



CHAPTER 1

The Humanities *in* the digital

The ultimate, hidden truth of the world is that it is something that we make, and could just as easily make differently. (Graeber 2013)

1.1 IN THE DIGITAL

The digital transformation of society was saluted as the imperative, unstoppable revolution which would have provided unparalleled opportunities to our increasingly globalised societies. Among other benefits, it was praised for being able to accelerate innovation and economic growth, increase flexibility and productivity, reduce waste consumption, simplify and facilitate services and information provision and improve competitiveness by drastically reducing development time and cost (Komarčević et al. 2017). At the same time, however, warnings about the dramatic and disruptive changes and outcomes that it would inevitably carry accompanied the considerable hype. For example, several economists raised serious concerns about the major risks that would derive from the digital transformation of society. A non-negligible number of evidence-based studies projected rise in social inequality, job loss and job insecurity, wage deflation, increased polarisation in society, issues of environmental sustainability, local and global threats to security and privacy, decrease in trust, ethical questions on the use of data by organisations and governments and online profiling, outdated regulations, issues of accountability in relation to algorithmic

governance, erosion of the social security and intensification of isolation, anxiety, stress and exhaustion (e.g., Autor et al. 2003; Cook and Van Horn 2011; Hannak et al. 2014; Lacy and Rutqvist 2015; Weinelt 2016; Frey and Osborne 2017; Komarčević et al. 2017; Schwab 2017).

Despite all the evidence, however, the extraordinary collective advantages presented by the new technologies were believed to far outweigh the risks (Weinelt 2016; Komarčević et al. 2017; Schwab 2017). Indeed, the prevailing tendency was to describe these great dangers rather as ‘challenges’ which, however significant, were believed to be within governments’ reach. The digital transformation of society would have undoubtedly provided unprecedented ‘opportunities’ to collaborate across geographies, sectors and disciplines, so naturally, on the whole, the highly praised positives of the digital revolution overshadowed the negatives. Some experts comment that this is in fact hardly surprising as in order for a revolution to be accomplished, the necessary support must be mobilised by governments, universities, research institutions, citizens and businesses (Komarčević et al. 2017).

Thus, in the last decade, though with differences across countries, both the public and the private sector have embraced the digital transformation (European Center for Digital Competitiveness 2021). Governments around the world have increasingly implemented comprehensive technology-driven programmes and legal frameworks aimed at boosting innovation and entrepreneurship, whilst the industrial sector as a whole has invested massively in digitising business processes, work organisation and culture, modalities of market access, models of management and relationships with customers (*ibid.*). The digital transformation has then over the years forced businesses and governments to revolutionise their infrastructures to incorporate an effective and comprehensive digital strategy. Indeed, like always in history, the choice between adopting the new technology or not has quickly become rather between innovation and extinction.

The digital transformation has profoundly affected research as well. The incorporation of technology in scholarship practice and culture, the implementation of data-driven approaches and the size and complexity of usable and used data have increased exponentially in natural, computational, social science and humanities research. The ‘Digital Turn’, as it is called, has almost forced scholars to integrate advanced quantitative methods in their research, and in the humanities at large, it has, for example, led to the

emergence of completely new fields such as of course digital humanities (DH) (Viola and Verheul 2020b).

Institutionally, universities have in contrast been slow to adapt. Although bringing the digital to education and research has been on higher education institutions' agendas for years, the changes have always been set to be implemented gradually over the span of several years. Universities have in other words adopted an *evolutionary approach* to the digital (Alenezi 2021), according to which digital benefits are incorporated within an existing model of knowledge creation. This means that, on the one hand, the integration of the digital into knowledge creation practices and the combination of methods and perspectives from different disciplines are highly encouraged and much praised as the most effective way to accelerate and expand knowledge. At the same time, however, technology and the digital are seen as entities somewhat separate or indeed separable from knowledge creation itself. This moderate approach allows a gradual pace of change, and it is generally praised for its capacity to minimise disruptions while at the same time allowing change (Komarčević et al. 2017; Microsoft Partner Community 2018).

The reasons why universities have traditionally chosen this strategy are various and complex, but generally speaking they all have something in common. In his book *Learning Reimagined*, Graham Brown-Martin (2014) argues that the current model of education is still the same as the one that was set to prepare the industrial workforce of the nineteenth-century factories. This model was designed to create workers who would do their job silently all day to produce identical products; collaboration, creativity and critical thinking were precisely what the model aimed to discourage. As this system has become less and less relevant over the years, it has become increasingly costly to replace the existing infrastructures, including to radically rethink teaching and learning practices and to re-devise a new model of knowledge creation that would suit the higher education's mission while at the same time respond to the needs of the new digital information and knowledge landscape. Therefore, for higher education institutions, the preferred strategy has traditionally been to progressively integrate digital tools in their existing systems, as a means to advance educational practices whilst containing the exorbitant costs that a true revolution would entail, including the inevitable disruptive changes. After all, despite what the word 'revolution' may suggest, these complex and radical processes are painfully slow and always require years to be implemented. In fact, as the 'Gartner Hype Cycle' of technology¹ indicates

(Fenn and Raskino 2008), only some of these processes are actually expected to eventually reach the virtual status of ‘Plateau of Productivity’ and if there is a cost to adapting slowly, the cost to being wrong is higher.

The 2020 health crisis changed all this. In just a few months’ time, the COVID-19 pandemic accelerated years of change in the functioning of society, including the way companies in all sectors operated. In 2020, the McKinsey Global Institute surveyed 800 executives from a wide variety of sectors based in the United States, Australia, Canada, China, France, Germany, India, Spain and the United Kingdom (Sua et al. 2020). The report showed that since the start of the pandemic, companies had accelerated the digitisation of both their internal and external operations by three to four years, while the share of digital or digitally enabled products in their portfolios had advanced by seven years. Crucially, the study also provided insights into the long-term effects of such changes: companies claimed that they were now investing in their long-term digital transformations more than in anything else. According to a BDO’s report on the digital transformation brought about by the COVID crisis (Cohron et al. 2020, 2), just as much as businesses that had developed and implemented digital strategies prior to the pandemic were in a position to leapfrog their less digital competitors, organisations that would not adapt their digital capabilities for the post-coronavirus future would simply be surpassed.

Higher education has also been deeply affected. Before the COVID-19 crisis, higher education institutions would look at technology’s strategic importance not as a critical component of their success but more as one piece of the pedagogical puzzle, useful both to achieve greater access and as a source of cost efficiency. For example, many academics had never designed or delivered a course online, carried out online students’ supervisions, served as online examiners and presented or attended an online conference, let alone organise one. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), at the first peak of the crisis in April 2020, more than 1.6 billion students around the world were affected by campus closures (UNESCO 2020). As on-campus learning was no longer possible, demands for online courses saw an unprecedented rise. Coursera, for example, experienced a 543% increase in new courses enrolments between mid-March and mid-May 2020 alone (DeVaney et al. 2020). Having to adapt quickly to the virtual switch—much more quickly than they had considered feasible before the outbreak—universities and higher education institutions were forced to implement some kind of temporary digital solutions to meet the demands

of students, academics, researchers and support staff. In the peak of the pandemic, classes needed to be moved online practically overnight, and so did all sorts of academic interactions that would typically occur face-to-face: supervisions, meetings, seminars, workshops and conferences, to name but a few. Universities and research institutes didn't have much choice other than to respond rapidly. Thus, just like in the business sector, the shift towards digital channels had to happen fast as those institutions that did not promptly and successfully achieve the transition towards the digital were in high risk of reducing their competitiveness dramatically, and not just in the near-term.

The sudden accelerated digital shift by universities is one aspect of society's forced digital switch during 2020. Remote work, omnichannel commerce, digital content consumption, platformification and digital health solutions are also examples of how society was kept afloat by the migration to the digital during the pandemic. This is not the kind of process that can be fully reversed. On the contrary, the most significant changes such as remote working, online offerings and remote interactions are in fact the most likely to remain in the long term, at least in some hybrid form. According to the McKinsey Global Institute survey (op. cit.), because such changes reflect new health and hygiene sensitivities, respondents were more than twice as likely to believe that there won't be a full return to pre-crisis norms at all. Similarly, higher education predictions concerning digital or digitally enhanced offerings anticipated that these were likely to stay even after the health crisis would be resolved. Dynamic and blended approaches are therefore likely to become the 'new normal' as they allow universities to minimise potential teaching and learning disruptions in case of emergency and more importantly, they can now be implemented at a moment's notice. Consequently, instructors are more and more required to reimagine their courses for an online format. The same goes for all the other aspects of a scholar's life such as conference presentations, seminars, workshops, supervisions and exams, as well as research-specific tasks, including data gathering and analysis.

