Paul van Geest Emile Aarts Ronald de Jong

HOW UNIVERSITIES MIRROR SOCIETY

The Impact of Artificial Intelligence on Academic Research, Education and our Conception of the Human Being

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How Universities Mirror Society

About the cover

The cover image juxtaposes two origins of intelligence. On the left is the image of Adam, painted by Michelangelo in the Sistine Chapel, representing the origin of humanity as something created and bestowed. On the right is an image of a humanoid robot generated by ChatGPT, symbolising humanity's capacity to harness artificial intelligence as a creative force.
In between these images, two young students approach the university, representing a new generation that must find ways to navigate the tension between these extremes. The university symbolises a reflective space where these opposites converge: a place for critical thought, ethical discernment, and the ongoing redefinition of what it means to be human in an age of artificial creation.

HOW UNIVERSITIES MIRROR SOCIETY

The Impact of Artificial Intelligence on Academic Research, Education and our Conception of the Human Being

Paul van Geest Emile Aarts Ronald de Jong

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Introductory Note

The book before you is the English edition of *De universiteit als spiegel van de samenleving*, which was developed in parallel and originally published by Open Press TiU. The decision to work simultaneously in both Dutch and English reflects the specific context of the book: while the subject matter is closely connected to the Dutch academic and societal context, the working and teaching language at Dutch universities and many institutions of higher professional education (HBO) is predominantly English.

As authors, we wish to emphasise that neither publication is intended as a concluding statement on the subject discussed. Rather, both texts aim to stimulate further reflection and discussion, broadening and deepening insights into the interaction between artificial intelligence and changing conceptions of the human person, and thereby contributing to a more precise understanding of the future role of the university in this regard.

The initial idea for writing this book arose from the observation that universities are currently experiencing particularly turbulent and eventful times. This realisation led to a shared sense of astonishment – bordering at times on concern – about developments within universities themselves: about the ways in which difficult decisions have been made under financial pressure, about international tensions that have sparked protests on campuses and affected international collaborations. Above all, it concerned the remarkable speed with which artificial intelligence

(AI) has taken hold of society and, consequently, of education and research within universities, while also influencing our understanding of human nature and our conception of the self.

At the level of the broader perspective – namely, the effects of AI on the development and application of general knowledge as an epistemic enterprise – many questions remain open, and speculation is widespread across the globe as to whether AI might eventually render human thinking and decision-making obsolete. Such speculation generates considerable tension. The academic world perceives a potential threat to its very existence, while simultaneously recognising opportunities to reinvent itself. These tensions are discussed extensively in this book.

The emergence of this book is rooted in the transformations brought about by AI, in which societal trends and developments within universities seem to mirror one another. Both in academia and in society more broadly, conceptions of the human being are changing as humans are increasingly compared with systems and processes associated with AI. Expectations regarding the application of AI continue to rise, and the question whether the growing use of AI requires different forms of leadership is becoming increasingly pressing. Although the book was written within a relatively short period of time, it draws upon intellectual sources that have been developed within the respective academic fields for many years, and in some cases even centuries.

Coming from different backgrounds, i.e. the humanities, the natural sciences, and business administration, our ideas intersected in unexpected places. Concepts developed within our respective academic disciplines or professional practices were enriched and deepened by engaging them with ideas concerning AI, education, research, and the conceptions of the human

being shaped by these developments within the disciplines of our interlocutors. To a significant extent, the process was characterised by a highly stimulating form of serendipity: the accidental discovery of something valuable while not initially searching for anything specific.

Developments in AI are unfolding at a dizzying pace. Almost every day brings new developments worthy of attention. Will binding AI regulations be introduced, or not? In what way can academic research and education be enriched through AI-based methods? Will the technological bubble burst, or will developments continue to accelerate? Likewise, the questions confronting universities have not yet found definitive answers. Will the anticipated budget cuts be implemented, and if so, in what form? And how can universities navigate these turbulent times? For this reason, we have chosen to conclude with an open ending – one that serves as a prelude to further questions.

Foreword

In his important book *Wisdom's Workshop: The Rise of the Modern University*, James Axtell observes: "All universities are shaped by and must respond to the ambient conditions of their times, otherwise they wither and die." (Axtell, 2016, p. 44). This encouraging observation is substantiated with extensive historical analyses. He, for instance, supports the claim that medieval universities were already confronted with developments that placed nothing less than their "very existence" at stake. More than once, these developments were technological in nature. In the fifteenth century ("a fast moving century," sic!), universities such as Oxford and Cambridge experienced the rise of the printed book: "the replacement of manuscript texts with smaller, less expensive books made possible [by] movable-type printing." This had consequences for the ways in which knowledge was disseminated. It became more accessible. The authors of the present volume would speak of changes in the "gatekeeping function" of universities. Change is a phenomenon of all times, and the fact that many universities have endured its dynamics for centuries may be a source of hope. Nevertheless, vigilance is required.

In keeping with the best traditions of sound scholarly research on the significance of technological developments, Axtell clearly demonstrates that the emergence and impact of such developments are, to a large extent, constituted by a frequently complex interplay of socio-economic and political relations (which some-

times also substantially influence the ways in which these technologies themselves develop). Technology is not neutral; it is closely connected to forms of power formation in the economic and political domains, and can support and engender very specific goals. The independence of universities was already vulnerable in those days: dependence on the authorities of the time – who, especially through financial means, were able to force universities into royal straitjackets – was growing. Henry VIII in particular (who reigned from 1509 to 1547) proved highly adept at manipulating universities: "The bear hug in which he embraced the universities made it difficult for them to distinguish affection from coercion" (Axtell, p. 45).

The book before you may likewise be called important, and I therefore warmly commend it to your attention. It demonstrates with equal force and thoroughness that, as a society – and universities in particular – we must once again exercise considerable vigilance in order to protect our institutional distinctiveness, independence, and core mission. Governments still require our continuing alertness, but increasingly large technology companies also demand our attention. They develop and exploit technologies that fundamentally affect the ways in which education and research within universities are organised. Artificial intelligence does not appear to be merely another technological development or application; rather, it is one that, even more than before, calls for our particular attention because of its disruptive as well as deeply penetrating effects on the way we learn, teach, and investigate.

The book before you offers a highly welcome, critical, and fundamental reflection on a technology that, according to some, places the very *raison d'être* of universities at stake. In some

places, the debate has already begun in earnest, and from within our own university there have also been – sometimes quite far-reaching – calls to prioritise this debate (Van Laarhoven & Van Vugt, 2025, pp. 2750–2762). Artificial intelligence, among other things, is said to lead to cognitive laziness and to create substantial challenges with regard to questions of scientific integrity.

Indeed, there is work to be done: the Netherlands Scientific Council for Government Policy (Wetenschappelijke Raad voor Regeringsbeleid) has rightly characterised AI as a "system technology," whose operation penetrates deeply into processes and activities that once had little to fear from the steam engine or the typewriter. No discipline escapes its influence. Discussions with and among the chairs of our examination boards have been ongoing for some time, and the first questions about how we can comply with the emerging European legislation are already being placed insistently on administrative agendas.

This legislation is informed by the question of which (European) values we must protect – once again in light of this new technological development. Here the fundamental character of the work presented in this publication proves particularly valuable. It situates the rise of AI within the historical and recent context of the institutional history of universities and rightly asks which idea of the university is promoted by AI – or, conversely, which comes under pressure. In doing so, the authors look beyond the narrow confines of their own institution and explicitly attend to the broader system within which universities must function: nationally, across Europe, and internationally. The rise of AI currently generates more questions than answers at all these levels, compelling us to reflect on where the essential

value of a university lies and which fundamental values, on that basis, may deserve additional protection. Particularly important is the insight that universities not only develop and transmit knowledge but also, in the words of the authors, "safeguard the conditions under which reliable, critical, and meaningful knowledge can emerge," thereby promoting "methodical doubt, plurality, slow thinking, and careful evaluation."

The book's extensive description and analysis of what AI actually is and entails subsequently serves as a source of critical reflection and, at times, of concrete recommendations for various groups within the academic community, such as students, researchers, and teachers. In doing so, the authors do not hesitate to problematise further algorithmisation from the perspective of the human image: the model of the human being is considerably more complex than a language model. Views on thinking and on the essential nature of the human person are discussed at length. This too provides a fertile basis for analysing and placing on the agenda the dimensions of what may become highly problematic if the various manifestations of AI are embraced uncritically.

In my view, the perspective of making explicit the underlying conception of the human being is a highly fruitful – and indeed fundamental – way of framing further discussions: it looks beyond the latest release or version of technological applications and instead calls urgent attention to the more essential questions that arise. These questions are, of course, far from being fully answered; indeed, they may not even have been fully articulated. Yet there is work to be done, particularly for a university such as ours, which neither wishes nor is able to evade the important role of law, religion, and ethics in such discussions. For all those who

bear administrative responsibilities within universities, this book is equally important. How do we inspire, how do we safeguard, and how do we guide the university towards and within a future in which – once again – a technology penetrates deeply into its core practices?

I would like to thank the authors for their commitment to bringing this publication into being. It has become a rich and fundamental reflection which, for our nearly century-old university – currently preparing for a renewed reflection on its strategic priorities – provides an excellent source for further thinking and discussion about what presents itself as an essential task: to further develop and protect the essence of the university in a time that, much like technology itself, is marked by strongly disruptive elements and developments. The fact that it has been written in constructive collaboration by a scientist, a business scholar, and a church historian/theologian once again demonstrates how essential work requires cooperation across distinct academic disciplines.

Wim van de Donk

Wim van de Donk (1962) is Professor of Public Administration, Rector Magnificus, and President of the Executive Board of Tilburg University. Previously he served as Chair of the Netherlands Scientific Council for Government Policy (Wetenschappelijke Raad voor het Regeringsbeleid, 2004–2009) and as the King's (formerly Queen's) Commissioner in the province of North Brabant (2009–2020).

The University in the Information Age: An Introduction

A Past and a Mission

The university is one of the oldest institutions of our civilisation. Together with the army and the church, it belongs to the rare institutions that span centuries without losing their core and mission. Where kingdoms became republics, political parties soon merged into other parties after their founding, and companies generally do not withstand the test of time for long, the university persisted as *alma mater*, as a nurturing mother who for generations has connected research, education, and critical reflection in their pursuit of truth and insight. Thus, it became and remained the guardian of knowledge, culture, and civilisation itself.

Its outward form changed, the number of scientific disciplines increased, and its students became more diverse over the centuries. Yet the mission remained unequivocal: the expansion, deepening, and transmission of knowledge and understanding. Whereas in the Middle Ages the aim of the university was initially to discern the order given by God in creation, in history, as well as in human beings themselves, this aim would later change. It became the university's task to describe the coherence of all things and all beings – or causal relations – *etsi Deus non daretur*:

as if no God lay at the foundation of this coherence. On this basis the legal system was developed. This did not prevent Georges Lemaître (1894–1966), the "discoverer" of the primeval atom – a compact state from which the universe began to expand as in a Big Bang – from not only being an astronomer and physicist but also a theologian and Catholic priest. He is proof that the university, as a space for academic formation and personal growth, has connected – and continues to connect – scientific knowledge, critical reflection, and philosophical or religious depth in the broadest sense.

Today this mission is under pressure as rarely before. The university finds itself in a world that is rewriting its premises: a world in which knowledge is everywhere, can be generated by anyone, and in which even non-human systems produce new knowledge. Until the advent of AI, the capacity to acquire and transmit knowledge was reserved for the phenomenon of the human being: "an animal endowed with reason," as Aristotle formulated it in order to distinguish human beings from other living creatures. Precisely because humanity has now entered a phase in history in which technology produces knowledge and insight as well, we are compelled to radically reconsider knowledge as the product of human thinking, and of this thinking alone. Having reached this point, the role of the university must therefore also be reconsidered.

The Monopoly on Knowledge

Throughout the centuries, the acquisition of knowledge seemed to be reserved for a kind of elite. In his *Vita Karoli Magni*, Einhard writes that Charlemagne, although interested in reading

– and even somewhat proficient in Latin – never mastered writing, not even when he began to practise it at night in his old age. The development and transmission of knowledge was almost exclusively the domain of the clergy. When universities were founded in the High Middle Ages, clerics determined how these institutions were organised. Although the advent of the printing press began to undermine this exclusivity – knowledge became reproducible and accessible on a larger scale – it still remained in the hands of an elite, because not everyone had learned to read and write yet.

Moreover, the speed and manner in which knowledge was expanded or disseminated bore no comparison to the way in which this occurs today. Renaissance popes had to make great efforts to gather manuscripts and incunabula in one place: their library. Scholars were forced to travel for days along poorly passable roads and, in the words of Desiderius Erasmus, to spend the night in inns with "stinking stoves" in order to increase their knowledge in a particular place. Today, with a single search query on a smartphone or a prompt in a language model, we have access to libraries, databases, simulations, code, translations, and conceptual frameworks. Generative AI technologies such as ChatGPT, Claude, or Gemini produce texts, designs, research proposals, syntheses of scientific literature, or even mathematical proofs in seconds.

The University as Gatekeeper?

Where universities once held a monopoly over knowledge, the gates of the knowledge institutions that universities are now, seem to have been forced wide open. University communities

are being flooded with knowledge that they have not brought forth themselves – paradoxically through the efforts of university-trained individuals. On the one hand, AI is a subject of academic research; on the other, it is a technology that puts pressure on the exclusivity of university knowledge production. Whereas universities long possessed a quasi-monopoly on the production, validation, and dissemination of knowledge, AI appears to decentralise these functions. Knowledge thus becomes increasingly accessible to broader segments of society, with far-reaching implications for the status, function, and identity of the university as an institution.

Students, moreover, no longer need to sit at the feet of the teacher if they wish, for example, to understand the universalizability maxim or the maxim of human dignity developed by the German philosopher Immanuel Kant. A well-formulated prompt suffices. Researchers themselves can also make use of systems that take over parts of their task: systems that analyse literature or even direct empirical research. AlphaFold, for example, is DeepMind's AI system that can predict the structure of proteins with unprecedented accuracy. Where scientists once required years of laboratory research, AlphaFold offers within seconds models that open the door to new medicines and treatments. For the judiciary, AI systems generate summaries of case law, detect bias in judgments, or assist in drafting contracts. In this respect the university as a nurturing mother plays hardly any role at all. "Times change and we change with them," Augustine remarked in his *Sermon 80*, delivered at a time when the Roman Empire was more or less collapsing.

The Aim of This Book

This book centres on the question of what the consequences of AI are for the institution that for centuries held the patent on knowledge and successfully maintained the monopoly of gatekeeping. Should the university resist AI in order ultimately to regain its monopoly position in the expansion of knowledge? Or should it become a place where the function and essence of AI are critically and reflectively examined? What are the consequences of AI for the organisation of our education and research? Should education radically reinvent itself? Why continue writing essays if AI does it better? Research, too, faces questions, such as: Who is the author when AI co-writes? What does peer review mean when the "peers" are partly artificial? What is the status of "knowledge" generated by a non-human source? And therefore also: Why should citizens trust experts if AI can deliver comparable analyses in more comprehensible language or provide a sharper diagnosis?

This book is best read as a plea for the university as a reflexive space. Because so much knowledge is generated, meta-knowledge – insight into how, why, and for what purpose knowledge is formed – is urgently needed. The university should become a place, a laboratory, in which successive generations learn to assess the value of the knowledge produced within and beyond the university – value in the broadest sense of the word.

It is necessary for the university to reinvent itself. It is no longer the exclusive gatekeeper but must develop as a giver of meaning: as a nurturing mother that provides the space to judge the scientific and moral quality of the knowledge produced and the streams of information that circulate. Are these not some-

times invented in order to persuade people to adopt a particular worldview or conception of humanity, while unjustifiably suggesting that solid research has been conducted?

Universities must become places par excellence where reflection takes place on the responsibility that accompanies the expansion of knowledge and on the consequences of applying that knowledge for creation, humanity, and the unequal strata within society. AI produces knowledge, but it does not understand what this knowledge may lead to. AI has no moral compass, no historical awareness, and no consciousness that is rooted in lived experience. What role can universities play in developing meta-knowledge, in which ethical reflection on acquired knowledge is inherent to the acquisition of that knowledge itself?

In a world of ever faster knowledge production, the university must in fact dare to be slower; it must dare to create reflexive space in which both the intentions and the consequences of knowledge expansion are considered. Seen in this way, the university is no longer only a factory of knowledge but also an ethical laboratory where students and researchers learn to deal with the fact that knowledge is not a neutral good. What bias is embedded in the algorithm? Who determines what counts as "reliable"? Which values and conceptions of humanity are built into our epistemic systems? To what extent are virtues such as justice, moderation, or the equality of all accounted for in an algorithm?

Plan of Approach

In order to answer roughly all of the questions raised above, it may be useful to first pause and consider what exactly a university is. For that reason, the first part of this book outlines in two chapters the history of the emergence of "the university." The first chapter presents the history of the university in Europe. From medieval institutions in which theology, law, and medicine formed the core, universities developed into modern centres of research and education where scientific progress and societal impact went hand in hand. Universities responded to the signs of the times and continually adapted to new scientific and social demands and expectations.

The second chapter presents the history of universities in the Netherlands. Within the broader history of universities in Europe, this history displays a certain distinctiveness. Under the influence of New Public Management thinking, they were recently subjected – more than universities in countries such as Spain or Italy – to rules of efficiency, measurability, and external accountability. Universities transformed from intellectual communities into semi-market organisations with administrators, dashboards, performance requirements, and contractual targets. Rectors became CEOs. Students became "clients."

Both chapters contain a *spieghel historiael*: a "mirror" in which the course of history can be observed in order to draw lessons from it. They also contain a plea to preserve universities as institutions where one learns to reflect on the quality of knowledge and as training grounds in which one acquires the space necessary to distinguish between good and evil in the intentions and consequences of actions and algorithms.

In the second part of this book, the third chapter examines the most important of all the factors that caused universities to tremble on their foundations: AI. What exactly is meant by artificial intelligence, what forms does it take, and how has it developed technologically and conceptually? The fourth chapter then reflects on the consequences that AI has for our self-image, our conception of humanity, and our anthropology.

Universities have traditionally played a crucial role in shaping conceptions of the human being. Now that AI appears capable of simulating or even surpassing human cognitive capacities, classical notions of the human being as the "crown of creation" come under pressure – especially since the human being is no longer regarded as a free being endowed with reason but as a being comparable to an algorithmic system. Can critical observations be made about this conception of humanity? And can these observations be made from the perspectives on freedom, responsibility, or the moral autonomy of the human phenomenon as developed at universities over the centuries?

Finally, the third part addresses the practical consequences that follow from the historical reflections in the first part and the systematic reflections in the second. The fifth chapter focuses on the question of what AI will mean for the way universities are governed. For a long time, the administrative culture was dominated by the pursuit of efficiency, risk management, and reputation management. Should there not be room for a form of leadership in which the pursuit of these necessities is supplemented by the intention to allow universities to be places of reflection as well? And if so, how would this work in practice? The sixth chapter then turns to education and the labour market. Which skills must students acquire in order to function in a

knowledge economy shaped by algorithms? Do academic teachers shape them merely into specialists, or also into individuals who possess critical and reflective capacities, and who are resilient and creative?

The epilogue should above all be understood as an invitation to profound reconsideration. What is the university if the human being is no longer the only knowing subject? What does learning mean when machines understand faster than we do? What is the value of thinking if AI can already anticipate our thoughts? What does it mean that the university is not a neutral system that automatically adapts to new times, but a vulnerable institution that must partially reinvent itself amid the storms of digitalisation and the AI revolution? And that it must do so not from the idea that it exists solely for the sake of economic growth or technological progress, but above all because it provides the much-needed reflexive space required to distinguish good from evil? And what does all this mean for those who govern and inspire universities today? The answers to these questions determine the future of the university.

1
From Knowledge Scarcity to Abundance: Developments at Universities Through the Centuries

Introduction

The history of the university, which we outline here in broad strokes, is best understood as a continuous search for equilibrium. From their very origins, universities in Europe have been shaped by the tension generated by three structural poles. First, there is the pole of epistemic authority: the authority grounded in scholarly competence to produce, evaluate, and teach knowledge. Throughout the centuries, this authority has required knowledge of the subjects studied by academics and methodological rigor; it formed – and continues to form – the core of the university's identity.

In addition, universities have always been socially embedded. They are situated within broader social, cultural, and economic contexts, and are partly defined by the expectations, needs, and interpretations of the communities that sustain them. Finally, throughout their history, universities have also faced political

pressure: direction, regulation, and influence exerted by political actors and structures that help determine the scope of academic autonomy and freedom.

These three factors – epistemic authority, social embeddedness, and political pressure – reappear in varying constellations throughout the centuries and have consistently shaped the identity of the university.

The Precursors of the University

Universities are often regarded as a European invention of the Middle Ages. Yet the origins of organised higher education lie elsewhere. While the academies of Plato, Xenophon, and Aristotle in Athens were not institutional predecessors of the medieval universities, they shared a fundamental intellectual orientation. Both traditions were directed towards the pursuit of truth and wisdom through logical reasoning and observation of reality. What began in the Greek schools as a philosophical pursuit was strongly formalised in the medieval universities within a structure of knowledge transmission and critical thought – an institutionalisation that left a lasting influence on science, culture, and society. Both the academies and the universities were never merely institutions of knowledge.

As early as the ninth century, institutions emerged in the Islamic world that may be regarded as precursors to the modern university. The University of al-Qarawiyyin, founded in 859 in Fez (Morocco), is widely recognised as the oldest continuously operating university in the world. It offered instruction in religion, law, grammar, logic, astronomy, and medicine. Equally significant was the founding of Al-Azhar University in Cairo in

971. It developed into an influential centre for Islamic theology and law. These institutions were often connected to religious complexes such as mosques, yet they also offered secular subjects and attracted students from diverse regions.

Reforms and the Emergence of Universities

During the Middle Ages, society in what is now Europe underwent a major transformation. Although the agrarian feudal system remained in place, itinerant traders travelling from court to court began to set up stalls in circles on open fields – often near rivers for purposes of transport – thereby creating markets. These markets became the centres of European towns, where a self-aware bourgeoisie emancipated itself and gave society a new social profile. Urbanisation and the accumulation of wealth in both secular and ecclesiastical institutions, in turn, generated numerous poverty movements: groups that sought to recalibrate medieval society according to the ideals of moderation and sobriety exemplified by Christ.

Some of these poverty movements were approved by the Church. The movement surrounding Francis of Assisi, for example, was confirmed by Pope Honorius III, who recognised that the leadership of the Church had drifted far from its original mission. And although the origins of the Dominicans lay in the desire of Domenico de Guzmán to defend the essence of Christianity through preaching and teaching, they too were inspired by the spirit of the poverty movements. It was precisely these orders – more mobile than older monastic orders such as the Benedictines, who resided in abbeys – that exerted a significant influence on the medieval university system.

By the end of the eleventh century, universities emerged in Europe as a new, institutionalised form of higher education. The oldest university, Bologna (c. 1088), developed from a student community organised into *nationes*, associations of students based on geographical origin or "tongue" (language). These *nationes* functioned as semi-autonomous groups within the university and appointed the lecturers, who in Bologna primarily taught Roman law. In Paris, the university arose through the initiative of the priest Robert de Sorbon, when around 1200 teachers organised themselves into a *universitas magistrorum*. Here the emphasis lay on theology and philosophy. The University of Paris stood more firmly under ecclesiastical influence; the chancellor of Notre-Dame held authority over the granting of permission to teach (the *licentia docendi*). Founded by scholars and students who had fled Paris, the universities of Oxford (around 1208) and Cambridge (around 1209) would largely adopt the structure and theological profile of the University of Paris.

Originally, Salamanca was student-governed, like Bologna, with an elected rector and influence exercised by the *nationes*. Over time, however, power gradually shifted to the professors and to authorities outside the university: the king and the pope. This shift had advantages: universities obtained legal autonomy through papal or royal privileges. Financing came from multiple sources: students paid tuition fees, cities offered tax benefits and housing, and the Church supported universities through benefices, prebends, or income from ecclesiastical funds.

Latin functioned as the common language. Notably, there was considerable mobility among students and teachers – all men, incidentally, who belonged to the clerical estate. Some came

from prosperous bourgeois families, while others had entered a monastic order that guaranteed their financial support.

Scholastic Thought

The scholastic method, which formed the foundation of university teaching, dominated all faculties. This method was based on a rational and logical analysis of authoritative texts, according to the conceptual frameworks of Aristotle. His logical and natural-philosophical works (especially the *Organon*) were incorporated into the curriculum in the thirteenth century through Latin translations from Arabic. The acquisition of knowledge proceeded in three stages. First came the *lectio*, in which a particular text was read and explained. This was followed by the *quaestio*, in which the text was problematised. Finally, the *disputatio* involved a systematic discussion of the issues identified. This model, with its emphasis on syllogistic structure and logical coherence, influenced how knowledge was expanded in disciplines such as theology and law through the interpretation of texts.

The faculty of arts served as the foundational programme and comprised the *trivium* (grammar, logic, rhetoric) and the *quadrivium* (music, geometry, arithmetic, astronomy). The arts curriculum prepared students for the higher faculties and focused strongly on textual interpretation and dialectical exercises, with authors such as Boethius, Priscian, and later Aristotle serving as core material. In the medical faculty, the thought of Galen and Hippocrates was central, often studied through Arabic commentaries, particularly those of Avicenna (*Canon Medicinae*). Study focused on the balance of the four humours (blood, phlegm, black bile, and yellow bile) and the correlation between

cosmic and bodily order. Anatomical teaching remained limited until the fourteenth century.

In the faculty of law, with Bologna as its epicentre, the rediscovered Roman law (*Corpus Iuris Civilis*) formed the central subject of study, along with canon law as recorded in the *Decretum Gratiani*. This was particularly significant because the Catholic Church was one of the most powerful institutions – if not the most powerful – in medieval societies. Teaching took place through *glossae* (marginal commentaries), casuistic reasoning, and disputations. Legal knowledge was constructed through the hermeneutic interpretation of sources according to logical principles. Genres such as *summae*, *distinctiones*, and *notabilia* formed the basis of legal training.

