Erasmus University Rotterdam

110 YEARS
Making Minds Matter

Erasmus Centre for Data Analytics

Data, AI and Immersive technology

Impact & Engagement Report 2023-2024

convergence

Societal Impact of AI

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Welcome

Welcome to the Erasmus Data, AI, and Immersive Tech Impact & Engagement Report for 2023-2024. In the following pages, you'll find a comprehensive range of impactful initiatives originating from Erasmus University Rotterdam (EUR) and extending throughout the Convergence Alliance, which includes EUR, Erasmus MC, and TU Delft.

This report sheds light on diverse data, AI, and immersive technology initiatives with applications spanning various industries, including education, healthcare, business, law, art, and culture. What binds these endeavours is their dedication to multidisciplinary collaboration and a human-centric approach. These projects underscore collaborations between academia, both profit and public sectors of the industry, and emerging data talent. Furthermore, all initiatives are driven by innovation, embodying an entrepreneurial spirit, and often embracing an experimental character, with a strong emphasis on application and hands-on development.

Collaboration is the cornerstone of our philosophy – a closely-knit community of experts in data, AI, and immersive tech who share knowledge and extend their influence beyond their individual domains. This collaborative multidisciplinary approach positions the Erasmus University Rotterdam as a valuable partner for our stakeholders.

This report underscores the symbiotic relationship between EUR's impact and engagement efforts, yielding mutual benefits through a multi-layered approach that spans short-term successes and long-term strategies. However, it is important to note that this report highlights a selection of data and AI-related projects and activities at the university and does not encompass the entirety of our efforts in this domain.

Our gratitude goes out to the dedicated community members whose contributions have made this report informative and personally resonant. Their involvement exemplifies a shared mission. Together, we will harness the power of data, AI, and immersive tech for positive change, driving societal impact and engagement.

With anticipation for the chapters ahead,

Marta Stachowiak - de Wit
Head of Marketing & Communications at
Erasmus Centre for Data Analytics

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1/ Data and Artificial Intelligence at Erasmus University Rotterdam

by Professor Ed Brinksma
Chairman of the board
at Erasmus University
Rotterdam

Introduction

The influential British magazine The Economist compares Artificial Intelligence to other great technological innovations that have profoundly changed our societies on a global scale, such as the advent of steam power, which caused the industrial revolution, and electrification a century later, which provided much of the foundation of the modern age. Once effectively absorbed, such new technologies lead to great improvements in productivity that disrupt existing ways of working, enable completely new ways of tackling economic and societal challenges, and ultimately reshape our societies and cultures.

As someone that has a scientific background in computer science, I sometimes get the feeling that AI is such a hot and attractive label that everything that was formerly simply known as automation is nowadays relabelled as AI. Being part of this exciting technological wave that is making such inroads sells better. But not always. In the popular media the meaning of algorithm, a long existing central concept in the field of programming, is used in the much more specific meaning of the reasoning principle behind AI-supported decision making, especially in botched applications. 'The Algorithm' as the beast, the abstract, cold, impersonal decision maker that gets it wrong. It is ironical that such failures typically are not of algorithmic nature, but due to corrupted, incomplete, or biased data that drive the decision making.

The current developments of AI build upon a long history of prior technological developments, such as the continuous improvement of hardware and software, the internet, search engines, learning algorithms etc., etc. But it is fair to say that the more recent refinements of learning strategies in combination with possibility to gather and access almost unlimited amounts of data, allowing statistical analysis and training of learning algorithms on an unprecedented scale, are now promising huge productivity improvements in many fields where high-quality data can be made available. The massive scraping of data that go into the so-called Large Language Models have brought us generic tools, such as the much-discussed ChatGPT and its successors. They give us the automated capacity to produce stylistically robust texts in all languages with sufficient source data. Although the reliability of the auto-generated content is still an issue, the availability of such automated copywriters is, of course, very useful in many applications. And at the same time poses great challenges. For example, for educators that want to avoid plagiarism in the work of their students.

Clearly, these developments must be addressed by all societal stakeholders in one way or another, as they have the potential to affect all of society profoundly. For EUR the revolution in AI and Data Science influences our activities in more than one way:

1. It affects our methods of teaching and learning
2. It affects the way in which we conduct research
3. It is a very important subject of in our research portfolio
4. It is a very important ingredient in our strategic mission that focusses on (positive) societal impact.

We do not work in isolation but in networks, such as the Convergence Alliance. Here we collaborate intensively with Erasmus Medical Center and Delft University of Technology and bring together our expertise in social sciences and humanities, the medical sciences and natural science and engineering to address major societal challenges. Although EUR has does not have a science and technology section, it does have relevant expertise in statistics and data science. Given its excellence in the SSH domain EUR makes a big difference by studying AI through that lens: the social, economic, legal, organizational, ethical, and philosophical perspectives on AI and data science. And, of course, the medical perspective in collaboration Erasmus MC, with whom we share our medical school.

"Because of its strength in social sciences, humanities and medicine EUR can play a unique role in the societal application of AI and data science in these domains."

Professor Ed Brinksma Chairman of the board at Erasmus University Rotterdam

Another main asset of EUR is the Erasmus Centre for Data Analytics (ECDA) which fosters experimentation and innovation in this area through platforms like the Erasmus Data Collaboratory. It stimulates collaboration within EUR - such as with AiPact, ErasmusX, Erasmus UPT, and Erasmus Q Intelligence - and is a House of AI of the Convergence Alliance. But also engages external stakeholders for societal impact, helping them with education, experimentation and innovations with AI and data science.

In this way EUR has realized a rich and varied portfolio of activities in de area of AI and data. It is a leading institution in the study of these technologies, especially in the context of social sciences and humanities. I hope that with this report you can learn about our many exciting endeavours in this very important and exciting field and feel invited to collaborate with us on the many promises and challenges that it holds for our future.

Happy reading!

by Professor Annelien Bredenoord
Rector Magnificus at the Erasmus University Rotterdam

1.1 The Importance of ethical AI guidelines for our university

At Erasmus University Rotterdam, we actively engage with significant societal challenges across various schools and domains. We embrace our responsibility to address these challenges. This commitment is especially evident in our approach to the rapid advancements and utilisation of algorithms, as well as the broader development of Artificial Intelligence (AI).

With substantial capabilities come corresponding responsibilities, especially for institutions like universities. We recognise the need to get involved early in the technological development process. It's imperative for us to actively participate as a community, extending beyond philosophers and ethicists to encompass our entire collective.

Given the real-time nature of technological evolution, we advocate for real-time ethics research that aligns with the pace of development. Our ethical considerations must be ingrained within the core of AI and algorithmic progress, not confined to an isolated ivory tower. We advocate for the integration of empirical research and active public involvement in shaping AI through collaborative efforts.

"Ethics should not follow data & AI, they should walk together in parallel"

Our focus is not solely on the ethical acceptability of algorithms, but also on the accuracy and quality of the questions AI seeks to address. We aim to make AI transparent and comprehensible rather than shrouded in mystery. Equally important, we question how AI outcomes positively impact the individuals whose data is used; are principles of justice woven into the fabric of these technological advancements?

In our collaborations within the EUR, both public and private, we seek to contribute as a reliable partner. Our commitment is to pose and address complex, intricate questions, thereby transforming AI into trustworthy AI. These are the questions often overlooked in the haste of progress and the eagerness to disrupt.

Discussing ethics shouldn't be considered as a scholarly diversion. Rather, it should be a collective duty to raise this imperative, one that extends beyond ethicists to include the very developers of these technologies.

"Ethics is the starting point of any responsible innovation"

Navigating these challenges and inquiries necessitates internal and external dialogues, fuelled by research and driven by an AI community. This is why the AI@EUR programme is of such great importance to us. I thus extend an invitation to all those who are engaged in AI research and support at the EUR, including our external parties and stakeholders, to join us in this endeavour.

Annelien Bredenoord, is a professor and former member of the Dutch Senate, supervisory authority, and director. She operates at the intersection of healthcare, technology, innovation, ethics, and politics. She led the Department of Medical Humanities at UMC Utrecht. Her research group focuses on the ethical and social implications of new and often contentious technology, such as Artificial Intelligence, Big Data, biobanks, regenerative medicine, tissue engineering, stem cell research, and genetics (such as CRISPR/Cas) in reproductive technologies.

1.2 The AI@EUR Programme

About
EUR's Artificial Intelligence community is rapidly expanding, ushering in new AI studies and projects. To promote synergies, connections, and dialogues among academics, a thriving AI, Data & Digitalisation community is essential. The AI@EUR programme aims to fuel EUR's growth in these domains while addressing ethics, trustworthiness, and responsible use. Its mission is to address questions arising from within the community whilst co-developing essential AI guidelines and tools.

> It's great to see that EUR is actively embracing Trustworthy AI instead of awaiting the AI Act's enactment. This approach fosters internal trustworthiness and underscores EUR's strong commitment to ethics,

Henriette Dietz
Legal Counsel at Erasmus University Rotterdam

A team, including EUR data protection officers, programme and marketing managers from the Erasmus Centre for Data Analytics (ECDA), along with internal and external AI (ethics) experts, leads the programme. They are be supported by AiPact and ambassadors representing various faculties.

Within the AI@EUR programme, the team aims to:

1. Identify and connect all researchers and (support) staff engaged in AI at EUR to enhance awareness of AI-related activities through collaborative communication and events.
2. Foster dialogue on ethical and trustworthy AI, its implications for Erasmus University Rotterdam, and relevant legislation, such as EU regulations, for stakeholders.
3. Elevate EUR's AI maturity and capabilities.
4. Provide AI support and guidelines for algorithms used at EUR.
5. Keep faculty members and staff informed about AI legislation developments, including those from the EU.

Laying the Foundation.
Propelled by fast-paced developments and new legislation, notably from the EU, the team is actively facilitating dialogues with EUR researchers and staff around ethical, trustworthy, and responsible AI usage.

On May 11, the inaugural AI@EUR event, titled "Ethics & Data Ethics," explored the potentials and risks of recent AI advancements on ethical considerations, daily practices, and ethical dilemmas. Three experts: Prof. Dr. Muel Kaptein (RSM), Joris Krijger (Volksbank), and Prof. Dr. Hub Zwart (ESPhil) delved into AI from a human-centred standpoint. They examined ethical dilemmas arising from AI and provided us with a glimpse into possible future implications for individuals, organisations, and legislation.

The event serves as a starting point for a series of in-depth events and working sessions. These sessions invite EUR faculty, staff, and external partners to reflect on challenges, opportunities, and limitations tied to the development and application of algorithms through the lens of 'Erasmian Values'. The sessions in 2023 will capture insights from the latest research for future reference.

> Ethics isn't about ticking boxes; it's a collaborative endeavour. With that in mind, we work closely together with AI@EUR ambassadors, AI and ethics experts, AI support staff, and students through sessions, inviting experts to provide input and feedback

Bo Schijven
Privacy Officer at Erasmus University Rotterdam

Growing AI and Data Capabilities and Providing Guidelines.
One of the AI@EUR programme's pillars revolves around aiding EUR in adopting, utilising, and developing trustworthy AI. The programme's findings ensure AI techniques adhere to laws, regulations, ethical principles, and EUR's values. Models based on research conducted by EUR academics, such as the maturity model developed by Tamara Thuis and Joris Krijger, will help to determine EUR's baseline and subsequent steps.

To enhance outcomes, the programme collaborates with other universities and supportive organisations in the domain, like SURF. It learns from best practices, including those of the Ministry of Internal Affairs, the Volksbank, and the University Utrecht Data School. The latter employs the Value Sensitive Design method to assess AI projects.

Mapping the AI@EUR Community.
EUR researchers focused on AI, algorithms, or those working with AI, as well as EU support staff engaged in AI or algorithms, are encouraged to join the AI@EUR community. This way, the programme team can incorporate them into the AI@EUR mapping dashboard, an effective tool to connect colleagues and facilitate collaboration.

To participate in the AI@EUR programme, please send an email to malkus@rsm.nl and marlon.domingus@eur.nl to inquire about upcoming events, to stachowiak@rsm.nl to inquire about communications materials, and to Henriette.dietz@eur.nl or bo.schijven@essb.nl to inquire about anything related to Trustworthy AI.

1.3 EUR Smart Campus Project

About

The project's goal is to demonstrate that data, analytics, and immersive visualisation tools can create awareness and support decision-making in the context of campus user wellbeing, campus sustainability, and operational excellence concerning campus facilities. In doing so, it contributes to creating a smarter campus. ECDA leads this initiative with Erasmus Real Estate & Facilities (RE&F), Erasmus Digitalisation & Information Services (EDIS), and the EUR Data Privacy Officers. Students are involved through data analytics projects and student-driven initiatives like the Erasmus sustainability hub. Our academic experts ensure precise experimental design and execution for generating academic insights. External tech partners and startups from our ecosystem are integral to several experiments.

> "The project's strength lies in the active involvement of the campus community, including students, researchers, and professional support staff, in ideation, experimentation, and findings presentation. This unique approach involves collaboration on tangible challenges aimed at enhancing our campus's sustainability and creating a more enjoyable environment for work and study."

Dr. Marcel van Oosterhout
Project Lead, Deputy Executive Director at Erasmus Centre for Data Analytics

Within the project:

- Our campus serves as a testbed for innovation projects that contribute towards the wellbeing of campus users, sustainability of the campus, operations excellence, and optimal and durable use of campus facilities (Our campus as living lab).
- We already have two student projects on visualization tools (maquette campus with 3D printer and data coming to live) and the development of insightful and practical Power BI dashboards. That serve as starting points for discussion and guidelines within the EUR.
- We are using and testing out new sensors (air quality measurement) and tools that for example measure and visualize the use of and crowdedness of study spaces based on Wi-Fi and sensor data.
- Researchers will assess how nudges can impact behaviour in the context of sustainability and well-being.

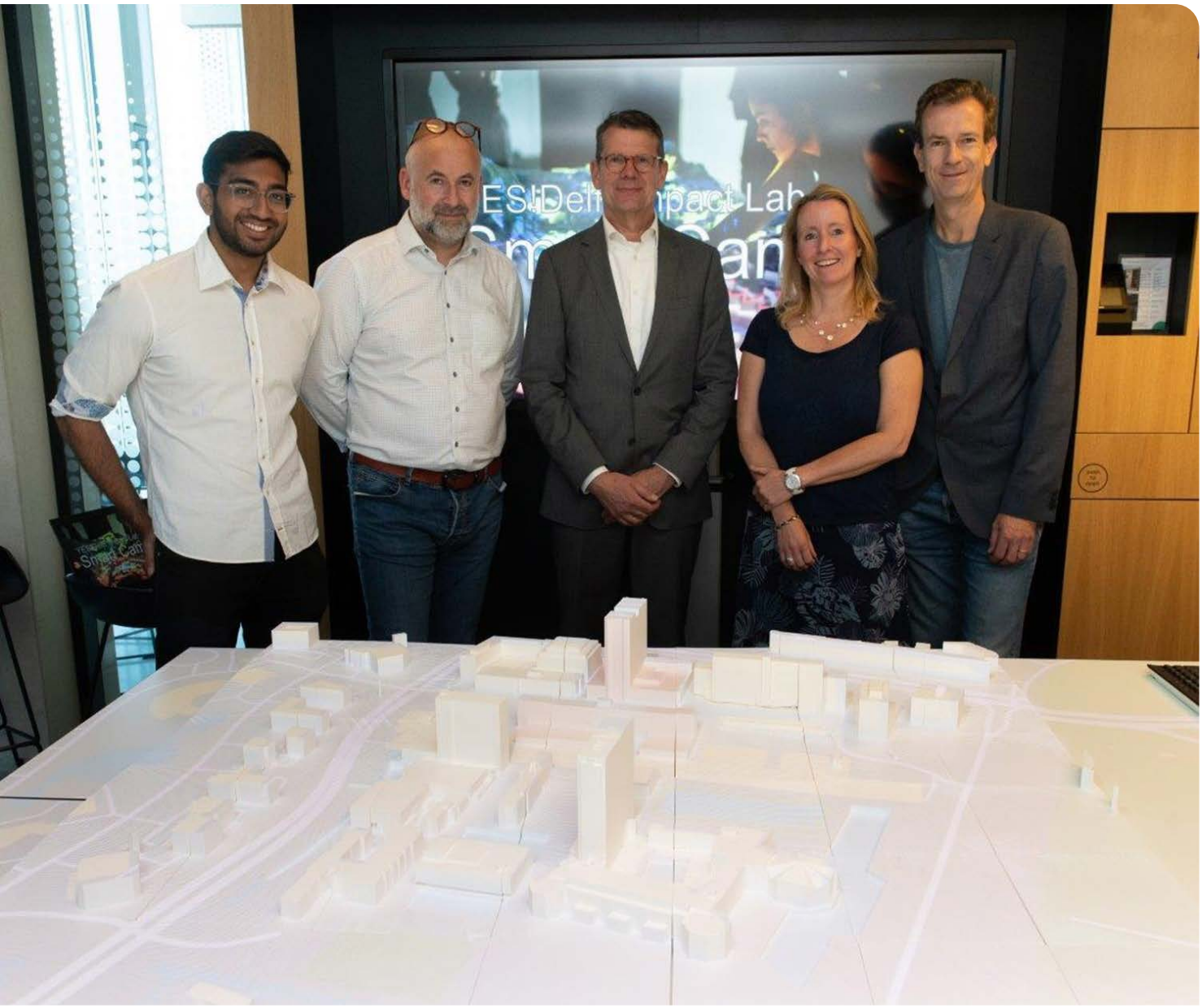
> Together, ECDA and EDIS give shape and content to data-driven working. Through collaborative projects and experiments, EUR gains experience that benefits the education and research processes.