COVID-19 has finally also changed the role of technology particularly with regard to its crucial function in universities' risk mitigation strategies. According to the 2020 Coursera guide for universities to build and scale online learning programmes, universities that today are investing heavily in their digital infrastructures will be able to seamlessly pivot through any crisis in the future (DeVaney et al. 2020, 1). Although the digitisation of society was already underway before the crisis, it is argued in these reports

that the COVID-19 pandemic has marked a clear turning point of historic proportions for technology adoption for which the paradigm shift towards digitisation has been sharply accelerated.

Yet if during the health crisis companies and universities were forced to adopt similar digitisation strategies, almost three years after the start of the pandemic, now things between the two sectors look different again. To succeed and adapt to the demands of the new digital market, companies understood that in addition to investing massively in their digital infrastructures, they crucially also had to create new business models that replaced the existing ones which had simply become inadequate to respond to the rules dictated by new generations of customers and technologies. The digital transformation has therefore required a deeper transformation in the way businesses were structuring their organisations, thought of the market challenges and approached problem-solving (Morze and Strutyńska 2021). In contrast, it appears that higher education has returned to look at technology as a means for incremental changes, once again as a way to enhance learning approaches or for cost reduction purposes, but its disruptive and truly revolutionary impact continues to be poorly understood and on the whole under-theorised (Branch et al. 2020; Alenezi 2021). For instance, although universities and research institutes have to various degrees digitised pedagogical approaches, added digital skills to their curricula and favoured the use and development of digital methods and tools for research and teaching, technology is still treated as something contextual, something that happens alongside knowledge creation.

Knowledge creation, however, happens *in* society. And while society has been radically transformed by technology which has in turn transformed culture and the way it creates it, universities continue to adopt an evolutionary approach to the digital (Alenezi 2021): more or less gradual adjustments are made to incorporate it but the existing model of knowledge creation is left essentially intact. The argument that I advance in this book is on the contrary that digitisation has involved a much greater change, a more fundamental shift for knowledge creation than the current model of knowledge production accommodates. This shift, I claim, has in fact been *in*—as opposed to *towards*—the digital. As societies are in the digital, one profound consequence of this shift is that research and knowledge are also in turn inevitably mediated by the digital to various degrees. As a bare minimum, for example, regardless of the discipline, a post-COVID researcher is someone able to embrace a broad set of

digital tools effectively. Yet what this entails in terms of how knowledge production is now accordingly lived, reimagined, conceptualised, managed and shared has not yet been adequately explored, let alone formally addressed. In relation to knowledge creation, what I therefore argue for is a *revolutionary* rather than an *evolutionary* approach to the digital. Whereas an evolutionary approach to the digital extends the existing model of knowledge creation to incorporate the digital in some form of supporting role, a *revolutionary* approach calls for a different model which entirely reconceptualises the digital and how it affects the very practices of knowledge production. Indeed, claiming that the shift has been *in* the digital acknowledges conclusively that the digital is now integral to not only society and its functioning, but crucially also to how society produces knowledge and culture.

Crucially, such different model of knowledge production must break with the obsolescence of persisting binary modulations in relation to the digital—for example between digital knowledge creation and non-digital knowledge creation—in that they continue to suggest artificial divisions. It is the argument of this book that dual notions of this kind are the spectre of a much deeper fracture, that which divides knowledge into disciplines and disciplines into two areas: the sciences and the humanities. Significantly, a consequence of the shift in the digital is that reality has been complexified rather than simplified. Many of the multiple levels of complexity that the digital brings to reality are so convoluted and unpredictable that the traditional model of knowledge creation based on single discipline perspectives and divisions is not only unhelpful and conceptually limiting, but especially after the exponential digital acceleration brought about by the 2020 COVID-19 pandemic, also incompatible with the current reality and no longer suited to understand and explain the ramifications of this unpredictability.

In arguing against a compartmentalisation of knowledge which essentially disconnects rather than connecting expertise (Stehr and Weingart 2000), I maintain that the insistent rigid conceptualisation of division and competition is complicit of having promoted a narrative which has paired computational methods with exactness and neutrality, rigour and authoritativeness whilst stigmatising consciousness and criticality as carriers of biases, unreliability and inequality. The book is therefore primarily a reflection on the separation of knowledge into disciplines and of disciplines into the sciences vs the humanities and discusses its contemporary relevance and adequateness in relation to the ubiquitous impact of digital technolo-

gies on society and culture. In the pages that follow, I analyse many of the different ways in which reality has been transformed by technology—the pervasive adoption of big data, the fetishisation of algorithms and automation, the digitisation of education and research and the illusory, yet believed, promise of objectivism—and I argue that the full digitisation of society, already well on its way before the COVID-19 pandemic but certainly brought to its non-reversible turning point by the 2020 health crisis, has added even further complexity to reality, exacerbating existing fractures and disparities and posing new complex questions that urgently require a re-theorisation of the current model of knowledge creation in order to be tackled.

In advocating for a new model of knowledge production, the book firmly opposes notions of divisions, particularly a division of knowledge into monolithic disciplines. I contend that the recent events have brought into sharper focus how understanding knowledge in terms of discipline compartmentalisation is anachronistic and not equipped to encapsulate and explain society. The pandemic has ultimately called for a reconceptualisation of knowledge creation and practices which now must operate beyond outdated models of separation. In moving beyond the current rigid framework within which knowledge production still operates, I introduce different concepts and definitions in reference to the digital, digital objects and practices of knowledge production in the digital, which break with dialectical principles of dualism and antagonism, including dichotomous notions of digital vs non-digital positions.

This book focuses on the humanities, the area of academic knowledge that had already undergone radical transformation by the digital in the last two decades. I start by retracing schisms in the field between the humanities, the digital humanities (DH) and critical digital humanities (CDH); these are embedded, I argue, within the old dichotomy of sciences vs humanities and the persistent physics envy in our society and by extension, in research and academic knowledge. I especially challenge existing notions such as that of ‘mainstream humanities’ that characterise it as a field that is seemingly non-digital but critical. I maintain that in the current landscape, conceptualisations of this kind have more the colour of a nostalgic invocation of a reality that no longer exists, perhaps as an attempt to reconstruct the core identity of a pre-digital scholar who now more than ever feels directly threatened by an aggressive *other*: the digital. Equally not relevant nor useful, I argue, is a further division of the humanities into DH and CDH. In pursuing this argumentation, I examine how, on the one

hand, scholars arguing in favour of CDH claim that the distinction between digital and analogue is pointless; therefore, humanists must embrace the digital critically; on the other hand, by creating a new field, i.e., CDH, they fall into the trap of factually perpetuating the very separation between digital and critical that they define as no longer relevant.

In pursuing my case for a novel model of knowledge creation in the digital, throughout the book, I analyse personal use cases; specifically, I examine how I have addressed in my own work issues in digital practice such as transparency, documentation and reproducibility, questions about reliability, authenticity and biases, and engaging with sources through technology. Across the various examples presented in the following chapters, this book demonstrates how a re-examination of digital knowledge creation can no longer be achieved from a distance, but only from the inside, that the digital is no longer contextual to knowledge creation but that knowledge is created in the digital. This auto-ethnographic and self-reflexive approach allows me to show how my practice as a humanist *in* the digital has evolved over time and through the development of different digital projects. My intention is not to simply confront algorithms as instruments of automation but to unpack ‘the cultural forms emerging in their shadows’ (Gillespie 2014, 168). Expanding on critical posthumanities theories (Braidotti 2017; Braidotti and Fuller 2019), to this aim I then develop a new framework for digital knowledge creation practices—the post-authentic framework (*cf.* Chap. 2)—which critiques current positivistic and deterministic views and offers new concepts and methods to be applied to digital objects and to knowledge creation *in* the digital.

A little less than a decade ago, Berry and Dieter (2015) claimed that we were rapidly entering a world in which it was increasingly difficult to find culture outside digital media. The major premise of this book is that especially after COVID-19, all information is now digital and even more, algorithms have become central nodes of knowledge and culture production with an increased capacity to shape society at large. I therefore maintain that universities and higher education institutions can no longer afford to consider the digital has something that is happening *to* knowledge creation. It is time to recognise that knowledge creation is happening *in* the digital. As digital vs non-digital positions have entirely lost relevance, we must recognise that the current model of knowledge grounded in rigid divisions is at best irrelevant and unhelpful and at worst artificial and harmful. Scholars, researchers, universities and institutions have therefore a central role to play in assessing how digital knowledge is created not

just today, but also for the purpose of future generations, and clear responsibilities to shoulder, those that come from being *in* the digital.