The theological faculty, with Paris as its principal centre, was considered the most important faculty at the universities. Theological study began with the Bible and with commentaries on the *Sententiae* of Peter Lombard, the later bishop of Paris. These works consisted of a systematic compilation of passages from the Bible and statements from Church Fathers concerning the sacraments, God, and the Trinity, and they served as the standard handbook for theological education and debate in the Middle Ages. Methodologically, the *Sententiae* aligned with the arts and sciences. Epistemologically, the approach was Aristotelian: theology, like medicine or law, was conceived as a *scientia* grounded in authoritative texts and the rational derivation of principles. In the medical and legal faculties, authoritative texts (such as Galen or the *Corpus Iuris Civilis*) likewise served as the basis for study, and similar structures of *glossae*, *summae*, and *quaestiones* were employed, inspired by the theological model.

Within theology there were two paths. First, there was the *via antiqua* ("the old way") associated with the Dominican Thomas Aquinas and the Franciscan Bonaventure. Its starting point was the idea that the world and human reason were ordered in such a way that universal truths about God and creation could be derived from them. There was also the *via moderna* ("the new way"), developed by figures such as William of Ockham, Gregory of Rimini, and Gabriel Biel. Ockham rejected the realism of the *via antiqua* and argued that abstract concepts were merely mental constructs (nominalism).

The *via moderna* therefore emphasised logical analysis and philosophy of language. In particular, the Franciscan William of Ockham denied the existence of universal entities and recognised only individual, observable things. Nominalism thus became a philosophical precursor to empiricism, as it undermined confidence in abstract essences and metaphysics and shifted attention towards the concrete, the observable, and the testable. The emphasis placed by Ockham and his followers on the concrete, the contingent, and the observable fostered greater appreciation for induction and observation as methods of acquiring knowledge – an orientation that would later resonate in empirical approaches in the natural sciences, especially among thinkers such as Francis Bacon and John Locke in the sixteenth and seventeenth centuries. The German priest Gabriel Biel (d. 1495), founder of the University of Tübingen and the last major representative of the *via moderna*, attempted to reconcile both approaches in his commentaries on Lombard. This effort succeeded only partially.

An important moment in the development of the university network in the Low Countries was the founding of the Univer-

sity of Leuven in 1425, under the impetus of Duke John IV of Brabant and with the approval of Pope Martin V. Leuven was the first university in the Netherlands and quickly became an important intellectual centre. The university played a prominent role in the spread of humanist ideas and maintained connections with major figures of the Renaissance, including Erasmus. Leuven reflects the increasing institutionalisation of intellectual life in Northwestern Europe and marks the beginning of a tradition of university education in the Low Countries that continues to the present day.

Scholasticism and Humanism

From the fourteenth and early fifteenth centuries onwards, humanism – originally a hermeneutical method – gained influence. Initially in Italy (for example in Florence and Padua), and later in Paris, Leuven, and Oxford as well, scholars turned away from the abstract scholasticism that relied heavily on syllogistic reasoning. Humanists such as Petrarch and Valla emphasised the importance of reading primary sources with philological precision, as well as the importance of moral formation, focusing on human potential rather than human sinfulness. The emphasis shifted from formal logic to textual interpretation and moral judgment.

Ad fontes! – back to the sources! – proclaimed the Rotterdam priest and humanist Desiderius Erasmus. He sought to publish the works of classical authors, the Church Fathers, and the Scriptures in their entirety. He accused scholastic authors of forcing passages from Scripture and the Church Fathers into the Procrustean bed of their own academic and speculative ques-

tions, thereby failing to do justice to the intentions of the original writers. Scholastic *summae*, he argued, were murky pools; Scripture and the works of the Church Fathers were clear streams. Only there, in his view, could one truly refresh oneself.

In the medical faculties, humanism led to increased attention to direct observation and anatomy (for example in the work of Vesalius). This development marked the beginning of the transition towards the modern research university, in which empirical research, source criticism, and interdisciplinarity would become central.

Humanist thinkers – including Lorenzo Valla, Rudolphus Agricola, and the aforementioned Erasmus – exerted considerable influence on universities, particularly in Italy, France, Germany, and the Low Countries. Increasingly, universities established schools devoted to the *studium humanitatis*: an educational programme aimed at forming a critical, morally responsible, and rhetorically skilled individual. The Renaissance also brought – already prepared by the *via moderna* – a renewed appreciation for empirical research and curiosity, indirectly providing fertile ground for the scientific revolution of the seventeenth century. Although the traditional university curriculum changed only gradually, humanists introduced new subjects, methods, and texts into the academic domain, thereby fostering a broader and more worldly perspective on knowledge. By the end of the fifteenth century, the university was no longer solely a bastion of theology and canon law but also a breeding ground for new ideas, cultural reorientation, and societal influence. While still rooted in religious and hierarchical traditions, the university stood at the beginning of a process of modernisation that would permanently alter its role in society.

University institutions, however, were rarely perfect or neutral. They were exclusionary, reproduced social hierarchies, and operated under the protection – and therefore under the influence – of church or state. Yet they were also places where new ideas could emerge, where authority could be critically questioned, and where, in the best circumstances, thought could develop without immediate economic or political pressure. This tension between reproduction and critique, between tradition and transgression, lies at the heart of the academic ethos. In this early phase the university largely served the Church, and only later the state. Academic freedom was not self-evident but depended on external protection. Paradoxically, however, this dependence coincided with the development of an ethos of a certain degree of academic autonomy, understood as the self-regulation of intellectual discourse.

State Universities

In the sixteenth century, universities became increasingly integrated into the apparatus of the state. Medieval autonomy gave way to state control and confessional embedding. New universities were founded by princes, cities, and churches in the service of state formation and religious uniformity, often with explicit confessional or political functions. Institutions such as Leiden, Wittenberg, Edinburgh, and Vilnius served simultaneously as centres of state formation, preaching, and scholarly renewal.

The theological faculties remained dominant in the sixteenth century as guardians of religious truth in a time of doctrinal conflict. Nevertheless, the importance of the faculty of law grew, particularly in the context of the Baroque period and abso-

lutism. Roman law was applied to state administration, and it was above all jurists who reflected on the structure of social order. The jurist and theologian Hugo Grotius introduced a fundamentally new starting point: the idea that legal systems should be designed *etsi Deus non daretur* – as if God did not exist. In doing so, he provided international law and natural law with a secular, rationalist foundation and initiated a trend that would shape both legal scholarship and the university as an institution in the centuries to come.

In the medical faculties of cities such as Padua, Leiden, and Montpellier, empirical research made significant advances: dissections, hospital-based teaching, and systematic observation formed the core of a new medical pedagogy.

Economics as a scientific discipline emerged only in the eighteenth century, developing out of moral philosophy and natural law. Its founder was Adam Smith, who analysed economic processes as autonomous systems but did so in an interdisciplinary manner, consistent with his background as a moral philosopher. In *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776), he developed a view of self-interest according to which individual pursuit of self-interest, when embedded in a system of free markets and mutual interdependence, leads to general benefit. Individuals pursue their own interests, but in a well-functioning market this indirectly contributes to the welfare of others. In the nineteenth century the field expanded into an independent academic discipline within the philosophical faculties, stimulated by the rise of market economies and industrial states. Around 1900, the first separate faculties of economics were established in Germany, Austria, and later the United States.

This development reflected the growing need for scientific knowledge about trade, labour, production, and public policy.

Wilhelm von Humboldt and *Bildung*

The nineteenth century was thus a distinctive period in the history of the university, marked by further differentiation. Paradoxically, this development coincided with profound reflection on the mission and identity of the university.

The Humboldtian model of *Bildung*, formulated by Wilhelm von Humboldt (1767–1835), gave the modern university its characteristic form. Von Humboldt – a German philosopher, linguist, and educational reformer – advocated the ideal of a university in which research and teaching were inseparably connected and in which academic freedom for both professors and students was paramount. Personal formation (*Bildung*), scientific progress, and social responsibility were to converge within a single institutional framework. In this way, the university became not only a knowledge institution but a social institution as well: a place where elites were formed, expertise was produced, and policy was legitimised. Above all, in the Humboldtian tradition the university was a space for free exchange of ideas, unconstrained inquiry, and intellectual autonomy. For decades these ideas served as a normative compass for the European model of the university.

The Idea of a University

One of the most influential visions of higher education can be found in *The Idea of a University* by John Henry Newman

(1852/2008). The book originated in a series of lectures delivered in connection with the founding of the Catholic University of Ireland (now University College Dublin). The later cardinal argued for a university as a place of intellectual and moral formation rather than a vocational training institution. For Newman, the development of a "cultivated intellect" is central – a mind that learns to distinguish, reason, and judge, thereby achieving independent formation. In contrast to utilitarian conceptions, he emphasises that knowledge possesses intrinsic value: "Knowledge is capable of being its own end." And thus: "To know and to reason, to compare and to discriminate, to analyse and to combine, to have a ready insight into things – this is the object of a liberal education."

For Newman, the university is not a factory or training centre but a living community where ideas circulate and collide: "A university is… a place where inquiry is pushed forward… and error exposed by the collision of mind with mind" (Newman, 1852/2008, p. 470). Within this community, not only is knowledge transmitted, but character is formed: students are shaped into rational, critical, and morally conscious citizens. Crucial to his vision is the idea that – "All branches of knowledge are connected together" – and that theology must also occupy a legitimate place within the university curriculum because religious truth is "a condition of general knowledge." Therefore, Newman's ideal of liberal education as an end in itself stands in sharp contrast to contemporary views in which the efficiency or applicability of knowledge takes precedence.

Towards an Entrepreneurial and Subordinate University?

Despite the ideals of Humboldt and Newman, the university has not proved immune to social and political influences. The rise of neoliberal policy logic from the 1980s onwards has led to what some authors describe as the managerial university or the entrepreneurial university (Clark, 1998; Slaughter & Rhoades, 2004). In this model the university is increasingly governed according to principles of market competition, efficiency, and measurable output. Teaching and research are instrumentally deployed for economic and policy objectives, creating tensions with classical notions of academic autonomy and knowledge pursued for its own sake.

Contemporary challenges – such as internationalisation, digitalisation, performance-based funding, social justice, and mission-oriented research – require renewed reflection on the ideal of the university. In this respect, *The Idea of a University* offers not only a historical lens but also a critical benchmark: it reminds us that the university is more than a knowledge factory or a policy instrument. It is, or should be, a public space in which truth, freedom, and social responsibility are held in balance, as scholars such as Nussbaum and Collini have argued in recent years.

The central question that remains is therefore not what universities do, but why they do it and from which vision of their existence. In this sense, the idea of the university is not a finished concept but an ongoing conversation about the meaning of knowledge in and for society. Or, as Stefan Collini puts it: "We must insist that the university's core mission is not reducible

to measurable outcomes. Its role is cultural, critical, and civic" (Collini, 2012, p. 87).

The twentieth century brought radical changes. During the two world wars and under totalitarian regimes, the university was both victim and instrument of ideology. In Nazi Germany, Jewish and dissident professors were dismissed, and racist pseudoscience was institutionalised. In the Soviet Union the university was strictly subordinated to communist doctrine: science served Marxism–Leninism, and disciplines such as genetics, philosophy, and sociology were ideologically corrected or banned.

The massification of higher education after 1945 – made possible in the Netherlands partly through the welfare state – transformed the university into an institution for the citizen rather than exclusively for the elite. This expansion was not merely quantitative: it entailed a profound reconfiguration of the university's function. The university became less an exclusive institution for a small intellectual elite and developed into a broadly supported social provision in which diverse groups of students with different backgrounds and expectations came together. This growth was accompanied by new pedagogical and organisational challenges, including the need for curriculum reform, expansion of infrastructure, and professionalisation of educational processes. At the same time, the relationship between research and teaching changed as universities adapted to shifting social and economic needs. Massification thus became a structural force that permanently altered the identity and internal dynamics of the university.

Research increasingly became collective, often embedded in large-scale projects and dependent on external funding. At the same time, the focus shifted towards societal applications: tech-

nological innovation, military uses, and later economic output became central goals of research. From the 1980s onwards – perhaps partly as a consequence of these developments – the managerial turn also took hold in European universities. Universities came to be governed according to principles of efficiency and accountability; students became customers and educational programmes products. Rectors increasingly functioned as managers rather than intellectual leaders, as had long been customary at medieval universities.

It is noteworthy, moreover, that in the United States a university model developed already in the nineteenth century that differed markedly from the European pattern. From the outset, the American university was pluralistic, pragmatic, and oriented towards societal application. The land-grant universities were established with government funding and focused on agriculture, industry, and technology. In the twentieth century a strong emphasis on research was added: American universities became leaders in the natural sciences, technology, and biomedical research, often in collaboration with industry and government.

After the Second World War, institutions such as MIT, Harvard, and Stanford grew into global centres of knowledge production. The GI Bill (1944) granted millions of veterans access to higher education, leading to massive expansion. Yet instead of *Bildung*, a model developed in which innovation, diversity, and market mechanisms played central roles – with the result that the United States became globally dominant in scientific research and academic reputation.

Conclusion

In short, universities have never been static institutions. They have always been positioned between three poles: epistemic authority, social embeddedness, and political pressure. After the Second World War this triangular relationship was intensified by massification, the democratisation of education, and later by globalisation and digitalisation. Today universities experience considerable pressure from all three poles. The widely cherished autonomy within the academic world is often regarded as an exclusive academic right: the right to decide and act independently. This ideal must be preserved by all possible means. It represents freedom – the ability to determine, without external interference, what is studied, how teaching is conducted, and what is considered important.

In light of history, it becomes even more apparent that new forces are emerging. External pressure is increasing. At the beginning of the twenty-first century, a paradigm shift occurred. The university, once an exclusive gateway to knowledge, found itself confronted with a world in which knowledge was no longer scarce. Through the internet, open science, open access, and digital learning platforms, the traditional hierarchical model of knowledge transmission has been eroded. The university's monopoly as knowledge broker and educational institution is under pressure: knowledge is no longer the unique source of power that elevates humans above all else, because a digital form of knowledge has emerged that at times challenges – and even surpasses – human capacities. In the world of knowledge, the university is no longer a monopolist but a seeker of its new legitimacy.

2
Developments at Dutch Universities

Introduction

Universities in the Netherlands, both collectively and individually, possess a distinct character that becomes clearly recognizable when viewed in the context of the broader history of universities in Europe. They developed from relatively autonomous communities of knowledge into strategically governed and output-oriented institutions. This chapter outlines the institutional evolution of Dutch universities in order to interpret it within its historical context. At the same time, the question arises how this evolution relates to the challenges that have recently emerged in the tension between academic freedom and administrative control, between market forces and national policy objectives, and between public value creation and international competition.

In short: How has the Dutch university system developed, and what perspectives on the future of the university can be discerned against this background of historical developments, evolving governance structures, and changing institutional objectives?

The Emergence of the First Universities in the Netherlands

The Dutch university system has a history dating back to the sixteenth century. In comparison with developments elsewhere in Europe, it therefore emerged relatively late. The foundation of the Dutch university system was laid in 1575 with the establishment of the University of Leiden. This institution was founded by William of Orange as a gesture of gratitude to the city of Leiden for its resistance against Spanish occupation during the Siege of 1574 in the Eighty Years' War.

On 28 December 1574, he addressed a letter to the States of Holland and West Friesland proposing the establishment of a Protestant university, supplemented by a collegium for Latin, Greek, and Hebrew as preparatory education. He urged that the plan be implemented with urgency. The academic building in Leiden was established in the church of the former convent of the Jacobines, female religious belonging to the Order of Saint Dominic. Academic ceremonies of the Leiden University still take place in this building.

The establishment of this university, however, should not merely be interpreted as an expression of appreciation by the "Father of the Fatherland." The new Protestant administration of the still young Netherlands required an intellectual elite. The members of this administration preferred not to have educated at a Catholic university such as that of Leuven.

Leiden developed into the intellectual centre of the Republic of the Seven United Netherlands. During its first decades it gained prominence through humanists such as the Leuven scholar Justus Lipsius and Josephus Justus Scaliger, theologians

such as Franciscus Gomarus, philologists such as Bonaventura Vulcanius, and natural scientists such as Rudolf Snellius. They contributed to the university's international academic profile. Hugo Grotius, the founder of international law, was taught there by Scaliger, and René Descartes also resided in Leiden for a period.

The university primarily offered education in the four classical faculties: theology, law, medicine, and philosophy. In 1610, Willem van Swanenburg made a copper engraving of the first university library of Leiden at the Faliede Begijnhof, which leaves little room for ambiguity. The collection for the *literatores* occupied two cabinets, that of the *mathematici* one, the historians four, the physicians two, the philosophers two, and the *iurisconsulti* five. Theology occupied the most space both literally and figuratively. Six cabinets were reserved for books by and for theologians. Theologians in particular were considered essential for the formation of a national identity.

Following the establishment of the university in Leiden, several other universities were founded in the Republic, often with the intention of serving a regional function. The sixteenth and seventeenth centuries saw the establishment of the university of Franeker (1585) as the second Dutch university, the University of Groningen (1614) serving the northern provinces, and the University of Utrecht (1636) for the central regions. Groningen would later develop into one of the largest universities in the Netherlands.

The University of Harderwijk (1648) offered relatively inexpensive education and therefore acquired the nickname "degree factory," but it later disappeared, as did the University of Nijme-

gen (1655), which was closed in 1679 after only a short operational period due to political and religious tensions.

Early universities thus mainly provided education in the classical disciplines of theology, law, medicine, and philosophy. Because the administrative elite sent their children to the universities, these institutions formed the backbone of governance in the Dutch Republic. The institutions were largely confessional in nature. Many ministers, jurists, and physicians were trained for responsible positions in the young Republic. Although international contacts existed – Latin served as the lingua franca – the institutions established after the founding of Leiden were primarily nationally oriented and, as noted, regionally embedded.

The Role of the State and the Church in Relation to the University in the Nineteenth and Twentieth Centuries

The period between 1795 and 1880 was characterised by far-reaching reforms and centralisation. After the French period the state assumed a larger role in higher education. During the nineteenth century, the university system was centralised under King William I.

With the Batavian Revolution (1795) and later the incorporation of the Netherlands into the French Empire, the relationship between state and university changed fundamentally. The idea of a central state responsible for education was adopted from the French model. Universities came under national government supervision, and a standardised system of admission, curricula, and examinations emerged.

In 1815, following the establishment of the United Kingdom of the Netherlands, the government recognised only four

"higher schools": Leiden, Utrecht, Groningen, and Ghent. The institutions in Harderwijk and Franeker were closed.

In Amsterdam, the Athenaeum Illustre (1632), the precursor of the University of Amsterdam, developed into an important scientific centre from 1825 onwards, although it was only formally elevated to university status in 1877.

The most important structural reform followed by the Higher Education Act of 1876. This law legitimised the modern university system, with state funding, regulated personnel, and a fixed organisation in faculties. Universities became public-law institutions and were assigned the dual task of providing both education and scientific research.

Between 1880 and 1945 the university system became "pillarised," paralleling the pillarisation of Dutch society through the emergence of denominational and specialised universities. From the end of the nineteenth century onwards, this societal pillarisation led to the establishment of confessional universities that were financed within their own ideological communities for a long time.

The Vrije Universiteit Amsterdam (1880), founded by Abraham Kuyper, who advocated the principle of "sphere sovereignty," operated within the Reformed Protestant pillar. The Catholic University of Nijmegen (1923), later the Radboud University, originated from the Saint Radboud Foundation, a coalition of bishops that advocated the emancipation of the Catholic population in the Netherlands following the restoration of the episcopal hierarchy in 1853.

With similar objectives, the Roman Catholic School of Commerce in Tilburg was founded in 1927. It was created as a Catholic-social response to the impoverishment of the Catholic

community caused by industrialisation in the south of the Netherlands. The institution evolved into a fully fledged university now known as Tilburg University.

These three universities played an important role in the pillarised Dutch society of the time. Confessional universities contributed effectively to the emancipation of social groups whose members in previous centuries had not automatically had access to public office and had sometimes been regarded as "second-class citizens."

From their emergence in the sixteenth century, Dutch universities thus functioned as exclusive gatekeepers of knowledge. Professors selected and trained an administrative elite possessing the intellectual capital necessary to govern the young Republic and manage its principal knowledge domains such as theology, law, and medicine.

Even when new universities became regionally embedded during the seventeenth and eighteenth centuries, academic education continued to provide access to the centre of culture and governance. With the nineteenth-century centralisation, admission became increasingly regulated by the state, which through uniform entry requirements and curricula aligned the production and legitimation of knowledge with the interests of the nation-state.

During the pillarised period this gatekeeping function acquired a confessional dimension, with Protestant and Catholic universities functioning as intellectual strongholds in which knowledge was produced, authorised, and transmitted.

Across the board it therefore becomes evident that universities were not neutral passageways of science but institutions that actively determined which knowledge acquired authority and

how that knowledge helped shape social, political, and cultural relations in the Netherlands.

Technical Universities and Schools of Commerce

Technical universities have long been a significant component of the Dutch university system. Both in Europe and in the Netherlands, they occupy a distinctive position. In contrast to the classical universities, whose identity and mission were defined primarily by theological, legal, and medical education, these institutions developed from the need to produce technological and applied knowledge for an industrialising and globalising society.

Delft University of Technology was founded in 1842 as the Royal Academy for the education of civil engineers, focusing on civil work and military engineering. Through transformations into a polytechnic school (1864) and a technical college (1905), it became Delft University of Technology in 1986.

The Eindhoven University of Technology was established in 1956 to meet the demand for engineers in the rapidly growing industrial south, particularly around Philips. Since 1986, the university has operated as a technical university and it continues to play a central role in the Brainport region.

The Technical University of Twente (1961) was created with the goal of distributing higher education more evenly across the country and stimulating the economy of eastern Netherlands. The University of Twente adopted not only a campus model but also a multidisciplinary approach to technology.

Wageningen University & Research represents a distinctive category within the Dutch system. Its origins lie in the establish-

ment of the National Agricultural School in 1876, which became the Agricultural College in 1918. Since 1986, it has operated as Wageningen University, and since 1997 it has functioned in close integration with applied research institutes under the name Wageningen University & Research.

In addition to classical and technical universities, the Netherlands also has an important tradition of institutions rooted in economic higher education. These schools of commerce emerged in the first half of the twentieth century in response to the growing demand for academically trained economists, accountants, business administrators, and public administrators.

The oldest and most well-known school of economics was the Nederlandse Economische Hogeschool, founded in 1913 in Rotterdam. In English, this is usually translated as Netherlands School of Economics or sometimes Netherlands Economic School. Its establishment was a joint initiative of the Rotterdam business community, the Chamber of Commerce, and the municipality, all of which recognised the need for higher levels of education among personnel in trade and industry. In 1939 the institution was renamed the Netherlands School of Economics. In 1973, it merged with the medical faculty of Rotterdam to form Erasmus University Rotterdam.

The Roman Catholic School of Commerce (Roomsch Katholieke Handelshoogeshool), founded in Tilburg in 1927, has already been mentioned in the previous paragraph. In 1938 it became the Catholic School of Economics (Katholieke Economische Hogeschool). Later the name changed successively to Catholic University Brabant (Katholieke Universiteit Brabant, 1986), University of Tilburg (Universiteit van Tilburg, 2002), and Tilburg University (2010).

Technical universities and schools of commerce likewise assumed a gatekeeping role within the modernising Dutch society. Whereas classical universities regulated legal, medical, and theological knowledge, these institutions were foundational for developments in technology, industry, and economics. Technical universities trained the engineers who would build the infrastructure, industry, and later the knowledge economy of the Netherlands. Schools of commerce in Rotterdam and Tilburg explicitly aligned economic and business knowledge with the interests of business communities and societal pillars. They became gateways to modern expertise, and thus to new forms of economic and social influence in an industrialising, and later globalising, society.

Institutional Upscaling and Democratisation

Times change, and universities change with them. In the second half of the twentieth century, developments were no longer primarily shaped by national identity formation, emancipation, or specialisation. Instead, the identity of universities became defined by administrative ambitions towards expansion, by students' demands for democratisation, and by society's desire for a less elitist academy.

In the decades following the Second World War, the demand for higher education increased dramatically. A phase of expansion began. Student numbers grew, the number of programmes expanded, and universities became open institutions for broader segments of society.

State universities, such as Leiden and Utrecht, developed into large universities, and new institutions were founded, including

the Eindhoven University of Technology (Technische Universiteit Eindhoven, 1956) and the University of Twente (Universiteit Twente, 1961). Maastricht University (Universiteit Maastricht) was founded in 1976 and immediately adopted an innovative problem-based learning approach that differed from teaching practices at other universities.

This period also witnessed strong democratisation movements. Students and staff demanded greater participation and representation in university governance. The occupation of the Maagdenhuis (1969) at the University of Amsterdam became a national symbol of this movement.

From the 1980s onwards, the emphasis in government policy concerning universities shifted. Greater focus was placed on output-oriented funding, quality assurance, and administrative scalability. Universities were expected to operate more efficiently and to present themselves more clearly in societal terms.

The introduction of evaluations, accreditations, and performance indicators altered the character of university governance. The gatekeeping function of universities in the process of knowledge production did not disappear, but it was redefined in terms of measurable quality, efficiency, and societal relevance.

In 1984, the Open University of the Netherlands was established. Its foundation was based on the conviction that knowledge was no longer static or acquired only once but had to be continuously renewed. In a rapidly changing labour market, learning came to be viewed as a lifelong process.

Education was no longer merely preparation for a profession but also a means to facilitate flexibility, adaptability, and retraining. At the same time, the conviction grew that access to higher education should be broadened: adults without a traditional

university background should also be able to develop academically. These changing views on learning and work – learning as a lifelong, flexible, and inclusive practice – formed the foundation for the establishment of this university.

System Changes and Reforms

At the beginning of the twenty-first century there was a continuous stream of university reforms, often driven by administrative ambitions to internationalise and become more competitive. The introduction of the bachelor's master's doctorate system (2002) within the framework of the Bologna Process constituted a fundamental reform. Programmes were divided into three-year bachelor's degrees and one- or two-year master's degrees, with the goal of promoting European mobility and making degrees internationally comparable.

From around 2010 onwards, policy shifted further towards an efficiency-driven mindset and performance-based funding. Universities were required by the Minister of Education to conclude performance agreements, and the funding model became partly dependent on student dropout and progression rates.

In 2015, a student loan system was introduced, which reignited debates about the accessibility of higher education. Around 2020, the system came under increasing pressure due to rising internationalisation, with a high proportion of English-language programmes and international students. Debates on the anglicisation of higher education, accessibility, and the balance between research, teaching, and societal impact – visible, for example, in the Recognition and Rewards programme – dominated the discussion.

COVID-19 and Dutch Universities

The COVID-19 pandemic demonstrated in an unprecedented way how fragile the once self-evident position of universities as exclusive producers and custodians of knowledge had become. When educational institutions closed in March 2020, all Dutch universities abruptly switched to online teaching.