Wout van Wijngaarden
CIO/Director Erasmus Digitalisation & Information Services (EDIS)

Approach

The approach of the project consists of six elements:

1. Identify and solve real problems that are faced by students and Staff at Erasmus Campus Woudestein in the context of operational excellence, wellbeing and/or sustainability.
2. Experiment with new technologies, ways of working and organize POC's. The campus serves as a testbed for (academic) experiments that aim to contribute to one of the key challenges.
3. Learn from the experience. We offer students the opportunity to be part of the pject, gain skills, knowledge, and a network. We also actively facilitate learning from other smart campus and smart building initiatives in the Netherlands and beyond.
4. Share documented findings with internal and external stakeholders, such as City of Rotterdam and the Dutch community of smart campus initiatives among educational institutes. Specifically, we will use different media and visualization tools to share learnings and facilitate engagement of stakeholders.
5. Inspire the community to learn more about how to organize a smart campus by visiting best practices, experimentation, and share learnings via immersive technologies in the Erasmus Data Collaboratory.
6. Finally, we activate campus users by involving them in the project and providing them with insights they can use to continue and scale up initial pilots after the project.




Erasmus Centre for
Data Analytics
ECDA INITIATIVE
Smart Campus
Erasmus University Rotterdam
Make your campus more sustainable with data

2/ Our Data, AI and Immersive Tech Community facilitated by ECDA

by Gerrit Schipper
Executive Director of ECDA

"The impact of AI on society dwarfs its impact on technology. Hence, conducting this research in isolation without involving societal partners and stakeholders is unfeasible. We would become obsolete if we thought otherwise".

Introduction

The Erasmus Centre for Data Analytics (ECDA) was established to help prepare society for a sustainable data-driven future; a future that requires hands-on data-competent talent and applied AI-related research. Skilled talent and dedicated research are key for the responsible use of data and AI, essential for digital transformation, and crucial for addressing the multifaceted societal challenges confronting humanity.

ECDA, originally initiated by the Technology and Operations Management department of the Rotterdam School of Management (RSM) at Erasmus University, holds strategic importance for Erasmus University Rotterdam (EUR) as it enables the university to remain closely linked to the evolution and societal impact of technology, especially in the domains of data analytics and artificial intelligence.

Multidisciplinary collaborations and approaches between the various schools and disciplines at EUR have consistently been a driving force behind ECDA's establishment. By transcending traditional academic or industry structures and topical domains, true societal impact can be achieved. We believe that technological progress should be contextual, driven by a human perspective, and developed with ethics, trustworthiness, and responsible usage in mind.

The Erasmus University Rotterdam is unique in its holistic approach to data, digitalisation, and AI. At ECDA, our Expert Practices combine deep contextual knowledge (e.g., specific application domain expertise, organisational context) with the implementation and improvement of cutting-edge techniques and methodologies in data analytics and AI. The immersive technologies emerging from this endeavour will help to improve human-centred decision-making and thereby contribute to addressing societal and organisational challenges. Our aim is to create the ideal conditions and provide the optimal facilities that are needed to make this happen.

This guiding purpose resonates across all our projects, programmes, and formats. The 'Leadership Challenge with Data Analytics' programme is a fine example of our holistic approach to tackling the societal impact of AI. Faculty members from Erasmus University Rotterdam jointly teach in this programme alongside counterparts from Delft University of Technology, Leiden University, and Erasmus MC. We take pride in its successful execution over multiple editions. An educational track variant has been co-developed and adopted by our partner Surf, for educating faculty members and staff in WO, HO, and MBO institutions in the Netherlands.

The journey shouldn't halt at Erasmus University Rotterdam. The urgent and complex societal challenges of our time necessitate collaboration beyond our university. This involves breaking boundaries between institutes and disciplines to create new perspectives and solutions. Therefore, Erasmus University Rotterdam, Erasmus MC, and TU Delft are unifying their efforts in the Convergence initiative, and ECDA has the privilege to contribute by hosting one of the Convergence Houses-of-AI: The Erasmus Data Collaboratory.

In both research and education, the Convergence Alliance is committed to harnessing the strengths, knowledge, and methodologies of the three institutes to address societal challenges like climate change, sustainability, pressures on the healthcare system, urbanisation, and digitalisation. On these challenges, the Convergence Alliance collaborates with numerous public and private partners in South Holland and beyond. By utilising the region as a live testing ground, the Convergence Alliance is creating a leading research and innovation ecosystem in South Holland with great ambitions and national and international allure.

2.1 The Erasmus Centre for Data Analytics (ECDA)

2.1.1 About

ECDA serves as a flagship centre within Erasmus University Rotterdam (EUR), facilitating applied research and active learning in the domains of AI, data, digitalisation, and making it tangible through immersive technology which encompasses VR and AR and creates captivating digital experiences. This technology intersects with AI, data, and digitalisation by harnessing data-driven insights for personalised interactions, leveraging AI for enhanced realism, and contributing to industrial digital transformation via interactive and data-rich environments. This convergence increases customer engagement, empowers informed decision-making, and drives innovation across sectors.

We concentrate on supporting the development and application of data analytics methods to address real-world challenges. Hence, we partner with both public and private organisations through an extensive partner programme.

Our Belief
We hold the belief that data, algorithms, and AI act as vehicles to bring the necessary changes and transitions required to confront current and future societal challenges and to move closer to achieving objectives like the Sustainable Development Goals (SDGs). We recognise our responsibility to equip our society with emerging talent that is proficient in data and AI – preparing them to navigate the swiftly evolving AI landscape in an effective and thoughtful manner. This approach should contribute to society in a positive and sustainable way.

Our Approach
At ECDA, our hands-on, human-centred approach serves as a central tenet of our programmes and activities. This approach involves working with real and current data sets, along with real individual, organisational, and societal challenges.
This human-centred approach is a critical aspect, and the link between context, strong techniques and society is a direct embodiment of the different schools (rooted in law, sociology, art, business, economics, and healthcare) that together form the Erasmus University Rotterdam and shape the Erasmian values.

We employ the SDG's framework as a guiding principle to drive societal impact through our research and innovation initiatives.

We encourage and facilitate vital debates on AI's design and the ethical, social, and legal considerations surrounding its use and societal impact. We contemplate its influence on aspects such as consumers, employers, workers, and the emerging generation of talent. In this light, we strongly believe that a balanced focus on context, techniques, algorithms, and human aspects is essential to ensure these technologies effectively serve broader society.

2.1.2 Our Focus

Within the ECDA community, we focus on facilitating multidisciplinary collaborations across established and emerging domains through various ways, including:

- Creating a structure of expert practices and chapters centred around specific impact themes;
- Enabling and igniting collaborative research and innovation programmes and initiatives;
- Cultivating and linking our fast-growing and diverse network of external partners with our researchers;
- Building and nurturing a strong community around data, AI, digitalisation and immersive technology through EUR initiatives and organisations like AiPact, Q-Intelligence, EDSC (EUR University library), and ErasmusX, CLI, EDIS and ERS;
- Facilitating and organising regular opportunities for engagement with both internal and external stakeholders through planned events, such as the annual Erasmus Data Summit and other gatherings, as well as spontaneous encounters within our physical hub: the Erasmus Data Collaboratory – Convergence House-of-AI.

2.1.3 Our Structure

Currently, the ECDA organisational structure includes 28 Expert Practices (or XPs), the Erasmus Initiative 'AiPact,' and the Convergence House-of-AI initiative 'the Erasmus Data Collaboratory':

- The Expert Practices focus on four foundational domains (technologies, methods, organisation & governance, and human/societal perspective) and five application domains (industry, health & care, port & logistics, energy & sustainability, public). These are described in more detail in section 3.1.
- The Erasmus Initiative 'AiPact' revolves around innovative and interdisciplinary AI research and education that places people and society at its core.
- The Erasmus Data Collaboratory | House-of-AI functions as the campus hub for data and AI activities.

by Professor Moniek Buijzen
Academic Lead AiPact

2.2 Erasmus Initiative AiPact: The Societal Impact of AI

2.2.1 Introduction

Whether it's shopping for groceries, dating, managing our work life, or streaming a show on Netflix—Artificial Intelligence (AI) has changed our daily lives on a tremendous scale, both personally and professionally. What implications does this hold for individual citizens and society at large? What lies ahead in the future, and how can we harness the potential of AI while minimising risks?

This Erasmus Initiative is dedicated to pioneering innovative and interdisciplinary research and education in AI that places people and society at the forefront. In collaboration with key stakeholders, we establish expectations for the responsible integration of AI to benefit society. Through this process, we aim to help the public understand the rapidly evolving integration of AI in society.

AiPact, has actively participated in accessible events to enhance familiarity with AI and to foster dialogues on social justice. For instance, our researchers delivered presentations on topics such as feminist AI and sustainable fashion innovation during the Erasmus University Opening of the Academic Year. The AIDocs festival curated documentaries exploring AI's impact on geopolitics, work, and health. During workshops on DIT Day and the Share Your Knowledge Week, professionals engaged in scenario building around work and just futures. Additionally, the Amnesty International Student Group Rotterdam organised a keynote speech on digital colonialism.

Moreover, in collaboration with the Social AI Research Seminars (ESSB/ESE) and strong engagement with the Minor AI in Society (ESHCC), a comprehensive connection has been formed with employees, alumni, and students. To further bolster the network, the AiPact Spore Fund was launched to support EUR scientists in innovative research and networking activities aligned with AiPact's objectives. This initiative has contributed to, for example, the Surveillance & Society Conference (ESHCC) and the AI World Summit (RSM).

2.2.2 Four Programme Lines

AiPact focuses on four key domains of our society, addressing overarching subjects such as urban AI, AI street art, sustainability, equal opportunities, diversity, and inclusion.

The four programme lines are AI in arts and culture, AI in communication and change, AI in healthcare policy and management, and AI in work and labour.

AI in Arts and Culture
The application of AI promises a transition to inclusive practices in arts and sciences. The central question in this thematic line revolves around how AI's use in art can create new opportunities for individuals, organisations, and systems to unlock their full potential with AI. We consider AI in arts and culture both as an object of study and as a living laboratory to foster creativity, engagement, and empathy – all essential to establish expectations for AI that can benefit individuals and society.

This programme line aligns with the research and teaching agenda of the 'Cultuurcampus op Zuid'.

AI in Communication and Change
The use of AI in communication, termed 'cognitive communication,' promises unprecedented opportunities for social, institutional, and behavioural change. The central question in this programme line is how the benefits of digital technology can be maximised for a healthy, fulfilling, and sustainable lifestyle and living environment, while minimising potential risks. With a human-centred approach, focusing on strategic and popular communication, we consider AI both as an object of study and a tool for innovative research and education on cognitive communication and change.

Pioneering for the Erasmus Initiative, Professor Moniek Buijzen launched this programme line in 2020, leading to the AI Movez team and the ECDA Expert Practice AI, digital communication, and behavioural change. Vici and Vidi grants strengthen the programme line. The team also collaborates with local societal partners New Momentum and Talentzskool ›››

Interview with Refik Anadol

Refik Anadol's interactive artwork at the Opening Academic Year 2022-2023 was a highlight for many visitors. We sat down with Refik to discuss how he contributes to 'positive societal impact' and hear his message for our students.

"I find it incredibly inspiring because in my practice I do something similar," he says about Erasmus University Rotterdam's mission of 'creating positive societal impact'. "Through my art, I believe that, for individuals with diverse backgrounds, adding positivity, optimism, inspiration, and motivation is much more important than focusing on the fears and negativity, especially in the context of AI."

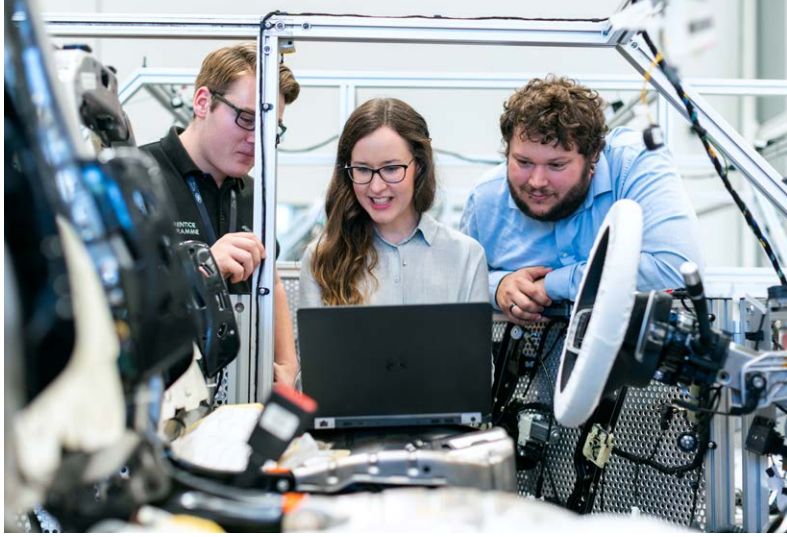
Refik Anadol is a world-leading artist and designer renowned for crafting digital, dream-like environments using data-driven machine learning. His work blurs the lines between the physical and digital worlds. At the Opening Academic Year 2022-2023, he displayed such an environment within the Aula of Erasmus University Rotterdam.

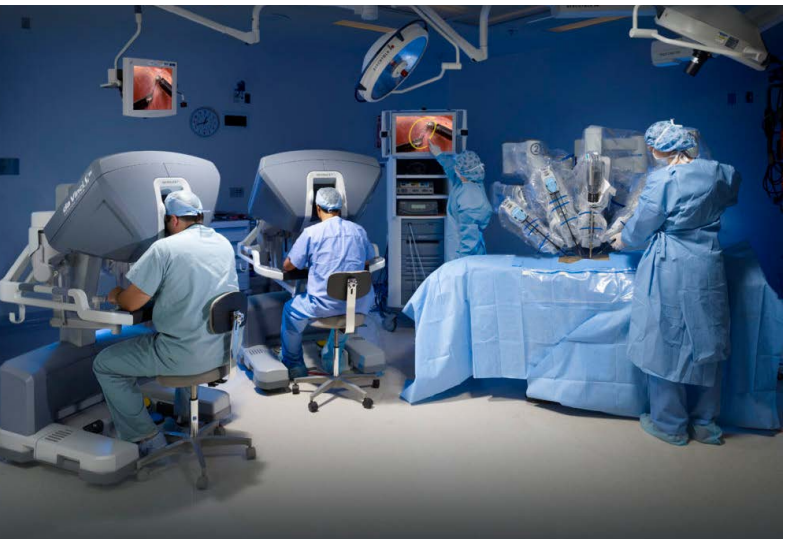
Art prompts deeper questions and perspectives about the values surrounding AI

Regarding the role of art in Artificial Intelligence research, he remarks: "Art sheds light on the ethics of AI, prompting deeper questions and perspectives about the values surrounding AI. Art flows from the imagination, acting as a collection of dreams and memories. The questions that art poses stem from the heart of society rather than resulting from statistical or mathematical observations. To me, arts embody the soul of humanity - and it's the artist's task to connect that soul to the mind."

Concluding the conversation, Refik adds, "AI empowers students to make their dreams a reality. If they can define their success narratives around these powerful tools, it can help them realise their dreams."

Photo credits: Creative Team - Broken Egg





AI in Healthcare Policy and Management

AI has a huge impact on our lives and how we experience and manage our health. Self-tracking enables us to keep up with our health achievements and detect possible health threats. AI also influences our healthcare system by affecting traditional approaches to organisation and care provision, introducing new participants (e.g. data scientists) and reshaping conventional concepts of quality care. Our research delves into how AI both shapes and is shaped by the health and social care system.

This programme line explores the practices of AI in healthcare governance, observing and collaborating with key stakeholders in the field. We examine research practices involving the creation and application of AI, regulation, service delivery, clinical decision-making, professional development, and the experiences of patients or clients. We examine how AI impacts notions of quality care and patient experiences, as well as how it influences policymaking and regulation. Conversely, we explore how historical and institutional arrangements (e.g. laws, ethical standards) influence the use and potential of AI. Using social science theories and methods, and closely collaborating with practitioners, regulators, professionals, and citizens, we explore the interactions between AI and society, seeking to understand the social impact of AI on health care.

AI in Work and Labour

Erasmus Initiative

AI

Societal Impact of AI

AI-based solutions are gaining prominence in organisational life, fundamentally altering work practices and relationships. On a macro level, this means encompasses data-driven decision-making and services, while on a micro level, automation could enhance workplace safety. This thematic line takes on a human-centred approach, emphasising opportunities for close collaboration between humans and machines while addressing challenges. Our research and teaching explore (i) new ways of organising and (ii) innovative work practices that can enhance the safety and well-being of all employees. As such, this thematic line strives to contribute to an inclusive future of work.

The lead of this programme line is Professor Claartje ter Hoeven, strengthened by her ERC consolidator project 'The Ghostworker's Well-being: An Integrative Framework' on the work conditions and well-being of crowd-workers in Europe (described in more detail in chapter 3) . In the academic years 2021-2022 and 2022- 2023, a master elective course is offered for all EUR students: 'Artificial Intelligence: The Present and Future of Work.'

by Dr. Jannes ten Berge, Tessa Boumans and Adriaan Odendaal, researchers at the Erasmus Initiative AiPact

2.2.3 AImaginaries - Exploring Equitable Technological Futures with Generative AI

While an all-knowing general AI remains a futuristic concept, increasingly sophisticated forms of AI are playing a growing role in our politics, institutions, economies, cultures, and daily lives. While these technologies offer great promise, there are also pervasive risks of social exclusion and inequality due to biases, black boxes, digital illiteracy divides, and many other issues.