1.2 THE ALGORITHM MADE ME DO IT!

Computational technology such as artificial intelligence (AI) can be thought in many ways to be like a ‘Mechanical Turk’.² The Mechanical Turk or simply ‘The Turk’ was a chess-playing machine constructed by Wolfgang von Kempelen in the late eighteenth century. The mechanism appeared to be able to play a game of chess against a human opponent completely by itself. The Turk was brought to various exhibitions and demonstrations around Europe and the Americas for over eighty years and won most of the games played, defeating opponents such as Napoleon Bonaparte and Benjamin Franklin. In reality, the Mechanical Turk was a complex, mechanical illusion that was in fact operated by a human chess master hiding inside the machine.

AI and technology can be thought in many ways to be like the Mechanical Turk whereby the choices and actions hidden from view only but create the illusion of both a fully autonomous process and impartial output. And just like the Mechanical Turk was celebrated and paraded, the ‘Digital Turn’ and its flow of data have been applauded and welcomed practically ubiquitously. Indeed, hyped up by the reassuring promises of neutrality, objectivity, fairness and accuracy held out by digital technology and data, both industry and academia have embraced the so-called big data revolution, data-sets that are so large and complex that no traditional software—let alone humans—would ever be able to analyse it. In 2017, IBM reported that more than 90% of the world’s data had appeared in the two previous years alone. Today, in sectors such as healthcare, big data is being used to reduce healthcare costs for individuals, to improve the accuracy and the waiting time for diagnoses, to effectively avoid preventable diseases or to predict epidemic outbreaks. The market of big data analytics in healthcare has continually grown and not just since the COVID-19 pandemic. According to a 2020 report about big data in healthcare, the global big data healthcare analytics market was worth over \$14.7 billion in 2018, \$22.6 billion in 2019 and expected to be worth \$67.82 billion by 2025. A more recent projection in June 2020 estimated this growth to reach \$80.21 billion by 2026, exhibiting a CAGR³ of 27.5% (ResearchAndMarkets.com 2020).

Big data analytics has also been incorporated into the banking sector for tasks such as improving the accuracy of risk models used by banks and financial institutions. In credit management, banks use big data to detect fraud signals or to understand the customer behaviour from the analysis of investment patterns, shopping trends, motivation to invest and personal or financial background. According to recent predictions, the market of big data analytics in banking could rise to \$62.10 billion by 2025 (Flynn 2020). Ever larger and more complex data-sets are also used for law and order policy (e.g., predictive policing), for mapping user behaviour (e.g., social media), for recording speech (e.g., Alexa, Google Assistant, Siri) and for collecting and measuring the individual's physiological data, such as their heart rate, sleep patterns, blood pressure or skin conductance. And these are just a few examples.

More data and *therefore* more accuracy and freedom from subjectivity were also promised to research. Disciplines across scientific domains have increasingly incorporated technology within their traditional workflows and developed advanced data-driven approaches to analyse ever larger and more complex data-sets. In the spirit of breaking the old schemes of opaque practices, it is the humanities, however, that has arguably been impacted the most by this explosion of data. Thanks to the endless flow of searchable material provided by the Digital Turn, now humanists could finally change the fully hermeneutical tradition, believed to perpetuate discrimination and biases.

This looked like 'that noble dream' (Novick 1988). Millions of records of sources seemed to be just a click away. Any humanist scholar with a laptop and an Internet connection could potentially access them, explore them and analyse them. Even more revolutionising was the possibility to finally be able to draw conclusions from *objective evidence* and so dismiss all accusations that the humanities was a field of obscure, non-replicable methods. Through large quantities of 'data', humanists could now understand the past more wholly, draw more rigorous comparisons with the present and even predict the future. This 'DH moment', as it was called, was perfectly in line with a more global trend for which data was (and to a large extent still is) presumed to be accurate and unbiased, therefore more reliable and ultimately, fairer (Christin 2016). The 'DH promise' (Thomas 2014; Moretti 2016) was a promise of freedom, freedom from subjectivity, from unreliability, but more importantly from the supposed irrelevance of the humanities in a data-driven world. It was also soaked in positivistic hypes about the endless opportunities of data-driven research methods

in general and for humanities research in particular, such as the artful deception of suddenly being able to access *everything* or the scientific belief in data as being more reliable than sources.

Following this positivistic hype, however, the unquestioning belief in the endless possibilities and benefits of applying computational techniques for the good of society and research started to be harshly criticised for being false and unrealistic (*cf.* Sect. 1.3). The alluring and reassuring promises of data neutrality, objectivity, fairness and accuracy have indeed been found illusory, algorithms and data-driven methods even more biased than the interpretative act itself (Dobson 2019) and, ironically, in desperate need of human judgement to not cause harm (Gillespie 2014).

Particularly the indiscriminate use of big data in domains of societal influence such as bureaucracy, policy-making or policing has started to raise fundamental questions about democracy, ethics and accountability. For example, data companies hired by politicians all over the world have used questionable methods to mine the social media profiles of voters to influence election results through a technique called microtargeting that uses extremely targeted messages to influence users' behaviour. Although it is true that this technique has proven highly effective for marketing purposes, the causality of political microtargeting remains largely under-researched and therefore it is still poorly understood. The fact remains, however, that the use of personal data collected without the user's knowledge or permission to build sophisticated profiling models raises ethical and privacy issues. For example, in 2015, Cambridge Analytica acquired the personal data of about 87 million Facebook users without their explicit permission. Their data had been collected via the 270,000 Facebook users who had given the third-party app 'This Is Your Digital Life' access to information on their friends' network. Cambridge Analytica had acquired and used such data claiming it was exclusively for academic purposes; Facebook had then allowed the app to harvest data from the Facebook friends of the app's users which were subsequently used by Cambridge Analytica. In this way, although only 270,000 people had given permission to the app, data was in fact collected from 87 million users. This revealed a scary privacy and personal data management loophole in Facebook's privacy agreement; it raised serious concerns about how digital private information is collected, stored and shared not just by Facebook but by companies in general and how these opaque processes often leave unaware individuals completely powerless.

But it is not just tech giants and academic research that jumped on the suspicious big data and AI bandwagon; governments around the world have also been exploiting this technology for matters of governance, law enforcement and surveillance, such as blacklisting and the so-called predictive policing, a data-driven analytics method used by law enforcement departments to predict perpetrators, victims or locations of future crimes. Predictive policing software analyses large sets of historic and current crime data using machine learning (ML) algorithms to determine where and when to deploy police (i.e., place-based predictive policing) or to identify individuals who are allegedly more likely to commit or be a victim of a crime (i.e., person-based predictive policing). While supporters of predictive policing argue that these systems help predict future crimes more accurately and objectively than police's traditional methods, critics complain about the lack of transparency in how these systems actually work and are used and warn about the dangers of blindly trusting the supposed rigour of this technology. For example, in June 2020, Santa Cruz, California—one of the first US cities to pilot this technology in 2011—was also the first city in the United States to ban its municipal use. After nine years, the city of Santa Cruz decided to discontinue the programme over concerns of how it perpetuated racial inequality. The argument is that, as the data-sets used by these systems include only reported crimes, the obtained predictions are deeply flawed and biased and result in what could be seen as a self-fulfilling prophecy. In this respect, Matthew Guariglia maintains that 'predictive policing is tailor-made to further victimize communities that are already overpoliced—namely, communities of colour, unhoused individuals, and immigrants—by using the cloak of scientific legitimacy and the supposed unbiased nature of data' (Guariglia 2020). Despite other examples of predictive policing programmes being discontinued following audits and lawsuits, at the moment of writing, more than 150 cities in the United States have adopted predictive policing (Electronic Frontier Foundation 2021). Outside of the United States, China, Denmark, Germany, India, the Netherlands and the United Kingdom are also reported to have tested or deployed predictive policing tools.

The problem with predictive policing has little to do with intentionality and a lot to do with the limits of computation. Computer algorithms are a finite list of instructions designed to perform a computational task in order to produce a result, i.e., an output of some kind. Each task is therefore performed based on a series of instructed assumptions which, far from being unbiased, are not only obfuscated by the complexity of the algorithm

itself but also artfully hidden by the surrounding algorithmic discourse which socially legitimises its outputs as objective and reliable. The truth is, however, that computers are extremely efficient and fast at automating complex and lengthy processes but that they perform rather poorly when it comes to decision-making and judgement. In the words of Danah Boyd (2016, 231):

[...] if they [computers] are fed a pile of data and asked to identify correlations in that data, they will return an answer dependent solely on the data they know and the mathematical definition of correlation that they are given. Computers do not know if the data they receive is wrong, biased, incomplete, or misleading. They do not know if the algorithm they are told to use has flaws. They simply produce the output they are designed to produce based on the inputs they are given.