Lectures were delivered via platforms such as Zoom and Microsoft Teams, while examinations were conducted digitally or in adapted formats. Universities such as Utrecht University and Delft University of Technology reported that, within a few weeks, thousands of lectures had been moved online – something that under normal circumstances would have required months of preparation.

The pandemic also had a major impact on scientific research. Fieldwork and laboratory projects were halted or postponed due to restrictions on physical contact. PhD candidates reported delays and uncertainty regarding their doctoral trajectories. Internationalisation also suffered significant setbacks. In the academic year 2020–2021, the number of incoming international students declined by approximately ten percent compared with the previous year. Scholarships and exchange programmes such as Erasmus+ were largely suspended.

Universities demonstrated considerable resilience in their rapid transition to digital education and research. The pandemic functioned as a catalyst for innovation but also exposed vulnerabilities.

When almost all teaching and research had to switch to digital platforms within days, it became apparent that it was not the universities themselves but commercial technology companies

that determined how knowledge circulated, was stored, and could be controlled. Zoom, Teams, Canvas, and Brightspace became the new infrastructure of the academy.

Power relations thus shifted silently: whoever manages the digital space manages the conditions under which knowledge is produced and distributed. In effect, the pandemic also functioned as a stress test for the epistemic community that the university represents.

It forced institutions to reflect on what distinguishes them from commercial knowledge providers. If lectures are fully digital and globally accessible, why should a student still enrol at a national university? And if artificial intelligence can write essays, produce analyses, generate code, and answer examinations, why is the university still necessary as a place where scientific knowledge and the methods by which it is produced are examined – or where a new generation learns to master those methods in any discipline?

The pandemic also stimulated digital collaboration between universities worldwide, leading to new forms of international teaching modules and virtual conferences. There appeared to be a lasting shift towards hybrid and digital forms of academic collaboration.

Yet once again it became clear that universities have lost their monopoly on knowledge and knowledge transmission. Knowledge is no longer scarce and is no longer produced exclusively by academics. YouTube, Coursera, online libraries, and AI systems illustrate this abundance.

In the digital environment, it became unmistakably clear that generative AI not only makes academically acquired knowledge available, but also creates or reshapes knowledge according to its

own conception of truth, goodness, and beauty, while presenting it as academic knowledge. The boundary between the results of genuine scientific research and automatically generated information has thus become blurred, making the question of what "academic authority" means more urgent than ever.

The rise of AI demonstrated, in an almost brutal way, that machines can generate information. At the same time, it became equally clear that AI cannot organise the critical contestation through which the truth and quality of knowledge are tested within academic communities. Nor can AI create a reflexive space in which slow reflection takes place about the moral intentions behind the acquisition, presentation, and reformulation of knowledge.

AI is also incapable of fully assessing the consequences of a scientific insight in any respect, because machines generate but do not create.

Gradually, the realisation emerged that the value of the university does not lie in the possession of information and knowledge, but in its capacity to form a community in which knowledge is questioned, tested, weighed, and ultimately affirmed or rejected.

Digital tools – including AI – can support this process but can never replace what makes a university a university: an institution that distinguishes itself from other knowledge producers not only by transmitting knowledge but by safeguarding the conditions under which reliable, critical, and meaningful knowledge can emerge. These conditions include methodological doubt, pluralism, slow thinking, and careful evaluation.

In an era of digitalisation, AI, and societal pressure, the university ideally remains the institution that determines which

knowledge deserves authority and why. This touches the very core of the university's gatekeeping function.

AI and a Performance-Driven Mindset at Dutch Universities

The rise of generative AI has also produced a new paradox within Dutch universities. The technology that made academic work more efficient than ever simultaneously undermines the conditions that have historically defined university education and research.

While AI streamlined processes, reduced administrative burdens, and made teaching and research faster and more reproducible, this same efficiency tempted policymakers to implement further budget cuts. Conversely, budget cuts forced universities to rely more heavily on AI as a substitute for time, personnel, and reflection.

A reciprocal dynamic thus emerged in which technological acceleration and financial scarcity reinforce one another. Ironically, this dynamic distances universities further from their original mission: cultivating intellectual formation within a reflexive space and protecting slow research driven by curiosity rather than productivity metrics.

Education at Dutch universities is now tightly organised around assessment matrices and checkable competencies. Learning objectives must be SMART – Specific, Measurable, Acceptable, Relevant, and Time-bound. Lectures must be formatted in advance, and assessments must be reproducible and defensible in policy terms.

The emphasis on constructive alignment has led to micromanagement of curricula, in which even assignments must correspond exactly to the programme's policy objectives. The study load is high. Students are expected to complete their bachelor's degree in three years and their master's degree in one.

Yet there is increasingly little room for wandering, doubt, and the development of original ways of thinking. Intellectual formation, as history shows, requires space for complexity, confusion, contradictory viewpoints, and philosophical depth.

It requires teachers who view their lecture halls as laboratories for thinking and students who are granted the freedom to get lost. A university that reduces itself to a perfectly efficient logistical chain oriented towards production loses something essential: the freedom to ask questions that fall outside the assessment matrix.

The same logic increasingly shapes research. Academic research is evaluated primarily through quantitative metrics: publication counts, citation scores, and impact factors. Those who do not publish become invisible. This "publish or perish" climate encourages strategic publication behaviour.

Research in the Netherlands is increasingly evaluated through the Standard Evaluation Protocol (SEP), which places strong emphasis on output, while qualitative evaluation has become more marginal. Although the Association of Universities in the Netherlands launched the Recognition and Rewards initiative (2019) to challenge this culture, practice remains resistant to change.

Moreover, the system produces perverse incentives: publishing large numbers of mediocre articles is often more successful than producing a single, in-depth study.

The budget cuts announced in 2024 and implemented in 2025 – amounting to more than one billion euros in structural reductions – mark a turning point in Dutch science policy. They were accompanied by the termination of sector plans, starter grants, and long-term investments, as well as the repurposing of the National Growth Fund and the erosion of structural support for early-career researchers.

These measures undermine the continuity of research and shift the university from an autonomous intellectual community towards an implementing organisation for policy priorities. One of the core tasks of universities is thereby weakened, because sustainable knowledge development does not flourish under intermittent funding shocks.

Fundamental research becomes marginalised, and precisely those characteristics that make science scientific – the open question, risk, and slowness – come under pressure.

Budget cuts also encourage excessive reliance on AI because it produces rapid and apparently coherent output that rarely deepens insights gained through scientific research. AI generates but does not create and therefore does not extend intellectual boundaries.

AI may thus contribute to the illusion of productivity by facilitating the type of research that remains feasible under financial pressure: fast, accountable, measurable.

A dangerous feedback loop emerges where political budget cuts reduce reflection, while AI fills the resulting vacuum with speed without depth. This interaction between financial scarcity and technological acceleration reveals what is truly at stake: reflexive space, with the possibility of slow and original thinking.

For universities, this is particularly problematic. A university that, under financial pressure and bureaucratic expectations, begins to embrace AI output as a substitute, rather than as a tool, loses its capacity to distinguish between information and knowledge – and thereby its epistemic authority.

The central problem is therefore the erosion of reflexive space – the space in which not only answers are given but, above all, the right questions are considered.

This space is not a luxury but the oxygen of science. It makes it possible to distance oneself from the immediate and measurable in order to attend to what is necessary and true. A university that must constantly justify its existence in terms of costs and efficiency risks losing precisely the freedom needed to think more deeply than society already does.

The loss of reflexive space may lead to the loss of something that fundamentally defines the university.

What Is at Stake?

Over the past decade the Dutch university system has undergone profound transformations driven by internationalisation, marketisation, digitalisation, societal engagement, and disruptive technological forces. These developments have reshaped the role of universities in the Netherlands and will continue to do so in the coming decade.

The once self-evident authority with which universities determined what constituted reliable, meaningful, and socially necessary knowledge has gradually eroded. Artificial intelligence makes this problem radically visible because it possesses no

traditions, methods, or values – and can therefore generate everything without understanding anything.

Precisely because AI lacks understanding, and because it is increasingly used within universities, it forces universities to redefine their own core. In an era in which AI knows, simulates, and produces, the university must convincingly demonstrate that understanding, interpretation, and judgment are not algorithmic processes but human practices that require intellectual formation.

Historically, the gatekeeping function of the university never consisted in shielding knowledge but in safeguarding the conditions under which reliable knowledge could emerge. Those conditions can be supported by AI but never replaced by it. AI can organise information but cannot determine what is morally responsible, socially necessary, or intellectually meaningful.

If universities wish to maintain their societal legitimacy, they must return to their core mission: cultivating critical minds, nurturing fundamental research, and safeguarding free debate.

In the spirit of John Henry Newman, the university is primarily aimed at forming a cultivated intellect – a mind that learns to distinguish, reason, and judge, thereby achieving intellectual independence.

Encouraging in this regard is the Code of Good Governance in Dutch Universities (2019) issued by Universities of the Netherlands (UNL), which emphasises that education, research, and knowledge transfer can only be authoritative when they take place within an open, principled, and inclusive academic community.

This is promising because universities must therefore reflect on the meaning of values such as openness, integrity, and inclu-

sivity. Reflection presupposes reflexive space in every sense of the word "space." As the Stoics already observed: *otium* precedes *negotium*. Reflection, study, and self-formation must precede action, work, and the assumption of public responsibility. Not the other way around.

3
Artificial Intelligence as a Watershed

Introduction

In the preceding chapters we outlined how universities in Europe and in the Netherlands, under the influence of digitalisation, the COVID-19 pandemic, administrative restructuring, and changing societal expectations, have come to face a complex set of challenges. Due to these developments, the university has become not only a knowledge enterprise but also a producer of diplomas, while academic work has increasingly had to conform to demands of efficiency and measurable output. To a significant extent, these various challenges are also connected with the rise of artificial intelligence (AI). AI has had a fundamental influence both on the organisation of education and research and on the underlying forms of knowledge production. For universities, AI is the factor that enables or amplifies many of the current transformations taking place within them. More than that, as already noted: digital systems are increasingly assuming functions that were traditionally reserved for the university.

The democratisation of knowledge through open-access platforms, digital libraries, and online learning communities has given students, professionals, and citizens access to materials that previously circulated exclusively within academic institutions. At the same time, generative models, AI tutors, and algo-

rithmically guided search and analysis systems have become alternative sources of explanation, structuring, and evaluation. As a result, the university has been – and continues to be – confronted with the question of how it can redefine its role within a distributed knowledge ecosystem, now that epistemic authority can no longer simply be attributed to the university and to the university alone. We have already addressed this in the preceding chapters.

Paradoxically, the university itself has played a crucial role in the emergence of the technologies that are redefining its current position. The foundations of artificial intelligence were largely laid within academic research programmes, by universities that pioneered work in logic, mathematical modelling, computational structures, and machine learning. Universities in the Netherlands also contributed to this development. To this day they function simultaneously as centres of AI research, as institutions that educate generations who will further shape this technology, and as organisations that employ AI in teaching, administration, and policymaking. As a result, universities occupy a dual role: they face the task of reinventing themselves within a knowledge landscape shaped by AI – one that has not been shaped exclusively by them – while at the same time having contributed significantly to the development of that very landscape.

In order to understand the nature and scope of this interaction between AI and the university, it is useful to reconstruct the history of AI as it largely unfolded within academic contexts. In this chapter we provide an overview of that history in order to gain a clearer understanding of the interaction between AI and the university of the future, which will give new meaning to the university's gatekeeping function.

The Role of Universities in the Development of Artificial Intelligence

The history of artificial intelligence begins along research trajectories at several universities. As early as the 1950s, the first contours of what would later be called "AI" emerged at institutions such as Princeton, Dartmouth, Cambridge, and Stanford. The development proceeded cyclically: periods of great promise were followed by times of disappointment, which were in turn succeeded by periods in which new breakthroughs occurred. This pattern corresponds closely to Gartner's "hype cycle" of innovation trigger, inflated expectations, disillusionment, renewed enlightenment, and eventually productive application. AI has gone through this cycle multiple times, and universities have played a crucial role in each phase.

The period following the Second World War was characterised by unprecedented optimism regarding technology, as if every problem could be solved through technological means. Computers, initially developed for military and scientific calculations, increasingly came to be viewed as universal symbol-processing machines. The 1950s therefore mark a fundamental period in the development of artificial intelligence.

The origins of AI lie in the work of Alan Turing, who was affiliated with the University of Cambridge. His work on computability, *On Computable Numbers, with an Application to the Entscheidungsproblem* (1936), and his essay *Computing Machinery and Intelligence* (1950), laid both the technical and philosophical foundations for AI. In the first work, he demonstrated that a universal machine could perform any computation that a human being could carry out through algorithms. Both human beings and

machines therefore had to be considered intelligent. In 1950, he emphasised this once again: if a machine were able to respond in a dialogue exactly as a human being would, then the machine would be as intelligent as a human being. Turing's pragmatic proposal to regard machines as intelligent had repercussions for conceptions of humanity at the time. If human intelligence could be formally captured, then it could in principle also be simulated. This made the human phenomenon less unique: the human being appeared as a formal system that did not fundamentally differ from a computer.

Turing's conception of the human being resonated in the funding proposal for the Dartmouth Conference. In this proposal the term *artificial intelligence* was used explicitly for the first time:

"The artificial intelligence problem is taken to be that of making a machine behave in ways that would be called intelligent if human beings were so behaving" (McCarthy, Minsky, Rochester and Shannon, 1955).

With this formulation, AI was conceived as an attempt to functionally replicate human intelligence – a conceptual model that would inspire universities around the world.

The first practical implementations of AI directly reflected the conception of humanity embedded in this framework. Allen Newell and Herbert Simon, both pioneers of early artificial intelligence and at that time affiliated with Carnegie Mellon, developed the Logic Theorist in 1956, the first programme capable of proving mathematical theorems independently. This marked the beginning of the symbolic reasoning paradigm, which assumed that human reasoning could be replaced by formal rules. In other words, by applying formal rules to symbolic

representations of knowledge, it would be possible to simulate human thought processes.

This paradigm dominated AI research for decades and was supported by the conviction that all human knowledge and reasoning could in principle be formalised. Gradually, however, scientists became aware that the conception of the human being implicit in this theoretical framework failed to account for aspects of human existence such as emotion, context dependence, and embodiment. Herbert Simon addressed these elements in his elaboration of the notion of "bounded rationality," in which he emphasised that humans are limited in their rationality because they cannot process all the information required to make a decision – especially under time pressure – and to foresee all the consequences of that decision.

Joseph Weizenbaum also demonstrated the limitations of an overly formal conception of the human being in the 1960s with his programme ELIZA (1966). ELIZA simulated a psychotherapist by repeating simple textual patterns and reflecting questions back to the user. To Weizenbaum's surprise, many users experienced the programme as a genuine conversation. This reaction revealed to him a fundamental problem: people tend to attribute meaning, empathy, and understanding to systems that in reality merely follow rules and patterns. As a result, by 1976, Weizenbaum had become convinced that machines are not intelligent, but that human interpretations of "intelligence" are inadequate. In this context, he also recognised that the conception of humanity according to which human judgment could be reproduced through symbol manipulation – although it had led to important breakthroughs – was nevertheless insufficient. We will examine this insight in greater depth in the next chapter.

This insight did not prevent Frank Rosenblatt, a psychologist and researcher at Cornell University, from introducing the Perceptron, a first-generation neural network that learned to recognise patterns by adjusting weights on the basis of examples, thereby laying a foundation for later research in machine learning. At the Stanford Research Institute, an interdisciplinary research team built Shakey, the first mobile robot capable of analysing its environment, interpreting it, and responding to it. At university research centres such as MIT, Stanford, and Carnegie Mellon, the algorithms, search methods, and logical structures that were developed during this period continue to reappear in modern systems. The work of Marvin Minsky and Seymour Papert was particularly influential, although their critical analysis of neural networks (1969) led to the temporary marginalisation of that line of research. Minsky and Papert demonstrated that single-layer perceptrons had limited learning and representational capacities. As a result, research into neural networks lost credibility for decades and largely lost its funding.

Expectations were frequently higher than technical capabilities. Limited computing power, the lack of large datasets, and the difficulty of scaling expert systems led to the notorious AI winters of the 1970s and 1980s. Both governments and companies reduced their investments due to disappointing results. Even within the field itself disappointment was voiced: Edward Feigenbaum, himself a pioneer of expert systems, pointed out that the knowledge engineering bottleneck – the laborious and slow process of encoding human expertise – frustrated the growth of the field. Researchers such as Hans Moravec (1988) emphasised that the complexity of genuine human intelligence and embodied perception had been greatly underestimated.

Recovery began in the 1990s. Improved hardware, the emergence of statistical methods, and the growth of digital data enabled new forms of machine learning, with important contributions from researchers such as Geoffrey Hinton (University of Toronto), Yann LeCun (AT&T Bell Labs and later New York University), and Vladimir Vapnik (AT&T Bell Labs, later Royal Holloway), while universities such as Stanford, MIT, and Carnegie Mellon developed new algorithms, datasets, and probabilistic models that moved the field in this direction. In probabilistic models, uncertainties were not filtered out but explicitly incorporated into the calculations. Instead of producing a single fixed outcome, they worked with probabilities. The victory of IBM's Deep Blue over Garry Kasparov in 1997 symbolised this return to progress. In the years that followed, AI systems found their way into logistics (such as route optimisation in parcel delivery), medical diagnostics (for example in systems capable of analysing X-ray images), and especially into the online infrastructure, from search engine algorithms to spam filters and recommendation systems.

Real acceleration occurred in the 2000s and 2010s. Increased computing power, the emergence of large datasets, and new algorithmic approaches enabled deep learning to reach full maturity. AI research experienced a renaissance. During this period, AI also developed into a distinctly interdisciplinary field at the intersection of computer science, statistics, cognitive psychology, linguistics, and ethics. A striking example is the ImageNet project, initiated at Stanford University. It provided a revolutionary dataset for training visual recognition systems. The success of deep learning in the ImageNet competition in 2012

is therefore often cited as the beginning of the current AI revolution.

During this period, universities also sought to foster a culture of openness and collaboration with regard to developments in AI. Universities made the scientific publications produced within their institutions freely accessible. Through platforms such as arXiv.org, which are widely used by academics, knowledge circulated rapidly. Major models such as BERT (Devlin et al., 2018) and GPT-2 were also based on research articles originating from or co-developed by academic researchers. BERT, developed within Google AI but grounded in academic insights, analysed words in their full context and thereby improved tasks such as question answering, translation, and text analysis. GPT models, which built upon the transformer architecture developed in academia, generated coherent language by repeatedly calculating the probability of the next word, thereby producing complete texts.

During the same period, universities also intensified their collaboration with industry. From the MIT-IBM Watson AI Lab to the Turing Institute in the United Kingdom, partnerships increased the societal impact of academic research and led to spin-offs such as DeepMind. DeepMind was founded by researchers from, among others, University College London and Oxford. The company achieved worldwide fame with AlphaGo. In 2016, DeepMind's AlphaGo defeated the South Korean world champion Lee Sedol in the board game Go, which had long been considered too complex for computers. At this point, however, a tension between universities and industry became apparent. Whereas universities advocated openness with regard to research results, corporate leaders generally pursued closed-

ness, since trade secrets were regarded as inviolable. Nevertheless, collaborations between universities and companies greatly strengthened the societal impact of AI. Universities and companies together ensured that AI applications have become inseparable from contemporary society. Speech and facial recognition, self-driving cars, medical image processing, and autonomous drones are only a few examples of how AI is shaping everyday reality.

More than companies, universities have remained the central arenas for critical debate about artificial intelligence. Academic attention to the societal implications and ethics of AI gained international visibility through events such as the public appearance of Geoffrey Hinton in May 2023. Hinton announced his departure from Google so that he could speak freely about the risks of AI, stating that part of him now regretted his life's work in retrospect.

Today, universities around the world are investing in specialised AI programmes and interdisciplinary research centres. European institutions in particular focus explicitly on human-centred AI, in which technical innovation is linked to ethical and societal questions. While commercial actors often emphasise speed and scalability, academics draw attention to issues such as bias, transparency, and responsibility. It is scholars at universities who regularly publish policy recommendations for the responsible use of AI or participate in international committees that formulate guidelines – guidelines that echo the concerns articulated by Hinton.

Educational programmes in AI and data science have grown explosively in recent years. Universities such as ETH Zürich, the Technical University of Munich, Oxford, and TU Delft offer

specialised master's programmes in which students acquire not only technical skills but also insight into the ethics and societal consequences of AI.

In short, universities have laid the foundations for what is now known as artificial intelligence. Through groundbreaking research, the education of generations of scientists and engineers, and the safeguarding of the ethical boundaries of technology, they have played a unique and, one hopes, enduring role. Moreover, in a world in which AI is increasingly driven by commercial interests, universities remain necessary as independent, critical, and creative forces. Their contribution to the development of AI is not only of historical importance but also essential for a future in which technology *serves* humanity and society rather than turning against them.

AI Development at Dutch Universities

Artificial intelligence was developed at universities in the Netherlands from the very beginning as well. In the 1970s and 1980s, the Netherlands played a remarkably strong role in the logical and knowledge-based approaches to AI. Around the Centrum Wiskunde & Informatica (CWI) and universities such as Amsterdam, Nijmegen, and Delft, intensive work was carried out on Prolog-based systems – software that reasons by deriving logical rules from given facts and that formed a foundation for early practical AI applications such as medical diagnosis, automated legal reasoning, and language processing. Dutch researchers such as Jan van Leeuwen, Jan Treur, and Frank van Harmelen carried out pioneering work in knowledge representation, formal semantics, and declarative programming languages, giving the

Netherlands an important role in the rise of so-called knowledge-based systems.

Knowledge representation concerns the recording of human knowledge in structures with which computers can reason. Formal semantics then determines how those structures should be logically interpreted so that a system not only follows rules but also understands their intended meaning. Declarative programming languages, such as Prolog, allow programmers to describe what a system must solve rather than how, which makes them particularly suitable for AI applications in which logical inference is central. In this respect, the Netherlands proved to be a guiding country.

The Netherlands also played a key role in the development of the semantic web: an attempt to make the web understandable to machines by not only storing information but also structuring it in so-called meaningful ontologies. Meaningful ontologies are structured descriptions of concepts and their relationships, designed to record knowledge in such a way that computers can reason logically with it. They are called "meaningful" because they do not merely list labels but also capture semantics: the meaning of and the structure behind the terms. In AI and the semantic web, meaningful ontologies are essential because they enable machines not only to store information but also to understand it, connect it, and process it logically. As a result, AI systems can, for example, answer questions, detect inconsistencies, or combine knowledge from different sources. At Vrije Universiteit Amsterdam, the aforementioned Frank van Harmelen contributed to OWL, the Web Ontology Language with which relationships between concepts are formally defined. This stand-

ard, now embedded worldwide, has become crucial for AI systems that require knowledge in structured form.

In the decades that followed, all Dutch universities steadily expanded their AI education and research. The technical universities developed strong groups in robotics, machine learning, and explainable AI. In 2020, TU Delft launched the university-wide AI Initiative, in which all faculties collaborate in research and education related to artificial intelligence. The University of Amsterdam gained international recognition through the Informatics Institute and the QUVA Lab, where researchers such as Max Welling carried out groundbreaking work on deep learning (AI that learns by processing enormous quantities of examples) and probabilistic models (systems that take probabilities and uncertainty into account). CWI also remained an important centre for AI research, with expertise in speech recognition, pattern recognition, and data mining – techniques that allow computers to understand language, discover patterns, and analyse large datasets.

Collaboration between universities and technology companies has also formed – and continues to form – an important pillar of AI development in the Netherlands. Multinationals such as Royal Philips, ASML, and NXP work closely with academic research groups. Philips' NatLab in particular was highly progressive from the 1950s onwards in areas such as speech technology, expert systems, pattern recognition, and later "Ambient Intelligence," in which sensors, data, and contextual information were integrated into domestic and healthcare environments.

A distinctive characteristic of the Netherlands is the strong focus on human-centred and societal AI. Radboud University, for example, connected cognitive neuroscience with AI in

research on neuro-symbolic systems and human–computer interaction. Utrecht University and Vrije Universiteit Amsterdam focused on AI in healthcare, sustainability, and education, while the University of Groningen developed applications in energy optimisation, healthcare, and smart mobility.

Over time, it also became increasingly clear that AI began to play a dual role within research at universities. AI was both an object of research and a research tool. Dutch universities ever more invested in interdisciplinary AI laboratories that focus on societal applications of AI. The University of Amsterdam, for example, established the Civic AI Lab, which develops AI technologies to address societal problems such as poverty and educational inequality. A comparable initiative is the ELSA Labs (2024), which operate on a national scale and focus on the *Ethical, Legal, and Societal Aspects* of AI.

In the medical sector, AI has made an important contribution to diagnostics. Researchers at Leiden University Medical Center use AI to analyse medical images, leading to faster and more accurate diagnoses. AI applications have also emerged within the humanities and social sciences, for example in the analysis of sentiments in large text corpora or in speech recognition for linguistic research.

Finally, the Netherlands has been – and continues to be – an international leader in the field of AI ethics and governance. TU Delft hosts the Digital Ethics Centre, where research is conducted into algorithmic justice and responsible innovation. Leiden University develops expertise in algorithmic governance, and Tilburg University and Radboud University are among the leading institutions in research on AI and law. Dutch scientists actively contribute to European guidelines and advisory groups,

such as the High-Level Expert Group on AI of the European Commission.

Through this combination of fundamental research, practical applications, and strong ethical reflection, Dutch universities rank among the European leaders in AI publications per capita, according to the European Commission, and their joint AI programmes function as an international training hub. It is therefore primarily at Dutch universities that ethical risks related to AI are recognised. Questions concerning privacy, autonomy, surveillance, and discrimination rank high on the academic agenda. Research institutes such as the Tilburg Institute for Law, Technology, and Society (TILT) at Tilburg University and the iHub at Radboud University analyse the legal and societal implications of AI applications. The pursuit of "responsible AI" is central: systems must be transparent, explainable, controllable, and fair. These principles align with European frameworks such as the Ethics Guidelines for Trustworthy AI of the European Commission, which take reliability, fairness, and human-centred values as guiding principles.

Students also increasingly integrate these technologies into their daily study practices. AI tools such as ChatGPT, Grammarly, GitHub Copilot, and generative image models are used for a wide variety of purposes: from writing and programming to study planning and creative work. Their use of AI also raises ethical questions about academic integrity. When does AI assistance constitute support, and when does it become fraud? Universities therefore developed guidelines regulating AI use. The University of Amsterdam (2024), for example, stated that students may use AI as a tool, provided that they explicitly indicate this in their work and remain responsible for the content.

