood as one more chapter in the perennial transformation of our disciplines to which humanists are summoned as protagonists in a *carpe diem* venture. Furthermore, if fears or contempt should arise concerning the utility of DH, the very first step to embrace them with confidence in our teaching and research activity is to realise that they will never replace us. “For while information might expand, almost as if automatically, knowledge is learned; and while data increase exponentially, wisdom must be acquired. The digital is all very well, but the human outdoes it all”,¹² has rightly warned Elaine Treharne. Distant reading and big data analysis prompted by artificial intelligence and machine

learning is available to enhance our work, but no software will ever become a historian or a philosopher.

Many medieval manuscripts reveal interactive readership with glosses in the margins to provide commentary, just as text encoding in DH projects has allowed such fascinating engagement with the text for modern readers, going far beyond the fixed nature of the printed page, while opening new perspectives on manuscript production and preservation, literary networks, authorship and readership in the Middle Ages. Professor Treharne, a medievalist specialised in manuscript studies, has been involved in DH projects at Stanford University and explains that “the digital images permit us not only to identify, describe, evaluate, and mine data that have until very recently been completely overlooked -the marginal indications of use, the annotations, the doodles, the underlinings, the interlinear glosses- but also to become those very interveners in the manuscripts ourselves”.¹³

The findings of some DH projects may persuade even the staunchest sceptics and encourage those willing to venture into the unknown. Digital processing of data concerning musical history have been able to discover compositional patterns which may be replicated today to produce notation with the particular style of a dead artist, just as genetic traces may one day allow scientists reproduce extinct species. For Victor Padilla, part of the research team at UNIR University, the consequences of this project are so significant that “the listener may not be able to tell the difference between an original composition and that one generated by a computer.”¹⁴

The pioneering work of Michael Witmore and Jonathan Hope on the style of Shakespeare is another research project with fantastic findings obtained by distant digital reading. By using Docuscope software analysis applied to a corpus of later plays, they have suggested that quantitative evidence reveals different styles developed by the English bard and that they can be grouped in periods.¹⁵ Thousands of scholars have studied Shakespeare and made significant contributions to understanding his literary genius, but most research has only gone as far as close (human) reading has permitted, while studies like those of Witmore and Hope have saved so much work, time and resources by using distant (computing) reading. Several canonical works of major writers have been tested by applying data mining to concept usage and literary interpretations hitherto established beyond scrutiny, and have now been opened to discussion as a result. Apart from style, DH studies on anonymous and pseudonymous writings have discovered authorship while the copy and citation of works has been analysed with data mining and processing to reveal the popularity of certain books or the means by which an author becomes part of a literary canon.

Let us visit two other case studies to further illustrate what the partnership between software and humanities can generate. In 2013, Robert Galbraith published crime fiction *The Cuckoo's Calling*, but shortly after it was discovered that the novel was in fact written by the very famous J.K. Rowling. Suspicion of the author's pseudonym had already been raised by *The Sunday Times*, but it was the DH work of academics Peter Millican and Patrick Juola that confirmed the book had been written by Rowling by running her work and that of similar novelists through stylometric matching produced by JGAAP (Java Graphical Authorship Attribution Program). Juola explained that “by looking at Galbraith's language choices, the program could quantify the degree of similarity between Rowling

and Galbraith [...] While this wouldn't prove that Rowling had written it, it would be a strong form of objective evidence".¹⁶

Another example, among many, were the studies by Rodrigo Faúndez and Alfredo Rodríguez about the authorship of another playwright and contemporary of Shakespeare, the Spanish Andrés de Claramonte. It was argued that back in the seventeenth century, some of his work was attributed to the more renowned Lope de Vega and Tirso de Molina because it would sell much better. But recent DH analysis of important works such as *La Araucana* and *El burlador de Sevilla* have suggested Andrés de Claramonte as the likely author.¹⁷ Unlike the Rowling case, there still much debate about the attribution of these celebrated plays of the Spanish Golden Age, but the vital function fulfilled by software analysis in such cases is undeniable, not only in establishing authorship, but also for the study of such fascinating historical subjects as literary fame, readership and book production. Tirso de Molina and Lope de Vega have received due praise during centuries, but DH is now playing a crucial role in doing justice by unearthing authors buried by circumstances. It is riveting to think how much is out there to be discovered if humanists are willing to embrace the digital.