Generative AI Workshops – Use and Reflection.
As social AI scientists within AiPact, we're committed demystifying AI and making it more accessible. By organising generative AI workshops, we want to introduce people to the possibilities and limitations of AI tools like ChatGPT, HuggingChat, Stable Diffusion, and DALL-E and encourage creative, effective, and reflective applications of these tools.

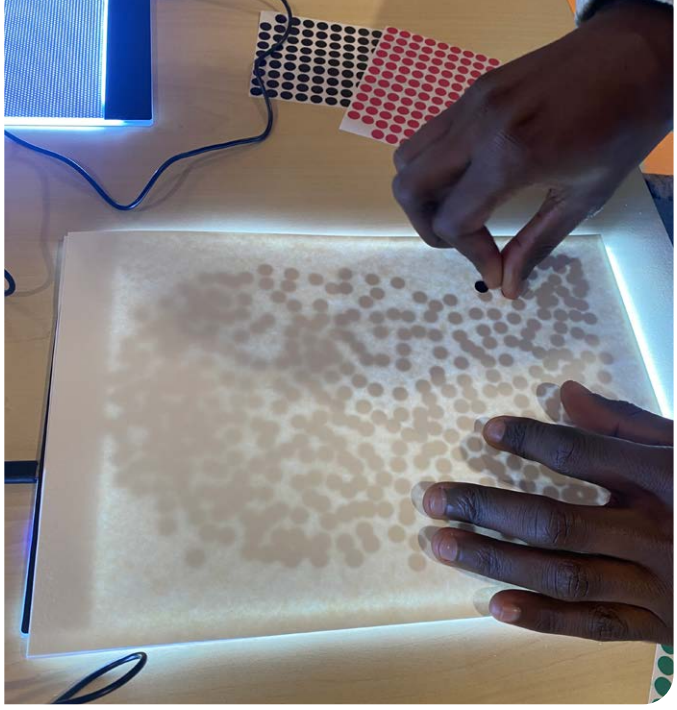
It's not just about playing with cool new tech; we also need to contemplate the future we wish to construct with AI technology. That's why it's our goal to develop justice-oriented future scenarios by both utilising and reflecting upon these tools.

By collaborating with participants from diverse societal backgrounds, we explore different ideas, AI technologies and uses, priorities, and perceptions of what a desirable AI future looks like for different individuals. This collaborate effort is aimed at contributing to a more inclusive, equitable, and sustainable AI transition. The outcome of each workshop takes on a unique form, consisting of text-written scenarios and visual content.

In the end, the outcomes of these workshops will be transformed into an interactive work of art that reflects co-created visions for more equitable and justice-driven technological futures.

Key Insights
Throughout the workshops, we observe that participants can unleash their creativity with the assistance of AI, yet they also quickly recognise that AI is far from flawless. While some participants are more experienced at using generative AI tools, others are novices. Regardless of their level of experience, we discover that people can create interesting, beautiful, and funny textual and visual pieces, all while engaging in meaningful reflections on the tools at their disposal through this process.

We welcome collaborations with diverse groups, organisations, and even industry stakeholders. Our aim is to collaborate with different societal segments, ranging from individuals well-versed in AI to those with limited computer skills, in order to make AI accessible to all. To learn more, please feel free to contact us at: aimaginaries@eur.nl.



by Annemiek Mi-Jin de Groote & Nanna Kassenaar

2.2.4 AICON - Where Academics, Artists, Citizens, and AI Come Together.

AICON is the transdisciplinary project of the Erasmus Initiative AiPact, serving as a nexus that unites citizens, artists, and researchers in an exploration of the socially beneficial prospects and challenges posed by AI. Rooted in collaboration, this project empowers communities, enabling them to uncover the defining aspects of their surroundings and their interactions with the world.

The overarching objective is to contribute to the democratisation of AI; making it understandable and accessible to communities while advocating for an alternative approach to collaboration and urging for a re-examination of the values that shape a society and its inhabitants.

AICON revolves around co-creation and takes into consideration cross-sectoral concepts that transcend conventional boundaries. By collectively creating art, opportunities arise to discuss AI and its social implications. Why art, you might ask? Art challenges, inspires, and fosters dialogue. Art belongs to everyone, just as AI does.

Our Observations

Considering the lightning-fast technological advancements, it's only human to struggle to keep pace. Yet, true innovation extends beyond mere technological progress; it's about ensuring that AI serves humanity.

Transdisciplinary collaboration helps us to ensure that AI technologies are developed ethically, with fairness and accountability at the forefront. The importance of AI and cross-sectoral teamwork extends well beyond individual expertise. By joining forces, we shape AI systems that mirror our values and prioritise the well-being of individuals and communities. Transdisciplinary endeavours fuel creativity and enable us to view challenges from various angles, igniting sparks of inspiration that can drive breakthroughs.

Trans disciplinarity and an intrinsic drive to make a difference have been ingrained in AICON's DNA since the beginning. AICON extends an open invitation to all interested parties, forming an ecosystem in which the seeds of imagination find fertile ground to grow. Artists, scientists, and citizens on equal footing, co-creating within a safe space.

Collaborative Endeavours

Over time, AICON has evolved from an isolated project into a burgeoning movement; a coalition of the willing that includes individuals driven by an intrinsic motivation to contribute meaningfully. Presently, AICON has joined forces with ErasmusX, HefHouse, ECDA, Convergence Alliance, TU Delft, D&I Office, YesDelft!/Erasmus Enterprise, ECE Students, Zadkine, Lucify.io, VR Days Europe/Immersive Tech Week, Oceanlab010, Boijmans van Beuningen, Erasmus Graduate School of Social Sciences and the Humanities (EGSH), Creative Industries Fund NL, Hogeschool van Amsterdam/Amsterdamse Hogeschool vd Kunsten (AHK), Gemeente Rotterdam, Ronniesopzuid, and many more.

More information: www.eur.nl/en/research/research-groups-initiatives/erasmus-initiatives/societal-impact-ai/aicon

For those interested in collaborating, please feel free to reach out to us at: welcome@teamkallenbach.com

by Jos van Dongen Director Erasmus Data Collaboratory

2.3 The Erasmus Data Collaboratory – Convergence House of AI

2.3.1 Introduction

The Erasmus Data Collaboratory is an inclusive, open experimenting environment for data and AI, situated on the campus of Erasmus University Rotterdam. Within this space, people can collectively think, work, innovate, and learn. Housed at the heart of the campus within the Polak building, this physical hub is being developed to facilitate hands-on action learning, action research, experimentation, and valorisation. It will serve as a space where the entire data science cycle can take place, from data engineering to data analysis, including data visualisation. It will also act as a central venue for meetups, workshops, masterclasses, and projects. The overarching goal is to cultivate a better understanding of data and AI.

To bring data to life in the EDC, ECDA forges partnerships with leading tech companies and startups. These partners offer (cloud) infrastructure and software tailored to data and AI, providing access to specific technologies, data sets, algorithms, and advanced tools for AI, machine learning, process mining, and visualisation. Within this environment, emerging talent like students from the Erasmus Tech Community and Turing Students Rotterdam can strategize and execute their endeavours. Concurrently, established professionals from our corporate partners can convene to learn, exchange insights, and conduct research. This dynamic ecosystem accommodates collaborative projects and can subsequently showcase the results.

One of the main aims is to foster collective creativity, innovation, and societal impact by uniting students, academics, public and private partners, as well as startups and scale-ups. Collectively, we can address issues such as the energy transition, resilient deltas, health systems, and smart, inclusive cities. These issues usually offer complex and hard to resolve challenges that demand creative, systemic, and multifaceted solutions. Each design challenge will be supervised by highly experienced expert facilitators.

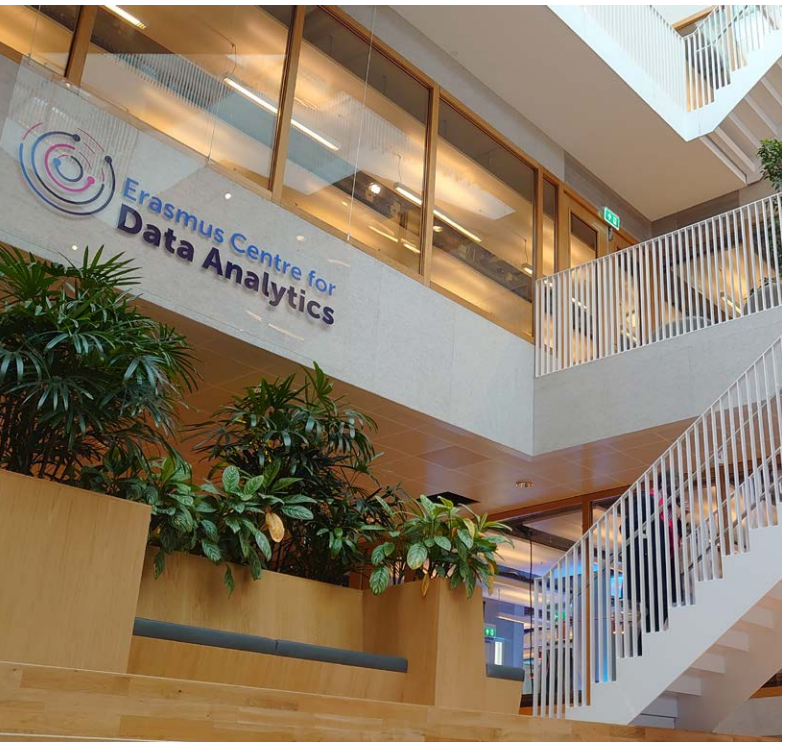
The Erasmus Data Collaboratory features project and meeting rooms furnished with creative and invigorating tools that support research and education. It includes a data lab, equipped with high-quality workstations, high-resolution displays, and a cloud infrastructure with fast connectivity. Moreover, you can also find an Immersive Tech space equipped with advanced digital projection facilities.

2.3.2 Data Lab – Where Data Comes to Life

The data lab, dedicated to hands-on training and in-depth research, operates as a laboratory environment for various ECDA expert practices and community members. It will also serve as a place for practical training, where professionals from diverse industries (education, business, law, health care, culture & art) and students from varied educational programmes and backgrounds can engage with real datasets and employ cutting-edge data analytics, AI, and machine learning tools. Here, they can also visualise their experiments and findings, inviting others to partake in their data and AI journeys. A key function of the data lab is access to the Erasmus Data Sandbox - a sophisticated data environment that lab users may consider as their experimental playground.

"The Erasmus Data Collaboratory is an open environment where we welcome students, researchers, faculty, and industry professionals to collaborate on innovative projects. At the Collaboratory we invite everyone to experience and learn about the latest advancements in data, analytics, machine learning and AI. Let's make these experiences accessible and use data for good to create a positive societal impact together".

Jos van Dongen, Director Erasmus Data Collaboratory



The Sandbox constitutes of the combined Data and AI infrastructure & toolset offered as part of the Data Collaboratory. This platform permits students, researchers, commercial partners, and startups to experiment and develop new innovative solutions, fostering proof of value and driving innovation. The Sandbox also serves as the central repository of knowledge, allowing access to data, algorithms, code, and documentation to facilitate reuse and support new developments. Initial pilot projects have already taken place, and user feedback is being harnessed to refine the Sandbox further.

Responsible Data Management (RDM) is an integral part of our projects, with university data stewards offering guidance and support for researchers throughout the research data lifecycle, aligned with international RDM standards and FAIR principles (Findable, Accessible, Interoperable, Reusable). Compliance with General Data Protection Regulations (GDPR) is overseen by the EUR privacy officer, ensuring secured sharing, and storing of research infrastructure, data, software code, research material, and corresponding metadata. These measures also facilitate collaboration within international consortia. ECDA guarantees that collaborations and data sharing with partners adhere to legal stipulations and codes.

by Rob Grim, Economics, Business & Data Librarian ESE/RSM, University Library, Erasmus University

2.3.3 EDSC – Access to economic and financial data, at what price?

All concepts and items have an economic value, and therefore a price. However, due to the increasing importance of data, it is crucial that we find ways to support digital economics and business science. Even though there is a growing demand for data in economic and business research, having more data does not always lead to better science. In fact, it can lead to a completely different economic science. The accessibility of data is also becoming a problem as many sources are controlled by large commercial data companies.

Nobel Prize winner Paul Romer observes that while data is increasingly used in economics and finance research, concepts like economic growth have not seen any new theoretical developments in the last twenty years. Research in these fields is becoming more reliant on specialized environments and platforms outside of universities, leading to higher costs for access to data. Data companies often have complicated revenue models, selling digital data in various products and licensing it with strong one-time prices and year-on-year price increases.

There is a high demand for new data-hungry methods, techniques, and professions, such as machine learning, text and data mining, and data scientists. However, the available budgets do not currently meet this demand, posing practical and fundamental challenges. In a world where data is essential for research advancement, universities must find ways to fund and support this growing field. Can university libraries play a role in this fast-paced data landscape, populated by data monoliths and Open Science ambitions?

Open Science financial databases: future or hallucination?

The modern landscape of scientific research is firmly rooted in the principles of Open Science and FAIR data, especially as it pertains to socially significant topics. Despite the considerable influence of companies, financial institutions, and other entities on the economy, there seems to be a surprising lack of emphasis on the systematic collection, archiving, and accessibility of economic and business data. Despite ongoing efforts to promote Open Science and transparency, there are growing indications that data relevant to economic, financial, and business research is becoming more difficult to obtain or access.

To effectively support the ambitious goals of Open Science and meet the data needs of the economy, substantial investments are needed to develop data infrastructure, curation, and expertise. The Erasmus University Rotterdam (EUR) has been selected as the spearhead for storing economic and business data of scientific importance in the Netherlands. Given the current data landscape, it is surprising that economic and business data have not been deemed scientifically relevant and thus have not received the necessary investment in repositories.

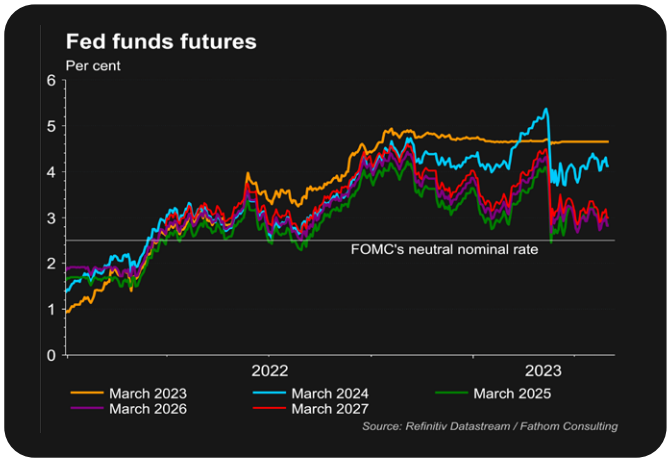
Supporting data-rich economics, business, and finance research at the EUR

The EUR boasts an extensive collection of economic and financial databases, catering to the needs of students and researchers alike. With hundreds of databases and thousands of data sources available through the university library and the Erasmus Data Service Center (EDSC), EUR has established itself as an institution with a rich data infrastructure.

However, sourcing historical business and financial data can be an arduous task, even for seasoned experts. The EDSC has been at the forefront of providing assistance in this regard for over 15 years. The center is staffed by a team of knowledgeable experts who act as a 'human search engine', providing invaluable support to students and researchers. Their expertise is currently irreplaceable. ›››

The EDSC's success can be attributed to its knowledge center approach, serving as a panopticon for all themes and subjects covered in economics and business education at the Erasmus School of Economics (ESE) and the Rotterdam School of Management (RSM). This enables the center to easily respond to the demand for data, including popular subjects such as green investments, shareholder activism, ESG, sustainable enterprise, diversity, inclusive work, and the personality traits of board members. These are all subjects that were once on the fringes of economics and business administration research but are now in high demand.

When it comes to scientific research, data is essential to gain insights, respond to societal inquiries, and create practical applications. Access to economic, business, and finance data is therefore crucial for the real economy and the progress of business and economics research. Libraries' data intelligence can play a pivotal role in providing access to such data and supporting research innovation. It's surprising and necessary to recognize this fact.



One of the many finance data-series available from Refinitiv Eikon

The text is a summary of an article that will appear in the spring of 2024 in the EUR lustrum book under the title: EUR Financial Databases: A special data collection for economics and business studies: impossible work or a mer à boire?

2.3.4 Immersive Tech Space – Engagement Through Experimentation

Immersive technology is an umbrella term that encompasses a range of digital experiences that enable users to interact with digitally created environments, evoking a sense of physical presence. It includes technologies like Augmented Reality (AR), Virtual Reality (VR) and Mixed Reality (MR) to deliver a fully immersive experience. Immersive Tech enables Erasmus University to offer education in novel, more inclusive, and sustainable ways. Immersive Tech can serve as a powerful tool to conduct experiments and communicate research findings, making it easier to exchange knowledge intuitively with stakeholders around the world.

The Immersive Tech Space fulfils several roles:

1. **Connecting & Inspiring:** It serves as a platform to update campus stakeholders and external partners on the latest XR technologies, visualise projects and expertise, and provide an inspirational venue for events.
2. **Supporting education:** This space facilitates experimentation with new XR technologies, houses small-scale XR classrooms, acts as a playground for students, and facilitates experiments related to VR and holographic imaging.
3. **Supporting research & Innovation:** In the Immersive Tech Space, XR technologies can be used at the outset of research projects and innovation programmes, immersing stakeholders in research results. It helps to clarify complex concepts (such as social networks, (path) dependencies, interactions), simulates scientific experiments, and employs gamification elements to present research in a more engaging manner.