Transparency regarding the use of AI also plays a major role. Many educational institutions require students to specify at which stage and in what manner they used AI, comparable to citing sources. In this way the learning process remains controllable and fair. In short, AI has become an integral part of the study practices of many students. Whether it concerns explanations of complex material, assistance with writing assignments, programming tasks, or creative applications, AI tools make studying more efficient and accessible. At the same time, there is a need for clear frameworks and guidance in order to promote ethical and conscious use. By using AI as a tool rather than a replacement, students can strengthen their own learning processes while benefiting from the power of intelligent systems.

The deployment of artificial intelligence within Dutch universities is therefore multifaceted and is transforming the academic world on several levels. AI enriches education, accelerates and deepens research, optimises administrative processes, and strengthens student support. This technological transition, however, requires continuous ethical reflection, transparency, and human oversight, so that AI can contribute to an inclusive, responsible, and future-oriented system of higher education. It is precisely in this respect that the Netherlands fulfils a clear pioneering role: by explicitly working on frameworks for the careful use of AI, the Dutch university landscape gives contemporary expression to the gatekeeping function that has traditionally characterised the university.

Generative Artificial Intelligence

For the sake of completeness, we will now discuss generative artificial intelligence (GenAI) as well: a rapidly growing field within artificial intelligence that focuses on creating new content resembling the data on which the system was trained. Unlike traditional AI, which is primarily designed for classification, prediction, or pattern recognition, generative AI goes one step further by producing original output. This may range from generating natural language texts and images to music, video, and even programming code. This form of AI is particularly valuable because it can support, complement, and expand human creativity and productivity.

An important breakthrough in generative AI occurred in 2017, with the introduction of the so-called transformer architecture by Ashish Vaswani and his team at Google Brain. This architecture made it possible to process large quantities of text efficiently by using attention mechanisms that determine which words in a sentence are most relevant for the model. This architecture introduced the so-called attention mechanism, enabling a model to determine which parts of the input are most important at a given moment. As a result, it can identify relationships in large volumes of text more efficiently and accurately. This led to the development of powerful language models such as the aforementioned BERT and GPT. Both models are capable of generating coherent and contextually relevant texts.

Transformers form the basis of large language models (LLMs), which through training on enormous quantities of text from diverse sources become increasingly proficient at imitating human language. GPT-3, GPT-4, and GPT-5, for example, can

not only write texts but also answer questions, produce summaries, provide translations, and perform creative tasks such as writing poetry or inventing stories.

In addition to text generation, generative AI has also made major advances in image generation. Initially, traditional techniques such as Generative Adversarial Networks (GANs) were used, but diffusion models have recently become the standard. These models create images by iteratively removing noise from an image, enabling them to produce detailed and realistic visuals based on textual input. Applications such as DALL·E 2 and Stable Diffusion allow users to generate complex artworks using simple textual descriptions. This represented a revolution for digital art and design. These applications democratise creative processes and open new possibilities for both professionals and amateurs.

Another important development within generative AI is multimodality: the ability to combine and process multiple types of data, such as text, images, sound, and video. Multimodal models can, for example, create an image based on a text description or generate a video with accompanying spoken narration. This greatly expands possible applications, particularly in interactive media, education, and virtual assistance.

The rise of generative AI has led to broad integration across various sectors. In the creative industries it is used to generate ideas, develop prototypes, and accelerate creative processes. In the business world, it helps automate customer service through chatbots, generate marketing materials, and analyse large datasets. Generative AI also offers opportunities in education, for example by creating personalised learning materials.

Models such as GPT, DALL·E, and Midjourney thus illustrate how AI can approach or even take over creative processes. This technology therefore offers enormous opportunities for innovation. At the same time, it raises serious questions about the spread of misinformation, privacy, bias, and copyright issues. Ethical concerns have increased to such an extent that political and societal actors have become more actively involved in determining the direction of AI. During the AI Safety Summit in Bletchley Park (November 2023), leaders from 28 countries and CEOs of major companies gathered to make agreements on regulation and oversight. Elon Musk advocated the establishment of an independent "referee" that should maintain a balance between innovation and societal interests.

It is well known that the AI sector contains a broad spectrum of leaders: from technological visionaries such as Sam Altman and Elon Musk to critical thinkers such as Timnit Gebru and Geoffrey Hinton. Notably, this latter group, which voices critical concerns about the impact of AI, is also receiving recognition. Both Gebru and Hinton were included in the TIME 100 AI list of 2023, acknowledging that critical leadership is indispensable in a technology of such far-reaching significance.

The history of AI demonstrates that technological progress cannot be separated from societal responsibility and ethical leadership. In 2014, Stephen Hawking warned that artificial intelligence could potentially mean the end of humanity if adequate oversight of its use were not established. This call for global cooperation sounds more urgent today than ever. It is no coincidence that Stephen Hawking's natural habitat was the university.

Epilogue: AI and Human Thought

When we survey the historical development of artificial intelligence, it becomes more than clear that this technology originated in the university world and was systematically developed there for decades. At the foundation of AI lay academic research programmes developed at Princeton and Stanford, the early robotics initiatives of the Stanford Research Institute, pioneering work at the Massachusetts Institute of Technology and Carnegie Mellon, and the cognitive and computational experiments of Newell, Simon, Minsky, and Papert. Universities were the places where the first robots explored their environments, where ELIZA and other early chatbots simulated human interaction, where the perceptron as the first generation of neural networks was tested, and where the transformer architecture – the engine of contemporary generative AI – found its origin.

The same was true in the Netherlands. Institutions such as the University of Amsterdam, TU Delft, Radboud University, the Centrum Wiskunde & Informatica (CWI), and several technical institutes of applied sciences conducted fundamental research in close cooperation with companies such as Philips, ASML, and NXP in fields including pattern recognition, machine learning, and computational linguistics. In this way, a hybrid knowledge ecosystem emerged in which universities provided both the conceptual frameworks – logic, statistics, cognitive psychology, linguistics, and ethics – and the training of talents who later contributed to industrial innovation. The global AI revolution was therefore not merely a technological success story but also the result of decades of academic knowledge development, interdisciplinary research, and public investment in science.

Through the development of AI, the contemporary gatekeeping function of universities acquired a new meaning. AI has radically changed the conditions under which knowledge is produced, disseminated, and validated. Yet universities remain gatekeepers. On the one hand, they fulfil this function in the most fundamental way: by systematically testing their own research for quality, reproducibility, and scientific integrity. On the other hand, universities assume responsibility by placing themes such as ethics, societal impact, and digital justice at the centre of their work – topics that are often under pressure in commercial innovation processes. In doing so, they safeguard not only technological progress but also the conditions under which AI can truly benefit every individual and society as a whole.

The Netherlands plays a clear pioneering role in this regard. Universities and research institutes actively participate in national AI coalitions, invest in responsible AI programmes, and develop frameworks for explainability, fairness, and human oversight. They also explicitly present themselves as institutions that safeguard the quality of knowledge within an open and distributed information ecosystem. In doing so, they give contemporary meaning to the gatekeeping function that has traditionally characterised the university: no longer based on exclusive access to knowledge, but on the capacity to distinguish – within an abundance of data and AI-generated output – what is reliable, valid, and human-centred.

In an era in which synthetic text, images, and analysis are scarcely distinguishable from human production, the task of the university shifts towards safeguarding epistemic conditions and addressing questions such as: How do we teach students and

professionals to distinguish what constitutes knowledge from what is merely plausible simulation? How do we assess the origin and reliability of data, and how do we determine whether it has been obtained justly?

In this context, AI also raises difficult questions concerning justification. Why should we believe a conclusion if we do not know how the system arrived at it? Many AI models, particularly deep-learning models, function as "black boxes": they produce outcomes but offer no insight into the reasoning behind them or the way in which those outcomes were generated. This makes it difficult to evaluate or correct their claims. Transparency, a crucial condition for epistemic accountability, is lacking. Moreover, there is a conceivable risk that transparency will not even be pursued, because the pursuit of transparency often conflicts with the pursuit of efficiency.

It is also problematic that many AI systems operate with probabilities rather than clear true/false outcomes. Truth is replaced by degrees of reliability. As a result, our thinking about knowledge shifts towards a probabilistic epistemology. Because AI learns from historical data, it also inherits the blind spots and biases present in that data. Knowledge generated by AI is therefore never neutral but always embedded in social and historical contexts.

Finally, AI changes who or what counts as an epistemic authority. When physicians, jurists, or policymakers rely heavily on AI, the source of knowledge production partly shifts from humans to machines. This can lead to fruitful cooperation between human expertise and artificial computational power. But it may also weaken our epistemic autonomy, as we might begin to make decisions based on systems we do not fully under-

stand. The question of who is included in the training data – and who is not – also demonstrates that AI raises questions about the interaction between inclusiveness and epistemic justice.

In short, AI does not possess knowledge in the classical sense, but it functions as a powerful knowledge instrument. As a result, it changes not only *what* we know but also *how* we know and who can possess knowledge. Future epistemology will therefore have to take into account the role of non-human systems in the acquisition of knowledge. Within such a future epistemology, a normative foundation must be established to ensure that this knowledge acquisition remains morally and scientifically responsible.

Behind all these developments, there emerges a question directly related to fundamental philosophical and theological questions that universities have contemplated for centuries. Now that generative AI has proven capable of performing tasks traditionally associated with human intelligence – reasoning, summarising, interpreting, creative writing, and even solving complex mathematical problems – it becomes necessary to ask again what makes human thinking unique.

This question touches upon the core of the distinction between humans and machines. The classical definition of knowledge as "justified true belief," rooted in the Platonic tradition, was always linked to human cognitive capacities: consciousness, reasoning, reflection, moral judgment, and sense-making.

Although AI achieves impressive results in pattern recognition and text generation, human thinking remains characterised by capacities that are, at least for now, not reproducible by algorithms: intentional consciousness, self-reflection, moral judgment, and contextual reasoning. These aspects demonstrate that

human cognition is more than information processing; it is meaning-making, value-oriented, and embedded in experience.

A crucial difference between humans and machines lies in the phenomenon of intentional consciousness. Philosophers such as John Searle emphasised in 1980 that computers can manipulate syntactic symbols but do not possess semantic understanding. In his famous thought experiment, the Chinese Room, Searle argued that a system that manipulates Chinese characters according to rules does not necessarily understand Chinese.

AI, however advanced, lacks what Brentano already called intentionality in 1874: the capacity of mental states to be about something, to be directed towards meanings in the world. Human thinking is not merely reactive but meaning-oriented. We understand not only words but also their context, implications, and relational value. AI, by contrast, operates on the basis of probability: it predicts the most likely next word but does not know why that word fits within a given context. The "thinking" of AI is therefore computational, whereas human thinking is phenomenological, connected to experience and consciousness and shaped by our embodied existence.

A second unique characteristic of human thinking is self-reflection: the ability to think about one's own thinking. This metacognitive capacity enables humans to evaluate, improve, and morally weigh their own cognitive processes. Damasio argued in 1999 that this capacity for inner reflection is strongly connected to bodily awareness and emotional states. AI, by contrast, possesses no self-awareness, no inner experiential world, and no possibility for introspection. Even when a language model produces grammatically correct sentences about "itself," this is merely a linguistic act without inner reference. Human thinking,

by contrast, is subjectively informed. We experience doubt, hesitation, and self-criticism, which lead to cognitive growth and ethical deliberation.

Human thinking is also intertwined with moral considerations. We constantly make normative judgments: What is just, good, and responsible? This moral dimension is not based solely on logic but also on empathy, historical experience, cultural context, and human vulnerability. As Martha Nussbaum has argued, moral thinking cannot be separated from imagination and emotional engagement; it requires us to place ourselves in the position of others and to judge from a position of humanity. AI, by contrast, possesses no moral awareness, no empathy, and no hierarchy of values. Even when a model produces ethical statements, these are derived from training data rather than from normative reflection. AI may therefore simulate moral reasoning but cannot truly exercise it. Human thinking, by contrast, carries responsibility, a dimension inseparable from freedom, conscience, and guilt.

Another distinguishing feature of human thinking is the capacity for contextual reasoning. Humans can adapt reasoning to changing situations, cultural expectations, relational dynamics, and hidden layers of meaning. They can recognise and interpret nuance, irony, ambiguity, and metaphor. AI models perform relatively well in standardised situations but often fail when confronted with unexpected, ambiguous, or socially complex contexts. Human thinking is flexible and adaptive precisely because it is not based solely on rules but also on intuition, experience, and situational judgment.

Although AI is capable of generating new text, code, or images, the question remains whether this truly constitutes cre-

ativity. Margaret Boden distinguished between combinational, exploratory, and transformational creativity. AI performs reasonably well in the first two forms: combining or exploring existing patterns. But AI lacks transformational creativity, in which fundamental conceptual frameworks are restructured or transcended. Human creativity often arises from wonder, frustration, desire, or incomprehension – phenomena that fall outside the scope of AI. Creativity is connected to intentionality, self-awareness, and the ability to question established structures. In this sense, human thinking is not merely a cognitive function but also an existential act.

Human thinking therefore differs fundamentally from the functioning of AI systems. Whereas AI calculates, simulates, and reproduces, humans think in order to discern meaning and significance, endowed as they are with moral awareness and the capacity for self-reflection. Human thinking is not merely information-processing but also value-oriented and grounded in experience.

This insight, in turn, forms the basis for further questions. What is the human being? To what extent are human beings defined by their thinking? And to what extent does AI shape the ways in which humans think about themselves, their origins, their purposes, and their relationships with others?

4
Between Aristotle and Algorithm: Artificial Intelligence and the Recalibration of Our Conception of the Human Being

Introduction

Quid homo? What is the human being? "Man is like a breath; his days are like a passing shadow" (Psalm 144:4). These centuries-old words of the psalmist acquire particular relevance today, as capacities long regarded as uniquely human, such as thinking, language, creativity, and reflective awareness, are increasingly imitated by machines. Although human thinking remains distinct from these developments, recent advances in generative artificial intelligence – OpenAI's GPT-4, Anthropic's Claude, Mistral, and Gemini – have rendered this question more urgent. Will human beings, in light of these developments, become even more fleeting than the psalmist could have imagined?

This question brings us back to the university's gatekeeping function. This often-overlooked aspect of the university relates

to its role in the development and continual recalibration of our conception of the human being. Scientific insights do not merely shape our knowledge of the world; they also influence our understanding of what human beings are – or ought to be.

The previous chapter concluded with the observation that human thinking – despite all progress in artificial intelligence – cannot be reduced to algorithmic computation. Human cognition encompasses intentional consciousness, self-reflection, moral judgment, context-sensitive interpretation, and a form of creativity that cannot be equated with pattern recognition or statistical optimisation. Where AI predicts or simulates, human beings interpret and weigh values; where AI advances plausibly, humans reflect upon their own thinking. Thus, behind the question of human thought inevitably emerges the deeper question of the essence of the human being: What is the human? And to what extent does AI contribute to changes in the way people think about themselves, their origins, their purpose, and their relationship with others?

This chapter will show that AI has immense repercussions for our image of the human. The rise of AI confronts the university with a new, reductionist conception of humanity in which human functioning is framed in terms of data, computation, and algorithmic logic. Although this model is attractive because of its apparent coherence, it raises fundamental questions: How do concepts such as freedom, consciousness, responsibility, and conscience relate to an algorithmic anthropology? What remains of human autonomy when action and judgment are reinterpreted as computational processes?

For centuries, universities have reflected on the phenomenon of the human being and on how conceptions of humanity arise,

including the scientific and technological assumptions that resonate within them. It is often claimed today that the conception of humanity emerging from the rise of AI embodies an overly reductionist view of the human person. Yet, as the biblical book of Ecclesiastes reminds us, "there is nothing new under the sun." To illustrate this point, we will outline several historical developments in conceptions of the human being – developments that, even when not originating directly from academic speculation, were nevertheless critically examined by scholars within universities. The history of our image of the human functions as a mirror in which the repercussions of AI for our understanding of humanity can be properly assessed. It is towards such an assessment that this chapter is directed.

Aristotle and Human Dignity

Long before the emergence of artificial intelligence, human existence was understood through categories that cannot be reduced to calculation. Aristotle described the human being as a *zōon politikon*: a creature that can flourish only within community. Even more fundamentally, however, he regarded the human being as free and endowed with reason – the only living creature capable of acquiring theoretical knowledge *(epistēmē)*, skill *(technē)*, and practical moral judgment (*phronēsis*). This capacity for reflective and moral self-determination endowed the human being with a dignity rooted not in functionality but in inner form and purposiveness (*telos*).

In the Greco-Roman world, human dignity was initially tied to social status. Under the influence of Jewish-Christian thought, however, it acquired an intrinsic and relational character: every

human being possesses dignity because he or she is created in the image of God and therefore – regardless of position or achievement – stands in relation to the *Logos* (the Word; Gen. 1:26–28; Rom. 6:4–5). Following the Constantinian recognition of Christianity in 313, this idea quickly found resonance in law. New regulations prohibited the branding of slaves' faces and the separation of children from their mothers. Although existing hierarchies persisted, the idea of inalienable dignity gradually permeated legal and moral consciousness. Later constitutional traditions and human rights frameworks stand within this lineage.

Augustine's Vision of the Human Being

Augustine built upon this heritage by understanding the human being as the image (*imago*) of a mystery that always transcends him. Because human beings are created in the image of God, they remain fundamentally inscrutable – never fully reducible to biological or psychological mechanisms. The likeness (*similitudo*) may be weakened by misguided orientations in life, but the image itself is inalienable. Human dignity therefore remains inviolable even where vulnerability, dependence, or moral failure become visible.

In his reflections on the Trinity, Augustine developed a subtle analysis of the human mind. *Memoria*, *intelligentia*, and *voluntas* are distinct yet exist only in mutual relation: memory evokes desire, desire directs thought and thought orders memory. Augustine regarded this unity-in-distinction as an analogy illuminating the elusive dynamics of human consciousness. In doing so, he inadvertently became one of the pioneers of a psychological

approach that understands human inner life as reflexive, intentional, and relational.

At the same time, Augustine saw human existence as marked by inner division. Human beings are free, but this freedom is strained by *concupiscentia*: conflicting desires, tendencies towards envy, anger, or domination that can isolate and destabilise the subject. Human beings always experience a "two-will structure" (*duae voluntates*). True freedom therefore does not consist in autonomous self-determination but in the capacity to receive love (*amari*) and to give love (*amare*). A person is truly known only to the extent that he or she is loved. Human beings are not primarily human because they think (*cogito*), but because they are capable of entering into relationship with others and relating themselves to the origin of life: God (*De Trinitate*, VIII.10.14). The phrase "I am because we are" echoes this intuition, which also finds expression in the African concept of *ubuntu*.

This relational anthropology deeply influenced later psychology and social philosophy. Donald Winnicott, for instance, argued that the capacity to develop a "true self" depends upon a "good enough mother" – a caregiver who responds to the child with attuned love. Similarly, John Rawls grounded part of his critique of the meritocratic social ideal in Augustine's theology of grace. Just as Augustine maintained that morally good action depends upon divine grace or the love of others, Rawls argued that the tendency to attribute success solely to personal merit is misleading. Against this "logic of merit," he proposed his concept of *justice as fairness*, in which justice requires acknowledging and compensating for the moral significance of contingency and inequality.

The Conception of the Human Being in Scholasticism

Following Augustine, medieval thinkers – particularly after the rediscovery of Aristotle in the thirteenth century – sought to systematise the scriptural statements concerning the human being. Within this synthesis, key themes included the relationship between body and soul, human freedom, the human will, and human sinfulness. The question of how human beings relate to God and what their ultimate destiny might be formed a continuous thread throughout these reflections.

The scholastic synthesis reached its culmination in the work of Thomas Aquinas. Thomas argued that human beings possess free will as a capacity for self-determination, yet, like Augustine, he maintained that human beings require grace in order to reach their ultimate destiny: the vision of God. Original sin wounded human nature but did not destroy it; reason and will were weakened but remained operative.

In the Christian anthropology that would shape legal and political thought for centuries – across feudal, urban-capitalist, and later social forms – human beings were therefore portrayed as called to something lofty yet profoundly fallen: sinful but created in God's image and capable of restoration through grace. A layered and paradoxical image of the human emerged, in which the immortal human being must continually choose between good and evil, remains dependent upon a higher authority for redemption, and lives in uncertainty about the mystery of life beyond death, beyond the limits of time and space.

The Salutary Optimism of the Renaissance

In the late Middle Ages and the Renaissance, the term *humanista* acquired a new meaning. It initially referred not to an ideology but to scholars who devoted themselves, with philological precision, to reading, studying, and editing classical and early Christian texts. Their work no longer relied on compilations but on complete primary sources – a methodological shift that contributed directly to a form of human science in which the human being was taken seriously as a rational, linguistic, and moral creature. The humanist was therefore not a freethinker *avant la lettre*, but a Christian scholar trained in the *artes liberales* and the *studia humaniora*.

For Erasmus, priest and humanist, philological precision was never an end in itself. Respect for the *fontes* served the purpose of inner reform. Reading was therefore not a passive activity but an opportunity for moral transformation. Scholarship, piety, and personal formation belonged together: the intellect served the soul, for only a cultivated mind can attain true humanity.

Within the humanist ideal, the human being was no longer portrayed primarily as determined by the forces of evil but as the architect of his own life. In his *Oratio de hominis dignitate* (Oration on the Dignity of Man), Pico della Mirandola revived Augustine's idea that the human being is the only living creature capable of choosing either to degenerate into beast-like forms of life or to ascend to higher, even divine, modes of existence. Neoplatonism and Christianity here converge, as they already had in Augustine's thought. In *De Trinitate*, Augustine argued that the human being must maintain this middle position (*medietas*): if one seeks to become God or lives like a beast, the proper

balance is lost – a formulation echoing Aristotle almost verbatim.

For the philosopher, the Church Father, and the humanist alike, human dignity lies in freedom, reflective capacity, and autonomy. Human beings can reflect upon their behaviour, instincts, and motivations, and they alone are capable of channelling emotional impulses arising from instinct – for example, by maintaining the proper mean between cowardice and recklessness.

The Salutary Pessimism of the Reformation

The optimistic anthropology of humanism was not shared by reformers such as Martin Luther (1483–1546) and John Calvin (1509–1564). Yet their conception of the human being was more complementary than opposed to that of the humanists. Luther, a former Augustinian monk whose actions in 1517 initiated the Reformation, articulated an anthropology rooted in the teachings of Paul and Augustine, in which human beings are fundamentally dependent on God's grace and love.

Luther regarded *concupiscentia* – which Augustine described as the nearly uncontrollable force within human beings that leads to chaos in both the self and the world – as sin itself. He also understood it as a force leading to death unless it were forgiven. Luther's emphasis on human sinfulness served two purposes: to prevent human beings from placing excessive trust in themselves and to make them aware of their need for the help and grace of Another – Christ – in order to be delivered from the consequences of the logic of sin into which they are born.

Although Luther shared with the humanists their focus on Scripture as the primary source (*sola scriptura*), his anthropology resonated with the scholastic insight that human beings are justified not through their own will or works but *sola fide* (by faith alone) and *sola gratia* (by grace alone) (cf. Rom. 3:28). The downplaying of human capability and the emphasis on human sinfulness in his anthropology were therefore not ends in themselves but served to underscore dependence upon Christ (*solus Christus*) and upon Christ's righteousness and mercy.

Pressed by Pope Clement VII, Erasmus eventually responded to Luther in *De libero arbitrio diatribe sive collatio* (1524). Erasmus acknowledged the weakening of human nature but rejected the idea of its total corruption. In his view, it was important that human beings actively cooperate with God's grace. Thus human dignity remained, to some extent, preserved by human effort, whereas Luther saw dignity as bestowed primarily through Christ. For Luther, freedom did not mean autonomy but liberation from sin through divine grace: dependence and reciprocal love were central, not human autonomy.

Like Luther, John Calvin regarded human beings as radically dependent upon God's grace. He described the human condition after the Fall in stark terms: "We are not merely sick but dead; not merely weak but entirely corrupted" (*Institutes* II.1.8). Yet the *imago Dei* remains present in humanity, though wounded; in Christ it can be restored, and every human being retains, however obscured, a *sensus divinitatis*, an intuitive orientation towards God. As with Luther, the human will is not decisive for Calvin; salvation is an act of God's goodness and grace.

Where the Renaissance emphasised the power of human culture, formation, and creativity, the Reformation pointed to

the brokenness of human existence. Both visions reveal essential aspects of humanity: on the one hand, the capacity for growth, freedom, and rational self-formation; on the other, existential dependence, the tendency towards self-destruction, and the longing for wholeness, grace, and love – qualities that no algorithm can simulate, let alone produce.

The Jesuit Conception of the Human Being

The Counter-Reformation brought about a profound reconsideration within the Roman Catholic Church of liturgy, sacraments, ecclesiastical authority, and theology. In this context, the Jesuit order founded by Ignatius of Loyola developed an anthropology in which freedom and responsibility once again took centre stage.

Where Luther, in *De servo arbitrio*, argued that the human will had become radically powerless after the Fall and that every moral achievement was ultimately illusory, the Jesuits emphasised that although original sin left real inclinations towards evil in human beings, it did not destroy their capacity for free choice. Their anthropology thus formed a response to Lutheran determinism and expressed a renewed appreciation of the human capacity for moral cooperation with divine grace.

Within this framework, the Jesuit Luis de Molina developed his theory of *gratia sufficiens*: grace provides human beings with everything necessary for salvation, but it becomes effective only when it is inwardly – and therefore freely – accepted. A key figure in this development was his fellow Jesuit Francisco Suárez, whose work proved decisive for the way metaphysics, psychol-

ogy, philosophy of law, and moral theology were taught in early modern universities.

Although Suárez acknowledged the human inclination towards evil, he understood grace as bestowed in a way that respects and supports human freedom. In his *Defensio Fidei*, he emphasised that human beings are intellectually and morally responsible for their choices precisely because they are free to accept or reject grace. His anthropology, in which human freedom occupies a fundamental place, influenced early modern thought, including the political philosophy of Locke. In *De legibus*, Suárez argued that political authority ultimately derives not from a monarch but from the people: all human beings are equal in freedom and dignity, and the people constitute the source of temporal authority. Human freedom here is not merely a theological notion but a foundational principle of social and political order.