If the cases mentioned seem daunting for traditional research in the humanities and far beyond our software dominion, let me share my initial experience with DH so that threshold may be crossed more easily. Some years back, I studied the dower document of a medieval queen who received some property as marriage right, all of it listed in an original parchment dating back to 1170. In order to visualize the geographical distribution of such property within the kingdom of Castile, I used the very friendly and open access tool *Recogito* (Pelagios Network) to analyse the distribution of towns, castles and ports granted to this queen. I had done close reading of the document several times to publish an article in 2016, but visualizing the geography of these medieval locations by distant reading allowed me to confirm some of the political intentions behind this royal initiative as well as discovering some spatial patterns of the queen's patrimony, which are historically relevant.¹⁸

No sophisticated skills in DH or programming knowledge were needed and there are a number of online courses and approachable tutorials that will take you much further. When feeling discouraged or overwhelmed, beginners should never lose sight that DH is a highly collaborative space. Lenny Muellner, former director of publications and IT at Harvard's Center for Hellenic Studies assured that "it's amazing what happens when you take somebody whose basic training is in humanities and you teach them how to program. It becomes a creative experience of astonishing proportions".¹⁹

It is unlikely that close reading will ever be replaced by DH programming because it entails the critical and reflexive approach to sources which is proper to human intellectual activity. But likewise, researchers will never be able to produce the quantitative analysis that artificial intelligence yields when applied to texts. Academics have laboriously studied these cultural phenomena for decades by close reading hundreds of books, chapters and articles, but such a task has become more efficient, precise and comprehensive with DH, while prompting the visualization of new aspects or dimensions within a field of study. In some cases, DH have assisted the generation of new questions for our sources or they have entirely modified accepted interpretations when concealed patterns or correlations emerged, because as Franco Moretti has suggested, "the first thing that happens when a literary historian starts using computers to think about literature is that the object of study

changes”.²⁰ Furthermore, letting computer analysis into the sacred space of humanities research may also multiple our time for other academic undertakings and perhaps counteract some of those precious hours spent in distressing management duties in our heavily bureaucratic university system.

A lot in the DH environment is open access, highly collaborative and interdisciplinary, but the traditional university system has not been fertile ground for its development. HD is oriented to transdisciplinarity while research funding, academic career and teaching jobs at universities are mostly structured in disciplinary units, some of which have resisted innovation of any kind or have overlooked the relevance of the digital culture for the future -and perhaps survival- of the humanities. Even so, DH have gained some ground in degree programmes (especially in English-speaking institutions) and several centres, labs, organisations and publications have been established at some of the world’s most prestigious and leading universities to study this phenomenon and embark on well-endowed projects.²¹ Even universities like Oxford known to treasure tradition and guard their history in in the midst of ancient sandstone are moving forward in generating spaces for innovation and digital engagement for the humanities. Its newly established Stephen A. Schwarzman Centre for the Humanities will include the cutting-edge Institute for Ethics in Artificial Intelligence.

Although metadata or macroscopic analysis will never replace human research, DH are likely to be part of the core curriculum of humanities degrees in a few years’ time and its learning outcomes will not be simply functional, but they also point to an understanding of our global, complex and diverse digital culture.

Besides the amazing possibilities enabled by DH for academic research, some of these projects also engage with ethical dilemmas and cultural intricacies that can only be approached from the humanities. Design thinking training with state-of-the-art programmes are beginning to incorporate humanities as recognition that “technical things and systems must be responsive to aesthetics, personal preferences, cultural differences, and human behaviors of all sorts”,²² observes William Bryant. In terms of the transformation that universities will face in the next decades, DH provide a powerful space for interdisciplinary collaboration by connecting academics from fields and departments so distant from each other as the humanities, computing and technology.

III. Communicating the humanities digitally

Digital Humanities quickly come to mind when finding the links between humanities and the digital world, but the possibilities that will flourish from such integration are not reduced or reserved to DH. What the humanities can achieve by working together with digital communications and social networks, and the forthcoming metaverse development of augmented and immersive reality is paramount and unimaginable. In all of this, humanists have the chance to seize the moment and claim a leading role that will place the humanities back at centre stage, perhaps so decisively as when the ancient Greeks began to think the world 3.000 years ago.