Collaboration with diverse immersive tech startups and scale-ups takes precedence. Our technology partners will actively participate in various projects to support the innovation missions of our community members with their tools and technologies. Additionally, the space will offer opportunities to showcase AI and immersive art installations, embodying a hands-on, inspiring exemplar of our mission to facilitate multidisciplinary immersive collaborations.

To realise the Immersive Tech Space, it's essential to unite experts within our community and the broader ecosystem. We will closely collaborate with the ERIM behavioural VR Lab and engage regional partners. Our partnership with the City of Rotterdam, Innovation Quarter, TU Delft, Hogeschool Rotterdam, Zadkine Beauty & Design Lab, Grafisch Lyceum Rotterdam, VR Days, 360 Fabriek, and Bureau RAUWcc will position us a pivotal cornerstone within the regional immersive tech ecosystem. For innovations and experiments related to education, we will collaborate with ErasmusX, the Centre for Learning Innovation (CLI) and Surf. Professor Yvonne van Everdingen will provide support as our XP lead for Virtual and Augmented Reality.

2.3.5 Immersive Tech – Challenges and Opportunities

Interview with Professor Yvonne van Everdingen

Yvonne van Everdingen is a Professor of Marketing and Innovation at the Rotterdam School of Management, Erasmus University. She also is Academic Director of the ECDA Expert Practice 'Virtual and Augmented Reality'.

As a Professor, what topics or questions will you be focusing on in the foreseeable future?
Overall, I will focus on Augmented Reality (AR) and Virtual Reality (VR) applications in marketing and healthcare.

For instance, concerning AR in marketing, I am delving into the effects of AR apps on online purchase decisions, analysing how they affect consumers' post-purchase product evaluation and their return rates.

Further, I am exploring how VR experiences can help companies broaden their outreach as a substitute for or to complement real-life experiences.

I am also looking into consumer responses to such VR experiences and their willingness to pay for them. Currently, this research focuses on the opportunities of VR in the entertainment sector (e.g., watching a sports event or going to concert). In the coming years I want to expand this research into other sectors and domains, like visits to museums, amusement parks, and tourism in general, as well as its impact on more active leisure activities, such as sports or fitness.

Next, I will be investigating consumer behaviour within virtual shops. Specifically, I'm interested in nudging consumers towards healthier food choices, such as studying how consumers react to Nutri-Score labels on food packaging.

In the healthcare sector, there are numerous opportunities for VR and AR to create value. I'm part of a consortium involving researchers from the Alzheimer Centre of Erasmus MC, researchers from TU Delft, and the faculty of ESSB, working on exploring the potential of VR for early diagnosis and treatment of dementia patients. Here, we will also explore how these technologies can be used to enhance caregivers' understanding of the behaviour of people with dementia.

What impact do you want to achieve in your role?
I see several opportunities for creating impact, but I will highlight two key areas in which I'd like to achieve impact in the coming years.

1. I believe that VR creates new opportunities for training and education. I believe it's crucial to educate students not only about the business potential of immersive technologies, but also to leverage immersive technologies for educational purposes. VR lectures provide a more immersive and engaging experience, enhancing learning outcomes and making education accessible to a global audience.
2. Being the first female professor in the marketing department at RSM, I would like to serve as a role model for female colleagues across departments and universities. I am open to support their professional growth and work-life balance, and contributing to reducing gender inequality that unfortunately still exists in academia.

What key trends or developments do you foresee in your field that will drive change in the coming few years?
One big trend is the blending of immersive technologies, such as VR and AR, with artificial intelligence (AI). If consumers can use an AR app not only during the purchase stage but also receive AI-driven product suggestions, it could significantly aid purchase decisions. I anticipate that VR and AR will transform the retail sector.

I also believe that VR and AR will change the way we watch television, sports, and movies. For example, Fox Sports VR already offers their customers the opportunity to enter a VIP stadium suite to virtually watch live sports events, complete with front-row seats, while AR can be used to add match statistics. I expect these opportunities to expand rapidly in the near feature. These technologies will also drastically reshape the movie industry, with the rise of VR cinemas (the first ever VR cinema in the US has recently been announced, and, closer to home, LantarenVenster in Rotterdam also offers VR movie experiences), but people will also be able to watch VR movies at home via streaming platforms like Netflix. How much impact these trends will have on society will also depend on adoption of VR headsets by consumers.

2.4 Erasmus Data Summit

The Erasmus Data Summit serves as a platform at Erasmus University Rotterdam, bringing together professionals from the South Holland region who are involved in data, AI, and Immersive technologies. This annual event is a place for inspiration, networking, and meaningful collaborations. The unique combination of established experts, academics, innovative startups, and promising students makes the summit distinctive. With high-quality speeches, panels, hands-on data, and the Immersive Tech Fair, the event offers an energetic and multifaceted experience.

Collaborating with our AiPact and ErasmusX community members, this year's event showcases the diverse digitalisation initiatives at EUR to our external partners, guests, and participants. Looking ahead, we're excited to announce that Erasmus Q-Intelligence will also be part of the programme in the upcoming edition on April 15, 2024. If you'd like to collaborate, suggest speakers, organisations, or technologies, or register as a VIP guest, please get in touch.

Summit Conference:
Generative AI & Immersive Technologies
This year's summit centred on the societal impact of generative AI and Immersive Technologies. We explored their influence on the way we work, recruit and train employees, lead our organisations, provide healthcare, and approach art and culture. Experts shared insights on the latest trends in generative AI and immersive technologies, argued for the importance of the psychology of AI, the synergy between ethics and AI, and provided examples of when not to use AI, especially when data doesn't yet allow for the responsible use of the algorithms.


Immersive
Social
Interaction and
learning
Vivian H.H. Chen
Erasmus University Rotterdam


Summer
?
AI Winter

We were honoured to be inspired by the following speakers:

Jim Stolze, *AI expert, speaker, and writer,* **Eric Kalsbeek**, *Motion designer and AI-powered Creative,* **Pieter den Hamer**, *VP Artificial Intelligence at Gartner,* **Anne Kathrin Klesse**, *Professor in Marketing at RSM, EUR, Academic Director Psychology of AI at ECDA,* **Claartje ter Hoeven**, *Professor of Organisational Dynamics in the Digital Society at EUR,* **Linda Li**, *Lead Ethics & AI at the Dutch Police,* **Charlotte Melkert**, *Co-founder and CEO at Equalture,* **Hilary Richters**, *Director and Lead Digital Ethics at Deloitte,* **Sennay Ghebreab**, *Professor Socially Intelligent AI at UVA,* **Gijs den Butter**, *Co-founder and CPO at SenseGlove,* **Robbert Brouwer**, *Co-founder at SyncVR,* **Yvonne van Everdingen**, *Professor of Marketing and Innovation at RSM, EUR, Academic Director Virtual and Augmented Reality at ECDA,* **Frederike Manders**, *Programme Manager Immersive Technologies at Hogeschool Rotterdam,* **Jenny Hansen**, *Former Communications Director at Meta,* **Esther 'O Callaghan**, *Co-founder and CEO at hundo.xyz,* **Vivian Chen**, *Associate Professor and head of UX research at EUR, video game and VR expert*

Summit Immersive Tech Fair

The Immersive Tech Fair allowed all participants to experience the latest immersive technologies from the South Holland region firsthand. This included VR, AR, XR, gamification, haptics, deep fakes, and holographs. The fair showcased immersive solutions for various sectors, from commercial organisations to educational and medical institutions, law enforcement, creative industries, and more.

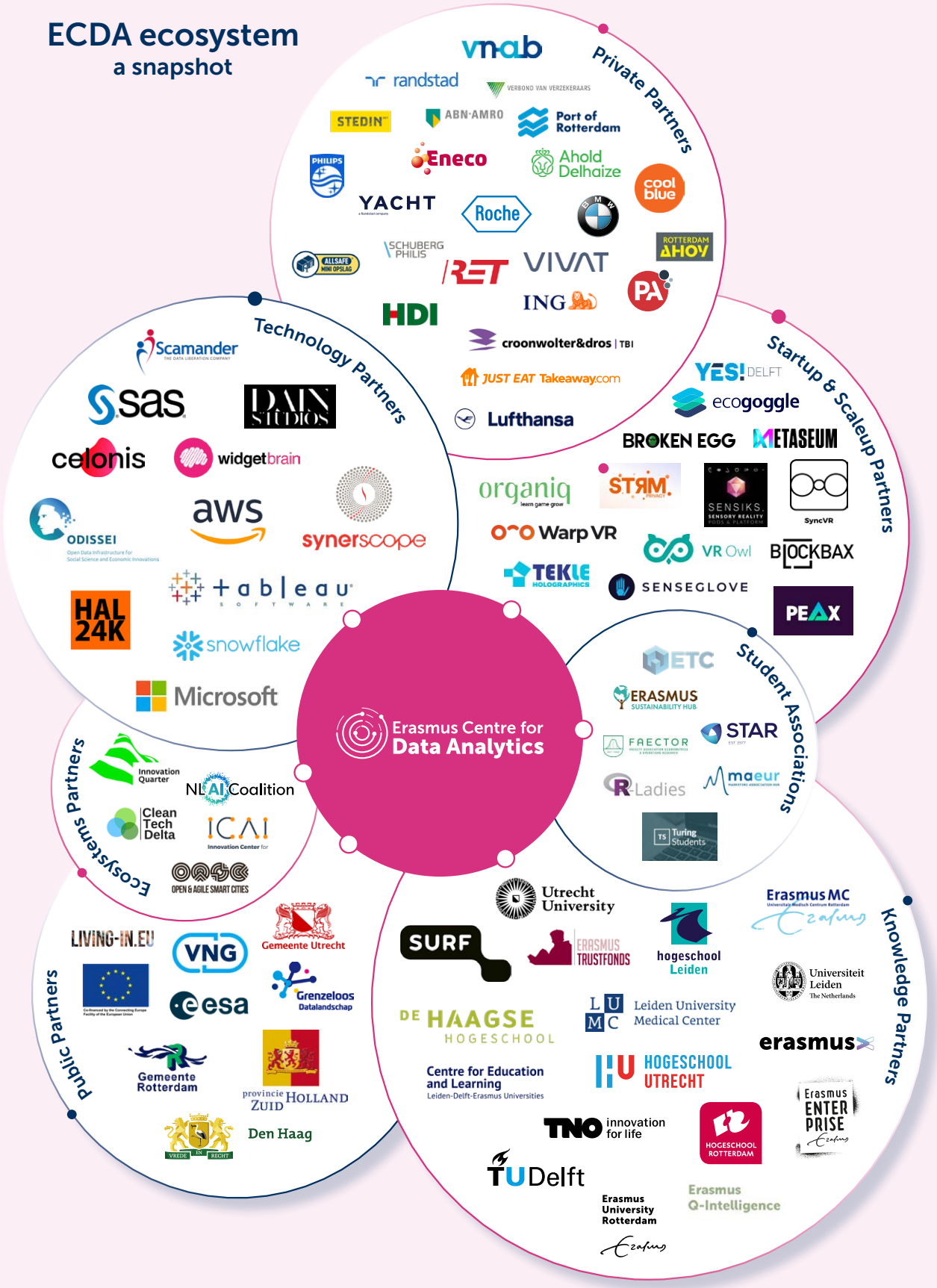
The presented innovative solutions demonstrated the transformative potential of immersive technologies across industries. These technologies are not just mere additions or gimmicks but are key to providing impactful solutions that enhance wellbeing, learning, efficiency, adoption, and engagement.

> Uniting and connecting the potential of external innovators like startups, with eager students and top-notch academics during the Immersive Tech Fair, really showed the strength of our community for me.

Matthijs Malkus
Project & Event Manager at Erasmus Centre for Data Analytics

The Fair featured the following innovative organisations, initiatives, and experts from different industries, all presenting the latest immersive technologies: *SenseGlove, Gemeente Rotterdam, VR Owl, Ecogoggle, AICON, Warp VR, SyncVR, Sensiks, Yori Ettema, Nikki Scheijen, AI@EUR programme, Smart Campus Project, Organiq, Tekle Holographics, and Convergence of Universities.*

ECDA ecosystem
a snapshot



2.5 Our wider Ecosystem & Partnerships

The Purpose and Shape of our Partner Ecosystem
The partner ecosystem at ECDA is centred on our commitment to enriching, sharing, and valuing knowledge. We excel in fostering collaborative relationships that enhance expertise. Becoming a part of our community means becoming an integral component of a vibrant collective devoted to advancing knowledge and collectively addressing the task of knowledge valorisation. Examples of this include Recharge Earth, Immersive Tech Week, and Immersive Tech Hub Rotterdam.

Partnership Engagement Examples. VNAB – Full Partnership

The latest addition to our partner ecosystem is the VNAB (Dutch Insurance Exchange Association). VNAB serves as the Dutch sector organisation for the corporate insurance market. Its members provide insurance solutions coupled with risk management consultancy for extensive and complex risks. VNAB advocates for the sector by streamlining the market through efficient ICT systems, advancing knowledge development and transfer, addressing themes that are of relevance to the sector, and by actively managing the sector's reputation.

VNAB and ECDA have united their efforts to facilitate a more accessible and application-focused avenue to data, digitization, and the rapidly evolving potentials of AI for VNAB-affiliated organisations. All VNAB members can acquaint themselves with ECDA through an affiliate partnership.

An important part of this partnership is the opportunity to gain inspiration and insights into current developments in data and AI. This includes acquainting yourself with best practices through participation in events and programmes organised by the ECDA community, such as the leadership challenges in data analytics, ECDA insights sessions, and the annual Erasmus Data Summit.

In addition, ECDA collaborates closely with VNAB by organizing expert events, including C-suite executive knowledge sessions, and engages its academic directors to share expertise during the annual VNAB College.

Furthermore, by establishing connections between the ECDA expert practices and VNAB members, both communities foster numerous opportunities for collaborative ventures. These encompass specific research questions, studies, active sessions, and deep dives, which create immediate impact by exchanging expertise and industry experiences.

VNAB College

In the VNAB College, members and associate partners of VNAB are invited to immerse themselves in learning and gaining inspiration about recent topics. The focus of this year's college was on Artificial Intelligence. Professor Ting Li, Academic Director of the Digital Business Expert Practice at ECDA, delivered a speech on the general and insurance-industry-specific opportunities that AI offers. This included discussions expectations and anticipated challenges. Associate Professor Dr. Luliana Sandu, Academic Director of the Trustworthy and Accountable AI Expert Practice at ECDA, offered insights into the skills demanded by these developments. The second part of the session included short presentations and a discussion with three co-founders from start-ups within ECDA's ecosystem: Syntho, Blockbax, and STRM: safe data. The discussion focused on how platforms make data available and usable while safeguarding privacy and security.

VNAB C-Suite Sessions

During the c-suite sessions, executives convene in small groups within an informal setting to discuss key challenges in data, digitalisation, and AI, and how they impact their industry. Termed 'Data Dialogues' by VNAB, these sessions facilitate in-depth conversations at an executive level. Professor Ting Li, Academic Director of the Digital Business Expert Practice at ECDA, provided insights on AI applications across diverse industries, with a focus on the insurance sector. Afterwards, extensive discussions were held about the specific AI experiences of each VNAB member. Questions were raised, and best practices were shared. More Data Dialogues are scheduled for the upcoming year.

VNAB interview with Marcel van Oosterhout, Deputy-Executive Director, Erasmus Centre for Data Analytics (ECDA)

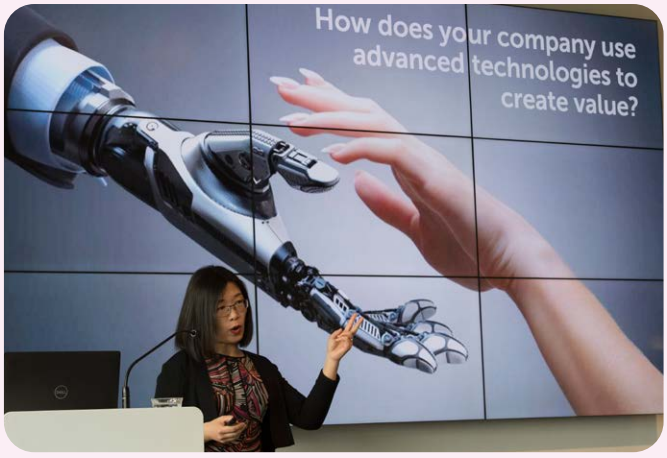
(Highlight of the article written for the VNAB visie, NL)

Relationship Data and AI
According to van Oosterhout, data and AI have a close relationship as AI depends on the quality of the data to work effectively. "AI systems learn from data to discover patterns, make predictions, generate content themselves (consider ChatGPT) and make decisions. To train AI systems, they need to be fed with large amounts of data that are labelled and used to develop and refine the models. The quality of the data is essential here, as the accuracy of the results depends on the quality and relevance of the data used. With the powerful computing power available to everyone through cloud computing, AI algorithms can discover complex patterns and trends that would otherwise be difficult to detect." Data is also the basis for the success behind digital platforms. "Many of the best-performing organisations worldwide owe this to the development of a digital platform that connects users and brings together a wide variety of data sources. Processes are then optimised, or new services developed. Consider, for example, Uber, booking.com, and Netflix."

Data Ethics and Accountability
Van Oosterhout: "At ECDA, we emphasise the importance of data ethics and accountability. This includes ensuring the privacy of individuals and ensuring transparency in the design, training and use of algorithms, so-called explainable AI models. This is necessary to increase trust in AI among customers and employees and to comply as an organisation with laws and regulations regarding the use of data and AI."