Thus, the Jesuits laid crucial foundations for modern thinking about freedom, responsibility, contract law, and economic ethics. Their deepest influence on the Western conception of the human being, however, occurred indirectly through a student of the Jesuit Collège Henri IV at La Flèche: René Descartes.

Descartes' Thinking Human Being

René Descartes' famous dictum *Cogito, ergo sum* marked a decisive break in the Western conception of the human being. For centuries, God had been regarded as the origin and goal of creation, and human beings had unfolded their existence *coram Deo*. In his *Meditationes*, however, Descartes placed the thinking subject itself at the starting point of certainty. "I am, I exist – this must nec-

essarily be true whenever it is uttered by me or conceived in my mind," he writes in the Second Meditation. Doubt thus became proof of existence.

Ironically, Descartes' method was itself deeply indebted to the Ignatian spirituality of the Jesuits. Ignatius' *Exercitia spiritualia* were based on disciplined self-reflection and the systematic purification of beliefs. Descartes transformed this practice into a secular retreat, in which methodical doubt and introspection no longer led to finding God in all things but to finding epistemological certainty in the self.

Be that as it may, the human being came to be understood primarily as a thinking mind (*res cogitans*): a non-extended, conscious, thinking substance. This thinking mind was nevertheless contained within an "extended" body: a material, measurable substance that functions according to natural laws (*res extensa*). In the fifth part of his *Discours de la méthode*, Descartes argued that the body – both human and animal – functions mechanically and is subject to the laws of nature. Only the human being, however, possesses the thinking, immaterial mind. Animals, according to this scheme, are no *âme pensante*, no consciousness, and therefore no subjective experience of pain, fear, or joy.

Although some interpreters – such as the Finnish philosopher Lilli Alanen (1941–2021) – have pointed out that Descartes spoke more nuancedly about animal affectivity than later interpreters have suggested, the separation between human beings and animals remains fundamental. Animals are "*comme une machine*," better ordered by the Creator than human artifacts, yet lacking language and self-consciousness. Descartes therefore argued that it is more plausible that worms and flies move mechanically than that they all possess immortal souls (*Discours*

de la méthode, Part V). In a later letter he writes: "They eat without pleasure, cry without pain, grow without knowing it; they desire nothing, fear nothing, know nothing" (Letter to the Marquess of Newcastle, 1646).

This Cartesian conception of animals represented a clear break with earlier Christian traditions. According to Augustine, for example, the boundary between humans and animals is less clear-cut. He acknowledged that animals possess an *anima viva*: they remember, recognise, anticipate, and in a certain sense even display a form of "knowing." In *De quantitate animae* he speaks of a consciousness bordering on knowledge, and in his sermons he acknowledges that animals often surpass human beings in sensory capacities. Although only humans possess an *anima rationalis*, the distinction remains gradual rather than absolute. In this tradition, the human being is a relational creature within a community of life, not an isolated thinker confronting passive mechanisms.

Descartes' influence proved immense. His conception of humans and animals became dominant in the seventeenth and eighteenth centuries. Only later did thinkers such as Voltaire and Rousseau emphasise the sensitivity of animals. Modern cognitive ethology further undermined the Cartesian framework by recognising that animals display joy, grief, a sense of fairness, and empathy in their behaviour. The primatologist Frans de Waal once remarked that he could not imagine that if humans possess a soul, animals do not.

Empirical Research as the Basis for a Renewed Conception of the Human Being

From the seventeenth century onwards, a scientific revolution unfolded in which knowledge was increasingly generated empirically and rationally, *etsi Deus non daretur* – as if God did not exist. God was no longer self-evidently regarded as the explanatory ground of the cosmos and of humanity. This shift becomes visible in jurisprudence in the work of Hugo Grotius, who – although a devout Christian – designed a legal order that no longer rested on theological authority but on an autonomous rational order.

In the same period, Francis Bacon described in his *Novum Organum* (1620) how systematic observation, induction, and experiment constitute the new path towards reliable knowledge. At universities such as Padua (Galilei), Oxford (Boyle), and Leiden (Boerhaave), and within networks such as the Royal Society (founded in 1660), a form of natural inquiry developed that was based on measurement, verification, and the reproducibility of experiments. Isaac Newton, a member and later president of the Royal Society, was a central figure in this development. In his *Philosophiæ Naturalis Principia Mathematica* (1687) he formulated the laws of mechanics and gravitation, *etsi Deus non daretur*. He described how all bodies with mass – from falling stones to orbiting planets – move, accelerate, and attract one another according to universal laws that can be mathematically formulated; thus the same natural regularities apply to both terrestrial and celestial phenomena. Nature as a whole became intelligible as a single, coherent, mechanical system. Although a devout Christian, Newton as a scientist stated *hypotheses non fingo* – "I

frame no hypotheses" – to indicate that all scientific findings must be grounded in observation. Empirical evidence and rational ordering gradually began to replace revelation, metaphysics, and authority.

This epistemic transformation had major consequences for the conception of the human being. For whereas human beings had for centuries been understood as ensouled, relational creatures, created in the image of God and called to reflection and moral formation, the human mind now became an object of investigation. John Locke, for example, introduced his theory of the *tabula rasa* in the *Essay Concerning Human Understanding* (1690). He argued that the human mind at birth is a blank slate without innate ideas: all mental content arises through sensory experience and reflection. His view was a direct response to Descartes' rationalism, which explained certain knowledge by means of innate ideas. Locke, by contrast, emphasised education and environment as sources of knowledge, morality, and identity – and with this the idea of the human being as a malleable creature began to grow.

From the mid-nineteenth century onwards, this notion of malleability acquired a new, more technical dimension as psychology developed into an experimental science. Ernst Heinrich Weber demonstrated in *De Pulsu, resorptione, auditu et tactu* (1834) that sensory experience could be expressed in exact measures. In 1879, Wilhelm Wundt founded the first laboratory for experimental psychology in Leipzig and investigated elementary sensations and associations. Oswald Külpe developed an experimental method of introspection to isolate acts of thinking that could not be reduced to sensory impressions. Hermann Ebbinghaus and James McKeen Cattell investigated reaction times,

memory curves, and other cognitive processes. In the Netherlands, Franciscus Donders laid a foundation for cognitive psychology through his research on the speed of mental reactions.

These developments reinforced the view of the mind as a systematically functioning, measurable, and quantifiable whole. Consequently, the conception of the human being shifted once again: from an ensouled, relational, and moral being to an organism that could be understood, predicted, and perhaps ultimately optimised – a line of thought that in our own time is being radically extended in the age of artificial intelligence.

Responses to an Overly Empirical Conception of the Human Being: Immanuel Kant and Others

From the eighteenth century onwards, the mechanistic conception of the human being – especially promoted by Locke and by physiologists – became increasingly dominant. Yet Giambattista Vico (1668–1744) formulated an early opposing voice by arguing that the truth about humanity can only be known through what human beings themselves have produced in history: *verum factum*. In doing so, he situated the human being not in the abstraction of the thinking subject but in the concrete world of culture and history. His influence came to maturity only later, but it became essential for hermeneutics and cultural philosophy.

In the conceptions of the human being developed by Hobbes, Leibniz, Hume, and ultimately Kant, the transition from early modern to critical philosophy is reflected. Hobbes regarded the human being primarily as a natural creature driven by fear and desire, in which reason has merely an instrumental function. Leibniz, by contrast, emphasised the inner rationality of the

human being as a monad participating in a divine harmony. Hume broke with this rationalism by subordinating reason to the passions: knowledge and morality are rooted in experience and feeling. Kant responded to all three and developed a revolutionary conception of the human being in which the human being is at once rational and free. Against Hobbes he defended freedom; against Hume the constitutive role of reason; against Leibniz he limited metaphysical speculation.

In his *Kritik der reinen Vernunft* (*Critique of Pure Reason*, 1781), Kant argued that human beings are not passive receivers of impressions but rather constitute reality; space, time, and causality are forms of human consciousness: "Der Mensch ist das Maß aller Dinge, insofern er die Bedingungen der Möglichkeit bestimmt." At the same time, in his *Anthropology from a Pragmatic Point of View* (1798), he emphasised that the mind cannot be measured purely empirically but possesses a fundamental elusiveness that cannot be described in terms of natural laws.

As a reaction against both a rationalistic conception of the human being and attempts to reduce humanity to a natural phenomenon or chemical process, German *Lebensphilosophie* also emerged at the end of the eighteenth century. Thinkers such as Johann Herder and Friedrich Schelling emphasised the irrational, emotional life, imagination, and the formation of the human being through history and culture. Herder argued that human beings truly become human only through language and culture; he opposed any essentialist anthropology that assumes a universal human nature. Darwin's theory of evolution reinforced this view: the human being came to be seen increasingly as the product of a process rather than of a metaphysical act of creation.

Friedrich Nietzsche radicalised this insight further: the human being is a "bridge between animal and Übermensch," not a fixed essence but a process of self-transcendence. Humanity is therefore not a complete unity but a field of tension between its animal origins and a possible, creative future. The Übermensch does not represent a biologically superior being but rather a human being who brings himself to the highest form morally, creatively, and existentially – the "giver of meaning to the earth." Remarkably, this idea resonates with the thought formulated by the humanist and Catholic cleric Pico della Mirandola, who argued that God created the human being neither as an animal nor as an angel but as a *medietas* between the two, who must choose which direction to follow. Being human entails dangers and is in fact little more than – here a parallel with Della Mirandola can be discerned – a temporary condition between decline (a relapse into the animal) and transcendence (the creation of values). Nietzsche's conception of the human being is therefore more existential than the conception in which the human being is understood as an autonomous and primarily rational subject.

In opposition to a mechanistic or reductionist conception of the human being, all these thinkers – Vico, Kant, Herder, Nietzsche – reaffirm in different ways an insight already present in classical, Christian, and humanist traditions: that the human being is more than a biological process or a reactive mechanism. The human being is free, creative, historical, reflexive, and capable of transcending himself. In doing so, they formed an opposing philosophical voice that enriched the conception of the human being in a way fundamentally opposed to attempts to reduce humanity to neurochemical causality.

Homo Economicus as an All-Determining Model?

As economics increasingly came to be understood at universities as a behavioural science examining the efficient and purposeful actions of human beings, the model of *Homo economicus* emerged. This conception portrayed the human being as strictly rational, always consistent in his choices, endowed with unlimited cognitive capacity, and acting exclusively out of self-interest. Such a human being pursues two goals: the maximisation of monetary income and quantitative growth in production. Implicit in this model were characteristics that classical authors such as Plato and Aristotle would never have recognised: the *Homo economicus* is not shaped by others, has no intrinsic need to cooperate, and – when applied reductively – only outcomes count.

Adam Smith emphasised in *The Wealth of Nations* that people act out of self-interest – "It is not from the benevolence of the butcher, the brewer, or the baker…" – yet Smith's conception of the human being was far broader. This becomes clear when the work is read in the light of his earlier *The Theory of Moral Sentiments* (1759). There Smith argued that sympathy and moral judgment are essential components of human action. Moreover, as a moral philosopher, together with his friend David Hume, he developed a healthy aversion to the *mercantilistic jealousy of trade*. They considered such jealousy between trading nations to be counterproductive because it produced destructive competition. In their view, states could instead transform scarcity into prosperity and well-being through cooperation. The greater the diversity between partners, the greater the potential added value of collaboration for economic growth. For Smith, therefore, the human being is certainly not a caricature of selfishness but a complex being shaped

by a variety of motives. His conception of humanity was more nuanced, more colourful, and more realistic than the later model of *Homo economicus*.

The decisive step towards *Homo economicus* as an analytical model was taken in the nineteenth century. John Stuart Mill argued that economics should concern itself with the human being "as a being who desires to possess wealth." He explicitly acknowledged that this was an abstraction rather than a full description of humanity but believed such simplification necessary for economic analysis. As a result, economic thought became detached from its moral and social foundations. The mathematician Vilfredo Pareto in particular contributed to this development: his Pareto criterion implied a mathematisation of resource allocation that abandoned Smith's intersubjective comparison of utility. Ethics became subordinated to economics: "facts dictate values." Improvements in welfare could now be technically "efficient," even if they were morally or socially destructive.

Yet within economics itself the awareness gradually grew that this model was inadequate. Herbert Simon broke with the ideal of the perfectly rational human being by introducing the concept of "bounded rationality": people rarely possess complete information, are limited by time pressure and cognitive capacity, and therefore often make decisions that are merely good enough – *satisficing*.

Building on Simon's work, Amos Tversky and Daniel Kahneman refined the insight that human rationality is structurally limited. Kahneman distinguished between System 1 (intuitive, fast) and System 2 (slow, logical), with System 1 dominating in practice, especially under stress. Consequently, people make

decisions that appear irrational – not because they are unintelligent but because of the nature of their cognitive architecture. Emotions, intuitions, and loss aversion play central roles in decision processes; the classical image of the human being as a rational maximiser of preferences proved untenable.

Not only rationality but also morality turned out to be limited. The concept of "bounded morality" refers to the structural constraints people experience when making ethical choices. Context, social pressure, or fear can distort moral judgment – something Augustine already described when he recounted stealing pears as a child, not out of necessity but for the approval of his companions. The will was divided: *duo voluntates*. Human willpower also proved fallible: "bounded willpower" refers to the inability to translate intentions into behaviour. Visceral influences such as hunger, stress, or rejection can undermine consistency in action; neuroscience has even shown that decisions are sometimes made before consciousness intervenes.

Thus, it became almost a dogma that the traditional model of *Homo economicus* is at best instrumentally useful but does not offer a realistic conception of the human being. Economic behaviour turned out to be permeated by complexity, ambivalence, and irrational patterns.

Between AI and Philosophy: Herbert Marcuse's Conception of the Human Being

Herbert Marcuse (1898–1979), philosopher and member of the Frankfurt School, developed a conception of the human being deeply rooted in critical theory and in an analysis of the social role of technology and the economy. His work can be read as a

continuous search for the possibility of human liberation within a context that systematically leads to oppression and conformism. Although Marcuse did not write about artificial intelligence, his concepts – the "one-dimensional man" and "technological rationality" – offer powerful impulses for a critical reflection on contemporary AI developments.

In *One-Dimensional Man* (1964/2002), Marcuse argues that in modern industrial societies the human being has largely been reduced to a "one-dimensional" creature: critical and transcendent capacities are suppressed in a culture that shapes people into consumers and productive subjects. Desires and needs are not spontaneously formed but are largely imposed through technological, economic, and cultural mechanisms. The conception of the human being that emerges here is ambivalent: humans possess a deep potential for freedom, creativity, and solidarity, yet these potentials are frustrated by the structures of late capitalism. Freedom and imagination are key concepts: genuine human development does not consist merely in efficiency or material satisfaction but in the possibility of imagining and realising alternative realities, as Marcuse argued in 1972. His critique therefore concerns not only economic structures but also culture and technology, which are often instrumentally deployed to maintain conformism.

Although Marcuse never witnessed the rise of AI, his ideas provide a fruitful starting point for critically assessing phenomena associated today with algorithms and machine learning. He argued that technology is never neutral: it is developed within existing power structures and actively expresses those structures. This insight is highly relevant in relation to AI. What is often presented as objective and rational – such as recommendation

systems on social media – turns out to steer users towards content that holds their attention as long as possible, thereby reinforcing polarisation or superficial consumption behaviour. From Marcuse's perspective, such systems confirm the one-dimensionality of the human being: the spectrum of thought and behaviour is narrowed to what is commercially or technologically desirable. Facial recognition and predictive policing applications illustrate this mechanism as well: they reproduce inequalities and intensify surveillance. Rather than promoting liberation, they expand control and domination – precisely what Marcuse described as the operation of technological rationality.

Marcuse's idea of the one-dimensional human being thus gains renewed relevance in the age of AI. Although generative systems such as ChatGPT offer enormous possibilities for information and creativity, there is also a risk that people may be reduced to passive recipients of ready-made output. When AI is primarily used to maximise efficiency – in education, customer service, or creative industries – this may lead to a decline in critical capacities. Social media algorithms concretely demonstrate how users end up in information bubbles and how their behaviour becomes more predictable. Marcuse would regard this as a further intensification of one-dimensionality: the human being becomes increasingly shaped by algorithmic patterns that reinforce the status quo and thereby narrow the human capacity for critical freedom and imagination.

The Rise of AI and the Human Being as Machine

As already indicated in the first chapter, the period after the Second World War was characterised by unprecedented techno-

logical and scientific dynamism. Rationality was regarded as the core of human action: decisions and behaviours could be explained and predicted with mathematical models. A prevailing optimism held that technology could solve virtually any problem. Computers, initially developed for military and scientific calculations, increasingly came to be seen as universal symbol processors.

In this climate, a close interweaving emerged between the concepts of the human being and the machine. The cybernetics of Norbert Wiener (1948) contributed significantly to this perspective. Cybernetics described both biological and technical systems in terms of feedback, control, and information. As a result, it became conceivable to study brains, nervous systems, and computers using the same concepts. Claude Shannon's information theory (1948) provided a mathematical framework in which communication and the transmission of information – both in humans and machines – could be measured and modelled. This reinforced the idea that the essence of intelligence lies in information processing.

The way in which Alan Turing played a key role in the conceptualisation of AI has already been discussed in the first chapter. There, the implications for the conception of the human being that came to dominate in the 1950s were also presented, along with critical remarks about it. Turing's work reflected the dominant conception of the human being: the human is a formal system that does not fundamentally differ from a computer. Joseph Weizenbaum, however, raised fundamental objections to this view, arguing that the complexity, depth, and context sensitivity of human experience and responsibility were not taken into account. Nevertheless, the concep-

tion of the human being inspired by Turing continued to have repercussions, as we shall now see.

The Human Being as Algorithm?

Increasingly, our conception of humanity and our self-understanding are shaped by what artificial intelligence is capable of. Authors such as Yuval Harari, particularly in the present era, raise the question of what it means to be human in a world shaped by algorithms and draw parallels between the phenomenon of humanity and the results of artificial intelligence. In *Homo Deus*, for example, Harari introduces the notion of dataism, an ideology in which the ultimate meaning and purpose of existence are attributed to data processing. The universe consists of flows of information. Organisms, including humans, are essentially algorithms: a collection of biological processes that can, in principle, be analysed and improved. Every component, therefore – including the human being – is a set of organic algorithms produced through natural selection. In other words, the human being is nothing more than "a biochemical algorithm" (*passim*).

Harari assumes that as AI and algorithms become better at predicting outcomes, humans will lose primacy over their decisions. From medical diagnoses to partner selection, humans increasingly delegate their autonomy to technology: free will exists only in the stories humans have invented. If it then appears that AI systems make better decisions, the question arises whether human experience still retains relevance. Because algorithms might enable humans to understand themselves bet-

ter than they understand themselves, it might therefore be preferable to entrust (even moral) decisions to algorithms.

One is almost inevitably reminded of the conception of humanity already presented in the 1930s by Aldous Huxley in *Brave New World*. In that work, a world is depicted in which human autonomy has completely disappeared. People are genetically programmed and socially conditioned for predetermined roles in society. Freedom of choice is superfluous, because everyone is "happy" with their assigned place. Freedom has been exchanged for comfort. The resemblance to Harari's view of humanity is striking: Huxley likewise sketches a conception of the human being in which free will is illusory and systems guide and predestine the individual. In Harari's account this occurs through the voluntary transfer of decisions to algorithms; in Huxley's through social conditioning and genetic manipulation, whereby social classes are genetically determined. In this way, people are kept artificially satisfied and their freedom disappears.

In Huxley's world, human perfectibility results in a rigidly categorised society in which the elite are perfected and the lower classes are deliberately kept unintelligent. Harari foresees a comparable threat: a technological elite may arise that biologically enhances itself through technology, while the rest of humanity lags behind both economically and biologically relative to this new elite of genetically enhanced and technologically augmented "superhumans." As in Huxley's vision, inequality would then be determined not only socially but genetically.

As noted earlier, Descartes argued that it is more plausible that worms and flies move mechanically than that they all possess immortal souls. Harari essentially reiterates Descartes' mechanistic view but shifts its domain of application. Whereas

Descartes elevated the human being to a unique moral entity, Harari abolishes this uniqueness in favour of a conception of humanity in which the human being is understood first and foremost as a mechanistic – indeed algorithmic – entity: as an animal, therefore, within Cartesian thinking about humans and animals. In this perspective the human being is by no means a god, no *Homo Deus*, no *âme pensante*, but a machine comparable to the Cartesian animal. Viewed in light of Descartes' anthropology, Harari's conception paradoxically contains a form of dehumanisation; it entails a reduction of the human being to the very quality that Descartes attributed to animals. In his account, the unique status Descartes assigned to humanity has disappeared.

More generally, Raymond Tallis has already criticised the contemporary tendency to reduce the human being entirely to neurological or biological mechanisms. In *Aping Mankind: Neuromania, Darwinitis and the Misrepresentation of Humanity* (2011) he opposes the idea that consciousness, intentionality, and free will can be fully explained in biological terms. Opposing voices therefore exist – voices that can also be nourished by conceptions of humanity developed over centuries within Christianity.

Broadening the Perspective through Tradition

Harari's conception of humanity stands in sharp contrast to that of the Renaissance humanist. As noted earlier, Giovanni Pico della Mirandola argued in his *Oratio de hominis dignitate* that the human being is the only living creature capable of choosing to degenerate into beastlike forms of life or to rise towards higher forms of life that are divine. Humanity is thus postulated as a

moral being endowed with reason, freedom, and the capacity to choose between the higher and the lower:

"We have given you no fixed abode, O Adam, nor any particular form, nor any special function… You will determine for yourself the limits of your nature according to your own free will and judgment." (*Oratio de hominis dignitate*, paragraph 5)

The contrast between Pico and Harari therefore touches upon the core of the contemporary debate about humanity in the technological age. Where Pico celebrates the human being as a spiritual creature with an open destiny, Harari sees a biological algorithm that risks losing its autonomy to data and structures of power. The question becomes: What value remains in the human being if it reduces itself to that which can be measured, controlled, and optimised?

In his influential work *Inventing the Individual* (2014), Larry Siedentop argued that values such as individual freedom, equality, and freedom of conscience did not originate in the Enlightenment but are rooted far more deeply in the Christian tradition. In particular, he points to the apostle Paul, who systematically argued that all people – regardless of origin, gender, or social status – are equal before God and possess an inner conscience that guides moral action. This was radical in an ancient world in which identity was determined by hierarchical structures, family relations, and social roles. Siedentop speaks of a moral revolution: Christianity individualised the human person without detaching that person from his relational nature. Instead of collective submission to authority, emphasis was placed on personal responsibility in relation to God and the community. According to him, this development laid the foundations for modern liberalism, in which the autonomous individual stands

at the centre – not as an isolated atom, but as a moral being with both rights and responsibilities.

By conceiving the human being as a spiritual entity with a unique and intrinsic value, Christianity stimulated a culture in which freedom of conscience, human rights, and social equality could emerge. According to Siedentop, it is therefore a myth that these values were developed purely in secular terms. Even in their modern, often secularised form, they remain rooted in a deeply Christian conception of what it means to be human.

Harari and other techno-reductionists certainly offer striking comparisons between the functioning of algorithms and the functioning of human beings. Yet their conception of humanity contains precisely the loss about which they warn. The relational and moral self, as well as the uniqueness of consciousness, is either ignored or neutralised. Such claims invite critical reflection. Empirical research has not demonstrated that "consciousness" should be understood as the product of a sequence of instructions that, when followed exactly, always lead to a predictable outcome. *Quod non.* This is not the case. Thus, it occurs that techno-reductionists sometimes warn about the disappearance or loss of the human while simultaneously embracing an anthropology in which that loss has already taken place.

Where Harari describes the human being – compellingly and fascinatingly – as a biological algorithm that is predictable, controllable, and ultimately replaceable by artificial intelligence, the relational conception of humanity developed in philosophy and theology – found in the thought of Augustine, Thomas Aquinas, Descartes, Immanuel Kant, and many others – offers a powerful counter-narrative. This counter-narrative arose partly as a response to the mechanistic view of humanity that emerged in

an earlier period following the rise of empirical science. In a similar manner, scholars such as Simon and Weizenbaum demonstrated the limits of this mechanistic perspective. Their critique underscores that a purely mechanistic view fails to capture the essential dimensions of human experience and responsibility.

Following these philosophers and theologians, Simon and Weizenbaum discovered – precisely through empirical research – that the human being is not merely a data-driven brain in a body but a subject with a unique and, above all, unfathomable consciousness shaped within and through relationships. These relationships arise between moral beings endowed with reason, freedom, and the capacity to choose between the higher and the lower; between beastlike forms of life and forms of life in which Love takes shape. Human freedom, responsibility, and dignity cannot be reduced to biological mechanisms alone. What they can ultimately be reduced to will remain an unanswered question for as long as human beings live. Rationality is bounded. Humanity is destined to continue asking questions, even when answers regarding the phenomenon of humanity appear convincing on the basis of comparisons with developments in a particular scientific domain.

Critical Reflections from the Perspective of Planetary Technodiversity

In his recently published biography of the man who effectively invented nature conservation in the Netherlands, Dik van der Meulen notes that Jac. P. Thijsse did not doubt Darwin and his theory of evolution, yet still regarded the human being as a

phenomenon "that had transcended the other animals." For this reason, he opposed "analogies derived from the plant and animal world" (van der Meulen, 2025, p. 244). One thinker who gives voice to this form of opposition is the scholar Yuk Hui. In *Machine and Sovereignty*, Hui offers a fundamental critique of the conception of humanity that has become dominant in contemporary AI discourse – a conception expressed, for example, in *Homo Deus*. Whereas Harari interprets the rise of AI and datafication as the logical endpoint of a long humanistic development, the Hong Kong philosopher Yuk Hui argues that this narrative rests on a specifically Western technological metaphysics that mistakenly presents itself as universal.

Like Harari, he argues that the image human beings form of themselves is shaped by technological developments, and that these developments prompt comparisons with human capacities or constitutions. Yet he implicitly resists Harari's view of the development of humanity's self-understanding, in which the history from *Homo faber* through *Homo sapiens* appears to culminate almost naturally in *Homo deus*. According to Hui, this is not a neutral description but the result of a worldview in which efficiency, optimisation, and control serve as the measure of rationality, while never being questioned. He therefore does not wish to understand AI as an external power surpassing humanity but as the culmination of a long development in which the state, the economy, and knowledge itself are conceived as self-regulating systems.