Alongside DH, another emerging field where technology can benefit the humanities a great deal is digital communications and social networks. Let me provide a couple of personal examples to illustrate this so to explain that these possibilities are within everyone’s reach. In 2011, we organised

an exhibition of a real size replica of the Bayeux Tapestry and it was incredibly successful.²³ More than 30 groups of school children and nearly 3.000 people came to see the amazing sequence of scenes and images that so vividly describe the Norman conquest of England back in 1066. Over a couple of months, I gave some 20 guided visits to small groups and one of them was filmed and uploaded to my YouTube channel along with a brief documentary we produced for the exhibition.²⁴ In seven years, nearly 15.000 people have watched the guided visit and if these numbers seem insignificant if compared to what is uploaded these days by popular influencers, it is a fascinating accomplishment if we think of the audience a medieval historian would normally reach with such a specific subject. It should also be considered that the video is in Spanish for the numbers would have been considerably bigger had the guided visit been given in English.

An exhibition in Chile about an object from medieval Europe watched around the globe by thousands of people thanks to an internet channel with your own videos would have been unthinkable or considered surrealistic only 20 years ago. Without having to spend a cent or acquire complex computing skills with ICT training, this is how powerfully effective digital means can be for spreading historical knowledge. What humanist would not like his/her intellectual work to reach the widest possible audience? People outside universities are indeed interested in what academics have to say and our challenge is mainly concerned with the means available to reach them.

A second story -among many others- will probably be enough to make the point. Before the Covid pandemic, I used to offer continuing education courses in medieval history and would congratulate myself if I managed to get above 20 people attending in person. But as people could no longer go to campus due to intermittent quarantines, I was forced to look for solutions. Once again, it was the digital world that would come to my rescue and the outcome was simply stunning. From teaching only 4 to 6 courses a year with some 150 students altogether, I was able to teach more than 20 courses in 2020 and 2021 and increased my audience by nearly twenty times. I gave an open lesson for Ilustre in YouTube Live about the prejudices against the medieval period that was joined at once by more than 8.000 people from several countries! Again, these numbers may not impress experienced youtubers, but they are surely colossal for academic humanities.²⁵ As usual, much of this achievement is grounded on hard work with a little touch of creativity and innovation, but none of it would have been possible outside the digital world. The best news for university professors is that these rewarding endeavours are perfectly compatible and mutually enriching with traditional academia.

Besides the fascinating possibilities offered by these digital means to take the wisdom of humanism to a much larger public, we should not overlook the unprecedented freedom and independence that online courses offer to academics. Close attention should be given to this phenomenon that is likely to change the constraining dynamics of university tenure and the pervasive dependence of intellectual productivity on highly competitive and market-directed funding.

Initiatives of this sort driven by institutions and foundations are much more relevant and successful cases are abundant, but I have offered these personal examples so to demonstrate how far individual undertakings can get if humanists drop the guard against technology and approach the digital means without fear or distrust. Communications and social networks in this digital age can serve the mission

of the humanities and boost their relevance in environments far removed from the university classroom or the academic congress.

Online international courses and training will pose a real challenge to universities. Low cost and innovation driven courses with academics from the different parts of the world will very likely beat any offer universities can possibly manage and when -and if- certification is vested with global recognition, many will decide to learn outside and beyond campus. Continuing education courses are less dependent on academic certification and that explains the success of MOOC (massive open online courses), for example, an experience joined by Google, IBM and many other tech companies concerned with online education.²⁶ For some institutions this has been a threat, while for others it has been an opportunity. Instead of confronting these challenges, some universities have embraced the trend wholeheartedly and gone online many years ago, like UNIR (Universidad Internacional de la Rioja), an officially recognised internet university based in Spain with more than 50.000 students worldwide, while others had been born as online institutions, like Tech Universidad Tecnológica, claiming to be the world's largest digital university.²⁷ Most of these initiatives have encountered problems and shortcomings and we all know that online education is by no means an assurance of quality and prestige. In fact, there is a lot evidence to suggest quite the contrary, with so many unscrupulous projects subject to no regulation whatsoever, devoid of any sense of academic excellence and driven mostly by commercial opportunism. But dodging some of the traditional and bureaucratic constraints of the university system, many private initiatives around the world have flourished in the last couple of years by seizing the opportunities brought by online teaching and offering the solace that only the arts and humanities can provide in these very testing times, just as the amusing stories of Boccaccio's *Decameron* comforted the spirits of those Florentine youngsters enduring the Black Death.