Boyd gives the example of a traffic violation: a red light run by someone who is drunk vs by someone who is experiencing a medical emergency. If the latter scenario is not embedded into the model as a specific exception, then the algorithm will categorise both events as the same traffic violation. The crucial difference in decision-making processes between humans and algorithms is that humans are able to make a judgement based on a combination of factors such as regulations, use cases, guidelines and, fundamentally, environmental and contextual factors, whereas algorithms still have a hard time mimicking the nature of human understanding. Human understanding is fluid and circular, whilst algorithms are linear and rigid. Furthermore, the data-sets on which computational decision-making models are based are inevitably biased, incomplete and far from being accurate because they stem from the very same unequal, racist, sexist and biased systems and procedures that the introduction of computational decision-making was intended to prevent in the first place.

Moreover, systems become increasingly complex and what might be perceived as one algorithm may in fact be many. Indeed, some systems can reach a level of complexity so deep that understanding the intricacies and processes according to which the algorithms perform the assigned tasks becomes problematic at best, if at all possible (Gillespie 2014). Although this may not always have serious consequences, it is nevertheless worth of close scrutiny, especially because today complex ML algorithms are used extensively, and more and more in systems that operate fundamental social functions such as the already cited healthcare and law and order, but as a

matter of fact they are still ‘poorly understood and under-theorized’ (Boyd 2018). Despite the fact that they are assumed to be, and often advertised as being neutral, fair and accurate, each algorithm within these complex systems is in fact built according to a set of assumptions and cultural values that reflect the strategic choices made by their creators according to specific logics, may these be corporate or institutional.

Another largely distorted view surrounding digital and algorithmic discourse concerns data. Although algorithms and data are often thought to be two distinct entities independent from each other, they are in fact two sides of the same coin. In fact, to fully understand how an algorithm operates the way it does, one needs to look at it in combination with the data it uses, better yet at how the data must be prepared for the algorithm to function (Gillespie 2014). This is because in order for algorithms to work properly, that is automatically, information needs to be *rendered* into data, e.g., formalised according to categories that will define the database records. This act of categorising is precisely where human intervention hides. Gillespie pointedly remarks that far from being a neutral and unbiased operation, categorisation is in fact an act of ‘a powerful semantic and political intervention’ (Gillespie 2014, 171), deciding what the categories are, what belongs in a category and what does not are all powerful worldview assertions. Database design can therefore have potentially enormous sociological implications which to date have largely been overlooked (*ibid.*).

A recent example of the larger repercussions of these powerful worldview assertions is fashion companies for people with disabilities and how their requests to be advertised by Facebook have been systematically rejected by Facebook’s automated advertising centre. Again, the reason for the rejection is unlikely to have anything to do with intentionally discriminating against people with disabilities, but it is to be found in the way fashion products for people with disabilities are identified (or rather misidentified) by Facebook algorithms that determine products’ compliance with Facebook policy. Specifically, these items were categorised as ‘medical and health care products and services including medical devices’ and as such, they violated Facebook’s commercial policy (Friedman 2021). Although these companies had their ads approved after appealing to Facebook’s decision, episodes like this one reveal not only the deep cracks in ML models, but worse, the strong biases in society at large. To paraphrase Kate Crawford, every classification system in machine learning contains a worldview (Crawford 2021). In this particular case, the implicit bias in

Facebook's database worldview would be that a person with disability is not believed to possibly have an interest in fashion as a form of self-expression.

Despite the growing evidence as well as statements of acknowledgement—'Raw Data is an oxymoron', Lisa Gitelman wrote in 2013 (Gitelman 2013)—in most of the public and academic discourse, data continues to be exalted as being exact and unarguable, mostly still thought of as a natural resource rather than a cultural, situated one. To the contrary, it is the uncritical use of data to make predictions in matters of welfare, homelessness, crime and child protection to name but a few which has created systems that are, in Virginia Eubanks' words, 'Automating Inequality' (2017). The immediate, profound and dangerous consequence of the indiscriminate use of automated systems is that the resulting decisions are remorselessly blamed on the targeted individual and justified morally through the legitimisation of practices believed to be evidence-based, therefore accurate and unbiased. This is what Boyd calls 'dislocation of liability' (2016, 232) for which decision-makers are distanced from the humanity of those affected by automated procedures.

In this book, I advance a critique of the mainstream big data and algorithmic discourse which continues to fetishise data as impartial and somewhat pre-existing and which obscures the subjective and interpretative dimension of collecting, selecting, categorising and aggregating, i.e., the act of *making* data. I argue that following the shift *in* the digital rapidly accelerated by the pandemic, a new set of notions, practices and values needs to be devised in order to re-figure the way in which we conceptualise data, technology, digital objects and on the whole the process of digital knowledge creation. Drawing on posthumanist studies (Braidotti 2017; Braidotti and Fuller 2019; Braidotti 2019) and on recent theories of digital cultural heritage (Cameron 2021), to this end, I present a novel framework: the post-authentic framework. With this framework, I propose concepts, practices and values that recognise the larger cultural relevance of digital objects and the methods to create them, analyse them and visualise them. Significantly, the post-authentic framework problematises digital objects as unfinished, situated processes and acknowledges the limitations, biases and incompleteness of tools and methods adopted for their analysis in the process of digital knowledge creation. In this way, the framework ultimately introduces a counterbalancing narrative in the main positivist discourse that equals the removal of the human—which in any case is illusory—to the removal of biases. Indeed, as the promises of a newly found freedom from subjectivity are increasingly found to be false, the post-authentic framework

acts as a reminder that in our own time, computational technology is like the Mechanical Turk of that earlier century.

Featuring a range of personal case studies and exploring a variety of applied contexts such as digital heritage practices, digital linguistic injustice, critical digital literacy and critical digital visualisation, I devote specific attention to four key aspects of knowledge creation in the digital: creation of digital material, enrichment of digital material, analysis of digital material and visualisation of digital material. My intention is to show how contributions to working towards systemic change in research and by extension in society at large, can be implemented when collecting, assessing, reviewing, enriching, analysing and visualising digital material. Throughout the chapters, I use the post-authentic framework to discuss these various case examples and to show that it is only through the conscious awareness of the delusional belief in the neutrality of data, tools, methods, algorithms, infrastructures and processes (i.e., by acknowledging the human chess master hiding inside the Turk) that the embedded biases can be identified and addressed.

My argument is closely related to the notion of ‘originary technicity’ (see, for instance, Heidegger 1977; Clark 1992; Derrida 1994; Beardsworth 1996; Stiegler 1998) which rejects the Aristotelian view of technology as merely utilitarian. Originary technicity claims that technology is not simply a tool that humans deploy for their own ends, because humans are always invested in the technology they develop. In this way, technology (e.g., AI and algorithms) becomes in turn a central node of knowledge and culture production and the knowledge and culture so produced shape humans and their vision of the world in a mutually reinforcing cycle. Culture is incorporated in technology as it is built by humans who then use technology to produce culture. Hence, as the very concept of an absolute objectivity when adopting computational techniques (or in general, for that matter) is an illusion, so are the notions of ‘fully autonomous’ or ‘completely unbiased’ processes. An uncritical approach to the use of computational methods, I maintain, not only simply reinforces the very old schemes of obscure practices that digital technology claims to break, but more importantly it can make society worse.

This is a reality that can no longer be ignored and which can only be confronted through a reconfiguration of our model of knowledge creation. This re-examination would relinquish illusory positivistic notions and acknowledge digital processes as situated and partial, as an extremely

convoluted assemblage of components which are themselves part of wider networks of other entities, processes and mechanisms of interaction. Broadly, the argument that I advance is that the current model of knowledge must be re-figured to incorporate this critical awareness, ever more necessary in order to address the new challenges brought by the pandemic and the digital transformation of society. The shift *in* the digital has created a complexity that a model of knowledge supporting divisive positions (i.e., between on one side disciplines that are digital and therefore believed to be objective and on the other disciplines that are non-digital and therefore biased) cannot address.

I start my argument for an urgent knowledge reconceptualisation by building upon posthuman critical theory (Braidotti 2017) which argues that the matter ‘is not organized in terms of dualistic mind/body oppositions, but rather as materially embedded and embodied subjects-in-process’ (16). In this regard, posthuman critical theory introduces the helpful notion of *monism* (*cf.* Chap. 2), in which the power of differences is not denied but at the same time, it is not structured according to principles of oppositions, and therefore it does not function hierarchically (*ibid.*). A model of knowledge *in* the digital equally abandons dichotomous ideas that continue to be at the foundation of our conceptualisation of knowledge formation, such as digital vs non-digital positions, critical vs technological and, the biggest of all, that of the sciences vs the humanities.