Consequently, the conception of humanity shifts – not because machines become human, but because humans learn to understand themselves according to the model of the machine and describe their self-understanding "merely" in terms of algo-

rithms and measurability. Whereas Harari in *Homo Deus* describes this shift as inevitable – and even embraces it – Hui emphasises its contingency. For him, AI does not embody "the future of humanity" as such but it represents only one concrete manifestation of technology emerging from Western rationalism and concepts of sovereignty.

In order to broaden and deepen Harari's scenario and conception of humanity, Hui advocates redefining the human being as a relational, technical, and ecological entity within a planetary perspective. In this view, AI is not the crown of human history but the result of political and philosophical choices. Hui therefore reflects on the conditions under which a non-algorithmic, non-sovereign, non-dataist conception of humanity might remain conceivable in the age of AI. Thus, whereas Harari reduces the human being to an animal in the Cartesian sense, Hui attempts – quite rightly – to challenge this conception by once again asking what "life," "intelligence," and "being human" might mean outside the paradigm of the machine chosen in the West.

Transhumanism and Superintelligence

Yuk Hui was not the only thinker to raise critical questions about the worldview and conception of humanity presented by Harari. In order to situate some other critics in perspective, a brief reflection on "the angel" as understood in scholastic thought may be useful.

In addition to attempting to understand the essence of humanity, thinkers such as Augustine and Thomas Aquinas also reflected on angels: purely spiritual entities possessing immediate

knowledge, a superhuman capacity for abstraction, and a form of intelligence far exceeding human capabilities. An angel "embodied" a form of knowledge that transcended human thinking and human existence in time and space. Angels marked a boundary between humanity and a higher order of being as intended by the Creator.

What transhuman intelligence shares with the essence of the angel is that both compel us to reflect on the scope of human autonomy and on the forms of intelligence that human beings can comprehend or control. Just as earlier reflections on angels prompted contemplation of the limits of being human, so too do contemporary developments in superintelligence invite similar reflection.

The Swedish philosopher Nick Bostrom, in *Superintelligence: Paths, Dangers, Strategies* (2014), has profoundly influenced thinking about artificial intelligence and its potential risks to humanity. He argues that artificial superintelligence could transform – or even displace – the human species. Human beings represent a transitional phase in an evolutionary process that can no longer be traced back to a given order of creation but has instead been initiated by humanity itself. In Bostrom's thinking, the phenomenon of humanity is therefore deeply ambiguous. On the one hand, humans are the only species capable of developing technologies that transcend the limits of being human. On the other hand, that same creative power contains the danger of self-destruction.

This tension is also visible in contemporary policy discussions. The recent EU AI Act (European Commission, 2024), the first comprehensive attempt to regulate AI legally, reflects pre-

cisely this Bostromian concern: technology offers enormous opportunities but may also generate existential or societal risks.

Bostrom's ideas are closely connected to transhumanism, a movement that views humanity not as an endpoint but as an intermediate stage. He regards superintelligence as a human-created cognitive order that structurally surpasses all human capabilities and thus represents a historical turning point. Like classical depictions of superhuman intellects, it implies a fundamental asymmetry of power – though now without a transcendent dimension. Bostrom focuses particularly on the alignment problem: the question of how an entity more intelligent than humans can remain permanently aligned with human values and goals. Incorrect or absent alignment could render superintelligence incomprehensible or dangerous precisely because of its superiority. Thus, superintelligence simultaneously becomes a tremendous opportunity and a major risk, as humanity might become dependent on an intelligence it has itself constructed but cannot fully control.

Central to Bostrom's work is therefore the idea that the traditional conception of humanity as a fixed and unchanging entity must be relativised: the human being is not the endpoint of evolution but represents a vulnerable and mutable phase within a broader trajectory of possible forms of intelligence. Yet precisely this relativisation imposes greater responsibility. Because we can create systems that surpass us, we must reflect on the direction, risks, and moral conditions of this development. This dual movement – abandoning the human as the measure of all things while strengthening human responsibility – is what makes Bostrom's influence on the modern self-image so profound. His work shifts attention from technology towards a fundamental

anthropological question: What does it mean to be human in an era in which we design our potential successors, and in which policy, education, and culture are already shaped by that possibility?

Although Bostrom's work has generated an extensive and influential field of research, it has also attracted criticism. Techno-sceptical researchers have pointed out that his central scenarios are empirically weakly substantiated. Several AI specialists have questioned the plausibility of a sudden intelligence explosion or singularity, noting that no technical mechanisms are currently known that would make such a leap plausible. Crucial conditions for autonomous self-improvement are entirely absent in the current generation of AI systems. The capacity not only to recognise patterns but also to understand and predict causal relationships, for instance, is lacking. Critics have also observed that AI lacks the ability to apply abstract principles flexibly in new, unknown situations. Finally, there is no evidence that systems possess the ability to analyse, evaluate, and autonomously improve their own architecture, goal structures, or strategies – capabilities that together form the minimal conditions for a system capable of developing itself from subhuman to superhuman levels without continuous human guidance. It has also been argued that Bostrom's theory relies on a largely one-dimensional conception of "intelligence," whereas contemporary cognitive scientists tend to view intelligence as a set of partially autonomous cognitive capacities.

Other critics have focused on the socio-political implications of Bostrom's line of thought. By shifting attention to hypothetical long-term threats, critics argue, his approach risks diverting attention from urgent problems already manifesting today, such

as algorithmic discrimination, the concentration of technological power, and large-scale data-driven surveillance. They fear that this line of thinking could be used to justify further centralisation of power: governments and corporations may argue that stricter oversight and extensive control are necessary "for security reasons," while in practice such measures primarily strengthen their own institutional positions.

Once again, these developments demonstrate that technological progress – just as in the time of Turing and Weizenbaum – compels us to reflect on what it means to be human. Bruno Latour previously argued that human beings are co-shaped by technologies, institutions, natural forces, and other people. Consciousness, identity, and freedom do not arise solely within the individual as a thinking being but emerge through the interactions that sustain the network. Technology, in his view, is therefore far from a neutral instrument; rather, it functions as an actant that helps shape our field of action. For him it is fundamental that technology must never overshadow or eliminate human responsibility. Technology must not extinguish the reflexive space required for ethical reflection on the networks of which we are part and on the technologies we ourselves develop.

And so: human beings may indeed create "angels" – entities that surpass our cognitive capacities. But these entities must not acquire a form of hegemony over us. Precisely there lies the boundary already recognised by Pico della Mirandola. Human beings give shape to their intrinsic dignity by choosing a form of life in which they remain as authentically human as possible: a being endowed with imagination, emotional engagement, empathy, the capacity for love, and moral awareness – precisely those qualities that artificial intelligence will never be able to realise.

5
Academic Leadership in the Age of Artificial Intelligence

The Essence of Leadership: An Overview

As noted in the first part of this book, universities are certainly not navigating calm waters. COVID-19, the digital AI transition, rationalisation, wokeism, and geopolitical developments have resulted in a rapidly changing and increasingly complex context. These developments have had a profound and lasting effect on the positioning of universities in society as well as on their internal operations. Academic leaders are challenged to develop new, future-proof visions and plans, to generate broad support for them, and to ensure their implementation. Academic leadership has thereby become a societal responsibility in which inspiration, safeguarding, and mobilisation form the foundations for a future-proof university in a rapidly changing and increasingly complex society.

Over the years, much has been written and published about leadership. Each year an estimated 15,000 business books are published worldwide, a substantial portion of which relate directly to leadership (The Times, 2023). Within this broad body of work, several publications have become bestsellers in man-

agement literature. An influential example is *How to Win Friends and Influence People* by Dale Carnegie (1936/2022), which has sold more than 30 million copies and offers timeless lessons about the importance of interpersonal relationships and influence. *The 7 Habits of Highly Effective People* by Stephen Covey (1989/2020) is another absolute bestseller, with more than 20 million copies sold. Covey's work is popular because it combines fundamental principles of leadership effectiveness with practical applicability. A third example is *The One Minute Manager* by Ken Blanchard and Spencer Johnson (1982/2015), which has sold 15 million copies worldwide. Its success lies in its simplicity: short, directly applicable techniques for effective leadership. What these books have in common is that they are not only accessible and practical but also timeless or strongly grounded in research. Classics such as Carnegie and Covey remain relevant because their lessons are universally applicable, while more contemporary works respond to current challenges.

More recent and widely discussed publications, such as *Good to Great* by Jim Collins (2001) and *Dare to Lead* by Brené Brown (2018), reflect a broader trend in literature: a shift from a focus on efficiency and techniques towards attention to culture, trust, and human-centred, inspiring, and connective leadership.

Leadership studies over the past century reveal three dominant paradigms. Research has focused primarily on transactional, transformational, and contextual leadership. Each of these concepts reflects the spirit of the era in which it emerged. Transactional leadership, characterised by powerful leaders and a focus on clear agreements and rewards, functioned well in the predictable industrial economy of the early twentieth century. Transformational leadership, aimed at managing change, emerged as a

response to the social revolutions of the 1960s. Contextual leadership emphasises effectively navigating complexity in a dynamic and unpredictable environment. These three forms of leadership have influenced how universities were conceptualised and led in their respective periods.

Leadership in the Academic Context

In the past decade, several books have also been published specifically on leadership in the academic context. An analysis of a number of these works shows that attention is concentrated around three central themes: authenticity and personal growth, vision and strategy, and collaboration and shared leadership in the context of change and practice-based learning.

The importance of authenticity is a recurring theme in recent leadership literature. The emphasis rests on the working hypothesis that effective leadership begins with self-knowledge, integrity, and personal values (Bennis, 2009). Kouzes and Posner (2017) likewise argue that leadership is not an innate trait but a set of behaviours that anyone can learn by working on personal development and credibility. Ibarra (2015) adds that leaders develop their identity through action and experimentation rather than through reflection alone.

In addition to authenticity, vision is a fundamental aspect of academic leadership. Kissinger (2022) illustrates this through historical leaders who were able to connect a larger mission with pragmatic strategies. Hennessy (2018), in his reflections on leadership at Stanford University, emphasises that simplicity, empathy, and innovation are crucial values for guiding an academic institution.

In the academic world, where knowledge sharing and collaboration are central, the theme of shared leadership has also become increasingly prominent. Elrod and Kezar (2020), for example, discuss how shared leadership can contribute to systemic change within higher education institutions. Practice-based learning and case-based approaches, such as those proposed by Northouse et al. (2021), provide leaders with concrete situations in which they can practice dealing with moral dilemmas, diversity issues, and decision-making. This aligns with Ibarra's call to view leadership skills not merely as knowledge but as abilities developed through experimentation.

The studies mentioned above make one point clear: academic leadership entails more than directing an institution. It requires careful development and integration of personal competencies and the ability to navigate complex and constantly changing contexts. In their book *Reframing Academic Leadership*, Gallos and Bolman (2021) even state:

"Leadership in the modern university has evolved from a more strictly delimited and almost rule-governed activity of institutional management into the more complex and powerful role of 'helping to set the moral tone for the academic community'" (p. 283).

According to their view, leadership within modern universities should not be limited to directing operational tasks or to strictly rule-bound management. Academic leadership has evolved into something far more comprehensive: shaping a value-driven culture within the academic community. At the centre of the ethos from which leaders operate should be the ambition to embody and foster values such as integrity and (academic and personal) freedom, to promote inclusivity and diversity (*e pluribus unum*),

and to encourage the university community to assume societal responsibility. Academic leaders must provide direction, create meaning, and help determine and apply the "moral compass" of the academic community in the implementation of policy.

General Challenges for University Leaders in the Netherlands

Practice at Dutch universities has, however, often appeared different. From the 1980s onwards, management steering, performance-based rewards, and governance by metrics strongly influenced how leadership was exercised at universities in the Netherlands. The latter refers to a form of management and accountability in which measurable indicators (metrics) play a central role. Policy decisions, evaluations, and resource allocations are largely determined by objectives based on standardised figures, rankings, or performance indicators.

These developments can be traced to global trends that have affected all sectors of society. The leadership model centred on management control, performance incentives, and governance by metrics originated in the private sector and increasingly became the reference framework for leadership models in other institutions, including the public sector. In those years, it became known as New Public Management, characterised by the pursuit of an efficient and business-like government. This paradigm also influenced the university world. New Public Management not only created growing pressure on academic leaders but also provoked profound unease, as universities quickly recognised that these developments were not beneficial for research and teaching.

In recent years, leaders of Dutch universities have seen four structural developments emerge that affected the core of the academic system.

First, the workload for both academic and support staff had long been exceptionally high. In 2022, 73% of academic staff and 53% of support staff reported "high to very high" workloads. The causes were primarily the size of the workload, increasing regulatory pressure, and the constant presence of strict deadlines. In addition, more than 70% of employees reported experiencing stress as a direct result of structural overtime. Professors and assistant professors regularly worked more than ten extra hours per week, often during evenings and weekends, while universities, according to the labour inspection, also lacked sufficient insight into the actual hours worked. Alongside this quantitative pressure, psychosocial strain played a significant role: more than half of employees reported experiencing undesirable behaviour in the past two years, ranging from bullying and discrimination to aggression, misconduct and harassment. When institutions implemented measures, these were often focused on individual support rather than on addressing structural causes, for example by introducing an overall plan for reducing tasks or redistributing work. As a result, existing problems largely persisted.

At the same time, the financial basis of higher education was under discussion. Over the past decade, successive policy interventions have led to a fragile and sometimes unpredictable funding climate. In 2019, the Van Rijn Committee advocated redistributing funds towards science and technology disciplines, which caused considerable unrest within the humanities and social sciences. Sector plans and starter grants introduced in

2022 were intended to provide relief, but their implementation proved complex and politically sensitive, particularly when debates arose in 2024 and 2025 about limiting or abolishing these funds. On top of this came government budget cuts in 2025, which led to hiring freezes and risks of forced redundancies. Academic leaders were therefore required to develop multiple long-term scenarios while simultaneously maintaining internal trust – an extremely complex challenge for university leaders.

Furthermore, from 2022 onwards the tone of the political debate on internationalisation changed significantly. Calls were made to reduce the influx of international students, resulting in the *Balanced Internationalisation Act* (Wet internationalisering in balans) and in measures proposed by universities themselves, such as enrolment caps for English-language programmes and the expansion of Dutch-language bachelor's degrees. Doctoral candidates and early-career researchers expressed concerns, fearing that this trend might lead to declining quality, since international enrolment is essential for many disciplines. University administrators thus found themselves in a difficult dilemma: How could they maintain academic quality and international attractiveness while societal and political pressure to intervene increased?

Finally, universities struggled with the transition to a new career and evaluation system. The traditional model, strongly based on quantitative indicators such as publication counts, impact factors, and citation scores, led to an overly narrow focus on research performance and insufficient appreciation of teaching, leadership, and societal contributions. The role of AI in this context was discussed in the second chapter. The programme

Recognition and Rewards, launched in 2019, aimed to achieve a cultural shift in which not just one but multiple career profiles would be considered equally valuable in evaluating staff members. However, implementation varied between institutions, leading to uncertainty among employees and questions about international alignment. This was very demanding for academic leaders, who had to design, legitimise, and implement new evaluation procedures within a short period of time. Workload, funding, internationalisation, and career policy interacted with one another and created structural tensions, placing a heavy burden on academic leaders.

Requirements for Good Academic Leadership in the Age of AI

Returning to the central theme of this book – the influence of technological developments, particularly artificial intelligence, on the core tasks of universities: the fifth and most far-reaching challenge for academic leaders concerns artificial intelligence. They were compelled to reflect on its significance for their leadership.

As discussed earlier, the rapid rise of artificial intelligence, and generative AI in particular, has fundamentally transformed the academic landscape. AI first forced academic leaders to reconsider the role of the university. Whereas traditional forms of knowledge transfer and research rely on human cognitive capacities, AI calls these assumptions into question. Systems capable of independently generating, classifying, and interpreting information make it necessary to think critically about what still distinguishes human academics from "the systems."

One of the core roles of academic leadership in this context is to develop clear, value-driven guidelines and ethical frameworks that guide the use of AI without inhibiting innovation. Leaders must serve as role models in this regard: they are responsible for promoting transparency, fairness, and accountability in the use of AI. At the same time, they must recognise that the AI landscape is unpredictable and rapidly changing and therefore allow room for learning and experimentation within their institutions.

The challenge for academic leadership in the age of AI lies in providing direction without seeking rigid control. Universities are institutions where autonomy and intellectual freedom are highly valued. This places specific demands on academic leadership. Such leadership should not be characterised by a strong need for control but rather by the aspiration to provide a guiding compass. Transformational leadership, which inspires and connects employees on the basis of shared values, appears more effective in this regard than transactional and output-oriented approaches, particularly when it comes to implementing AI in teaching and research.

Transformational leadership especially contributes to facilitating interdisciplinary dialogues about the role of AI within the university. By organising ethical panels, (inter)faculty AI committees, and policy groups in which students and staff are represented, a shared sense of ownership can emerge regarding the vision of the opportunities and threats that AI may pose within the academic community. This participatory approach fosters trust and prevents policies from being experienced as imposed from above. It significantly increases support. In 2025, EDUCAUSE, a U.S. nonprofit organisation focused on digital trans-

formation in higher education, therefore concluded that effective AI leadership requires governance models that ensure both transparency and inclusivity.

Another urgent dilemma for academic leaders concerns the balance between the autonomy of academics in conducting teaching and research and institutional regulation. On the one hand, there are calls for institutional freedom in developing AI strategies; on the other hand, external frameworks such as the European AI regulation impose requirements concerning transparency, risk management, and accountability. For this reason, scholars have advocated a form of multi-level governance in which universities develop frameworks that address local needs while simultaneously aligning with internationally developed ethical and legal standards for AI applications. Which standards will ultimately become formalised remains a subject of debate. This uncertainty complicates institutional decision-making and significantly increases the complexity of leadership challenges surrounding AI governance within universities.

A second tension concerns the relationship between technology and the human dimension. AI offers unprecedented possibilities for efficiency and scalability. Yet this also entails risks: teaching and research processes may become "dehumanised." As discussed in the third chapter, AI lacks empathy, contextual sensitivity, and the ability to make value-driven judgments. These human qualities cannot be replaced by algorithms, however advanced they may be. It is therefore the responsibility of academic leaders to ensure that conditions are created in which AI systems are used to support human interaction rather than replace it. This is no simple task. For academic leaders, ethics in AI is therefore not merely a matter of compliance but also of

positioning: What role does the university wish to play in a world mediated by technology?

Significant differences exist within universities regarding how AI is perceived and valued. Without active connections between people across faculties, there is not only a risk of policy incoherence regarding AI but also of the absence of a shared reservoir of norms and values underlying the different disciplinary perspectives from which AI is assessed. Inspiring and connective leadership within universities is therefore becoming increasingly important. Leaders must actively build bridges between faculties, disciplines, and functions.

Academic leaders also have an important role beyond the university. They must actively participate in the public debate about AI. Universities have a societal responsibility to interpret knowledge, reflect critically upon it, and contribute to the democratic discussion of technological developments and their societal impact. This requires collaboration with other universities, societal organisations, governments, and technology companies. Academic leaders must adopt a constructive but critical stance: neither naïvely trusting partners who mediate the technology nor operating in isolation. Responsible innovation is only possible when academia and industry jointly invest in transparency, in developing an ethics in which the human dimension prevails, and in societal value creation that endures.

In short, academic leadership in the AI era requires the capacity to think and act ethically, strategically, and connectively. Ethical leadership implies that choices concerning AI arise from familiarity with values such as transparency ("comply or explain"), fairness, privacy, sustainability, and responsibility. Strategic leadership requires a long-term vision in which AI is seen

as a means to achieve the goals that universities have traditionally pursued: generating and disseminating knowledge, safeguarding the quality of research, and striving for societal impact. Connecting capacity is also essential, as it is necessary to bring together and maintain relationships between people, ideas, and systems within – and even beyond – the university in times of profound change.

Finally, it is of the utmost importance that academic leaders are able to appropriate an ethical compass and use it when seeking the right direction for and within the university. The development of such a compass cannot occur without cultivating a particular mode of interaction among members of the academic community. Ideally, this interaction is characterised by sustained, respectful, open, and honest dialogue among the most diverse academics within the university. Such a mode of engagement presupposes that academic leaders create space for reflection, discussion, and experimentation. In doing so, they contribute to a culture in which AI is not only regarded as a technological innovation capable of making research and teaching more efficient, but also as an existential challenge that confronts both individuals and the entire academic community with social and moral problems – or even dilemmas.

Several such dilemmas have already been discussed. Researchers must consider when automation is a valuable tool and when it undermines their own scientific judgment. Models whose internal workings remain unknown raise questions about transparency and control, while unequal access to advanced systems may deepen academic inequality. In education, dilemmas also arise concerning privacy and personalisation, as well as the integrity and authenticity of student work. Together these issues

demonstrate that AI is not merely an efficiency tool but a fundamental challenge to the social, moral, and epistemic structures of the academy.

In the age of AI, academic leaders face paradoxical tasks: providing direction without controlling, innovating without dehumanising, regulating without suffocating. The strength of those called to this form of leadership derives above all from their capacity to preserve the human dimension at all times; or, as the philosopher Emmanuel Levinas argued, to interpret the face of the other as a call to ethical reflection and ethical action. This may well be the most fundamental societal mission of academic leadership today.

Synthesis

Leading a university is no easy task, especially at a time when the rise of artificial intelligence confronts administrators with both functional and ethical challenges that require strong connective and reflective capacities. The past decade has convincingly shown that universities can no longer rely on incidental interventions: what is needed is strategic, consistent, and morally grounded leadership that addresses acute problems while safeguarding structural improvements.

Four challenges stand at the centre of this task. With regard to workload and social safety, leaders must recognise that these problems directly undermine the quality of teaching and research. An effective approach requires clear target values, regular confidential monitoring, and recognizable, accessible intervention pathways. Leaders must also be equipped with skills related to psychosocial safety and conflict mediation.

In terms of funding, it is essential that administrators master scenario planning and risk management, and communicate transparently about choices and consequences. In this way, uncertainty and ad hoc measures can be minimised, contributing to a safe and stable working environment. The political debate surrounding internationalisation also demands administrative prudence. For each programme, language and intake strategies must be developed that balance academic quality, societal value, and international attractiveness. This can only be achieved if administrators actively invest in a broadly supported stakeholder dialogue.

The rapid rise of artificial intelligence, however, constitutes the greatest challenge for university leaders. AI places virtually all requirements of academic leadership under pressure. It changes the way knowledge is generated and requires a reconsideration of how we evaluate and value knowledge – and ultimately of how we understand ourselves as rational beings. In a world where algorithms appear to provide inexhaustible and immediately accessible sources of information, the mission of the university shifts from that of an exclusive alma mater to that of a guardian of reliable knowledge. Although AI makes knowledge widely accessible, it has become clear that unreflective use may weaken analytical and critical thinking capacities. Precisely for this reason, the university must guide the synthesis between artificially generated information and knowledge derived from human reasoning.

For academic leaders, this means determining how students, teachers, and researchers not only consume information but, above all, learn to distinguish, argue, and question critically. The development of academic judgment, integrity, and awareness of

the limitations and risks of AI thereby becomes a core task. This requires carefully considered choices in curriculum design, assessment methods, and pedagogy: technology may offer rapid answers, but education must stimulate reflection, analysis, and creative thinking. In research as well, AI may reveal patterns that were previously hidden, but interpretation, accountability, and ethical evaluation remain human responsibilities.

In practical terms, this means that universities require leaders who are not only strategically and communicatively skilled but also capable – through dialogue with their communities and societal partners – of developing a vision of the role of AI in academic knowledge processes. The dual task is clear: harness the opportunities of AI while safeguarding the core of academic work – the search for insight, meaning, and societal relevance. This requires leadership that understands the interaction between humans and technology and that fosters an academic culture in which curiosity, critical distance, and moral responsibility are central.

Academic leaders therefore carry a substantial moral responsibility: they must provide direction, create meaning, and help shape the moral compass of the institution. There is a real risk that teaching and research could become dehumanised through AI, since algorithms lack empathy, contextual awareness, and the capacity for value-based judgment. Leaders must therefore ensure that AI supports human interaction but never replaces it. In this respect, ethics is not merely a matter of applying rules but of positioning: What role does the university wish to play in a world transformed by technology?

As technological acceleration makes the academic field both more complex and normatively more vulnerable, universities

require leaders who connect, collaborate across boundaries, and are able to navigate paradoxes. They must set direction without dominating, innovate without losing the human dimension, and regulate without stifling innovation. Where strategic thinking, moral awareness, and relational leadership converge, AI can be convincingly embedded within academic culture. In that case, the starting point is not technology, but the human being

6
The Future of Academic Work in the Age of AI

Introduction

The way in which labour is organised, valued, and distributed is currently undergoing a phase of reorientation. Although every technological revolution has affected the labour market, the present shift surrounding artificial intelligence – and generative AI in particular – appears to be of a different order than previous transformations in the world of work. Whereas the industrial revolution automated physical labour and the digital revolution streamlined administrative processes, the rise of AI now affects precisely those cognitive tasks that were traditionally regarded as the domain of the highly educated professional. The young lawyer conducting case-law research, the junior consultant preparing reports, the policy officer organising and summarising files, the young researcher screening literature or cleaning datasets: all of them are witnessing their tasks being rapidly automated. Tasks that were once fairly straightforward have now largely been digitised. Young academics no longer begin their careers with relatively simple tasks to gain experience and gradually grow into more comprehensive responsibilities.

In this chapter, we discuss the skills that are considered essential for young academics and the implications thereof for higher education. In an era in which AI is profoundly transforming

research and education, the skill profile is shifting: alongside classical academic competencies, new digital and ethical capabilities are becoming indispensable.

The transformation of work in the age of AI, however, is not merely a technical matter. The way in which AI is deployed in relation to labour is also the result of political, economic, and institutional choices. Mariana Mazzucato (2018, 2021) has argued that societies themselves determine which forms of labour are valued and which are marginalised. AI can be used to increase efficiency, but it can equally be deployed to strengthen the societal value of certain forms of labour. For young graduates this means that their position in the labour market does not depend solely on technological trends, but also on the valuation that universities, employers, and policymakers attach to some forms of work rather than others. We will reflect on this phenomenon, but first we examine what the labour market itself demands in the age of AI.