IV. Learning by playing. Video games and humanities

Another dimension in which humanities have entered the homes of millions is video games. From the release of *Age of Empires* in 1997 to *Assassin's Creed Valhalla* in 2021, medieval history has been taught to people of all ages who have otherwise not developed any interest in the past. This is no mere entertainment fuelled with special effects and digital recreation of ancient worlds. What some historically-themed video games have achieved is to actually provide a very effective and massive learning experience that has taken the humanities well beyond the classroom. The cultural encounter between Viking invaders and Anglo-Saxons in ninth-century England is so accurately represented in *Assassin's Creed Valhalla* that I was able to give a conference about the subject by interacting with someone playing the game live.²⁸ Although most of these games offer warlike experiences, some recent releases have introduced a great deal of decision-making, strategy and skills other than fighting and killing people, with story scripts focused on individual agency and personal dialogues.

The video games industry is well aware of the success of products loaded with historical content as the *Assassin's Creed* saga has revealed. This has opened many professional paths for humanities graduates as specialised advisors, yet another possibility for the synergy that the digital and the humanities are called to accomplish and that also extends to TV series, movies and teaching

resources. It is very interesting that the increasing intention of video game developers for historical precision is not only turning them into potential class material at schools and universities, but it has also proved commercially attractive as many gamers seem to have a very stimulating experience when playing within virtual worlds that represent reality, even for those fascinated by science fiction or fantasy themed games.

This will not replace my traditional medieval history class, but it is no doubt a fantastic complement that will have a very engaging appeal to most of my students. As Francisco Jiménez Alcázar has observed when using video games in class, “the immersion achieved with this medium is only comparable to reading, where image and sound are so personal that is impossible to share the “experience” with others. The video game allows hearing and seeing images generated by other people, but those images are owned in the very moment you transform them so to make progress in the game”.²⁹ For Andrew McMichael, the use of computer games for teaching is beneficial for multiple reasons: a better engagement with historical phenomena is produced by a medium that is familiar and entertaining for students; learners can better relate stories of the past with their own when playing interaction takes place; and a critical discussion is likely to arise about the use and abuse of the past as commodification and ground for modern prejudices and ideologies.³⁰

The educational challenge for academics willing to include such material in class is to turn the experiences of gamers at home into deep learning at campus; a task as complex as crafting synergy between traditional teaching and what is virtually perceived by sitting in front of a screen. Our students may be digital natives when it comes to using social networks and apps, but they have to be guided and educated to learn history from *Total War*, *Kingdom Come* or *Call of Duty*.

Books such as Harry Brown's *Videogames and Education* (2008) have not only addressed the possibilities opened by the digital worlds of gaming for teaching, but also have dealt with issues concerning human cognition and discourse consumption, as well as the effects -desirable or not- that such an engagement with virtual reality may bare on our creativity, imagination, social skills and decision-making abilities.³¹ While some video games have been designed with the advice of humanists and have wonderfully served educational purposes, others have nurtured all sorts of pathological attitudes and social isolation, even leading to well-known tragedies.

Some years back, these issues were at best commented in gamer blogs; now they have become a very serious scholarly matter considered in university courses and by prestigious publishers. The sociological and cultural aspects of video gaming have been addressed by social scientists for a long time and humanists have also contributed to understanding such a phenomenon from different perspectives. But the point at stake here is elsewhere: how much is the industry willing to take sophisticated scripts developed by scholars and how is that content serving educational purposes and guiding new teaching and research methodologies in the humanities. Among other editorial projects, publishing house De Gruyter Oldenbourg has taken the issue in that direction by opening a book series with a dozen of collective volumes in which the mutual influence of humanities and video games is explored from different viewpoints and disciplines.³²

Provided that “games naturally engage with subjects that lie within the conventional province of humanistic enquiry, including storytelling, architecture, music, and visual art”,³³ James Coltrain and

Stephen Ramsay have come to the point of discussing whether video games may enter the realm of humanities scholarship. At the heart of these projects and discussions is the idea that the humanities are shaping video games as much as video games may be showing the way for the humanities. How a gamer perceives and understands philosophy, history, art and literature while sitting in front of the screen is a cognitive phenomenon that humanists must observe as an interesting input to profile teaching methodology in the humanities. This is why close attention and commitment to this collaboration between the humanities and technology has been granted by the National Endowment for the Humanities in the United States, a federal agency that has allocated very substantial funding to digital projects in DH and video games.³⁴

V. Towards the metaverse. Heritage in virtual and immersive reality

Another area where the unlikely marriage between humanities and the digital is growing fast and delivering astonishing results is in virtual reality. Augmented and immersive reality are driving the humanities to provide multisensorial experiences by applying technology to cultural objects and phenomena in a process geared towards the next big digital revolution after the invention of the world wide web: the metaverse. Simple examples will serve to explain this startling forecast.