1.3 A TALE OF TWO CULTURES

The hyper-specialisation of research that a discipline-based model of knowledge creation inevitably entails and how such a solid structure impedes rather than advancing knowledge has been debated in the academic forum for years (e.g., Klein 1983; Thompson Klein 2004; Chubin et al. 1986; Stehr and Weingart 2000; McCarty 2015). As the rigid organisation into disciplines has begun to dissolve over the course of the twenty-first century, observers started to suggest that the existing model of knowledge production was increasingly inadequate to explain the world and that it was in fact modern society itself that was calling for its reconceptualisation. Weingart and Stehr (2000), for instance, proposed that ‘one may have to add a postdisciplinary stage to the predisciplinary stage of the seventeenth and eighteenth centuries and the disciplinary stage of the nineteenth and twentieth centuries’ (*ibid.*, xii). At the same time, however, the undeniable

amalgamation of disciplines was affecting areas of knowledge unevenly; authors noticed how, for example, in fields such as the natural sciences with a problem-solving orientation and where knowledge production is typically fast, boundaries between disciplines were much more blurred than in the humanities (*ibid.*).

The Digital Turn seemed to be capable of changing this tradition. The dynamic and disrupting essence of the digital on knowledge creation and on humanities scholarship in particular appeared to be correcting this unevenness and make the humanities interdisciplinary. Scholars observed how the digital was not only challenging and transforming structures of knowledge but that it was also creating new structures (e.g., digital humanities, digital history, digital cultural heritage) (Klein 2015; Cameron and Kenderdine 2007; Cameron 2007). The field of DH, it was argued, would in this sense be ‘naturally’ interdisciplinary as it provides new methods and approaches which necessarily require new practices and new ways of collaborating. Another ‘promise’ of DH was that of being able to ‘transform the core of the academy by refiguring the labor needed for institutional reformation’ (Klein 2015, 15).

After the initial enthusiasm and despite many examples around the world of interdisciplinary initiatives, academic programmes, departments and centres (Stehr and Weingart 2000; Deegan and McCarty 2011; Klein 2015), in twenty years, the rigid division into disciplines has however not changed much; it remains the persistent dominant model in use for knowledge production, and true collaboration is on the whole rare (Deegan and McCarty 2011, 2). Indeed, what these cases of interdisciplinarity show is a common trend: when disciplines share similar interests, rather than boundaries dissolving and merging as interdisciplinary discourse usually claims, what in fact tends to happen is that in order to respond to the new external challenges, disciplines further specialise and by leveraging their overlapping spaces, they create yet new fields. This modern phenomenon has been referred to as ‘The paradox of interdisciplinarity’ (Weingart 2000):

interdisciplinarity [...] is proclaimed, demanded, hailed, and written into funding programs, but at the same time specialization in science goes on unhampered, reflected in the continuous complaint about it. [...] The prevailing strategy is to look for niches in uncharted territory, to avoid contradicting knowledge by insisting on disciplinary competence and its boundaries, to denounce knowledge that does not fall into this realm as

‘undisciplined.’ Thus, in the process of research, new and ever finer structures are constantly created as a result of this behaviour. This is (exceptions notwithstanding) the very essence of the innovation process, but it takes place primarily within disciplines, and it is judged by disciplinary criteria of validation. (Weingart 2000, 26–27)

The author argues that starting from the early nineteenth century when the separation and specialisation of science into different disciplines was created, interdisciplinarity became a promise, the promise of the unity of science which in the future would have been actualised by reducing the fragmentation into disciplines. Today, however, interdisciplinarity seems to have lost interest in that promise as the discourse has shifted from the idea of ultimate unity to that of innovation through a combination of variations (*ibid.*, 41). For example, in his essay *Becoming Interdisciplinary*, McCarty (2015) draws a close parallel between the struggle of dealing with the post-World War II overwhelming amount of available research that inspired Vannevar Bush’s Memex and the situation of contemporary researchers. Bush (1945) maintained that the investigator could not find time to deal with the increasing amount of research which had exceeded far beyond anyone’s ability to make real use of the record. The difficulty was, in his view, that if on the one hand ‘specialization becomes increasingly necessary for progress’, on the other hand, ‘the effort to bridge between disciplines is correspondingly superficial.’ The keyword on which we should focus our attention, McCarty argues, is *superficial* (2015, 73):

Bush’s geometrical metaphor (*superficies*, having length or breadth without thickness), though undoubtedly intended as merely a common adjective, makes the point elaborated in another context by Richard Rorty (2004/2002): that the implicit model of knowledge at work here privileges singular truth at depth, reached by the increasingly narrower focus of disciplinary specialization, and correspondingly trivializes plenitude on the surface, and so the bridging of disciplines.

According to Rorty, being interdisciplinary does not mean looking for the one answer but going *superficial*, i.e., wide, to collect multiple voices and multiple perspectives (2004). It has been argued, however, that true collaboration requires a more fundamental shift in the way knowledge creation is conceived than simply studying a common question or problem from different perspectives (van den Besselaar and Heimeriks 2001; Dec-

gan and McCarty 2011). This would also include a deep understanding of disciplines and approaches other than one's own (Gooding 2020). Indeed, the contemporary notion of interdisciplinarity based on the idea that innovation is better achieved by recombining 'bits of knowledge from previously different fields' into novel fields is bound to create more specialisation and therefore new boundaries (Weingart 2000, 40).

The schism of the humanities between 'mainstream humanities' and digital humanities, and later between digital humanities and critical digital humanities, perfectly illustrates the issue. In 2012, Alan Liu wrote a provocative essay titled *Where Is Cultural Criticism in the DH?* (Liu 2012). The essay was essentially a plea for DH to embrace a wider engagement with the societal impact of technology. It was very much the author's hope that the plea would help to convert this 'deficit' into 'an opportunity', the opportunity being for DH to gain a long overdue full leadership, as opposed to a 'servant' role within the humanities. In other words, if the DH wanted to finally become recognised as legitimate partners of 'mainstream humanities', they needed to incorporate cultural criticism in their practices and stop pushing buttons without reflecting on the power of technology.

In the aftermath of Liu's essay, reactions varied greatly with views ranging from even harsher accusations towards DH to more optimistic perspectives, and some also offering fully programmatic and epistemological reflections. Some scholars, for example, voiced strong concerns about the wider ramifications of the lack of cultural critique in DH, what has often been referred to as 'the dark side of the digital humanities' (Grusin 2014; Chun et al. 2016), the association of DH with the 'corporatist restructuring of the humanities' (Weiskott 2017), neoliberalism (Allington et al. 2016), and white, middle-class, male dominance (Bianco 2012). Two controversial essays in particular, one published in 2016 by Allington et al. (op. cit.) and the other a year later by Brennan (2017) argued that, in a little over a decade, the myopic focus of DH on neoliberal tooling and distant reading had accomplished nothing but consistently pushing aside what has always been the primary locus of humanities investigation: intellectual practice.

This view was also echoed by Grimshaw (2018) who indicted DH for going to bed with digital capitalism, 'an online culture that is anti-diversity and enriching a tiny group of predominantly young white men' (2). Unlike Weiskott (2017), however, who argued 'There is no such a thing as "the digital humanities"', meaning that DH is merely an

opportunistic investment and a marketing ploy but it doesn't really alter the core of the humanities, Grimshaw maintained that this kind of pandering causes rot at the heart of the humanistic knowledge and practice. This he calls 'functionalist DH', the use of tools to produce information in line with managerial metrics but with no significant knowledge value (6). Grimshaw strongly criticises DH for having disappointed the promise of being a new discipline of emancipation and for being in fact 'nothing more than a tool for oppression'. The digital transformation of society, he continues, has resulted in increased inequality, wider economic gap, an upsurge in monopolies and surveillance, lack of transparency of big data, mobbing, trolling, online hate speech and misogyny. Rather than resisting it, DH is guilty of having embraced such culture, of operating within the framework of lucrative tech deals which perpetuate and reinforce the neoliberal establishment. Digital humanists are establishment curators and no longer able of critical thought; DH is therefore totally unequipped to rethink and criticise digital capitalism. Although he acknowledges the emergence of critical voices within DH, he also strongly advocates a more radical approach which would then justify the need for a 'new' field, an additional space within the university where critique, opposition and resistance can happen (7). This space of resistance and critical engagement with digital capitalism is, he proposes, critical digital humanities (CDH).