New Skills
According to Van Oosterhout, organisations need different skills to gain a competitive advantage from data, which are often brought together in multidisciplinary teams. In addition to technical skills (related to data storage and management, data integration, security, and data engineering), it mainly concerns data science skills. These include programming, statistics, data engineering, machine learning, and deep learning. It also includes data visualisation and interpersonal and communication skills, such as storytelling. "Business analysts and translators can make the transition between business opportunities and possibilities that data (analysis) and AI offer. Creativity is perhaps the most important skill, which is also difficult to automate. The ability to think outside the box and find new ways to analyse data and gain insights can provide a significant competitive advantage for organisations."

For the full article and the complete VNAB vision magazine, please visit the resources section on the ECDA website.



Source: Gemeente Rotterdam

by Frank Vieveen, Programme Manager Digital Economies of the Municipality of Rotterdam

City of Rotterdam – Full Partnership

The Municipality of Rotterdam was one of the founding partners of ECDA in 2019. For us, this is an important partnership because of the increasing importance of data analytics and artificial intelligence in our society and economy. Working together with ECDA helps us understand the latest developments in these fields of technology and we are keen to help build a community of knowledge about this in Rotterdam.

ECDA is helping the Municipality of Rotterdam to become more data driven. Each year, various teams participate in the "Leadership Challenge with Data Analytics" programme that ECDA has developed. This programme immerses participants in real-world challenges. For example, one team built a tool that guides building owners and policymakers in transitioning from fossil fuels to sustainable alternatives.

We also together define the knowledge agenda for a digital smart city, which continues to integrate new topics. It serves as an interesting basis for EUR master students to work on, sometimes in combination with an internship. Since 2017, over 40 master's students have written their thesis on an extensive range of topics, generating valuable insights. These insights are used to further shape the smart city programme and the development of the urban digital ecosystem.

Other collaborations include the municipality digital experimentation centre VONK, together with other regional partners like Hogeschool Rotterdam, Grenzeloos Data Landschap (Borderless Data Landscape) a project initiated in partnership with the Province of South Holland and the City of the Hague, and the development of the Immersive Tech Hub Rotterdam. The latter also involves participation in the Immersive Tech Week Rotterdam. For the City of Rotterdam, the city as a metaverse provides new opportunities for engagement, inclusion, and citizen participation.

The City of Rotterdam also actively contributes to the development of the "Urban Digital Innovation" programme in which ECDA hosts city teams from other regions in Rotterdam, providing them with inspiration and frameworks for digital innovation aligned with climate-neutral cities and the green deal. This offers a nice opportunity to showcase Rotterdam's endeavours to other cities while learning from other cities' best practices.

The EU smart city "Ruggedized" programme is a more in-depth research collaboration. For this programme, researchers from ECDA's digital business expert practice have analysed urban data platform development across over 80 European cities. This has provided a lot of inspiration and insights for the development of Rotterdam's open urban data platform. One of the key findings of the study underscores the need for establishing trust. We have translated this into a governance framework that currently is worked out in more detail and will be the foundation of the Open Urban Platform development that being developed until 2024. The success of the "Ruggedized" collaboration fuels a continuous exploration of new cooperative prospects in European initiatives and consortia, with esteemed European partners like OASC, Eurocities, and Living-in-EU.

Recharge Earth Partnership

Recharge Earth is the Dutch platform that connects businesses, policy makers, innovators, network operators, academics, and energy experts to share their knowledge, come up with solutions and speed up the energy transition. During the first edition of the event in September 2021, more than 500 energy professionals came together to discuss, amongst other, policy, affordability, and feasibility. In 2022 the event grew bigger with more visitors, an even broader spectrum of relevant partners and an international program line. In 2023 the third edition added other elements to the programme such as an innovation expo with many startups and a young energy talent award. The Erasmus Centre for Data Analytics has been actively involved in this platform from the start by advising on the design of the event, participating in the advisory board and programme committee. In every edition one of the parallel sessions is organized by the ECDA team, with a focus on the enabling role of AI and digitalization in the context of the energy transition. Both academics and student talent from the Erasmus University are actively involved in the event.

More information: www.recharge-earth.com/en

> I really enjoy working with the ECDA because of their expertise, the valuable network and their commitment and reliability. Over the last few years our partnership has grown and from my perspective this collaboration will persist and expand in the coming years. I wish for everyone to experience such a valuable partnership as ours!

Pieter Bas Du Jardin
Manager Exhibitions, Ahoy

Becoming an ECDA Ecosystem Partner

Enriching knowledge is our core business, sharing knowledge fuels our drive, and valorising knowledge is our pursuit. By affiliating with ECDA, you become an integral part of our ecosystem.

Government, industry, and academic organisations each uphold different principles, models, and objectives. Consequently, ECDA has developed a collaborative model, available in a range of bundled packages, to facilitate cooperation among these sectors without compromising business operations, the educational value for students, or the scientific independence of our research.

Being an ECDA partner offers several advantages:

- Emerge yourself in state-of-the-art knowledge in the fields of AI, data, and digitisation.
- Engage with our student community to gain an innovative perspective.
- Participate in ongoing and new research, collaborating with dedicated scientists experienced in data science, data visualisation, and data engineering across various domains.
- Use our skills and expertise for seminars, workshops, and training needs – within open programmes or tailored to your specific organisational context.
- Become a part of an ecosystem alongside a diverse range of public and private partners.
- Access the Erasmus Data Collaboratory as a physical hub for meetings, training, and co-creation events.
- Participate in innovation challenges within ECDA's Data Sandbox environment, using a secure and impartial platform for data sharing, analyses, and Proof of Concept (POC) development. This facilitates identifying business prospects and achieving societal impact through student teams and accomplished faculty members.

However, a partnership with ECDA is not a one-way street. We expect our partners to help us enhance our academic curriculum with real-world business challenges and datasets. Collaborate on building various repositories containing use cases, metadata sets, and algorithms, while contributing expertise and knowledge for research and educational purposes. Ideally, our endeavours contribute, in some measure, to societal progress in alignment with the United Nations Sustainable Development Goals.

We offer four types of partnerships: affiliate partnerships. associate partnerships, full partnerships, and technology partnerships. For more information about collaborating with us, please refer to our website.

3/ Highlights from our Expert Practices

by Dr. Marcel van Oosterhout, Deputy-Executive Director of ECDA

Introduction

ECDA has organised its domain expertise into 28 expert practices, or XPs. These XPs cover four foundational domains:

1. **Technologies.** These expert practices focus on the adoption, use, and impact of specific technologies such as immersive technologies (AR/VR), open data infrastructures, blockchain, and digital twins.
2. **Methodologies.** These Expert Practices focus on the data science and machine learning methodologies to solve specific challenges, how to

design experiments and trials, how to combine language models with other analytics tools and how to assess the impact of specific technologies on performance and value generation.

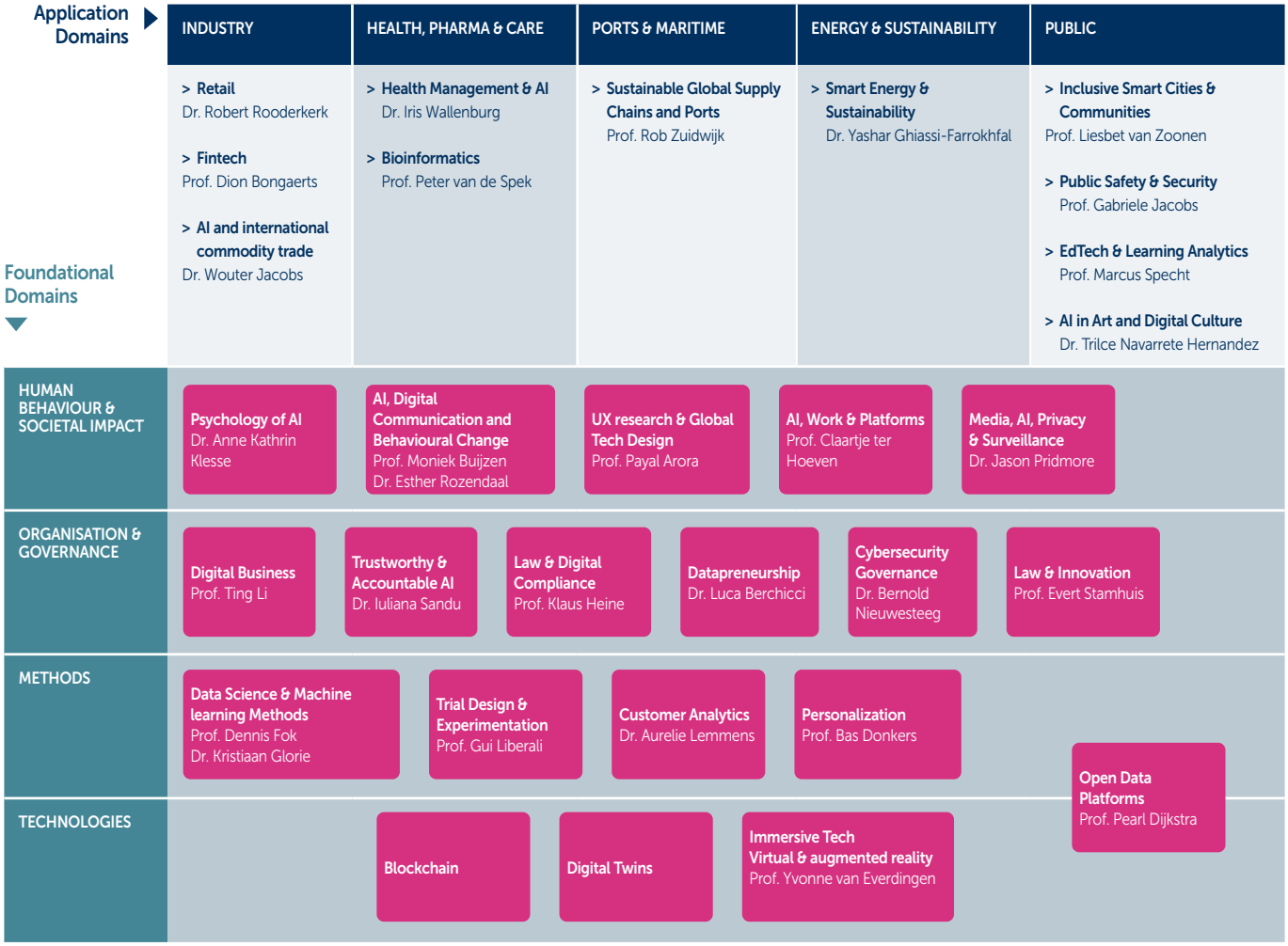
3. **Organisation & governance.** Expertise focuses on creating the right organisational conditions, structure, entrepreneurship, and capabilities to realise value from the use of data, digitalisation, and AI, while incorporating ethics, accountability, privacy, and security.
4. **Human behaviour and societal impact.** These Expert Practices focus on how to design and balance human user experience and behaviour with the use of analytics and algorithms in tech design and decision making. These practices aim to understand the human perception of the use of algorithms in business and society, and more generally, the impact of data, digitalisation, and AI on society and implications for work and jobs. It places the human centre stage.

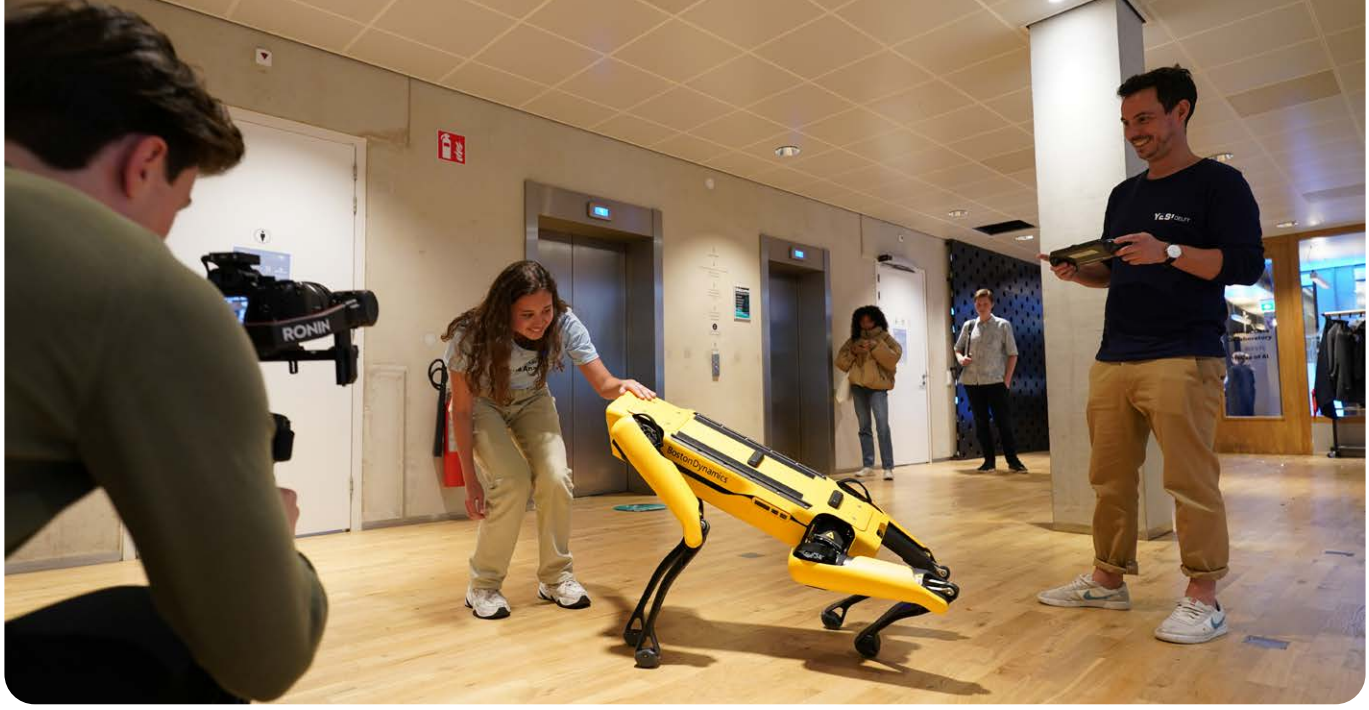
Research takes places with a focus on five main application domains:

1. Industry (retail, fintech, international commodity trade)
2. Health, pharma & care (health and management AI; bioinformatics)
3. Ports, maritime & logistics
4. Energy & sustainability
5. Public (Inclusive smart cities and communities, public safety & security, AI in art and digital culture, edtech & learning analytics).

Academics with foundational expertise usually work closely with academics with domain expertise in contributing to societal challenges. The expert practices are overseen by our Academic Directors – distinguished and forward-thinking researchers who hold prominence across various schools at Erasmus University Rotterdam. This makes it a truly transdisciplinary collective that represents the broad field of data sciences within the university. Each expert practice consists of a group of professors, PhD researchers, and frequently affiliated researchers from other academic institutions. Collectively, this makes a group of approximately 350 academics.

We anticipate the innovation potential to be particularly present in crossovers between different expert practices. For example, the application of specific algorithms developed in the context of retail industry applied in public application domains, such as: Health, Pharma & Care and Public Safety & Security.





by Dr. Anne Kathrin Klesse,

3.1 Psychology of AI

"Evidence shows that fine-tuning and optimising the algorithm only goes so far. To truly be effective, understanding communication with and the lay beliefs of your customer are essential."

Anne Kathrin Klesse, Academic Director, Psychology of AI Expert Practice

While research in information systems, computer science, and other disciplines focuses on the technical computations of algorithms and the output that they deliver, our experts focus on the humans who interpret and interact with AI and algorithmic advice.

They collaborate with numerous stakeholders, including employers, employees, customers, policymakers, and AI developers, and study a variety of topics, such as consumer acceptance of AI solutions and automated products; employee beliefs about the technological replacement of human labour; and how analysts make sense of data and AI.

From an organisational perspective, data application projects and AI-driven innovations succeed when they are well-received and correctly utilised by employers, employees, and customers. Important psychological processes like social comparison, attribution, the need for uniqueness, and self-consciousness explain how individuals respond to and think about intelligent machines. Therefore, in this lab, we conduct experiments with human participants and employ a behavioural science approach to AI.

From a societal perspective, current projections indicate that significant segments of the labour force will disappear or change due to robots and algorithms' escalating ability to automate tasks. Regardless of whether this displacement will be temporary or permanent, taking into account the societal impact, it's important to understand potential threats to the psychological well-being of affected individuals.

If you wish to collaborate, please email psychologyofai@ecda.eur.nl. For more details, please visit the relevant Expert Practice section on the ECDA website.

Anne Klesse is an Associate Professor of marketing at Rotterdam School of Management, Erasmus University (RSM), and the academic director of the ECDA expert practice "Psychology of AI". She has further developed the expert practice, originally established by Professor Stefano Puntoni, to encompass additional interdisciplinary experts focusing on the human aspect of artificial intelligence. Their work demonstrates the significance of organisations and developers to consider the psychology of AI. The successful introduction of AI ultimately depends on its trustworthiness and the people's adoption behaviour.

3.2 Trustworthy & Accountable AI

Interview with Dr. Iuliana Sandu.

After a wonderful and impactful career at the Rotterdam School of Management (RSM), Erasmus University, Iuliana Sandu, academic director of the ECDA expert practice Trustworthy & Accountable AI, is leaving the Erasmus University Rotterdam. She has been a staunch supporter of ECDA from the beginning and believed profoundly in the importance of engaging academic experts and professionals in the data analytics domain. She is set to join Tilburg University as an Assistant Professor.