I teach an undergraduate course called the Middle Ages in 12 objects. It is a very entertaining and effective way of explaining the medieval mindset (or mindsets) by analysing the symbolism and context information conveyed by material culture. But since the course is taught far away from Europe, I cannot get my students in touch and fully engage with these objects physically. This is, again, when digital technology comes to our rescue.

Henning Kleist is a freelance 3D artist who has done digital rendering of the crown of the Holy Roman Empire, crafted in the 10th century for the imperial coronation of Otto I.³⁵ As one of the most beautiful, symbolic and historically-charged objects of the Middle Ages, the *reichskrone* is in my course list. Kleist has used hundreds of high-quality photos taken from all possible angles and software for 3D modelling and animation to reproduce a digital version of the crown which is simply astonishing. The result enables the viewer anywhere in the world to appreciate so neatly a thousand-year-old object in augmented reality, offering details and parts of the crown that cannot be observed by the naked eye when appreciating the real object on exhibit at the History of Art Museum in Vienna. Nothing compares to the emotion felt by being face to face with a historical object so this virtual reality project does not replace that reality experience, reserved nevertheless to those who have the means to travel and visit museums.

But the cultural benefits of virtual reality are not confined to enhancing teaching in the humanities and taking these objects to the homes of millions around the world. By allowing access to details and views of the object concealed in the physical encounter, augmented virtuality has significantly enriched academic research. In the digital version of the crown, we can appreciate with full clarity how the pearls and precious stones are attached and the sophisticated techniques employed for the enamel paintings on the golden plates. These are only a few of the details which offer very important information on medieval craftsmanship and can hardly be perceived by looking at the real crown. I have seen the real object on display several times and never noticed such detail before.

In a few years' time with three-dimensional printers more available, you may have the crown or similar historical objects printed at home, for a museum exhibition or as teaching resources for schools and universities. Objects lost or damaged and historical buildings with missing or deteriorated parts may be restored in the near future with 3D printing. One example among many is the project by The National Archaeological Museum in Madrid in partnership with Acciona Enterprises which has digitised and reproduced some 30 medieval objects of its permanent exhibition, including an entire Romanesque arch.³⁶ Heritage preservation and artistic engagement for visitors motivated such amazing endeavour. The thought of medieval (or any historical) heritage being recovered or reaching every corner of the globe is enthralling and again, these are only some of the possibilities that come quickly to mind when considering the use of digital technology in the humanities. The reader of these lines can surely imagine many others.

Similar 3D modelling has been applied to other medieval objects (also studied in my course) like the Jelling runestone (Denmark) and the chalice of Lady Urraca of Zamora (Spain), a cup claimed by some to be the Holy Grail. Since 2014, when two academics from the University of Leon published a book claiming that the cup kept at San Isidoro Museum may have been the one used by Christ in the Last Supper, more than 130.000 tourists have queued every year to get as close as they can to the most searched relic in Christendom.³⁷ Up until this much debated discovery, the object was among the collection on exhibit at the museum, but now is shown in a special chamber especially designed to shine forth its singularity. In medieval times, relics were presented to be touched by pilgrims, but so that millions could experience this without causing damage to this thousand-year-old liturgical jewel, Hewlett Packard developed a digital project with the museum curators to produce a three-dimensional virtual copy of the object with virtual interaction. By using a non-invasive Virtual Reality Monitor and a ZVR platform, the object was scanned with the highest possible precision so to view details at 0,05 millimetres and provide users with the best possible immersive interaction as if they had the chalice in their hands when using 3D lenses.³⁸ This virtual experience will never replace what medieval pilgrims felt when touching or holding a reliquary, but the partnership between a technological company and a museum has greatly enhanced the access to such an amazing object of the Middle Ages (Holy Grail or not), and reveals how our engagement with cultural heritage may be boosted when creativity and innovation is applied to the humanities and the arts. But this is not only about tourism or heritage preservation, initiatives such as this will have an impact in future metaverse teaching and research well beyond imagination.

The digital version of the relics of the holy chamber of Oviedo Cathedral is also a wonderful example that allows virtual interaction with objects located out of reach for visitors.^{39,40} Even if you cannot physically touch them, the virtual interaction with these objects is engaging enough for the user to enjoy a very significant cultural experience. In some other cases, the discoveries yielded by augmented reality have been significant enough to trigger important breakthroughs in humanistic research.