Over the years, other authors such as Hitchcock (2013), Berry (2014) and Dobson (2019) have also advocated critical engagement with the digital as the epistemological imperative for digital humanists and have identified CDH as the proper locus for such engagement to take place. For example, according to Hitchcock, humanists that use digital technology must 'confront the digital', meaning that they must reflect on the contextual theoretical and philosophical aspects of the digital. For Berry, CDH practice would allow digital humanists to explore the relationship between critical theory and the digital and it would be both research- and practice-led. Equally for Dobson, digital humanists must endlessly question the cultural dimension and historical determination of the technical processes behind digital operations and tools. With perhaps the sole exception of Grimshaw (op. cit.) who is not interested in practice-led digital enquiry, the general consensus is on the urgency of conducting critically engaged digital work, that is, drawing from the very essence of the humanities, its intrinsic capacity to *critique*.

However, whilst these proposed methodologies do not differ dramatically across authors, there seems to be disagreement about the scope of the

enquiry itself. In other words, the open question around CDH would not concern so much the *how* (nor the *why*) but the *what for?*. For example, Dobson (2019) is not interested in a critical engagement with the digital that aims to validate results; this would be a pointless exercise as the distinction between the subjectivity of an interpretative method and the objectivity of both data and computational methods is illusory. He claims (*ibid.*, 46):

...

there is no such thing as contextless quantitative data. [...] Data are imagined, collected, and then typically segmented. [...] We should doubt any attempt to claim objectivity based on the notion of bypassed subjectivity because human subjectivity lurks within all data. This is because data do not merely exist in the world, but are abstractions imagined and generated by humans. Not only that, but there always remain some criteria informing the selection of any quantity of data. This act of selection, the drawing of boundaries that names certain objects a data-set introduces the taint of the human and subjectivity into supposedly raw, untouched data.

As ‘There is no such thing as the “unsupervised”’ (*ibid.*, 45), the aim of CDH is to thoroughly critique any claimed objectivity of all computational tools and methods, to be suspicious of presumed human-free approaches and to acknowledge that complete de-subjectification is impossible. The aim of CDH, he argues, is not to expand the set of questions in DH, like in Berry and Fagerjord’s view (2017), but to challenge the very notion of a completely objective approach. In this sense, CDH is the endless search for a methodology, the very essence of humanistic enquiry.

Berry (2014) also starts from the assumption that the notion of objective data is illusory, however, he reaches opposite conclusions about what the aim of CDH is. For him and Fagerjord (2017), CDH would provide researchers with a space to conduct technologically engaged work, that is, work that uses technology but also draws on a vast range of theoretical approaches (e.g., software studies, critical code studies, cultural/critical political economy, media and cultural studies). This would allow scholars from many critical disciplines to tackle issues such as the historical context of any used technology and its theoretical limitations, including, for instance, a commitment to its political dimension. By doing so, CDH would address the criticism about the lack of cultural critique in DH and it would enrich DH with other forms of scholarly work (*ibid.*, 175). In

other words, by ‘fixing’ the lack of critical engagement of the field, the function of CDH would be to strengthen DH, thus markedly diverging from Dobson.

Albeit from different epistemological points of view, these reflections share similar methodological and ethical concerns and question the lack of critical engagement of DH, be they historical, cultural or political. I argue however that this reasoning exposes at least three inconsistencies. Firstly, in earlier perspectives (e.g., Liu 2012), the sciences are deemed to be *obviously* superior to the humanities and yet, as soon as the computational is incorporated into the field, the value of the humanities seems to have decreased rather than increased. For example, Bianco (2012) advocates a change in the way digital humanists ‘legitimise’ and ‘institutionalise’ the adoption of computational practices in the humanities. Such change would require not simply defending the legitimacy or advocating the ‘obvious’ supremacy of computational practices but by reinvesting in the word *humanities* in DH. The supremacy of the digital would then be understood as a combination of superiority, dominance and relevance that computational practices—and by extension, the hard sciences (i.e., physics envy)—are believed to have over the humanities. However, as Grimshaw (2018) also argued later, in the process of incorporating the computational into their practices, the humanities forgot all about questions of power, domination, myth and exploitation and have become less and less like the humanities and more and more like a field of *execute* button pushers. Despite acknowledging the illusion of subjectivity, this view shows how deeply rooted in the collective unconscious is the myth surrounding technology and science which firmly positions them as detached from human agency and distinctly separated from the humanities.

Secondly and following from the first point, these views all share a persistent dualistic, opposing notion of knowledge, which in one form or another, under the guise of either freshly coined or well-seasoned terms, continue to reflect what Snow famously called ‘the two cultures’ of the humanities and the sciences (2013). Such separation is typically verbalised in competing concepts such as subjectivity vs objectivity, interpretative vs analytical and critical vs digital. Despite using terms that would suggest union (e.g., ‘incorporated’), the two cultures remain therefore clearly divided. The conceptualisation of knowledge creation which continues to compartmentalise fields and disciplines, I argue, is also reflected in the clear division between the humanities, DH and CDH. This model, I contend, is highly problematic because besides promoting intense schism, it inevitably

leads disciplines to operate within a hierarchical, competitive structure in which they are far from equal. For example, Liu's critique mirrors the persistent dichotomy of science vs humanities: due to the lack of cultural criticism—typical of the sciences but not of the humanities—DH is not humanities at all. DH may be instrumental to the humanities (i.e., the humanities is superior to DH but inferior to the sciences), but it is reduced to a servant role. Hence, if typical descriptions of DH as a space in which the two worlds—the sciences and the humanities—'meld' seem to initially suggest a harmonious and egalitarian coexistence, in reality the way this relationship is interplayed is anything but.

The third contradiction refers to what Berry and Fagerjord (2017) (among others) point out in reference to the digital transformation of society that "The question of whether something is or is not "digital" will be increasingly secondary as many forms of culture become mediated, produced, accessed, distributed or consumed through digital devices and technologies" (13). Humanists, they claim, must relinquish any comparative notion of digital vs analogue as this contrast 'no longer makes sense' (ibid., 28). What humanists need to do instead, they continue, is to reflect critically on the computational and on the ramifications of the computational in a dedicated space which, like Grimshaw and Dobson, they also suggest calling CDH, thus circling back to the second contradiction. If the humanities are critical and if the distinction between digital and analogue 'no longer makes sense', then by insisting on establishing a CDH, they fail to transcend the very same distinction between digital and analogue they claim it to be nonsensical.

While I see the validity and truth in the debates that have animated past DH scholarship, I also argue that the reason for these inconsistencies is to be found in the specific model of knowledge within which these scholars still operate: a model in which knowledge is divided into competing disciplines. Behind the pushes to relinquish ideas of divisions and embrace the digital is a persistent disciplinary structure of knowledge which, despite the declared novelty, is bound to the epistemology of the last century. Instead, I maintain, we should not accommodate the digital within the existing disciplinary structure as it is the structure of knowledge itself and its conceptualisation into separate fields and worldviews that has to change. The current model of knowledge creation, grounded in division and competition, is unequipped to explain the complexities of the world and the 2020 pandemic has magnified the urgency of adopting a strong critical stance on the digital transformation of society. This cannot happen through

the creation of niche fields, let alone exclusively within the humanities, but through a reconceptualisation of knowledge creation itself.

The post-authentic framework that I propose in this book moves beyond the existing breakdown of disciplines which I see as not only unhelpful and conceptually limiting but also harmful. The main argument of this book is that it is no longer solely the question of how the digital affects the humanities but how knowledge creation more broadly happens in the digital. Thinking in terms of yet another field (e.g., CDH) where supposedly computational science and critical enquiry would meet in this or that modulation, for this or that goal, still reiterates the same boundaries that hinder that enquiry. Similarly, claiming that DH scholarship conducts digital enquiry suggests that humanities scholarship does not happen in the digital and therefore it continually reproduces the outmoded distinction between digital and analogue as well as the dichotomy between digital/non-critical and non-digital/critical. Conversely, calls for a CDH presuppose that DH is never critical (or worse, that it cannot be critical at all) and that the humanities can (should?) continue to defer their appointment with the digital, and disregard any matter of concern that has to do with it, ultimately implying that to remain unconcerned by the digital is still possible.