What achievement are you most proud of during your time at Rotterdam School of Management, Erasmus University Rotterdam?
I believe my most valuable contribution at RSM was the way I engaged with my students; connection, humour, and kindness are the words that I would choose to describe my classes. These attributes allowed my lectures to be a place where students felt safe to openly learn, explore new ideas, and develop and grow.

Why did you decide to join the Erasmus Centre for Data Analytics?
Joining the Erasmus Centre for Data Analytics (ECDA) was a fantastic opportunity for me. ECDA was a superb playing ground, a place where I could experiment with new ideas and new topics such as the concept of 'Algorithms in Control'. Plus, the ECDA community was such a fun group to interact with, so innovative and so inspiring. It has been a wonderful experience!

From my perspective, ECDA facilitates the creation of important connections. In 2020, I presented my view on the audit of algorithms during the Erasmus Data Summit, which led to a connection with colleagues from Protiviti. This connection ultimately resulted in a collaborative paper. In 2022, together with Menno Wiersma and Daphne Manich, we published a paper titled 'Time to audit your AI algorithms'. Without ECDA, this publication would not have come to fruition.

I think we are still on a journey to understand how organisations use analytics and AI. ECDA facilitates this journey, supporting societal growth through knowledge development and dissemination. Specifically, it encourages work on projects which may seem unconventional at first, such as the topic of auditing algorithms back in 2019, when I started my collaboration with ECDA.

What are the key challenges facing professionals in your field today?
A saying goes, 'trust is good, but control is better'. Nowadays, especially in the field of auditing and accounting, the emphasis on 'control' seems to outweigh trust. There are too many checks and balances, excessive regulation, and a lack of a big-picture view. This creates extreme pressure and an organisational culture skewed towards management rather than leadership. I believe more emphasis should be placed on trusting people. That they are indeed capable, and can be entrusted with complex responsibilities, such as upholding high integrity standards.

What are the top three pieces of advice you would offer organisations/professionals?
To answer this question, I draw from my teaching philosophy, which I term "DIG" from "Do-Interdependent-Grit".

1. 'Do' signifies the need for action, accountability, and questioning: 'what can I do to improve this?' To illustrate this, consider the analogy of exercising. On tough days or when working on challenging projects, going for a run is a good first action. First, we 'do' the run, and ideas and solutions will follow. Simply start.
2. 'Interdependent' underscores the true collaboration with others. It involves recognising that the team's success is your success. Just as in a family, one member cannot overexert themselves to the detriment of others. The family, the team, thrives when everybody works together.
3. 'Grit' embodies an idea put forth by Angela Duckworth: 'fall down seven times, get up eight'. As the son of a friend of mine wisely told his worried mother: 'Mother, these are not low grades, these are opportunities for growth'.

What does trustworthy and accountable AI mean to you?
Steven Covey aptly wrote, 'you cannot have trust without trustworthiness'. Therefore, we cannot place trust in AI if we lack a trustworthy individual or organisation responsible for it. To me, 'trustworthy and accountable AI' means that AI is developed by trustworthy organisations that hold themselves accountable for their products. It signifies organisations that genuinely assume responsibility to rectify any AI failures.

by Prof. Claartje ter Hoeven

3.3 AI, Work, and Platforms: Wellbeing of Ghost Workers

The expert practice focusing on AI, work and platforms delves into how digital technologies, including AI and digital platforms, reshape work for different people across various job types. It particularly emphasises connectivity, digital labour, algorithmic management, and the welfare of workers.

Ghost Work
Artificial intelligence relies on human labour for tasks such as data cleaning, coding, and content classifying. This on-demand work takes place online, with payment per task, often on platforms like Amazon Mechanical Turk. Coined as 'ghost work,' this rapidly growing, platform-based work remains largely unseen: workers lack communication with managers, feedback, and labour safeguards.

Project 'The Ghost worker's Well-being: An Integrative Framework
To ensure decent work conditions as automation continues to expand, knowledge about the effects of ghost work on well-being is urgently needed. The project will develop and test an integrative framework for analysing the effects of ghost work on worker's well-being. Existing models for analysing the impact of work conditions on well-being fall short for studying ghost work, as these models assume a person has a job and most likely an employer and colleagues. Therefore, this project begins from the specificities of ghost work to synthesize theories and concepts about algorithmic control, occupational well-being, human computation, and platform labour, in order to understand how and through which mechanisms ghost work influences well-being. The project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No. 101003134)

The project contributes to interdisciplinary scholarship in platform labour and organisational studies of algorithmic technologies. Employing a multi-methodological approach, it begins with in-depth interview-based fieldwork on ghostworkers' work conditions. This is followed by qualitative diary studies tracking the short-term dynamics of ghost work's effect on job conditions and wellbeing. Finally, a four-wave longitudinal panel study will explore the relationship between ghost work and wellbeing over time. The resulting integrative framework and empirical findings will capture the attention of scholars across various fields, policymakers, and industry leaders.

"It is essential to gain more insight into the human labour behind AI and to better regulate this work. First and foremost because everyone has the right to decent work, but it is also important from a quality perspective: the work of these workers has a major impact on influential algorithms, for example algorithms used for robotic surgery, recruitment software, and self-driving cars."

Claartje Ter Hoeven

For further reading, visit: www.ghostwork.org and/or: eur.nl/ghostworkers

Claartje Ter Hoeven is a Professor of Organizational Dynamics in the Digital Society at Erasmus School of Social and Behavioural Sciences, Erasmus University. She is also academic director of the ECDA expert practice "AI, work and platforms". Her scholarly interests encompass constant connectivity, digital labour, algorithmic management, and worker's well-being. In 2020 she received an ERC consolidator grant for the project 'The Ghostworker's Well-being: An Integrative Framework' focusing on the work conditions and well-being of online platform workers in Europe.

Photo credits: Phil Nijhuis

by Dr. Aurélie Lemmens

3.4 Customer Analytics

The Customer Analytics expert practice was established to fulfil the demand for a platform dedicated to guiding organisations in leveraging their data to become customer centric. This initiative was initiated by the current academic director, Aurélie Lemmens. Expert members of the practice include Rodrigo Belo, Bram van den Bergh, Xi Chen, and Bas Donkers. The practice recently welcomed three new members: Sebastian Gabel, Jason Roos, and Charles Wan.

Their expertise is truly multi-disciplinary, encompassing (social) psychology and marketing (e.g., nudging customers for increased value creation), economics and causal inference (e.g., inferring customer responses to marketing interventions), and computer science and machine learning (e.g., optimising targeting strategies).

"Customer analytics brings together consumer behaviour research and the latest advances in machine learning to guide companies tailoring their marketing strategies to different customer audiences. In our expert practice, we celebrate customer centricity and recognize that customers are very different in the way we should approach them."

Dr. Aurélie Lemmens

It's the platform's ambition to create a forum for discussion where academics across these diverse fields can collaborate to identify and address challenges organisations face in adopting customer-centric approaches. Additionally, the Customer Analytics expert practice also offers a point-of-contact for profit and non-profit organisations seeking support in developing customer-centric strategies. We are open to providing tangible feedback and insights to organisations that regularly seek our guidance.

Among our most recent collaborative successes, we helped a non-profit organisation to create a more effective fundraising campaign by leveraging insights from psychology (offering donors the chance to actively allocate the charity's budget) and utilising causal machine learning to identify which donors the campaign should target. These efforts resulted in a 42% increase in fundraising revenues. Our ambition for 2023 is to initiate more of these projects through our existing collaborations and by expanding our network of partnerships with new external entities.

Our expert practice actively engages in educating its environment about the importance of customer centricity and is committed to imparting tools for generating customer value for various organisation types (B2B, B2C, nonprofits). This year, we played an active role in the Executive MBA programme at the Rotterdam School of Management, sharing insights with diverse executives. The goal for 2023 is to use this platform as a means of communication with executives and professionals, enhancing their understanding of customer analytics and involving them in joint projects. Other educational endeavours include a range of electives in multiple MSc programs at Erasmus University Rotterdam (both at RSM and ESE).

In addition to our activities within Erasmus University Rotterdam, our members actively participate in external events, such as the Data & Analytics Congress (November 2022) in Amsterdam, organised by MOA (the Dutch expertise centre for marketing insights, research, and analytics). We also offer masterclasses (e.g., on customer retention strategies) in collaboration with company partners (e.g., NN and Rockfeather). A podcast on customer churn is also set to be released soon.

Regular internal and externals workshops and events are planned from 2023 onwards. Among these, we are setting up a special interest group on "Targeting Customers: How to Experiment, Learn & Optimise" at the upcoming International Choice Symposium taking place at INSEAD, Fontainebleau, in August. This group brings together international experts from academia (Harvard Business School, Northwestern University, University of Chicago, Duke, Drexel, and Stanford) and practitioners (Amazon and Google).

Dr. Aurélie Lemmens is Associate Professor of Marketing Management at the Rotterdam School of Management, Erasmus University (RSM) and Academic Director of the ECDA Expert Practice "Customer Analytics".

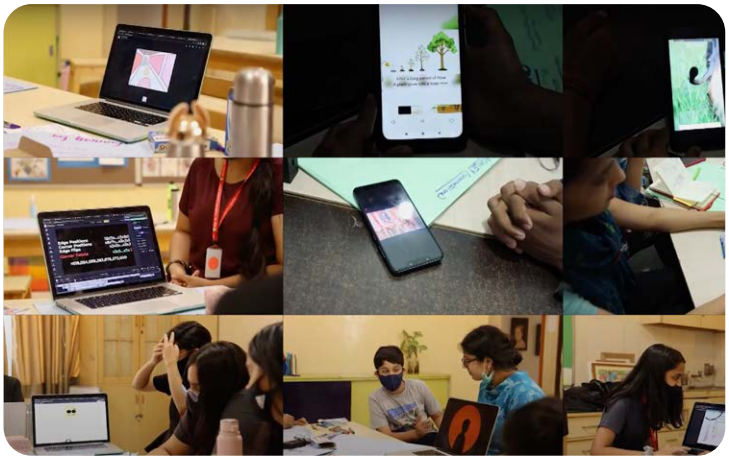
by Professor Payal Arora

3.5 Global Tech Design and the Future of Work

The Global Tech Design and the Future of Work expert practice emerged as a concerted response to the growing demand from design and tech companies to expand their user markets beyond the West. Additionally, there's mounting pressure from governments and civic entities to build inclusive and responsible technologies, with a special focus on the future of work. The initiative was kickstarted in 2020 with seed funding from the International Development Research Centre, a Canadian grant agency, to co-found FemLab—an initiative focused on feminist futures of work. Since its inception, FemLab has collaborated closely with diverse public and private stakeholders to conduct user-experience studies in Brazil, India, Bangladesh, and Namibia. The initiative has developed toolkits and campaigns on fostering inclusive designs in an AI-driven age.

Our team consists of interdisciplinary scholars and practitioners from around the world, including digital anthropologists, computational experts, designers, and legal experts. FemLab's close collaborators include members from organisations like Justice Adda—a design+law social venture, Adobe, Soteryx—a Risk, Resilience and Engagement company, UNHCR Innovation Services, and the Harambee Youth Accelerator Programme in Kenya.

Next Billion Ready
Professor Payal Arora, named the 'next billion champion' and 'the right kind of person to reform tech' by Forbes, along with her team, is committed to advising corporations, aid agencies, thinktanks, and design companies on preparing for the ascendancy of the next billion user markets - those outside the West - who will shape the future trends in AI and innovation. Our current focus is in the areas of emerging AI and the future of work, creativity, cross-cultural AI ethics, and inclusive and responsible design.



Current Projects Using our Expertise.
FINDR (2022-2025) Horizon EU grant project: Mitigating discrimination in AI-enabled recruitment software through innovative methods, such as generating semi-synthetic debiased datasets for partners such as Randstad.

PWILL Cost Action (2023-2025) project: Platform Work Inclusion Living Lab addresses the challenges and opportunities associated with digital platform work and explores ways to ensure fair and inclusive practices in this emerging sector.

"Time and again, I find myself reaching out to Payal to gain deeper insights into the complex relationships between consumers, cultures, and businesses in the Global South. Whether collaborating on a panel topic together for an event or digging into specific markets and challenges, Payal has that rare ability to connect the highly nuanced needs of people and their communities with the potential impact of technology, business, and design. She continues to be a trusted partner and advisor."
- Charles Hayes, Partner & Executive Managing Director, Asia, IDEO

Payal Arora is Professor of Technology, Values, and Global Media Cultures at the Erasmus School of Philosophy and academic director of "UX Research and Global Tech Design" expert practice at ECDA.


by Dr Jason Pridmore and Dr João Gonçalves

3.6 Media, AI, Privacy, Surveillance/ Security: Human-Centric Deployment of AI

Advancements in new media and communication technologies have produced many possibilities alongside numerous concerns related to personal, social, political, and economic aspects of life. This expert practice addresses the social, political, and ethical issues linked to media practices, the proliferation of artificial intelligence, privacy negotiations, various forms of surveillance, and challenges related to (cyber) security.

Protecting and Preserving Privacy for Construction Workers

The construction industry has one of the highest work-related fatality rates in Europe and lags behind other industries in adopting technology. Within the scope of the Horizon 2020 ASHVIN project, EUR explores how artificial intelligence technologies can be used to improve workplace safety and efficiency while safeguarding the privacy of construction workers. We also present a model for sharing data from public infrastructure to enhance citizen contributions and transparency in AI applications for construction maintenance. ASHVIN, a 3-year project funded by the European Commission, is expected to conclude in March 2024.

Further reading at: www.ashvin.eu

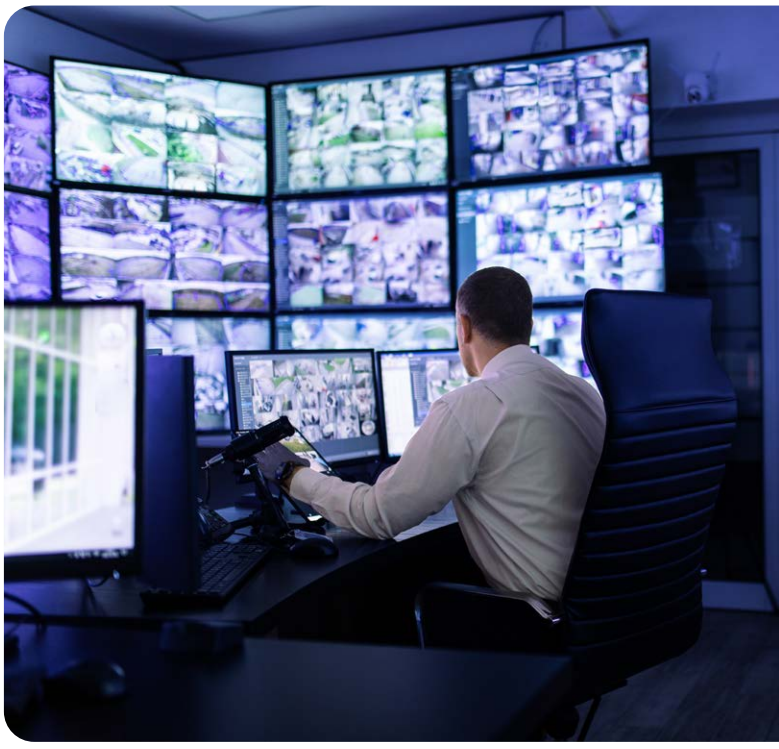
The SEISMEC Project

The interdisciplinary SEISMEC project, led by Erasmus University Rotterdam in collaboration with a multinational consortium of research, industry, and civil society partners, has been granted 10 million euros by the European Commission through the Horizon Europe Programme. SEISMEC aims to shape a future of work that is both productive and enriching, with a focus on creating sustainable work environments prioritising employee well-being and satisfaction. The exclusive funding underscores the potential of this four-year project to revolutionise workplaces and empower workers across key European industries.

A significant portion of the project focuses on co-designing explainable AI solutions empowering workers in industrial environments. These AI algorithms integrate real-time feedback from workers to improve workplace conditions and outcomes and will be piloted in various real-world industrial contexts. The project is set to start in January 2024.

Further reading at: www.eur.nl/en/news/better-work-better-workplaces-10-million-euros-awarded-seismec-project-european-commission

Dr. Jason Pridmore is Associate Professor at the Erasmus School of History, Culture, and Communication and academic director of "Media, AI, Privacy, Surveillance/Security" expert practice at ECDA. Dr. João Gonçalves is Assistant Professor at the Erasmus School of History, Culture, and Communication.



by Professor Bas Donkers

3.7 Personalisation

Personalisation aims to better meet customer needs in a timely and situation-specific manner. This requires detailed inferences on customer preferences that feed directly into automated systems tailoring the offerings to each customer's needs. Alternatively, interpretable models can be built, providing managers with a dashboard to monitor market, segment or individual-level requirements or a toolkit to support the design of tailor-made activities for meeting these needs. Our research focuses both on interpretable inferences to improve human decision-making on personalisation, as well as more complicated yet less interpretable approaches that personalise the user experience without human intervention or insights.

The expert practice actively engages with industry partners through education and research. Companies participate in large-scale case studies where students tackle challenging business problems full-time for an eight-week period. Recent research focusses on understanding the customer journey, analysing its touch points using models that also underlie large language models, specifically GPT. These models can be trained to understand and predict both the next touch point and the final outcome of the customer journey, such as a product purchase. By reverse-engineering this process, we can use this model to optimise the customer journey from a company perspective.