At the rate of technological change, no doubt virtual reality will become an essential aspect of the humanities in the 21st century, just as it is becoming for the arts. Non-fungible tokens (NFT) are unique digital reproductions of works of art, certified by encrypted codes and now traded as if they were tangible objects. According to some researchers, "by bringing scarcity to the digital realm for

the first time, crypto collectibles have increased the value of museum images and digitised collections of cultural heritage institutions significantly”,⁴¹ in spite of the financial risks and volatility involved. This is a revolution the humanities and the arts cannot leave in the hands of digital operators, but are called upon to lead.

Promising as all this collaborative interaction between the humanities and technology might be, these experiences are often limited in terms of its multisensorial immersion, where touch and smell are still missing. Let us now consider an example of immersive reality in the humanities which ventures beyond the experience of augmented reality because it enables a multisensorial engagement between the subject and the object and follows the path of metaverse, said to be the very next internet revolution.

The Battle of Bannockburn was fought between the 23rd and 24th of June of the year 1314. It was a decisive victory of Robert the Bruce over the English army and secured Scottish independence for centuries. Visitors could walk around the battlefield and admire a very large equestrian statue of the Scottish king and warrior, none of which really meant a very significant experience in terms of historical immersion. But the National Trust for Scotland spent more than 9 million pounds and opened a new visitor centre in 2014 and the experience changed dramatically. Equipped with 3D glasses, now you can enter a dark room of immersive reality where you experience a journey into the past to “feel” the battle. Arrows and blows come your way and other special effects hit you in a multisensorial experience. This is so striking that when I took a group of students to Bannockburn a few years back, some people left the room because they felt very anxious and uncomfortable, as you would if were in the midst of a medieval battle with blood spilt in your face, horses falling all around you and the terrifying sound of crushing armour. Project director David McAllister explains that “after a visit to the new Battle of Bannockburn experience, people can walk away not just with extra knowledge, but with the experience and emotions of medieval battle”.⁴² After this “unsettling” experience, the visitor is invited to join a game displayed in a 3D digital board that recreates every movement of the battle but with the possibility of changing the outcome. Historians are not only concerned with what happened, but we also entertain thoughts about what could have happened because such consideration usually leads to a better understanding of causality, one of the main factors in historical analysis and which is also present in the strategies and decisions deployed in video games. Digital gamification for historical understanding then becomes a powerful tool for interpretation.

Can my university lecture possibly compete with these experiences as a learning space? The good news is that they don’t have to if you are willing to accept technology and the forthcoming metaverse revolution as friendly partners of the humanities and understand that commanding this innovation is very much within our hold as humanists.

In many parts of Europe, medieval churches have been illuminated with colour projection that allows the viewer to understand how these buildings were painted centuries ago, and although this is not quite immersive reality, it enables a window into a very distant past that becomes more comprehensible for the modern mind. How many times we have heard that the Middle Ages were dark, dull and colourless? Technology applied to the humanities can now help to revert this and many

other misconceptions. Light projection, 3D rendering and audio-visual animation have also been used to animate the work of famous painters as Goya and Van Gogh with stunning results in terms of being able to enter the mind of an influential artist, a process hardly experienced when sitting in front of the artwork at a museum.⁴³ At this point, some scholarly critics might raise their voice to defend the artist's originality to regard these virtual "interventions" degenerate. But if the work itself remains intact, is there really an issue if the beauty produced by mankind travels out of museum confinement to the whole world? What if those "interventions" are designed by the experts themselves in multidisciplinary teams including art historians, educators, philosophers and psychologists? Were these artworks really conceived by their painters to be fixed in meaning and closed to any interpretation and interaction? The future profits of these innovative projects for the study of art history, psychology and aesthetics are hard to imagine and we can only be excited about them.

If metaverse achieves its aims and everything goes according to plan, millions will eventually feel history, culture and heritage will all senses in a digital dimension never experienced or even imagined before. The possibilities that metaverse will open for online education are simply unconceivable. Schools and especially universities have been spaces where reason has triumphed over the education of the senses for centuries, but this is likely to change in the next few decades as institutions are beginning to grasp the importance of sensorial training for professional performance. Most universities claim to offer an education for life and not just to get a job, some have even turned this into an institution motto. With this academic mission in mind, universities can no longer underestimate the centrality of the senses in the learning process and in our digital age of virtual reality, the role that metaverse could play in this educational shift will be crucial.