But the digital affects us all, including (perhaps especially) those who do not have access to it. The digital transformation exacerbates the already existing inequalities in society as those who are the most vulnerable such as migrants, refugees, internally displaced persons, older persons, young people, children, women, persons with disabilities, rural populations and indigenous peoples are disproportionately affected by the lack of digital access. The digital lens provided by the 2020 pandemic has therefore magnified the inequality and unfairness that are deeply rooted in our societies. In this respect, for example, on 18 July 2020, UN Secretary-General Antonio Guterres declared (United Nations 2020a):

COVID-19 has been likened to an x-ray, revealing fractures in the fragile skeleton of the societies we have built. It is exposing fallacies and falsehoods everywhere: the lie that free markets can deliver healthcare for all; the fiction that unpaid care work is not work; the delusion that we live in a post-racist world; the myth that we are all in the same boat. While we are all floating on the same sea, it's clear that some are in super yachts, while others are clinging to the drifting debris.

The post-authentic framework that I propose in this book is a conceptual framework for knowledge creation in the digital; it rejects the view of the digital as crossing paths with disciplines, intersecting, melting, merging, meeting or any other verb that suggests that separate entities are converging but which leave the model of knowledge essentially unaffected. I maintain that this sort of worldview is obsolete, even dangerous; researchers can no longer justify statements such as ‘I’m not digital’ as we are all *in* the digital. But rather than seeing this transformation as a threat, some sort of bleak reality in which critical thinking no longer has a voice and everything is automated, I see it as an opportunity for change of historic proportion. Any process of transformation fundamentally changes all the parts involved; if we accept the notion of digital transformation with regard to society, we also have to acknowledge that as much as the digital transforms society, the way society produces knowledge must also be transformed. This entails acknowledging the unsuitability of current frameworks of knowledge creation for understanding the deep implications of technology on culture and knowledge and for meeting the world challenges complexified by the digital. This book wants to signal how the digital acceleration brought by the 2020 events now adds new urgency to an issue already identified by scholars some twenty years ago but that now cannot be procrastinated any further. Hall for instance argued (2002, 128):

We cannot rely merely on the modern “disciplinary” methods and frameworks of knowledge in order to think and interpret the transformative effect new technology is having on our culture, since it is precisely these methods and frameworks that new technology requires us to rethink.

I therefore suggest we stop using the term ‘interdisciplinarity’ altogether. As it contains the word *discipline*, albeit in reference to breaking, crossing, transcending disciplines’ boundaries and all the other usual suspects that typically recur in interdisciplinarity discourse, I believe that the term continues to refer to the exact same notions of knowledge compartmentalisation that the digital transformation requires us to relinquish. In my view, thinking in these terms is not helpful and does not adequately respond to the consequences of the digital transformation that society, higher education and research have undertaken. Based on separateness and individualism, the current model of knowledge creation restricts our ability to identify and access the various complexities of reality. Traditional binary views of deep/significant vs superficial/trivial, digital/non-critical

vs non-digital/critical and the sciences vs the humanities may appear firm, but only because we exaggerate their fixity. Similarly, the separation into disciplines may seem inevitable and fixed, but in reality the majority of norms and views are arbitrary, neither unavoidable nor final and, therefore, completely alterable. Weingart, for instance, states (Weingart 2000, 39):

The structures are by no means fixed and irreplaceable, but they are social constructs, products of long and complex social interactions, subject to social processes that involve vested interests, argumentation, modes of conviction, and differential perceptions and communications.

With specific reference to the current model of knowledge creation, for example, Stichweh (2001) reminds us that the organisation of universities in academic departments is rather a recent phenomenon, ‘an invention of nineteenth century society’ (13727); in fact, to paraphrase McKeon, the apparently monolithic integrity of disciplines as we know them may sometimes obscure a radically disparate and interdisciplinary core (1994). The argument I reiterate in this book is that the current landscape requires us to move from this model, beyond (not away from) thick description of single-discipline case studies, and to recognise not only that knowledge is much more fluid than we are accustomed to think, but also that the digital transcends artificial discipline boundaries.

In the chapters that follow, I take an auto-ethnographic and self-reflexive approach to show how the application of the post-authentic framework that I have developed has informed my practice as a humanist *in* the digital. More broadly, I show how the framework can guide a conceptualisation of knowledge creation that transcends discipline boundaries, especially digital vs non-digital positions. Thinking in terms of *in* the digital—and no longer *and* the digital—thus bears enormous potential for tangibly undisciplining knowledge, for introducing counter-narratives in the digital capitalistic discourse, for developing, encouraging and spreading a digital conscience and for taking an active part in the re-imagination of post-authentic higher education and research. The world has entered a new dimension in which knowledge can no longer afford to see technology and its production simply as instrumental and contextual or as an object of critique, admiration, fear or envy. In my view, the current landscape is much more complex and has now much wider implications than those identified so far. In this book, I want to elaborate on them, not with the purpose of rejecting previous positions but to provide additional perspectives which

I think are urgently required especially as a consequence of the 2020 pandemic.

In what still is predominantly a binary conceptual framework, e.g., the sciences vs the humanities, the humanities vs DH and DH vs CDH, this book provides a third way: knowledge creation in the digital. The book argues that the new paradigm shift *in* the digital—as opposed to *towards*—accelerated considerably by the COVID-19 pandemic positions knowledge creation beyond such outdated dichotomous conceptualisations. We develop technology at a blistering pace, but so does our capacity to misuse it, abuse it and do harm. It is therefore everyone’s duty to argue against any claimed computational neutrality but more importantly to relinquish outmoded and rather presumptuous perspectives that grant solely to humanists the moral monopoly right to criticise and critique. Indeed, as we are all in the digital, critical engagement cannot afford to remain limited exclusively to a handful of scholars who may or may not have interest in practice-led digital research—but who are in the digital nevertheless—as this would tragically create more fragmentation, polarisation and ultimately harm.

This is not a book about CDH, neither is it a book about DH, nor is it about the digital *and* the humanities or the digital *in* the humanities. What this book is about is knowledge *in* the digital.

1.4 OH, THE PLACES YOU’LL GO!

The digital transformation of society—and therefore of academia and of knowledge creation more generally—will not be stopped, let alone reversed. The claim I advance in this book is that, whilst a great deal of talk has so far revolved around the impact of the digital on individual fields, how the model of knowledge creation should be transformed accordingly has largely been overlooked. I argue that the increasing complexity of the world brought about by the digital transformation now demands a new model of knowledge to understand, explain and respond to the reality of ubiquitous digital data, algorithmic automated processes, computational infrastructures, digital platforms and digital objects. I contend that such engagement should not unfold as coming from a place of criticism *per se* but that it should be seized as a historic opportunity for truly decompartmentalising knowledge and reconfiguring the way we think about it. A decompartmentalised model of knowledge does not denature

disciplines but it breaks the current opposing, hierarchical structure in which disciplines still operate. The digital transformation finally forces us to go back to the fundamental questions: how do we create knowledge and how do we want to train our next generation of students?

Be it in the form of data, platforms, infrastructures or tools, across the humanities, scholars have pointed out the interfering nature of the digital at different levels and have called for a reconfiguration of research practice conceptualisations (e.g., Cameron and Kenderdine 2007; Drucker 2011, 2020; Braidotti 2019; Cameron 2021; Fickers 2022). Fickers, for instance, proposes digital hermeneutics as a helpful framework to address both the archival and historiographical issues ‘raised by changing logics of storage, new heuristics of retrieval, and methods of analysis and interpretation of digitized data’ (2020, 161). In this sense, the digital hermeneutics framework combines critical reflection on historical practice as well as digital literacy, for instance by embedding digital source criticism, a reflection on the consequences for the epistemology of history of the transformation from sources to data through digitisation.

With specific reference to cultural heritage concepts and their relation to the digital, Cameron (2007; 2021) refigures digital cultural heritage curation practices and digital museology by problematising digital cultural heritage as societal data, entities with their own forms of agency, intelligence and cognition (Cameron 2021). By reflecting on the wider consequences of the digital on heritage for future generations including Western perspectives, climate change, environmental destruction and injustice, the scholar proposes a more-than-human digital museology framework which recognises the impact of AI, automated systems and infrastructures as part of a wider ecology of components in digital cultural heritage practices.

On the mediating role of the digital for the visual representation of material destined to humanistic enquiry, Drucker (2004; 2011; 2013; 2014; 2020) has also long advocated a critical stance and a more problematised approach. She has, for example proposed alternative ways of visualising digital material that would expose rather than hiding the different stages of mediation, interpretation, selection and categorisation that typically disappear in the final graphical display. Her work introduces an important counter-narrative in the public and academic discourse which predominantly exalts data, computational processes and digital visualisations as unarguable and exact.