Another research stream, granted an Amazon Research Award (www.amazon.science/research-awards/program-updates/26-amazon-research-awards-recipients-announced), focuses on optimally allocating one of multiple possible marketing actions to customers who visit a website or call a call centre. With many new actions available over time, and customers' tendency to not return, the key challenge is to quickly learn what works well, while also maximising the utilisation of acquired knowledge before launching new marketing campaigns and restarting the learning process. With the ambition to also implement personalisation in unstable industry environments, future research in the expert practice is guaranteed as it requires proper dashboarding.

Bas Donkers holds the position of Professor of Marketing Research at Erasmus School of Economics (ESE) and serves as the Academic Director of the "Personalisation" expert practice at ECDA.

by Professor Ting Li

3.8 Digital Business: Augmented Reality for Social Inclusion

The Digital Business expert practice combines experimental, statistical, econometric, and computational methodologies to study today's digital, social, and mobile business. It strives to bring together behavioural science, management science, statistics, and computer science (including data mining and machine learning) to understand the causes and effects of how emerging technologies and big data impact consumers, businesses, and societies.

Augmented Reality for Social Inclusion
Augmented Reality (AR) smart glasses overlay digital information onto the user's real-world environment. In the summer of 2021, we collaborated with a leading AR company to explore the potential of AR smart glasses as an innovative hearing aid solution. These specialised glasses superimpose real-time text captions onto the user's field of view, offering individuals with hearing impairment the unique opportunity to "see" spoken words. Our in-depth field study was divided into three distinct, yet interconnected phases, aiming to capture a holistic understanding of the technology's impact.

Initially, we gathered data from around 2,000 individuals with hearing impairment to determine their specific needs and preferences for traditional hearing aids and AR smart glasses. Subsequently, we initiated a randomised field experiment involving 60 users who were granted a two-week free trial of the AR smart glasses, with an additional 170 participants forming the control group. This phase sought to explore the impact of AR smart glasses on users' information acquisition and teamwork efficacy. We compared their performance across three scenarios: without a hearing aid, using a speech-to-text app on a smartphone, and employing the AR smart glasses. Finally, post-trial surveys and interviews were conducted to examine psychological changes and lifestyle adaptations resulting from the use of these smart glasses.

Our findings are as follows: firstly, AR smart glasses enhanced the auditory information comprehension for hearing-impaired users by up to 40% without compromising visual input. Secondly, these devices significantly enhanced communication efficiency and collective intelligence in teamwork settings. Additionally, users experienced increased confidence and comfort during group interactions. Thirdly, the AR smart glasses led to noticeable psychological shifts within just two weeks of usage, in comparison to the control group. Fourthly, post-trial interviews revealed substantial improvements in participants' daily life, work efficiency, and social interactions.

Following our 2021 study, the collaborating company undertook a 12-month Research and Design initiative, resulting in the product receiving the **UNESCO Top Ten Global Innovation Award** in 2022. The product was publicly launched in September 2022. The application of this groundbreaking product was featured in the documentary "Love in Silence," which garnered an impressive 6 million views. In the spring of 2023, we extended our research to an educational setting, initiating a six-week randomised control trial involving 100 students at a high school for the hearing-impaired to assess the impact of this new technology on learning outcomes. In future research, we aim to explore the long-term effects of this technology on students' learning outcomes, its impact on the aging population with hearing impairment, and its potential benefits for new language learners.

Ting Li holds the position of Professor of Digital Business at Rotterdam School of Management, Erasmus University (RSM). She is the founding member and Academic Director of the "Digital Business" expert practice at ECDA.

by Dr. Robert Rooderkerk

3.9 AI in Retail

The retail value chain, all the way from supplier to end-customers, has seen a huge influx of new technologies such as IoT, robotics, and augmented reality. Concurrently, innovative business models such as omnichannel retail and platforms have gained prominence. These developments have resulted in large amounts of data becoming available throughout the retail supply chain. The availability of extensive retail data has increased the need for advanced analytics to arrive at actionable insights in many decision domains including warehousing, transport, assortment planning, and inventory management.

The Retail Analytics expert practice advances retail analytics research while fostering a continuous dialogue with practitioners on this topic. Our focus centres on retail operations which includes "all activities involved in the selling of physical goods to end customers for consumption". Additionally, our scope extends to the restaurant industry. Our team conducts research in nearly all domains of the retail supply chain, including, but not limited to, warehousing, transportation, store operations, online stores, and omnichannel retail.

Currently, there's a big focus in the expert practice on omnichannel retail, last-mile logistics, human-robot collaboration in warehouses, the use of advanced analytics by retailers, labour staffing, and sustainable operations.

Our experts collaborate closely with retailers and manufacturers both within the Netherlands and internationally. Collaborations take diverse forms, including but not limited to collaborative research, inspiration sessions, business cases integrated into our educational programs, and master thesis projects. Collaborative partners include prominent companies such as Albert Heijn, Coolblue, and Philips.

> The collaboration with the Erasmus Centre for Data Analytics and Marloes Slotboom brought great value to Digital Sundai. Their expertise and new insights have bolstered our efforts in guiding clients to harness innovative Retail AI solutions. These insights and the event to share them were highly valued by our retail clients. The collaboration has been a win-win, fostering strong ties between AI academia, industry, and budding data and AI talent for future collaborative endeavours
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> 
>
> **Robin Zondag**
> CEO and Founder of Digital Sundai, a forward-thinking boutique consultancy specialising in digital and AI

ECDA Insights Session AI & Retail
The ECDA Insights Session dedicated to AI in Retail was a great way for professionals from the retail sector to come together and gain insights into key trends and the latest AI-related insights in the retail sector.

Robert Rooderkerk, Academic Director of the Retail Analytics expert practice and Associate Professor of Operations Management at RSM, shared these insights based on his latest research. The accompanying whitepaper offered a practical omnichannel framework, helping practitioners in determining AI's appropriate role for their organisations. The study underlying the paper focuses on AI applications in the retail sector and the technology's current adoption by retailers. Results show that a customer-centric approach is imperative for retailers to meet customer demands. The framework shows a clear mapping of AI applications along the customer journey. ›››

"New business models such as omni-channel retail and platforms require faster decision-making. Retailers have a growing trove of data at their disposal to inform these decisions. This data includes numerous unstructured sources like video and sensor data. If data is the new oil, then analytics form its refinery. Decision-driven analytics, enhancing decision-making for stakeholders in the retail value chain, are in high demand. The Retail Analytics expert practice is dedicated to equipping the retail sector with the latest tools to get the job done".

Dr. Robert Rooderkerk

The whitepaper draws from master thesis research conducted by Marloes Slotboom. A graduate in Business Information Management from RSM, Marloes, who possesses extensive experience in e-commerce and digital marketing, carried out this research in collaboration with Robin Zondag of AI consulting firm Digital Sundai. The academic supervision for this research was provided by Robert Rooderkerk.

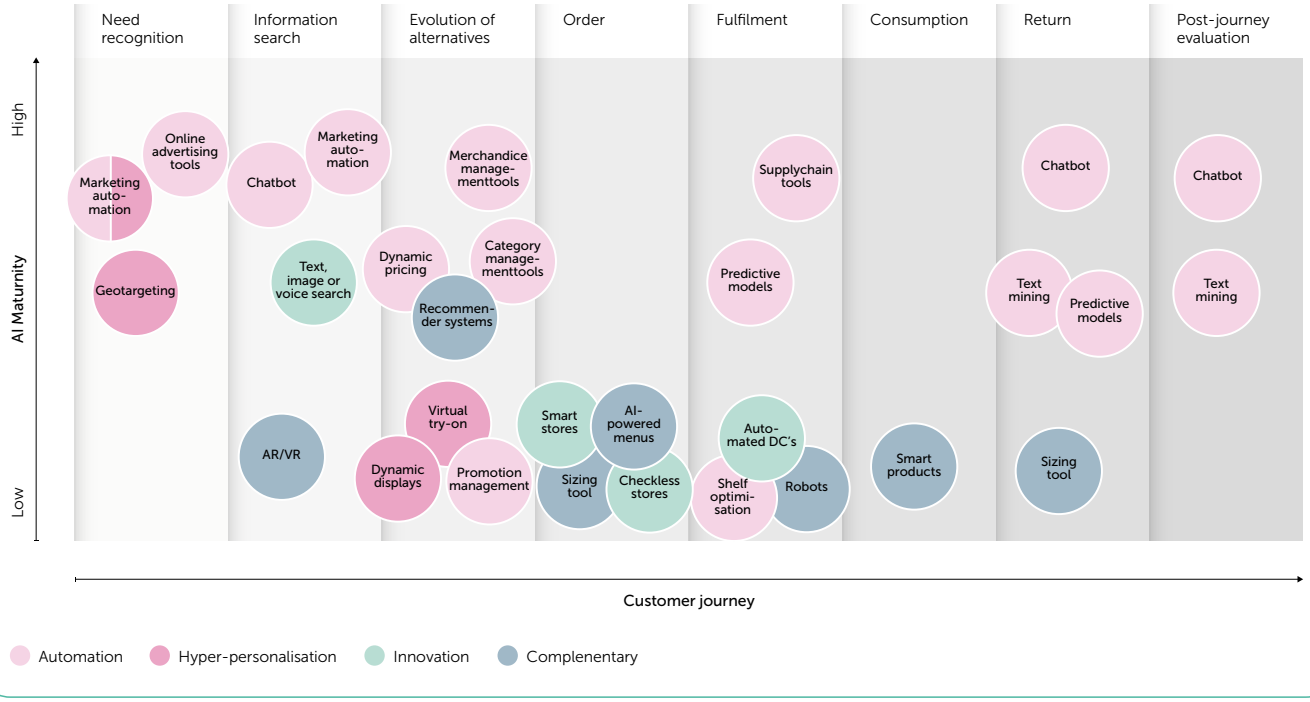
Please read the complete whitepaper at: ecda.eur.nl. Additionally, if you wish to explore the opportunity of engaging one of our talented data and AI students to conduct collaborative research under the supervision of our academic experts, please contact us via: moosterhout@rsm.nl

Robert Rooderkerk is Associate Professor of Operations Management at the Rotterdam School of Management, Erasmus University (RSM). He is the founding member and Academic Director of the "Retail Analytics" expert practice at ECDA.

"Robert Rooderkerk's practical expertise and Digital Sundai's in Retail AI proved invaluable in developing my framework. The event hosted by ECDA was the cherry on the cake, where my framework came to life, receiving commendation from both retailers and academics.

Marloes Slotboom
alumna Business Information Management at Rotterdam School of Management, Erasmus University Rotterdam

Framework for AI applications in Retail Customer Journey




by Dr. Rik Wehrens and Dr. Iris Wallenburg

3.10 Health Management & AI: the Consultation Room of the future

Working across disciplinary boundaries to shape "the Consultation Room of the future"

Last year, a dedicated team of researchers from Erasmus University, Erasmus MC and Delft University of Technology started the Flagship programme 'Consultation Room 2030'. The Flagship stands among the ten long-term programmes funded within the Health & Technology Convergence, a strategic initiative aimed at enhancing collaboration between these three institutes. By bringing together scholars from various disciplines, including medical fields, legal and ethical experts, designers, health economists, health services researchers, and sociologists, we aim to take the next step in the transition towards digital healthcare: fully integrating digital technologies into care provision to optimise patient support, empowerment, professional practice.

Include visual Consultation Room of the future
This digital transition is crucial due to the current turbulence in our healthcare system. The sector struggles with increasing staff shortages and financial limitations. Digital technologies, including home monitoring systems and wearables, have the potential to alleviate the burden on the health system, enabling patients to receive care at home, self-manage their own condition, stay informed, and take decisions together with healthcare providers. Nonetheless, the implementation of digital technologies is notoriously challenging and comes with organisational, social, and practical hurdles. To address these challenges, we must view digital healthcare technologies as systemic innovations that require new approaches to provision, organisation, governance, and reimbursement of care. ›››

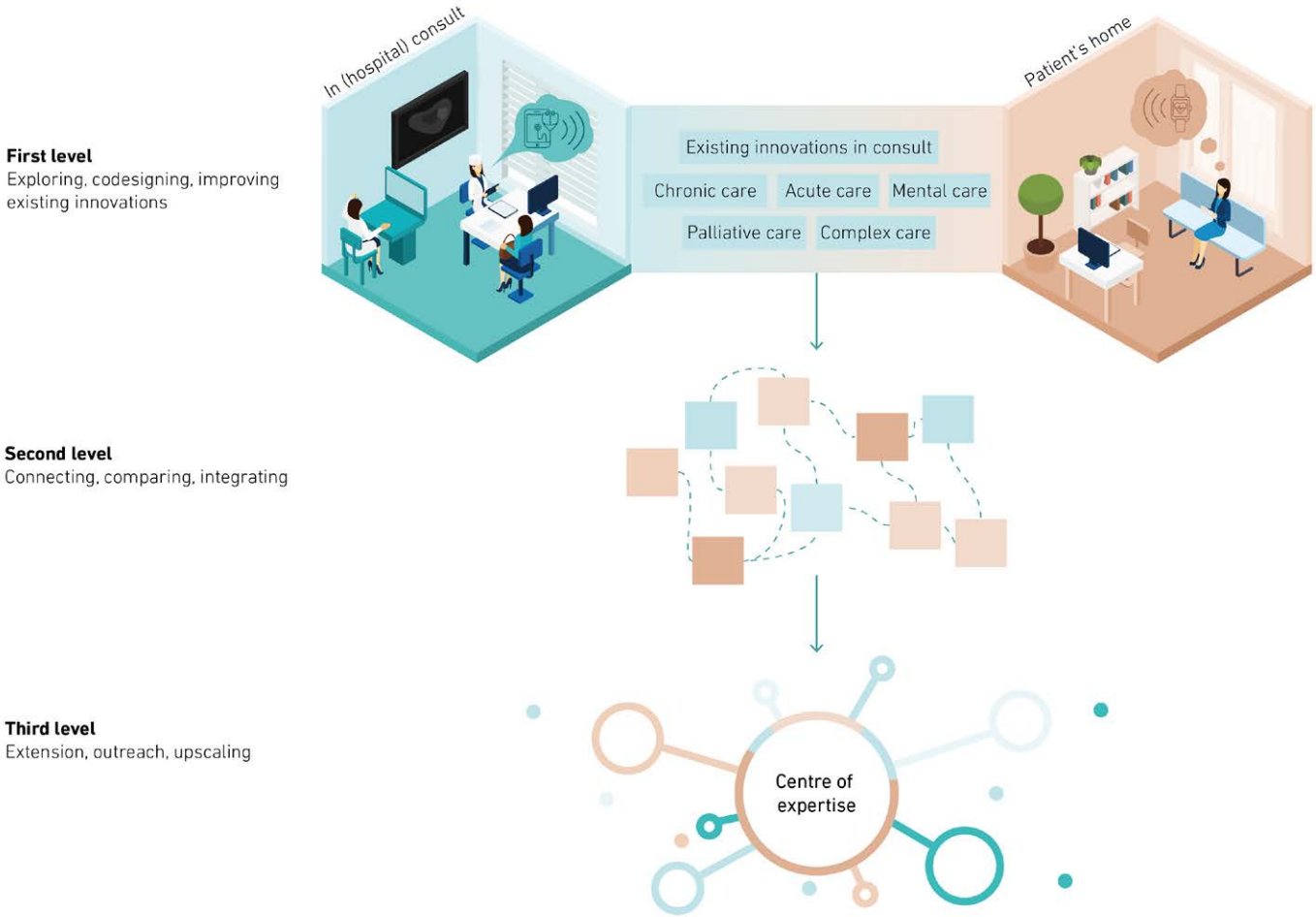


Photo credits: Rob van Esch

Our approach involves three key levels:

1. The first level consists of the further development of promising digital innovations within Erasmus MC. Examples include telemonitoring pregnant women at risk for hypertensive complications, real-time wireless lung function measurements for home monitoring of pulmonary fibrosis patients, and remote oncology care enabling optimal palliative care at home.
2. The second level interconnects and integrates these initiatives to identify general lessons and best practices to drive sustainable organisational change. Many digital innovations face similar challenges in terms of interconnected IT and data infrastructure, as well as structural reimbursement forms. Here, we examine how healthcare processes must adapt for digital technologies to become integral to regular care.
3. The third level expands and scales up to other hospitals in the regional network. We facilitate inter-organisational learning and identify the most promising solutions.

The full uptake of digital technologies in healthcare is a key example of an interdisciplinary challenge requiring synergy between different disciplines and methodologies. Much like the future consultation room not being confined to the hospital walls, we believe that scientific research should transcend disciplines. While working across disciplinary boundaries can be challenging, it is also a rewarding and inspiring experience!