The Future of Work According to the World Economic Forum

Worldwide, the rise of artificial intelligence, digital platforms, and automation is leading to a fundamental reconsideration of the meaning of work. The *Future of Jobs Report 2025* of the World Economic Forum provides a compelling view of the factors that will shape the global labour landscape up to 2030. The report is based on insights from more than 1,000 employers worldwide and on data covering 14 million employees, and it outlines both opportunities and risks for workers, policymakers, and companies. Central to the analysis is the increasing influence

of technology, particularly generative artificial intelligence, automation, and digital access. AI in particular is regarded by 86% of employers as the most significant game changer. The demand for AI specialists and software developers is expected to grow rapidly, while jobs dominated by routine and repetitive functions will come under the greatest pressure.

As a consequence, nearly 40% of required skills are changing. The most important skills will be analytical thinking, resilience, creativity, and technological literacy. In order to cope with these transformations and to develop the necessary skills, companies are investing heavily in reskilling. More than 85% of employers are planning additional training, while 50% intend to redeploy workers from declining roles to growing functions. Companies are also investing more in wellbeing and diversity: 64% regard wellbeing policies as a crucial factor in attracting talent, and 83% maintain active policies on diversity and inclusion. Finally, AI appears to be both a source of innovation and a threat to employment. Half of employers expect to adapt their corporate strategies to AI, with 40% also considering workforce reductions due to automation. According to the *Future of Jobs Report 2025*, the world of work stands on the eve of profound changes, even aside from the consequences of the green transition, economic uncertainty, and demographic shifts.

The report mentioned above sheds clear light on which competencies will be decisive over the coming five years. Virtually every worker is expected to be technologically literate, that is, capable of working with digital systems, understanding AI tools, and engaging critically with technology. Knowledge of data analysis, machine learning, and cybersecurity is ideally no longer reserved solely for IT specialists but is spreading across a wide

range of sectors, from healthcare to education, and from marketing to logistics. Employers signal a clear priority for so-called core cognitive skills. Analytical thinking – the ability to interpret complex information, recognise and interpret dilemmas, and ultimately arrive at well-substantiated decisions – tops the list.

Although technologies such as artificial intelligence, big data, and automation are taking over many tasks, this does not mean that humans are becoming redundant. On the contrary: precisely those human skills that machines cannot replicate are increasing in importance. Indeed, these skills can be further developed thanks to the time and space created by technology. Scholars such as Autor, Mindell, and Reynolds (2022), for example, argue that AI makes routine tasks more efficient, thereby creating room for the development of empathy, creativity, and contextual reasoning. Others, such as Paul Daugherty and Jim Wilson, describe the relationship between humans and machines as follows: AI systems analyse data and patterns at great speed, while humans remain responsible for interpretation, judgment, and ethical and moral deliberation on the basis of the analysed data.

For this reason, the report of the World Economic Forum (2025) also emphasised that, in addition to digital literacy, soft skills must be developed, such as critical thinking, adaptability, and emotional intelligence. AI remains limited in social interaction and moral reasoning, as we have already established earlier in this book. And precisely because AI changes the work environment, adaptability becomes essential. Workers who continuously retrain themselves and remain flexible in their thinking enjoy a significant competitive advantage. Employers therefore attach increasing value to skills that were previously labelled as "soft." In reality, however, these are the hard conditions for

effective collaboration and leadership in hybrid and diverse organisations. In a work environment in which teams are distributed across locations and cultures, and in which change is the norm, these qualities are crucial. Viewed in this way, AI brings out the best in human beings.

At the same time, it should also be noted that, parallel to the rise of AI and the opportunities it creates for the development of new skills, employers observe a decline in demand for certain competencies. Skills such as physical endurance, manual dexterity, and precision are becoming less important. Repetitive and routine tasks that can easily be automated are also losing value. Employees who fail to develop towards more complex or human-oriented roles risk being sidelined. According to the report, if the global workforce consisted of 100 people, 59 of them would need to be reskilled or upskilled before 2030. Of these, 29 could continue to grow within their current role, 19 would need retraining for another function within the same organisation, and 11 would likely lose their jobs without intervention. For this reason, an increasing number of employers are investing heavily in reskilling and upskilling. Approximately 85% of companies surveyed report that they intend to focus on this. At the same time, they also request support from governments, for example through investments in learning programmes, tax incentives, or public–private partnerships.

The picture that emerges from the *Future of Jobs Report 2025* is crystal clear: anyone wishing to participate in the labour market of the future must continuously invest in their own development. Technological skills constitute the gateway, cognitive adaptability forms the core, and social skills are necessary to develop a distinctive capacity to respond to the opportunities

and threats of AI. In times of change, therefore, it is not diplomas or titles that count most, but the willingness and ability to continue learning, adapting, and contributing meaningfully. The license to operate is no longer granted once and for all at graduation but will need to be periodically renewed.

The Future of Work According to McKinsey

According to McKinsey & Company, generative AI will in the coming years not only reshape work processes but also cause structural shifts in labour demand, competency profiles, and the dynamics of economic growth. McKinsey predicts that by 2030 up to 30% of current working hours in Europe and the United States could be automated, partly due to the deployment of generative AI. This implies as many as twelve million career transitions in Europe. It represents a societal transformation comparable in scale to the COVID-19 crisis. The sectors most affected will be office support, customer service, and administrative functions, while demand will increase for healthcare professions and Science, Technology, Engineering and Mathematics (STEM) roles, as well as for creative and leadership positions. The ability of generative AI to perform tasks such as writing texts, analysing legal documents, or creating software code quickly and accurately makes its disruptive potential unique. In this process not only the volume of work shifts, but also its content. As recorded in the *Future of Jobs Report 2025*, McKinsey likewise observes that routine tasks are being automated, enabling human input to focus more on judgment, creativity, and interaction.

McKinsey emphasises even more strongly than the World Economic Forum report that the burdens of these transitions are unevenly distributed.

Workers with lower wages and less formal education are fourteen times more likely to have to change jobs than highly educated workers. These groups often lack the digital skills or networks necessary to reorient themselves quickly. Older people, migrants, and individuals from lower socioeconomic backgrounds also face disproportionate risks of falling behind in the labour market of the future. Social inequality therefore threatens to intensify. If policy measures such as retraining programmes or income support fail to materialise, these groups may become structurally excluded from economic progress. McKinsey therefore argues that inclusive strategies – such as valuing skills above formal diplomas and making digital infrastructure and learning platforms accessible – are essential to narrowing this gap.

It may sound somewhat remarkable, but the insights presented here by McKinsey had already been articulated much earlier in key texts of Catholic social teaching. As early as 1891, in his encyclical *Rerum Novarum*, Pope Leo XIII emphasised that workers "without property are defenceless against the vicissitudes of the economy" (Leo XIII 1891, RN §29) and that "an excessive inequality in social status and wealth" undermines the common good (Leo XIII 1891, RN §19). When groups risk being permanently excluded from progress due to a lack of education, resources, or networks, it is therefore, according to Leo XIII, the duty of the state to intervene so that dignified work and social protection remain guaranteed (Leo XIII 1891, RN §36). In 2015,

Pope Francis likewise stated in his widely cited encyclical *Laudato Si'*, much like his distant predecessor, that the burdens of ecological and technological change systematically fall upon the most vulnerable: "the vulnerable of the world are the most exposed to the damage we cause" (Francis 2015, LS §48). Pope Francis warns that technological development not accompanied by social equality leads to a "throwaway culture" in which certain groups are structurally excluded (Francis 2015, LS §22), and he emphasises that access to knowledge, technology, and infrastructure must aim to reduce, not increase, inequalities (Francis 2015, LS §§102–104). Thus, the popes articulated what McKinsey once again substantiates through empirical research.

In the Netherlands, generative AI is expected to affect up to 15% of working hours around 2030: an increase of 50% compared with earlier estimates that did not yet account for generative technologies. At the same time, if productivity growth remains unchanged, labour market shortages may triple. The Netherlands therefore faces a dual challenge: on the one hand, labour-saving through technology; on the other hand, labour shortages due to population ageing. For the Dutch economy, the key lies in activating unused labour potential and increasing labour participation. Measures such as lifelong learning, sectoral mobility centres, and public–private partnerships with educational institutions can contribute to a more resilient labour market. Moreover, the Dutch tradition of consensus-based consultation provides a suitable basis for coordination between government, employers, and employees in order to guide technological change in a socially just manner.

The future of work, however, is shaped not only by technology but also by the choices that companies, governments, and

workers make today. Generative AI offers opportunities for economic growth and more efficient work structures, but it also requires a fundamental reorientation regarding skills and social justice. How AI will be deployed ultimately depends on political, economic, and institutional choices. Mariana Mazzucato (2021) already observed that societies themselves determine which forms of labour they value and which they marginalise. This brings us to the following discussion.

Mariana Mazzucato and the Revaluation of Labour

The economist Mariana Mazzucato has consistently made a fundamental contribution to the debate on the future of work by redefining the concept of economic value. In her book *The Value of Everything* (2018), she argues that modern economies often fail to distinguish between value creation and value extraction. Essential sectors such as healthcare, education, and public services are structurally undervalued compared with sectors such as financial services or digital platforms, which often receive high economic valuation while adding relatively limited public value. This way of thinking has far-reaching consequences for the way in which labour is rewarded, organised, and valued.

According to Mazzucato, technological innovation – including artificial intelligence (AI) – is not a neutral or autonomous force. The direction and application of technological progress are the result of political choices, societal priorities, and institutional structures. In her view, governments have a central role in steering innovation towards societal "missions" – objectives such as the energy transition, public health, or inclusive employment. This mission-oriented approach requires an active state

that does not merely correct market failures but actively shapes new markets and directs them towards the creation of collective societal value. Within this framework, the future of work is not a linear technological process in which jobs disappear or transform, but a normative and policy-driven choice. Mazzucato therefore advocates a revaluation of labour in which human dignity, social cohesion, and public value occupy a central place. This implies investing in sectors with high societal value – such as healthcare, education, and sustainability – even if these sectors generate lower short-term returns for private investors. Work, in her view, should not be reduced to a cost factor but recognised as a foundation of social justice and democratic citizenship.

Mazzucato also criticises the fact that governments often outsource their strategic thinking to consultants or technology companies. This leads to a vision of the future of work that is strongly guided by efficiency considerations and profit maximisation rather than by public values or long-term wellbeing. She calls for strengthening the public sector as an autonomous intellectual force capable of actively shaping technological development, labour market policy, and economic direction.

In light of the rise of AI, Mazzucato emphasises that the key question should not only be what technology can do to work, but above all who decides for what purposes technology is deployed, and which values guide these decisions. Her approach forms an important counterweight to market-driven visions of the future of work. Instead, it offers a human-centred, inclusive, and democratically legitimised vision of labour in which the creation of societal value takes precedence. In her later works and public contributions, she likewise stresses that the rapid rise

of artificial intelligence (AI) and automation is not merely a technical phenomenon but that it should be deeply intertwined with the responsible exercise of political choice aimed at consolidating societal values.

Just as the popes in their encyclicals and the authors of the reports of the World Economic Forum and McKinsey emphasise, Mazzucato also notes in her later work that the way in which AI is deployed can lead either to growing inequality or to inclusive employment, depending on policy choices and societal priorities. She therefore argues that such sectors should be integrated into the "new economy": an economy characterised by fair wages, good working conditions, and recognition of labour as the core of economic value. In this context, she warns against the dangers of technological determinism that presents innovation and unemployment as inevitable trends. AI and automation can contribute, in her view, to a just transition if they are embedded in a democratic process that actively involves workers, trade unions, and citizens in decision-making regarding technological applications.

This participatory approach not only promotes social justice but also increases the likelihood of socially accepted and sustainable innovations, which is crucial in light of the major challenges of our time. Governments must therefore invest in public institutions with strategic capacities to develop vision and policy. They should by no means outsource control over innovation to private technology companies or consultancy firms. Developing a democratic and inclusive vision of the future of work is, according to her, essential in order to connect technological progress with the ambition to allow societal values to flourish for the benefit of the entire community and the common good.

What AI Means for Young Academics

What does all this mean for young academics who will enter the labour market in the age of AI? Above we have already noted that the *Future of Jobs Report 2025* emphasises that analytical thinking, the ability to interpret complex information, and the capacity to recognise dilemmas will remain important in an era in which technologies such as artificial intelligence, big data, and automation will take over many tasks previously performed by human beings. Learning critical thinking – defined as the ability to systematically evaluate arguments and analyse complex information – will remain necessary in order to assess the reliability and relevance of data in a world in which information is abundant but not always accurate. This applies to young academics especially. Yet in the AI era, even more will be demanded of them. The term "problem-solving capacity" will need to be given a much broader meaning. Below, we provide building blocks for that elaboration.

In virtually all sectors into which university graduates enter – legal services, policy analysis, consultancy, the financial sector, data analysis, journalism, research, engineering, and communications – the first phase of a career previously consisted of a combination of preparatory, analytical, and supporting tasks. These tasks were repetitive enough to be carried out by juniors, yet substantively rich enough for them to learn the language, logic, and structure of the profession. They constituted the implicit curriculum of professional socialisation.

Generative AI has fundamentally altered this professional pedagogy. In roles involving large volumes of textual, numerical, or analytical input, AI can generate summaries, case law over-

views, policy analyses, market scans, technical documentation, or literature reviews within seconds. In sectors where junior staff previously produced the first rough draft of a memo, report or advice, this work is now often carried out by AI, after which the senior professional undertakes refinement and evaluation. The learning cycle thereby shifts: beginners are asked less often to create something and more often to evaluate something. That is a fundamentally different skill, and one that is normally developed only later in a career, once sufficient domain knowledge has been acquired to recognise quality, introduce nuance, and detect implicit assumptions.

A second shift concerns the emergence of new roles that are not purely technical but rather rely on distinctly human capacities. In virtually all sectors, the demand is growing for professionals who can understand and guide the interaction between humans and machines. The demand for AI-proficient generalists – people who do not primarily build AI but understand it, can steer it, and critically evaluate it – is rapidly increasing. Roles such as AI-augmented analyst, data interpreter, AI ethics liaison, digital policy officer, or socio-technical project leader are emerging in many organisations. These functions are not situated at the periphery of professions but are moving towards the core of strategic decision-making. They place higher demands on maturity, judgement, and interdisciplinary insight.

In short: cognitive skills will remain fundamental for young academics in the twenty-first century. Data literacy is also becoming increasingly important given the growing use of quantitative information in policy and organisational practice. In addition, systems thinking is essential when addressing complex societal challenges such as the energy transition, access to and

costs of healthcare, and social inequality. Students must be more than competent surfers of the internet and users of AI chatbots. They must be able to analyse problems and recognise interconnections within larger systems in order to formulate sustainable solutions that take long-term effects and unintended consequences into account. To develop these skills effectively, students must be trained in the application of methods such as causal loop diagrams, scenario analysis, and simulation models. Causal loop diagrams show how elements within a system influence each other through reinforcing or stabilising feedback loops. Scenario analyses map how different assumptions and developments may lead to divergent futures. Simulation models replicate the dynamics of a system so that the effects of choices or changes can be tested safely. Young academics must be more than familiar with these approaches.

Furthermore, digital transformation requires young academics to possess digital skills. These should not be limited to technical expertise but must also include the ability to deploy technology creatively and responsibly in societal contexts. The rapid rise of artificial intelligence, blockchain, the Internet of Things (IoT), and big data means that professionals must not only be able to use technology but also be able to assess its impact.

Developing these skills, however, is not easy. AI enormously accelerates the pace at which information is produced and analysed. As a result, expectations regarding productivity increase: where a junior previously needed days to produce an analysis, it is now expected that AI can generate a first version within minutes. The junior is then expected to critically assess, interpret, and improve this version. Much sooner than before, the junior must not so much "produce something" as "see through some-

thing." This requires young academics to develop domain knowledge and analytical capacity more rapidly than in the past. The classical learning curve – from understanding to application to evaluation – is inverted: evaluation and application are brought forwards, while understanding must subsequently be deepened. This creates tension: How does one evaluate quality when one has not yet fully mastered the underlying complexity?

Moreover, a junior policy officer who uses AI-generated analyses bears responsibility for their correctness. A young researcher who uses a language model to summarise literature must be able to indicate how bias or hallucination may colour interpretation. A starting lawyer must understand that an automatically generated contract clause is not necessarily legally coherent. This new responsibility demands the capacity for judgement – a capacity that earlier generations were generally expected to demonstrate only later in their careers.

Alongside cognitive and digital competencies, virtually all visions of the future emphasise soft skills such as social and communication skills. In a globalising and culturally diverse labour market, collaboration, leadership, and intercultural sensitivity are not optional qualities but fundamental conditions for professional success. Collaboration requires not only the ability to divide tasks and coordinate efforts but also the capacity to build mutual trust and resolve conflicts effectively. In an increasingly international context, intercultural sensitivity is highly valued. This presupposes a deep awareness of cultural norms, values, and communication styles, and the ability to respond appropriately to them across different environments. This capacity is closely connected to inclusive communication, in which

language, tone, and forms of interaction are chosen in such a way that all participants feel recognised and heard.

Another soft competence that is highly valued is metacognition: awareness of and reflection on one's own thinking processes. The willingness to continually question "holy beliefs" is an essential aspect of this. Metacognition enables highly educated professionals to continuously evaluate and adapt their methods and strategies. This requires reflexive space. In connection with the development of metacognition, learnability – or learning capacity – is understood not merely as the acquisition of new knowledge but as a continuous willingness, after reflection on one's own functioning, to abandon established routines in favour of more effective approaches.

The development of the ability to reflect deeply on one's own thinking and actions is also related to learning the skill and art of critically assessing technological and economic innovations in light of their societal implications: their sustainability, their relevance for achieving social justice, and their contribution to solidarity.

Mental resilience – the capacity to recover from setbacks and the ability to cope well with uncertainty – is also of great importance in a labour market in which changes occur rapidly and often unexpectedly. Self-care and stress management complete these competencies, since sustainable employability is impossible without a healthy balance between work and private life.

For the sake of completeness, it should be noted that many labour-market studies indicate that the future of professional organisations is inseparably linked to taking responsibility for global sustainability challenges, such as those laid down in the United Nations Sustainable Development Goals (SDGs). Knowledge of these goals, as well as of Environmental, Social

and Governance (ESG) criteria, is becoming increasingly important for young academics in both the public and private sectors. Understanding and quantifying ecological footprints is necessary because it enables them to measure and reduce the impact of policy and organisational practices in concrete terms. This is expected of them. And more than that: political sensitivity is essential here, since societal transitions rarely proceed in a technocratic or value-neutral manner. In the AI era, much is demanded of young academics.

In short, the disappearance of routine junior work, the emergence of complex socio-technical roles, the automation of selection systems, and heightened expectations regarding judgement together constitute a shift that compels young academics to operate from day one at a level that was previously reached only after years of experience.

AI and the Selection of Young Academics

It should not go unmentioned that AI is also changing access to jobs and thereby the conditions under which young academics enter the labour market. Recruiters, HR departments, and large organisations increasingly use algorithmic filters to screen and rank candidates. Skills-first hiring – the selection of candidates on the basis of skills rather than diplomas or linear CVs – is becoming a dominant trend, partly because AI can process large quantities of application data and recognise patterns.

This means that traditional signals of academic quality (programme of study, grades, thesis title, internship placements) no longer automatically provide access to entry-level positions. Candidates are assessed on visible, measurable, and demonstra-

ble competencies: project experience, proven digital skills, interdisciplinary work, abilities in collaboration and communication, reflective capacity, and the ability to think critically and independently in an AI-rich environment.

This automation of recruitment is not necessarily negative, but it does create new risks for young academics. Those who do not possess an explicit skills profile may unintentionally fall out of the first round of selection. Those who have not visibly practised with AI tools, interdisciplinary collaboration, or socially engaged projects may be eliminated in favour of candidates who have gained such experience. The selection process becomes more uniform but also less forgiving for candidates whose professional identity is still developing.

AI and the Expectations with Which Young Academics Enter the Labour Market

The expectations with which young academics enter the labour market have changed considerably over the past two decades. Formed in a period of digital abundance, globalization, and continuous social turbulence, and educated in a university environment in which flexibility and project-based work are central, they do not primarily seek work because it is a source of security. Work must not only be a source of income but also a form of expression, a structuring element of personal identity, and a contribution to a broader societal context. Economic security remains important but is no longer the exclusive yardstick; well-being, meaning, and flexibility are at least equally central.

This shift in expectations is widely documented. The *Deloitte 2025 Gen Z and Millennial Survey* shows that 89% of these gener-

ations indicate they remain loyal to employers who share their values. This connects closely with their experiences during their studies: students who, for example, were involved in a sustainability project during their education often consciously seek employers such as Too Good To Go or social enterprises in the circular economy. Even in traditional sectors this plays a role: graduate engineers are more likely to choose companies that invest in green energy, and law graduates prefer firms that engage in pro bono work.

Research therefore shows that young professionals seek organisations that align with their values: organisations that take sustainability seriously, promote justice, and pay attention to diversity and inclusion, as well as organisations that do not evaluate employees solely on measurable output but on integral professionalism. Moreover, young people expect flexibility in hours, location, and work format; they expect their work to fit around their life, not the other way around. They seek learning environments that continue to challenge them and employment relationships that offer space for growth, dialogue, and autonomy.

These expectations are not merely idealistic. They are partly shaped by the way higher education functions: the project-based character of programmes, the emphasis on interdisciplinarity, the possibility of combining study with extracurricular activities and part-time jobs, and the idea that reflection and personal development form an integral part of academic education. Young people therefore enter not only a profession but also a culture, a set of values, and a particular image of what professional life ought to be.

The rise of AI puts these expectations under pressure in several ways – not because AI makes these values impossible, but because it fundamentally changes the dynamics of work. The paradox confronting younger generations is that the labour market offers them more autonomy than ever before, but at the same time, as noted above, demands greater maturity than earlier generations were required to show at the beginning of their careers. AI makes work more flexible: remote working becomes easier, communication is digital, and project structures are less dependent on physical proximity. But AI also makes work faster, more demanding, and less forgiving.

A first collision between expectations and reality concerns the tension between autonomy and responsibility. Many young academics seek independence – the ability to determine their own working hours and form of work. AI strengthens this autonomy because many tasks can be carried out independently of time and place. At the same time, AI increases the responsibility of beginners because they must, for example, be able to assess which parts of an AI-generated model are robust and which are speculative, or they have to independently evaluate the reliability of automatically generated contract texts.

A second tension concerns the meaning of work. Young academics want their work to contribute to something larger than themselves. Organisations increasingly claim societal relevance, but AI can both reinforce and hinder this desire. On the one hand, AI can free young academics from repetitive tasks, giving them more room for substantive and creative work that contributes more directly to societal goals. On the other hand, AI can undermine the sense of meaning when the human contribution shifts from creation to control: evaluating AI output is

less visible and sometimes less satisfying than producing analyses or texts oneself. Young academics driven by the ambition to make an impact must learn that impact in the AI era is not always expressed directly in tangible products. Sometimes it lies in safeguarding integrity, recognising risks, or introducing nuance into a technological process that might otherwise go off course.

Universities must take this second tension seriously. To be a good employer for young academics, the university must therefore be an institution that does not primarily steer on measurable output but on intellectual growth, space for reflection, and sustainable careers. This means restoring academic autonomy in teaching and research, reducing bureaucratic pressure, and creating time and stability for in-depth work. Young researchers should not solely be judged on publication counts but also supported in developing original ideas, taking risks, and contributing to societal questions in ways that cannot always be captured in quantitative indicators. A university that provides this calm, freedom, and trust creates the conditions under which young academics can experience their work as meaningful if they are employed there. In doing so, the university, as the workplace of science, secures its own future.

A third tension arises around career development. Many young academics expect a steep learning curve, frequent feedback, and opportunities to grow through challenging projects. AI turns that learning curve into a paradox: some parts of the work accelerate enormously, but others – particularly those requiring deep understanding or tacit knowledge – become more difficult because classical practice tasks have been automated. The path to expertise becomes more abstract. Young academics must learn to "think along at a high level" more quickly, while

the opportunity to reach that level through a step-by-step process becomes less self-evident. This requires employers to redesign supervision and professional socialisation; without such reorientation, a generation may emerge that is capable but does not feel sufficiently competent.

A fourth tension concerns the search for balance between work and private life. Young academics value the idea that work should not come at the expense of wellbeing. They expect academic work to be integrated naturally and continuously into their lives, without sharp boundaries between professional obligations and other domains of life. AI can support this wish by making work more flexible and efficient. At the same time, however, AI increases expectations regarding output: when systems can generate analyses in minutes, an implicit pressure arises for people to respond faster, interpret faster, and deliver faster. The danger is that efficiency gains are returned as increased work pressure. Young academics in particular – who have not yet developed clear boundaries in their professional identity – are vulnerable in an environment in which speed and constant availability are implicitly rewarded.

AI therefore changes not only the work of young academics but also the pedagogy of work – the way novices become experts and experts become mentors. Universities and employers share responsibility for this pedagogy.

AI Governance and Ethics

One of the domains in which the demand for expertise is growing most rapidly is that of AI governance and ethics. This growth stems from the need within universities to understand

how algorithms function, what they are based on, where biases may arise, and what risks are associated with the use of AI in decision-making processes. Because this work primarily concerns assessing the interaction between technology and human values, it does not require advanced programming knowledge. As a result, new opportunities are emerging for young academics with backgrounds in law, philosophy, public administration, sociology, or data science to contribute to the development of a responsible technological ecosystem.

The need for responsible use is further reinforced by broader societal concerns about social protection and labour rights. International organisations such as the International Labour Organization (ILO) advocate modernising labour legislation so that platform workers and flexible workers also gain access to basic rights such as insurance and pensions. The rise of AI makes these reforms more urgent: algorithmic management of work processes and platform matching not only raise practical regulatory questions but also compel us to reflect on the moral limits of automation.

From this follow fundamental ethical questions. Who actually benefits from automation? How can we prevent algorithms from reinforcing existing inequalities? And what does work mean for human dignity when machines increasingly take over tasks? The debate must therefore not revolve solely around economic efficiency but also around meaning, autonomy, and social justice. At the same time, concerns about privacy in the workplace are growing: AI applications such as surveillance systems may lead to excessive monitoring, increased stress, and a sense of insecurity.

Because these risks will not disappear on their own, active policy is required to distribute the benefits of AI fairly. Such policy must focus on education and inclusion, but also on redistribution and the protection of vulnerable groups. Possible policy options include public investment in education, the redesign of social safety nets for flexible workers, and fiscal incentives for companies that explicitly invest in human-centred AI. In this way, technological progress becomes not only an economic engine but also a means of creating a more just labour market.