VI. Crossing the threshold to surf the wave

Tim Gorichanaz has argued that "that the success of our human future requires the pursuit of narrative, reflection and empathy (...) through education, civic discourse and therapy. But if the design of our digital technologies helped us get to where we are, then design can also help get us somewhere better".⁴⁴

The critics of digitizing the humanities usually point to the dangers of dehumanizing our disciplines and prompting social and academic isolation. But if credit should be given to such warnings and we have to identify the potential threats of technology to humanism and the humanities, it is undeniable that the digital means have prompted a highly connected and collaborative community around the world and has allowed the beauty, truth and wisdom of our trade to illuminate and inspire millions. Humanists are the very fortunate beholders of these treasures and should feel compelled to find the means to reveal them as far and wide as possible.

But just as important is to conceive that technology, the digital humanities and communications, immersive and virtual reality, are not only some of the instrumental means available for cutting edge teaching and research in these disciplines. They are also the product of human creativity and innovation and, as such, they provide a challenging opportunity to ponder on our mindsets, methodologies and institutional structures.⁴⁵ In this sense, our technological world needs the humanities perhaps as much as the humanities need the new technologies.

The future of DH and cultural metaverse cannot be realised by the expertise of technicians or humanists alone, but it will necessarily be the result of integration and collaboration. This will also shape the university of the 21st century, set to become much more interdisciplinary, technological and international.

One of the most innovative universities in Europe, IE University, was founded in Spain as *Instituto Empresa* to teach management and economics, and yet the humanities have always been at the very heart of the institutional project. In reference to the integration of humanities and technology, a message in its webpage reads: “we’re living in a world that’s increasingly defined by technology. But one of our main learnings from the pandemic is the fact that technology is built to support and sustain humanity -and we are in control of the effect it has on us”.⁴⁶ That a university at the heart of Silicon Valley like Stanford and the Massachusetts Institute of Technology in Boston are placed first and second in the 2022 World University Rankings (Times Higher Education) for arts and humanities is also telling of the changes to come.⁴⁷ The role that history, literature, philosophy and the arts have in this paradigm shift is crucial and demands assertive action by institutions, but also by individuals. In the long run, the effect produced by one single academic embracing digital culture is immense and we cannot wait for university authorities to move before is too late for the humanities.

After reading this paper, some may feel overawed by the opportunities ahead, while those who have relished the astounding upshot of the humanities going digital will know that this is but a very small sample. I have only intended to provoke curiosity and encourage exploration so the beauty and wisdom of the humanities can meet the challenges and deal with the questions of our age, but in its very own terms. Crossing the threshold for humanists to surf the digital wave is more a matter of attitude than training or capabilities.

The thoughts and possibilities presented here have not suggested an unconditional surrender of the humanities to a digital dictatorship or the demands of market utility, nor are they a call for our digitally-overdosed routines to spend more time in front of the screen. I have only claimed that technology could be mastered by humanists to greatly enhance the purpose, sources, methods and perspectives that have always defined our disciplines and thus secure not only their very existence, but also invigorate their unique relevance to society and culture.

¹ Cortina, 2013.

² Hartley, 2017.

³ Gupta, 2018.

⁴ Fernández, 2021.

⁵ Hendricks, 2014.

⁶ Agirre, 2021.

⁷ Gorichanaz, 2022.

⁸ Del Río Riande, 2018.

⁹ Schreibman; Siemens; Unsworth, (eds.) 2004; Gardiner, 2015. The site whatisdigitalhumanities.com offers more than 800 definitions of DH by different authors as you refresh the page.

¹⁰ Brennan, 2017.

¹¹ Saller, Richard P.; Treharne, Elaine; Moretti, Franco; Cohen, Joshua; Keller, Michael A. 2014, p. 30.