These contributions are all unmistakable signs of the decreasing relevance of the current model of knowledge production following the digital transformation of society and of the fact that the notion that the digital is something that ‘happens’ to knowledge creation is entirely anachronistic now. At the same time, however, these past approaches insist on disciplinary competence and indeed are modulated primarily within the fields and for the disciplines they originate from (e.g., digital history, digital cultural heritage, the humanities). The post-authentic framework that I propose here attempts to break with the ‘paradox of interdisciplinarity’ in relation to the digital, for which knowledge is not truly undisciplined but the digital is incorporated in existing fields and creates yet new fields, hence new boundaries. The post-authentic framework incorporates all these recent perspectives but at the same time it goes beyond them; as it intentionally refers to digital objects rather than to the disciplines within which they are created, it provides an architecture for issues such as transparency, replicability, Open Access, sustainability, accountability and visual display with no specific reference to any discipline.

I build my argument for advocating the post-authentic framework to digital knowledge creation and digital objects upon recent theories of critical posthumanities (Braidotti 2017; Braidotti and Fuller 2019). In recognising that current terminologies and methods for posthuman knowledge production are inadequate, critical posthumanities offers a more holistic perspective on knowledge creation, and it is therefore particularly relevant to the argument I advance in this book. With specific reference to the need for novel notions that may guide a reconceptualisation of knowledge creation, Braidotti and Fuller (Braidotti 2017; Braidotti and Fuller 2019) propose *Transversal Posthumanities*, a theoretical framework for the Critical Posthumanities. With this framework, they introduce the concept of *transversality*, a term borrowed from geometry that refers to the understanding of spaces in terms of their intersection (Braidotti and Fuller 2019, 1). Although the main argument I advance in this book is also that of an urgent need for knowledge reconfiguration, I maintain that *transversality* still suggests a view of knowledge as solid and thus it only partially breaks with the outdated conceptualisation of discipline compartmentalisation that aims to relinquish. To actualise a remodelling of knowledge, I introduce two concepts: *symbiosis* and *mutualism*. In Chap. 2, I explain how the notion of symbiosis—from Greek ‘living together’—embeds in itself the principle of knowledge as fluid and inseparable. Similarly, borrowed from biology, the notion of mutualism proposes that

areas of knowledge do not compete against each other but benefit from a mutually compensating relationship. Building on the notion of *monism* in posthuman theory (Braidotti and Fuller 2019, 16) (*cf.* Sect. 1.2) in which differences are not denied but which at the same time do not function hierarchically, symbiosis and mutualism help refigure our understanding of knowledge creation not as a space of conflict and competition but as a space of fluid interactions in which differences are understood as mutually enriching.

Symbiosis and mutualism are central concepts of the post-authentic framework that I propose in this book, a theoretical framework for knowledge creation *in* the digital. If collaboration across areas of knowledge has so far been largely an option, often motivated more by a grant-seeking logic than by genuine curiosity, the digital calls for an actual change in knowledge culture. The question we should ask ourselves is not ‘How can we *collaborate*?’ but ‘How can we *contribute* to each other?’. Concepts such as those of symbiosis and mutualism could equally inform our answer when asking ourselves the question ‘How do we want to create knowledge and how do we want to train our next generation of students?’.

To answer this question, the post-authentic framework starts by reconceptualising digital objects as much more complex entities than just collections of data points. Digital objects are understood as the conflation of humans, entities and processes connected to each other according to the various forms of power embedded in computational processes and beyond and which therefore bear consequences (Cameron 2021). As such, digital objects transcend traditional questions of authenticity because digital objects are never finished nor they can be finished. Countless versions can continuously be created through processes that are shaped by past actions and in turn shape the following ones. Thus, in the post-authentic framework, the emphasis is on both products and processes which are acknowledged as never neutral and as incorporating external, situated systems of interpretation and management. Specifically, I take digitised cultural heritage material as an illustrative case of a digital object and I demonstrate how the post-authentic framework can be applied to knowledge creation in the digital. Throughout the chapters of this book, I devote specific attention to four key aspects of knowledge creation *in* the digital: creation of digital material in Chap. 2, enrichment of digital material in Chap. 3, analysis of digital material in Chap. 4, and visualisation of digital material in Chap. 5.

The second content chapter, Chap. 3, focuses on the application of the post-authentic framework to the task of enriching digital material; I use DeXTER – DeepteXTminER⁴ and *ChronicleItaly 3.0* (Viola and Fiscarelli 2021a) as case examples. DeXTER is a workflow that implements deep learning techniques to contextually augment digital textual material; *ChronicleItaly 3.0* is a digital heritage collection of Italian American newspapers published in the United States between 1898 and 1936. In the chapter, I show how symbiosis and mutualism have guided each action of DeXTER’s enrichment workflow, from pre-processing to data augmentation. My aim is to exemplify how the post-authentic framework can guide interaction with the digital not as a strategic (grant-oriented) or instrumental (task-oriented) collaboration but as a cognitive mutual *contribution*. I end the chapter arguing that the task of augmenting information of cultural heritage material holds the responsibility of building a source of knowledge for current and future generations. In particular, the use of methods such as named entity recognition (NER), geolocation, and sentiment analysis (SA) requires a thorough understanding of the assumptions behind these techniques, constant update and critical supervision. In the chapter, I specifically discuss the ambiguities and uncertainties of these methods and I show how the post-authentic framework can help address these challenges.

In Chap. 4, I illustrate how the post-authentic framework can be applied to the analysis of a digital object through the example of topic modelling, a distant reading method born in computer science and widely used in the humanities to mine large textual repositories. In particular, I highlight how through the deep understanding of the assemblage of culture and technology in the software, the post-authentic framework can guide us towards exploring, questioning and challenging the interpretative potential of computation. Drawing on the mathematical concepts of discrete vs continuous modelling of information, in the chapter I reflect on the implications for knowledge creation of the transformation of continuous material into discrete form, binary sequences of 0s and 1s, and I especially focus on the notions of causality and correlations. I then illustrate the example of topic modelling as a computational technique that treats continuous material such as a collection of texts as discrete data. I bring critical attention to problematic aspects of topic modelling that are highly dependent on the sources: pre-processing, corpus preparation and deciding on the number of topics. The topic modelling example ultimately shows how post-authentic knowledge creation can be achieved through a sustained engagement with software, also in the form of a continuous exchange between processes

and sources. Guided by symbiosis and mutualism, such dialogue maintains the interconnection between two parallel goals: output—any processed information—and outcome, the value resulting from the output (Patton 2015).

Operating within the post-authentic framework crucially means acknowledging digital objects as having far-reaching, unpredictable consequences; as the complex pattern of interrelationships among processes and actors continually changes, interventions and processes must always be critically supervised. One such process is the provision of access to digital material through visualisation. In Chap. 5, I argue that the post-authentic framework can help highlight the intrinsic dynamic, situated, interpreted and partial nature of computational processes and digital objects. Thus, whilst appreciating the benefits of visualising digital material, the framework rejects an uncritical adoption of digital methods and it opposes the main discourse that still presents graphical techniques and outputs as exact, final, unbiased and true. In the chapter, I illustrate how the post-authentic framework can be applied to the visualisation of cultural heritage material by discussing two examples: efforts towards the development of a user interface (UI) for topic modelling and the design choices for developing the app DeXTER, the interactive visualisation interface that explores *ChronicleItaly 3.0*. Specifically, I present work done towards visualising the ambiguities and uncertainties of topic modelling, network analysis (NA) and SA, and I show how key concepts and methods of the post-authentic framework can be applied to digital knowledge visualisation practices. I centre my argumentation on how the acknowledgement of curatorial practices as manipulative interventions can be encoded in the interface. I end the discussion by arguing that it is in fact through the interface display of the ambiguities and uncertainties of these methods that the active and critical participation of the researcher is acknowledged as required, keeping digital knowledge honest and accountable.

In the final chapter, Chap. 6, I review the main formulations of this book project and I retrace the key concepts and values at the foundation of the post-authentic framework proposed here. I end the chapter with a few additional propositions for remodelling the process of digital knowledge production that could be adopted to inform the restructuring of academic and higher education programmes.

NOTES

1. The Gartner Hype Cycle of technology is a cycle model that explains a generally applicable path a technology takes in terms of expectations. It states that after the initial, overly positive reception follows a ‘Trough of Disillusionment’ during which the hype collapses due to disappointed expectations. Some technologies manage to then climb the ‘Slope of Enlightenment’ to eventually plateau to a status of steady productivity.
2. This is not to mistake for the *Amazon Mechanical Turk* which is a crowdsourcing website that facilitates the remote hiring of ‘crowdworkers’ to perform on-demand tasks that cannot be handled by computers. It is operated under Amazon Web Services and is owned by Amazon.
3. Compound annual growth rate.
4. <https://github.com/lorellav/DeXTER-DeepTextMiner>.

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