Conclusion: Universities and an AI-Driven Labour Market

The changes that AI brings about in the structure, access, and content of work have direct implications for the way universities shape their education. Traditionally, universities have had a dual mandate – knowledge transmission and academic formation – but in the age of AI a third responsibility is becoming increasingly urgent: preparing students for a labour market in which the boundary between humans and technology is structurally blurring. This does not mean that universities must reorient themselves into vocational training institutions, but it does mean that they must more explicitly ensure that students develop the competencies required to assume responsibility as early-career professionals in a technologically and socially hybrid work environment.

The first implication concerns the renewed appreciation of the academic core curriculum. The skills that are decisive in the AI era – interpretive capacity, critical analysis, technological lit-

eracy, communicative and social sensitivity, and reflective judgment – lie at the heart of academic education. Universities must connect this core more explicitly to the reality of an AI-driven labour market. This means that critical thinking can no longer remain merely an intellectual discipline but must become a practical competence: the ability to assess AI outputs, recognise algorithmic assumptions, and evaluate the epistemic status of digital information.

A second implication concerns the integration of technological literacy into all degree programmes. This does not mean that fundamental knowledge of AI, data processes, digital infrastructures, and ethical frameworks must be required in uncompromising detail for all students. However, students and young academics must understand how AI functions, what its limitations are, how bias arises, and how digital decision-making will influence their future work. This requires universities to revise their curricula and not restrict AI literacy to IT-related studies but to integrate it structurally into the humanities, social sciences, law, economics, and medical and technical disciplines. The question is not whether students will work with AI, but how they will do so in a responsible, ethical, and informed way. A basic understanding of algorithmic decision-making is therefore essential.

A third implication concerns the way universities prepare students for hybrid work practices. The early years of a career traditionally function as the phase in which tacit and difficult-to-transfer knowledge is acquired by performing routine tasks under the guidance of experienced colleagues. Precisely this layer of work is now increasingly being automated by AI. Universities must therefore allow students to practise earlier and more intensively the forms of work they will actually perform later. This requires

carefully designed educational models in which students work on challenging societal problems, participate in real-world projects, learn in experimental environments where theory and practice converge, collaborate across disciplines, and use practice-oriented yet scientifically validated methods. Students must learn to operate in environments characterised by uncertainty, speed, and complexity. This means practising the formulation of good questions, not only giving good answers; evaluating AI-generated analyses; developing solutions in which technological and human factors intersect; and communicating across disciplinary boundaries.

A fourth implication concerns the role of reflection, value orientation, and ethics within the curriculum. The AI-driven labour market requires not only technical insight and conceptual sharpness but also moral maturity. Young academics will encounter questions about privacy, algorithmic inequality, the power of technology companies, the sustainability impact of digital infrastructures, and the moral legitimacy of automation decisions. Universities must equip students with the ability to recognise, structure, and respond to these questions. This requires reflective learning pathways that go beyond traditional ethics modules and explicitly address the real dilemmas that AI generates in professional contexts. The university must not only provide knowledge but also support the development of a moral compass.

A fifth implication concerns the value of experience, portfolios, and public visibility. Because access to jobs is increasingly mediated by algorithmic filters and skills-first hiring practices, universities must help students generate demonstrable evidence of their competencies. Project portfolios, research reports, interdisciplinary work, societal projects, reflective essays, and digital products will become essential components of students' professional identity. Universities can encourage this by treating such

outputs not as by-products but as integral parts of the curriculum. In doing so, the university becomes not only a place where knowledge is transmitted but also a place where students build a professional narrative that is legible to the labour market.

Finally, changes in the labour market also imply that universities must reconsider their institutional identity. The central question is whether universities are willing to reorganise their pedagogy, organisational forms, and collaborative relationships in such a way that they genuinely function as learning environments for a hybrid world. This requires bridging tradition and innovation: maintaining the academic quality that distinguishes universities while recognising that the role of knowledge changes when technology increasingly assumes its executable dimension.

Universities must therefore prepare for a future in which work will involve hybrid profiles in which the whole human being is valued more fully than before, rather than merely in terms of functional productivity alone. In this emerging era, technical expertise and human qualities are becoming inseparably intertwined. Digital literacy, creativity, resilience, robustness, ethical awareness, and the capacity for reflection constitute the core competencies that must be cultivated and cherished both at the individual and institutional level.

INTERMEZZO:

A Week in the Life of Students in the Age of AI

A Week in the Life of Isabel

On Monday morning, Isabel is in a lecture hall for the course *Algorithmic Rule of Law*. She is studying a case in which an AI system predicts the likelihood of recidivism. Her lecturer, together with a computer scientist and a philosopher, discusses both the technical functioning of the model and its legal and ethical implications. Isabel and her fellow students practise questioning the outcomes: may a judge rely blindly on such an algorithm, or must human judgment always remain decisive?

On Tuesday, she has a project day in collaboration with computer science students. Together they work on a prototype of a system that can analyse rental disputes more quickly. Isabel's role is to examine whether the system is legally sound and whether it carries risks of discrimination. This interdisciplinary collaboration has become self-evident: lawyers, technologists, and ethicists learn from day one to build solutions together.

On Wednesday, Isabel follows an online module in *AI & Human Rights*, as part of her international minor. She works digitally with students from India and South Africa. While they describe the role of AI in promoting digital inclusion in their countries, Isabel explains how the EU AI Act attempts to protect civil rights. She notices how different the perspectives are: whereas privacy and transparency are central in Europe, accessibility dominates the debate in India and inequality is a primary concern in South Africa.

On Thursday, she attends a student forum organised in cooperation with the municipality of Utrecht. Citizens and policymakers discuss the introduction of a new AI system for traffic safety. Isabel sits on a panel on behalf of the university and realises how important it is that students not only possess knowledge but also learn to contribute to societal debates.

Friday is devoted to the future. At the university's career centre, she speaks with a coach about possible career paths. She knows that she will

not have one profession for life but rather a sequence of roles in which she will continually retrain herself. Perhaps she will start as a legal AI analyst at a court, later work for an NGO that audits algorithms for discrimination, and perhaps eventually join an international organisation in The Hague.

During the weekend she works on a personal blog in which she reflects on the role of AI in the legal system. She has learned that her voice matters – not only as a student but also as a citizen. The university encourages her to use that voice, because AI affects society as a whole.

A Week in the Life of Lucas

For Lucas, Monday begins with a practical session in *AI in Diagnostics*. Together with his group he analyses MRI scans that have been pre-processed by an AI system. The algorithm highlights suspicious abnormalities, but Lucas and his fellow students learn that they must always perform the final check: the system may support them, but responsibility remains with the physician. His lecturer repeatedly emphasises: "AI does not make the doctor – it makes you, as a doctor, sharper."

On Tuesday, Lucas attends an interdisciplinary session with students of psychology and ethics. They discuss an AI application that can detect burnout at an early stage through data from wearables. The question arises: may such data from employees be used? What if an employer uses it when hiring staff? Lucas experiences that doctors in 2030 require not only medical knowledge but also insight into legal and ethical frameworks.

Wednesday centres on international collaboration. In a virtual classroom, Lucas works with students from Japan and Brazil. They compare how their healthcare systems use AI: Japan focuses on care robots due to population ageing, while Brazil primarily uses AI to distribute scarce healthcare resources in rural areas. Lucas thus learns not only about medical applications but also about how culture and society shape forms of AI.

On Thursday, he undertakes a clinical placement at the hospital. There he observes how an AI system supports triage in the emergency depart-

ment. The system helps determine priority among incoming patients, but Lucas also notices its limitations: the algorithm estimates risks based on averages, whereas physicians pay attention to the unique context of each individual. This tension between efficiency and humanity becomes a recurring learning point.

On Friday, Lucas attends a workshop titled *Lifelong Learning in Healthcare*. He knows that his profession will change profoundly: some diagnostic tasks will be fully taken over by AI, while physicians will focus more on communication, guidance, and ethical decision-making. The university therefore teaches him not only facts but also how to continuously retrain himself in the future.

During the weekend Lucas participates in a hackathon organised by a student association and a startup. Together they build a prototype of an AI assistant that helps chronically ill patients manage their medication more effectively. For Lucas, this feels like the perfect combination: applying his medical knowledge in an innovative and practical setting.

A Shared Week for Isabel and Lucas in 2030

Monday begins with an interdisciplinary lecture at Utrecht University: *AI, Ethics, and Society*. Isabel and Lucas sit next to each other. The lecturer discusses a case in which an AI system influences both legal and medical decisions: a hospital wants to use an algorithm to determine priority among patients with complex conditions, but there are legal risks concerning liability and privacy. Isabel analyses the legal frameworks and patients' rights, while Lucas considers the medical validity and practical feasibility of the system. Together they learn that technology never exists in isolation from context: it combines science, ethics, and regulation.

On Tuesday, they collaborate on a project on AI and healthcare policy. Lucas contributes clinical knowledge, while Isabel focuses on legal and ethical evaluation. Their team investigates whether AI-driven triage is fair for all population groups. They discover that an algorithm using historical medical data may unintentionally reproduce discrimination. Their solution

combines technical adjustments with policy proposals and legal safeguards.

On Wednesday, they participate in an international online session. Lucas and Isabel meet students from India and South Africa. Together they compare how AI is applied in legal systems and healthcare in different countries. They observe that the European focus on rights and transparency is distinctive, while other countries place more emphasis on accessibility or efficiency. Through this collaboration they develop a global perspective on AI and learn to apply intercultural nuance in their analyses.

On Thursday, Isabel and Lucas attend a citywide AI public forum. Citizens, policymakers, and students discuss a new AI system that provides health advice and legal support in the city. Isabel explains which legal safeguards are necessary, while Lucas demonstrates how medical protocols are integrated. They notice how their combined expertise enriches the debate and builds public trust.

Friday is devoted to innovation: they participate in a hackathon organised by the university and a startup. Their project is an AI assistant that helps patients understand medical documents while simultaneously informing them about their rights. Lucas ensures that the medical information is accurate, while Isabel verifies that privacy and legal frameworks are respected. The result is a prototype that is both practically useful and ethically responsible.

During the weekend Isabel and Lucas reflect together on their experiences in an online portfolio. They write about what they have learned regarding collaboration across disciplines, the impact of AI on individuals and society, and the importance of approaching technology both critically and creatively.

In this scenario, Isabel and Lucas demonstrate that the future of students in 2030 will be interdisciplinary, international, and socially engaged. Students do not work solely within their own fields but learn from one another how AI influences society, and how humanity, ethics, and law intersect with technology. In their collaboration a balance emerges: Lucas

contributes practical medical expertise, while Isabel provides legal and ethical frameworks. Together they develop solutions that are both innovative and responsible. In this way, students are prepared for a world in which AI is not merely a tool but a crucial factor in decision-making, policy formation, and everyday interaction. They become professionals – and citizens – capable of making sound choices in a society in which technology and humanity remain in constant dialogue.

7
Epilogue

The university is among the oldest institutions of Western civilisation. While kingdoms collapsed and ideologies evaporated, it endured as a place where knowledge about the interconnectedness of all things and all people in the world – as well as about order within the human being – was gathered and transmitted. In the Middle Ages, it emerged from the coming together of teachers and students in cities such as Bologna and Paris. Theology, law, and medicine were the disciplines that placed emphasis on the study of the relationship between human beings and their Creator – as articulated in Scripture and in the works of earlier Church Fathers – on the just ordering of society, and on the understanding of the human body.

During the Renaissance, a humanistic reverence for original sources was added to this tradition: study proceeded from the conviction that careful reading, philological precision, and morality were essential to intellectual growth. In the early modern period, universities became intertwined with the emerging nation-states, functioning both as carriers of scientific progress and as instruments of state formation. Hugo Grotius laid the foundation for a secular legal order, and medical faculties made the transition to empirical observation and anatomical instruction. In the nineteenth century, Wilhelm von Humboldt formulated the ideal of *Bildung*, in which research and teaching were inseparably connected and personal formation stood at the centre. Around the same time, Cardinal John Henry Newman emphasised that the university should not be a vocational school,

but rather a place for intellectual and moral formation, where knowledge possessed intrinsic value and where students learned to distinguish, judge, and think critically.

In the twentieth century, the character of the university changed once again. The expansion that followed the Second World War made higher education accessible to broad segments of the population. Movements for democratisation, visible in the student movements and university occupations of 1968, such as the Maagdenhuisbezetting in the Netherlands, demanded greater participation and openness. At the same time, the university increasingly became an instrument of economic and political forces: technological innovation, military applications, and later economic output came to occupy a central position. As mentioned earlier, from the 1980s onwards, a managerial turn began to take hold. Universities were governed according to principles of efficiency and accountability; students became customers and educational programmes became products. Rectors increasingly functioned as managers rather than as intellectual leaders.

In the Netherlands, the university developed along its own trajectory. With the founding of the University of Leiden in 1575 – closely intertwined with state formation and religious conflict – an academic tradition emerged that was later expanded with Groningen, Utrecht, Franeker, and Harderwijk, each strongly rooted in its region. In the nineteenth century, centralisation under King William I produced a national system, while at the beginning of the twentieth century, new universities in Nijmegen, Tilburg, and Amsterdam reflected and reinforced the pillarised structure of society. The same holds for Maastricht University, founded only in 1976, and what would become the Open University, established in 1984. These universities formed

part of the emancipation of social groups that for centuries had played a secondary role in the Low Countries. The twentieth century brought further diversification: technical universities were founded in Delft, Eindhoven, and Twente, while economic institutions emerged in Rotterdam and Tilburg. As in other European countries, higher education in the Netherlands became increasingly accessible to broader layers of the population during the 1960s. Alongside institutional expansion in scale, there was also democratisation and internationalisation. The Maagdenhuis occupation of 1969 became a symbol of student participation.

In the decades that followed, other factors shaped the appearance of the university. Across Europe, as a consequence of a more business-focused reorientation, an efficiency-driven mindset and performance-based funding became dominant. In the twenty-first century, digitalisation and internationalisation accelerated these developments further, but also generated new tensions surrounding accessibility, language policy, and the societal role of universities. The COVID-19 pandemic accelerated these issues. Universities abruptly switched to online teaching, yet at the same time observed that students were confronted with isolation and mental health challenges, while lecturers struggled under heavy workloads. These were – and remain – worrying developments.

Yet until recently there was one constant. The university successfully retained its patent on knowledge and thus maintained its monopoly position in the production of knowledge. The university determined which knowledge acquired authority, which methods were considered legitimate for the practice of science, and which elites were admitted to appropriate scientific

knowledge and to transmit it in whatever form. Knowledge implied power, and that power was channelled, almost exclusively, through the university.

Today, however, this position of the university is under unprecedented pressure. The fundamental shift in the way knowledge is produced can be compared to a tsunami under which the university risks being overwhelmed.

Where knowledge was once scarce and laboriously gathered by people exclusively within universities, it is now generated in abundance and at great speed by algorithms – both within and especially outside the university. For the first time in history, the ability to produce knowledge is no longer exclusively human; it is no longer reserved to human beings alone. Systems such as language models and AI-driven research tools generate texts, designs, scientific hypotheses, and even new proofs. Where researchers once conducted experiments for years in order to uncover biological structures, AI now generates models within seconds that open doors to new therapies. The academically trained human being is no longer the sole actor in the field of knowledge production: the university now shares this terrain with a non-human co-actor.

Fundamental questions thus arise. If AI is capable of producing knowledge, why should we continue to place exclusive trust in the expertise of academics and thus in the authority of the university as an exclusive centre of knowledge? Who, for instance, is the author of a text or hypothesis when AI co-writes it? What does scientific authority mean when an algorithm produces analyses that are as sharp – or even more accessible – than those of an expert working at a university? Because artificial intelligence generates connections, writes texts, formulates

hypotheses, and performs calculations that were once reserved for those who shaped their lives within universities, the monopoly of the university over knowledge production has been radically broken. For universities, the words spoken by Jesus to the Pharisee and Jewish leader Nicodemus now suddenly apply: "Do not marvel that I said to you, 'You must be born again'" (John 3:7).

The university does so when, in this age of informational abundance, it directs itself not only towards producing reliable knowledge, but also towards developing means by which insight grows into how valid knowledge arises and how its validity should be assessed. In doing so, universities give contemporary form to the gatekeeping function that has traditionally characterised them: no longer based on exclusive access to knowledge, but on the capacity to distinguish – within an abundance of data and AI-generated output – what is reliable and human-oriented, and what sustains both individual and collective freedom. In a time in which synthetic text, images, and analysis can scarcely be distinguished from human production, the task of the university shifts towards safeguarding epistemic conditions and seeking answers to questions such as: How do we teach students and professionals to separate the wheat from the chaff in produced knowledge? What is scientific and what is merely plausible argumentation? What bias resides in the algorithm? Who determines what counts as "reliable"? Which values and which conceptions of the human being are embedded in our epistemic systems? To what extent are virtues such as justice, moderation, or the intrinsic dignity of every human being – regardless of origin or education – accounted for within an algorithm?

Good answers to such questions require *otium*: leisure, stillness, reflection, and reflexive space. The university must therefore guarantee this space, embody it, and invite others into it. In a world in which knowledge is produced ever more rapidly with the aid of AI, it is necessary that the university dares to do precisely the opposite: to slow down. It must create moments of reflection in which intentions and consequences are critically considered, and in which the impact of knowledge on creation, humanity, and the various sectors of society is contemplated. In this way, the university becomes not merely a factory of insights but an ethical laboratory in which students and researchers learn that knowledge is never value-neutral. While AI rapidly establishes connections and generates hypotheses, it lacks conscience, historical awareness, and a moral compass. Precisely for that reason a new task arises for the university: to build a bridge between algorithm and conscience, thereby creating space for meta-knowledge – the insight into what constitutes valuable knowledge and which moral choices are associated with the multiplication of knowledge.

A frequently overlooked but essential dimension of the university's gatekeeping function is that it also makes visible how scientific insights shape our conception of the human being. For centuries, successive conceptions of humanity have been evaluated within the academy: Is the human being a free, rational, and social creature, as Aristotle postulated? Is the human being determined by less favourable circumstances but nevertheless sufficiently free to be held responsible for thought and action, as Augustine assumed? Do humans distinguish themselves from animals because they think, as Descartes suggested? Time and again, universities reconsider and recalibrate conceptions of the

human phenomenon, and it is the task of the university to place critical annotations alongside conceptions of humanity that can be traced back to insights derived from developments in AI.

AI now leads to the interpretation of the human being as an algorithmic entity. The question is not only whether this is accurate, but also whether matters such as freedom, consciousness, responsibility, or conscience are adequately accounted for in this conception in light of earlier anthropologies. Precisely in the reflexive space that the university offers, it becomes visible that conceptions of humanity are never neutral. Therefore, the university must continue to investigate how conceptions of humanity arise, which among them are desirable, and what understanding of human existence we as a society wish to cherish. Which technologies resonate within them – and is that desirable? In this way, the university safeguards not only the quality of knowledge but also the conception of humanity that is presupposed on the basis of new developments in science.

From this follows that leaders within universities are required to possess qualities other than mere efficiency or the ability to manage the university's reputation effectively. Traditional leadership models have been strongly influenced by New Public Management thinking. This approach emerged in the 1980s in connection with the neoliberal policies of governments led by Ronald Reagan and Margaret Thatcher, in which market mechanisms, efficiency, and performance management were central. This political context legitimised the application of business-like management principles within the public sector and formed an important breeding ground for the institutionalisation of New Public Management. As a result, those who developed leadership models long navigated between the model of transactional lead-

ership – focused on control, risk management, an efficiency-driven mindset, and accountability – and that of transformational leadership. In the latter model, emphasis was placed on inspiration and change, yet it was ultimately often employed as a means of increasing effectiveness and productivity. What is needed today are leaders within universities who dare to assume responsibility for the necessary slowing down in a world in which machines understand faster than we ourselves do. Leaders who help the university reinvent itself as a reflexive space in which the consequences of technological acceleration are critically examined.

AI may be the driving force that rewrites the foundations of knowledge production, but it is the task of the university to provide direction, create meaning, and safeguard human dignity. Only then can it remain faithful, in the age of AI, to its deepest calling: not merely a factory of knowledge, but a community of wisdom and critical reflection. This requires a new interpretation of academic leadership, one in which the manager also dares to be a "monk": someone who protects *otium* against the omnipresent pressure of *negotium*. Concretely, this means that incubators must be created in which ethicists, jurists, social scientists, engineers, and scholars in the humanities engage in dialogue with one another about the implications of algorithmic governance. Academic and reflective leadership are necessary to create and protect such spaces.

And the students? They are formed in a world in which permanent digitalisation, informational abundance, and algorithmic governance shape their lives. They are familiar with online learning, flexibility, and technological tools, yet at the same time they seek orientation, meaning, and direction in a time in which AI

increasingly takes over cognitive tasks. They may expect from the university not only high-quality knowledge and practical skills, but also an environment in which they can doubt, change perspectives, make mistakes, and practise moral, social, and political judgment. At the same time, the age of AI demands more from them than technical competence: it requires a developed moral compass, character formation, resilience, communicative ability, and critical judgment – competences once called "soft," but which now belong to the hard core of academic formation. And these require slowing down in life in order to, for example, refine one's moral compass.

For that reason, the university must once again become an intellectual and reflexive space: a place where students debate, argue, think together; reflect and jointly search for solutions to complex technological and societal challenges. A mission-driven yet contemplative academy combines social engagement with critical distance: it contributes to major transitions while at the same time remaining the place where the foundations of those transitions are questioned – where it is asked who benefits, who remains invisible, and which conception of humanity underlies policy and technology. In this way, the university shapes responsible citizens and co-architects of a society in which human dignity, freedom, and critical thinking remain central, even in the age of AI.

That the university must simultaneously be a place of academic and professional formation and a reflexive space is, in the present age of AI, not a luxury but a necessity. On 4 September 2025, President Trump met in the White House with leaders of the largest American technology companies. It became clear that the United States intends to remain the undisputed global leader

in AI. The rhetoric promised economic prosperity, innovation, and job creation, yet conspicuously absent were critical questions concerning the ethical limits of this technology and the vulnerability of the conception of humanity affected by it.

At the global level, this meeting reveals deep fault lines. While the United States primarily focuses on economic dominance and innovation, other power blocs emphasise different priorities. In Europe, the debate surrounding the EU AI Act and strict regulation takes centre stage: technological progress is to be coupled with the protection of citizens, data rights, and ethical norms. China, by contrast, views AI as a key instrument of state power, social control, and economic planning, and integrates the technology explicitly into party-political objectives. Between these poles tensions are growing: the American trajectory risks intensifying a hyper-competitive race for supremacy, while international agreements concerning ethics, safety, and limits prove difficult to achieve.

It is within universities that these developments become subjects of discussion. It is within universities that the conceptions of humanity implicitly present in AI strategies are made explicit and assessed with regard to whether every human being counts and whether equal intrinsic dignity is attributed to each person. Through research conducted at universities it becomes possible to anticipate risks such as algorithmic discrimination, loss of autonomy, and the erosion of public institutions. Universities may perhaps even become countervailing forces: institutions that defend public values in a technological field strongly dominated by private interests. Precisely because they possess the capacity – through multidisciplinary collaboration – to build connections between government, industry, healthcare, educa-

tion, and the justice system, they can contribute to safeguarding public values and the common good.

We conclude. Universities must incorporate slowing down in the form of a reflexive space – physical, curricular, and internal. Within such spaces, developments can be ethically evaluated and universities can supplement the reductionist conception of humanity that often dominates commercial technological ecosystems with enriching critical reflections. In doing so, universities gradually build what Floridi (2017) calls an ethical infrastructure: a normative structure that precedes innovation and provides direction for the manner in which technology is embedded in society.

In an era in which AI continuously accelerates the pace of knowledge production, the university must create the space in which slowing down, judgment, and critical deliberation remain possible. Where algorithms generalise, it is its task to restore nuance; where optimisation becomes the dominant logic, it must confront this logic with questions of justice, responsibility, and human dignity. May efficiency marginalise human dignity? What place does human fallibility have in automated decision-making? How can we prevent technology from reinforcing inequalities of power – and how might it instead promote solidarity and the good of all?

Reflection is therefore not the final stage of academic activity but its beginning: the condition without which no sustainable knowledge, no responsible technology, and no humane future are possible. Only in this way can the university fulfil its enduring vocation: not merely to provide society with knowledge, but with judgment, wisdom, and the capacity to shape the future in freedom.

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About the authors

Emile Aarts (1955) was educated as a mathematician and physicist in Nijmegen and Groningen. From 1982 to 2012, he worked at Philips Research in various positions, the last of which was Chief Scientific Officer. From 2012 to 2015, he was Dean of the Faculty of Mathematics and Computer Science at Eindhoven University of Technology. From 2015 to 2019, he was Rector Magnificus of Tilburg University. His scholarly work comprises more than 200 publications and more than 20 books in various fields including artificial intelligence. He currently works as a commissioner, advisor, and board member.

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What will happen to the university when knowledge is no longer scarce, but ubiquitously available and even produced by machines? In *How Universities Mirror Society*, Paul van Geest, Emile Aarts, and Ronald de Jong show how artificial intelligence reaches into the very heart of academia, thus impacting education, research, governance, and our understanding of what it means to be human.

This book is a journey taking the reader from the medieval university to the contemporary campus, demonstrating how universities have continuously been challenged to respond to major societal shifts. However, the current AI revolution is different. AI is not merely a tool; it is transforming the very conditions under which knowledge is created, evaluated, and trusted. In doing so, it places the university's traditional role as gatekeeper under increasing existential pressure.

The authors provide a clear analysis of AI as a system technology and discuss its implications for scientific integrity, the transformation of academia, and the future of work at large. At the same time, they pose a fundamental question: how will AI-technologies shape our conception of humankind and how does this inflict the university as a space for reflection and critical inquiry?

This book is a powerful plea for a university that strives not only to be faster and more efficient, but above all wiser, more careful, and more humane.

"The rise of artificial intelligence confronts leaders not only with technological challenges, but above all with moral questions. This book demonstrates that the university is pre-eminently the place where knowledge, values, and responsibility must remain interconnected. It constitutes a powerful plea for a values-driven approach to science and society, in which our conception of humanity and moral compass should be decisive for academic leaders."

Prof. Dr Jan Peter Balkenende, Minister of State, former Prime Minister, and Emeritus Professor of Governance, Institutions and Internationalisation at Erasmus University Rotterdam.

"The authors have succeeded in presenting a clear and compelling account of the ways in which artificial intelligence is set to influence the academic world in relation to society and our conception of humankind."

Prof. Dr Kim Putters, President of the Dutch Social and Economic Council (SER) and University Professor of Broad Prosperity at Tilburg University.

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