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- ¹² Saller, Richard P.; Treharne, Elaine; Moretti, Franco; Cohen, Joshua; Keller, Michael A. 2014, p. 27.
- ¹³ Saller, Richard P.; Treharne, Elaine; Moretti, Franco; Cohen, Joshua; Keller, Michael A. 2014, p. 27.
- ¹⁴ Fernández, 2021.
- ¹⁵ Hope; Witmore, 2014, pp. 123-149. For a collection of DH studies on Shakespeare, refer to Kolentzis, (ed.), 2020.
- ¹⁶ Juola, 2013.
- ¹⁷ Faúndez Carreño, 2017, pp. 480-501. See also Rodríguez López-Vázquez, 1987.
- ¹⁸ Cerda Costabal, 2021; Cerda Costabal, 2016, pp. 63-96.
- ¹⁹ Manning, 2013.
- ²⁰ Saller, Richard P.; Treharne, Elaine; Moretti, Franco; Cohen, Joshua; Keller, Michael A. 2014, p. 28.
- ²¹ Keller, 2014, pp. 33-35.
- ²² Bryant, 2013.
- ²³ The exhibition was organised by the Center for Medieval Studies which I founded in 2010 and directed for several years at Universidad Gabriela Mistral (Chile). Some of the projects developed to take medieval history from the university classroom to the wider public are described in Cerda Costabal, J.M. and Crovetto Matamala, P. 2018, pp. 233-256. About this Bayeux Tapestry Exhibition in the Chilean press, see "El enigmático Tapiz de Bayeux: uno de los primeros cómics de nuestra historia", *El Mostrador*, 23 November 2011; "Monumental lienzo medieval se exhibe en Universidad Gabriela Mistral", *La Tercera*, 25 November 2011. A short documentary was produced for the exhibition: "Mini documental sobre el Tapiz de Bayeux 2011" (YouTube).
- ²⁴ This guided visit can be watched in YouTube by searching: "Visita guiada del Tapiz de Bayeux por el profesor José Manuel Cerda".
- ²⁵ Agirre, 2021. Among others, a private initiative worth a mention is Ilustre (www.ilustre.co), a cultural project originated in Colombia.
- ²⁶ Ong, 2021; O'Donnel, 2021; Marcus, 2012.
- ²⁷ UNIR was founded in 2008 and is officially recognised as online university by Spain's National Agency for Accreditation (ANECA) with nearly 50.000 students currently (www.unir.net). Established in 2015, Tech Universidad Tecnológica operates mainly from Mexico and Spain but with students from than 100 countries and more than 500.000 "graduates" (www.techtute.com). Some degrees are recognised by the Mexican Public Education Secretary.
- ²⁸ The session can be watched in YouTube: "Doctor en Historia Medieval reacciona a Assassin's Creed Valhalla".
- ²⁹ Jiménez-Alcázar, 2020, p. 3.
- ³⁰ McMichael, 2007, pp. 203-204.
- ³¹ Brown, 2008.
- ³² Book series *Video Games and the Humanities* edited by Nathalie Aghoro, Iro Filippaki, Chris Kempshall, Esther MacCallum-Stewart, Jeremiah McCall and Sascha Pöhlmann, De Gruyter Oldebourg, Berlin, Boston, 2020-2022. Further particulars about the series in <https://www.degruyter.com/serial/vgh-b/html>
See also Jagoda, 2014, pp. 189-215; Radetich ; Jakubowicz, 2014, pp. 9-22; Scheinman, 2021. On the historical narratives and portrayals of the past in video games, an interesting read in Wainwright, 2019.
- ³³ Coltrain; Ramsay, 2019, p. 36. See also one of the pioneering books on the subject, written 20 years ago: Gee, 2003.
- ³⁴ "Learning the Humanities through Video Games", *The National Endowment for the Humanities*, 20 June 2016. Up to 2016, the NEH had granted 3.6 million as research funding for educational video games with its "Arts in Media" program.
- ³⁵ Henning Kleist website and about this project: www.henning-kleist.com/imperialcrown
- ³⁶ Yusta, 2019.
- ³⁷ Torres Sevilla; Ortega Del Río, 2014.
- ³⁸ A nine-minute video about this in YouTube: "Presentación del Cáliz de Doña Urraca en 3D"
- ³⁹
- ⁴⁰ Ruiz; Rovés; García Voces, 2015, pp. 69-76.
- ⁴¹ Valeonti, F.; Bikakis, A.; Terras, M.; Speed, C.; Hudson-Smith, A.; Chalkias, K., 2021, 1-19. See also Kugler, 2021, pp 19-20.
- ⁴² "Bannockburn battle recreated in 3D", *BBC News*, 31 January 2014. The experience has attracted thousands of tourists and been qualified as one of the best in the United Kingdom ("Battle of Bannockburn visitor centre 'best in UK'", *The Scotsman*, 27 October 2015).

⁴³ Mansky, 2018; Hermoso, 2021.

⁴⁴ Gorichanaz, 2022.

⁴⁵ Some of this is discussed in Katz, 2005, pp. 105-118. For “just as there is no art without artists, there is no technology without the people who create it.” Then, “what if we considered robotics as art rather than technology?”, asks Eric Schatzberg when surveying the contempt for the mechanical arts in modern times and the focus on things rather than people. Schatzberg, 2019.

⁴⁶ “Using humanities to understand the world at IE University”, *UncoverIE*, 17 January 2022.

⁴⁷ Baty, 2021. Needless to say, university rankings are a very relative source of information.

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