Academic Leads: Kees Ahaus (EUR), Richard Goossens (TUD), and Joke Hendriks (EMC)

Read more: www.convergence.nl/the-consultation-room-of-the-future-physical-and-digital/

Dr. Rik Wehrens and Dr. Iris Wallenburg are both Associate Professor at the Erasmus School of Health Policy & Management (ESHPM). Dr. Wallenburg is also the Lead for AI in Healthcare Policy and Management at AIPact and Academic Director "Health & Management AI" at ECDA.

by Professor
Peter van der Spek

3.11 Bioinformatics: Leveraging AI and Deep Learning for Single Sell Morphology

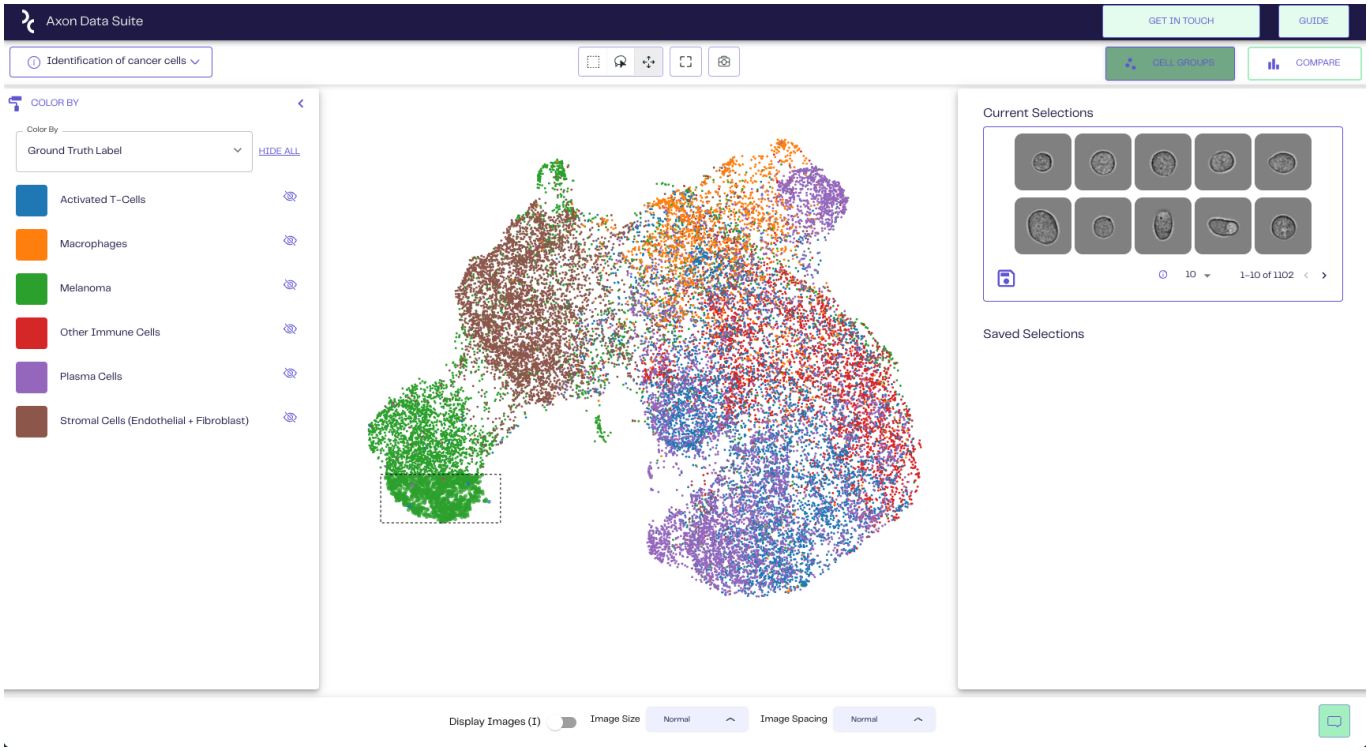
The bioinformatics expert practice focuses on translational medicine, which merges interdisciplinary data, resources, and expertise. This field combines molecular biology techniques with proficiency in computer science, information engineering, mathematics, and statistics to facilitate the diagnosis of complex patient cases. Our focus includes diagnostics and innovations in personalised healthcare, catering to congenital malformations and cancer patients. Additionally, we delve into how hereditary information encoded in our DNA shapes the evolution, development, structure, and function of the human brain and face.

Deepcell's REM-I platform

With the arrival of the Deepcell REM-I platform, Erasmus MC brought a technology to Rotterdam that enables fundamental and clinical researchers to explore cellular intricacies using a data-driven approach. This platform revolutionises our ability to understand cell structure and morphology in both health and disease. Impressively, the REM-I platform can differentiate between naïve and activated T cells, a feat that often eludes pathologists. Powered by AI, this platform detects subyle swellings within cell organelles in activated cells.

During the pilot and testing phases, Erasmus MC collaborates with Deepcell to refine the platform's technological features. This collaboration signifies our commitment to optimising personalised healthcare boundaries and reinforcing Rotterdam's status as a trailblazer in the medical technology sector. By using this cutting-edge technology within our research facilities and partnering closely with ECDA, our researchers gain access to a wealth of high-dimensional data, creating opportunities to make a significant impact and meaningful contributions to Rotterdam's thriving entrepreneurial community.

Peter van der Spek is Professor of Clinical Bioinformatics of the department of Pathology at the Erasmus University Medical Center Rotterdam and Academic Director "bioinformatics" at ECDA.



by Professor Dion Bongaerts

3.12 Fintech

The FinTech expert practice examines technology and data's role in enhancing our understanding of financial markets and reshaping them. This expert practice looks at both the positive and negative implications of such reforms. We will cover a spectrum of topics, including crypto-currencies, tokenisation, algorithmic trading, screening and selection procedures (such as investment selection and detecting money laundering), AI-driven market intelligence, as well as crowdfunding, marketplace lending, and token issuance as new ways for entrepreneurs to raise capital.

The project "Imputing Mutual Fund Trades" is an exemplary case of AI-driven market intelligence. This project generates insights on the strategies employed by professional asset managers, such as mutual funds and hedge funds, in handling entrusted funds. The ultimate goal is real-time monitoring of asset managers, though concerns about replicating investment strategies have led to reduced reporting demands. This initiative employs sophisticated algorithms to infer the size and timing of key trades executed by the studied funds, based on the limited available data. By doing so, this study enables effective monitoring and generates valuable data for fellow researchers, who can explore incentive issues within the asset management sector.

The expert practice promotes quality education at the intersection of data analytics, technology, and finance. This involves diverse team compositions based on natural language processing algorithms and incubator-style classes that challenge students to apply academic concepts as aspiring FinTech entrepreneurs.

Currently, the expert practice collaborates with TU Delft in an AI Convergence project, fostering joint research initiatives focusing on privacy-enhancing technologies, natural language processing, and econometrics with financial applications. This collaboration signifies our dedication to cultivating advancements at the nexus of finance and technology.

Furthermore, the expert practice collaborates with various other partners, including banks, institutional investors, insurers, pension funds, (semi)governmental entities, financial infrastructure providers, and regulators.

Dion Bongaerts holds the position of Professor of Financial Technology and Data Analytics at Rotterdam School of Management, Erasmus University (RSM) and serves as the Academic Director "Fintech" at ECDA.

by Professor Rob Zuidwijk

3.13 AI in Ports and Global Supply Chains

This expert practice focuses on sustainable development and effective management of global supply chains and ports. Central to our efforts is the acquisition and exchange of data across diverse organisations, harnessed for the advancement of sophisticated information services. Our academic pursuits, often with the involvement of public and private parties, include but are not limited to the integration of data analytics and AI into port logistics and the drive for sustainability within global supply chains.

Our ongoing projects embody the spirit of this endeavour:
The **MAGPIE** project, funded by Horizon 2020, is a substantial undertaking led by the Port of Rotterdam. Our team focuses on logistics operations enabled by automation and renewable energy. We work together with colleagues specialising in smart energy systems. Our work encompasses the planning of automated barge fleets utilising containerised energy cells, as well as electric truck charging strategies within the port area. Our work results in the development of decision support systems tailored to container logistics.

For details, please visit: www.magpie-ports.eu

The living lab **Catalyst** aims to direct innovation toward the integration of automated trucks. As part of this endeavour, we're designing supporting infrastructures in tandem with the adoption of automated trucks, and developing business models within the corresponding logistics ecosystems.

For details, please visit: www.tno.nl/nl/digitaal/intelligent-verkeer-vervoer/logistiek/geautomatiseerde-logistiek/catalyst-verduurzaming-wegvervoer

The **PLATO** project reflects on the impact of emerging digital platforms on the management of logistics ecosystems in ports. It examines how value-enhancing information services shape platforms and their positioning within the logistics ecosystem. Both private and public partners are involved.

For details, please visit: www.dinalog.nl/project/plato-platforms-and-digital-transformation-in-logistics

The **PATH2ZERO** project contributes to the transition towards emission-free inland shipping. To guide this transition, a data-driven virtual representation of the inland shipping system is proposed and developed. Our team focuses on the logistics chain and the transition as a transformative process.

For details, please visit: www.nwo.nl/en/news/research-supports-transition-zero-emission-inland-shipping

The **Sustainable and Digitalised Ports of the Future** project includes two PhD projects. These projects delve into the opportunities for ports within the context of individualised services in global supply chains. Driven by the rise of digital platforms and data analytics, it has become possible to understand individual customer demands while harnessing economies of scale. The project will develop methods to capitalise on these possibilities and assess the impact on port communities and authorities.

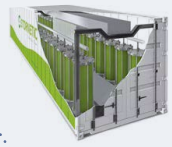
Professor Rob Zuidwijk serves as the Academic Director "AI in Ports and Global Supply Chains" at ECDA and is Professor of Global Supply Chains and Ports at Rotterdam School of Management, Erasmus University (RSM).

MAGPIE Smart Energy Matching Framework

Energy Supply
renewable energy

Energy Demand
(autonomous) transport (& storage)

Balancing & Conversion



storage

hydrogen production

chemical industry & refineries

Energy Matching

Port Digital Twin

Energy Trading

biomass, biogas & waste

terminals & equipment

gas & coal

charging infrastructure

steam & heat

city smart grid

by Dr. Yashar Ghiassi-Farrokhfal

3.14 Smart Energy & Sustainability

The landscape of energy systems is undergoing revolutionary changes driven by decarbonisation, deregulation, democratisation, and digitalisation. In this digital era, the role of AI is paramount. As the energy sector becomes more interconnected and data-driven, AI-driven technologies enable the efficient management of complex energy networks. Thanks to predictive analytics and machine learning algorithms, historical data can be analysed to accurately forecast energy demand patterns. This, in turn, facilitates proactive decision-making for grid operators and energy providers.

This predictive capability is particularly crucial for the integration of renewable energy sources. AI acts as a stabilising force, mitigating the intermittency challenges associated with renewables through the optimisation of energy storage solutions. Thus, AI ensures the consistency and reliability of power supply. An illustration of this is the smart energy matching framework, currently developed within the EU-funded project MAGPIE.

Moreover, AI plays a crucial role in bridging the gap between traditionally distinct sectors like heat, gas, and electricity. AI-driven platforms facilitate interaction between these sectors, enabling better conversion and distribution of energy. For instance, surplus electricity generated from renewables can be efficiently employed to produce hydrogen through electrolysis. This hydrogen can then be stored and used for heating purposes or reconverted to electricity during peak demand. AI orchestrates these interactions, enhancing energy efficiency, minimising waste, and harmonising the use of diverse energy carriers.

Because of the importance of these topics, our team concentrates on using AI and energy data analytics in the context of smart cities, sustainable energy, electric mobility, blockchain, IoT, and data platforms. Our aim is to help cities, communities, and stakeholders in achieving more sustainability and efficiency, all while fostering new business models founded on data, analytics, and intelligent pricing structures.

Our expertise spans a range of areas, including:

- AI-driven integrated and smart energy markets
- Harnessing AI for unlocking energy flexibility
- Smart charging and Vehicle-to-Grid (V2G) solutions
- Smart operation of energy storage systems
- AI-facilitated congestion management
- Building an AI-enabled hydrogen economy
- Optimising smart heat networks
- Designing and governing urban data platforms, along with evolving business models

For more details on our ongoing research projects and more, please refer to: ecda.eur.nl/expert-practices/smart-energy-sustainability/

Yashar Ghiassi-Farrokhfal serves as the Academic Director "AI in Smart Energy & Sustainability" at ECDA and holds the position of an Associate Professor of Technology and Operations Management at Rotterdam School of Management, Erasmus University (RSM).

by Dr. Trilce Navarrete

3.15 AI in Art and Digital Culture

The digital transformation in the arts and cultural sector continues to fundamentally change the creative process and the participation within cultural activities. These transformations influence society's cultural values and reshape our future understanding of art and culture. In this expert practice, we look at three distinct areas where digital technologies intertwine with the arts and culture:

1. **The arts and culture market**: we examine the market innovations brought by the cultural and creative industries, including new emerging art forms like AI art, the application of technological advancements in content display such as XR and personalisation, the introduction of new products and services like NFTs and digital museums, the emergence of new actors like cultural influencers and art bots, and new value propositions such as data access and culture data to train algorithms.
2. **The emerging forms of cultural participation**: we look at social preferences and cultural capital formation, with a special focus on newer generations. These generations may have a cultural consumption profile that includes AI recommendations spanning memes, games, and videos, all accessible through mobile phones. This contrasts with earlier generations who are more generally used to visiting cinemas, museums, and theatres.
3. **AI's implications in the arts and culture sector**: we dissect the societal shifts stemming from AI's impact on arts and culture. This involves delving into ethical agreements regarding AI in these domains, perceptions on authenticity, the value attributed to human craftsmanship in digital applications, and policy ramifications spanning legal, economic, and technical aspects.

What are topics or questions you would like to answer?

We are interested in questions that examine the socio-economic dimension of the intersection between art and culture and digital technology. Some of the questions we work with are concerned with:

1. How AI influences the art market, and why it's taking so long for data to be connected and disclosed to enhance sales.
2. How emerging forms of cultural participation are distinctly sensitive to levels of digital capital, and what will augment XR's effectiveness in fostering proximity to cultural content and nurturing symbolic capital.
3. Actors shaping a post-platform economy, and their implications for gatekeepers, particularly in terms of signalling quality and trust.
4. The factors determining the effectiveness of AI innovations in embracing intricate cultural subtleties, and how time investment is viewed in an era marked by instant AI gratification.

Dr. Trilce Navarrete is Assistant Professor in the Department of Arts and Culture Studies at the Erasmus School of History, Culture and Communication (ESHCC) and serves as Academic Director "AI in Art and Digital Culture" at ECDA.

by Professor Gui Liberali

3.16 Trial Design and Experimentation: Use of Machine Learning to Advance Design and Analysis of Medical Trials

In this expert practice, we look at two distinct areas involving adaptive experiments:

1. In the business sector, machine learning can help companies run large-scale online experiments to identify the best ways to communicate with consumers. This can lead to increased sales, improved customer satisfaction, and a better understanding of what customers want, thereby helping them to find the information and products they need.
2. In clinical trials, machine learning can help researchers design more efficient and effective trials. This can lead to the faster development of new drugs and treatments, contributing to better patient outcomes.

In a recent collaborative study with researchers from Erasmus Medical Centre and MIT, we propelled the advancement of medical trial design and analysis through machine learning methods. Phase III drug trials are under pressure to reduce their length and cost while also reducing potential harm to patients. We propose an alternative way to assess the clinical effects of drug treatments. The task at hand is to reduce the trial size (and its associated burden) without compromising the reliability of its final result.

Our method provides a more robust way of incorporating new information (such as a patient outcomes) pertaining to the parameter of interest (such as the drug efficacy). This entails real-time updates of existing efficacy estimates, throughout the course of the trial. In this study, we implement real-time adaptation of clinical trials into an algorithm and subject it to testing using trial data. We explore its performance thresholds through two simulations, each empirically grounded in individual patient data from large-scale trials, illustrating what would have happened if these trials had been adapted in real-time. Our findings show that our method, if implemented, could have averted cardiovascular events and fatalities in the scrutinised trials, while reliably identifying the most effective treatment.

Gui Liberali is a Professor of Digital Marketing at Rotterdam School of Management, Erasmus University (RSM) and Academic Director "Trial Design and Experimentation" at ECDA

by Dr. Crystal Smit
and Dr. Dave Blok

3.17 AiMovez: Using Artificial Intelligence to Help Young Media Users Achieve a Healthy and Sustainable Lifestyle

Advancements in communication technology have opened up unprecedented opportunities for nurturing healthy and sustainable behavioural change among the youth. In our expert practice, AI, Digital Communication, and Behavioural Change (AIMovez), our dedicated research team explores the potential of digital technology in fostering healthy and sustainable lifestyles among youth. Adopting a human-centred approach, we focus on empowering the next generation.

Our Focus:
Today's youth are deeply entrenched in a digital world, heavily using digital media communication technologies such as Instagram and WhatsApp. Within AIMovez, our mission is to implement AI to help these young media users achieve a healthy and sustainable lifestyle. Our research revolves around the utilisation of AI on extensive datasets to predict human online communication and behaviours, subsequently translating these insights into effective digital health interventions.

We delve into the dynamics of the online social networks of the youth, for example on social media platforms or online messaging apps. These digital social networks offer new pathways for examining communication and influence among youth. More specifically, for our research we investigate the communication data exchanged through online messaging apps or social platforms among the youth. These invaluable insights harvested from digital communication serve as the foundation for developing digital interventions aimed at promoting healthy and sustainable lifestyles within the social networks of young people.

Identifying Influential Peers:
In the quest to encourage health-conscious behaviour within the social networks of young individuals, it's imperative to identify influential peers who can spread positive behaviours among their circles. In our recent research initiative on social network interventions, we found that identifying influential peers based on online communication data could have a larger impact on behaviour change than traditional offline social networks. Next, we aim to investigate whether we could identify individuals who are or will become influencers in a social network of peers. We also aim to unravel the reasons behind behavioural shifts in the context of social networks among the youth.

Large Language Models:
Recent advancements in open-sourced Large Language Models (LLMs) have opened exciting possibilities for advanced behaviour change interventions. Currently, we're developing an LLM-based conversational assistant tailored to promote vegetarianism among youth. By adapting the language styles commonly used by youth, our goal is to assess the impact of language personalisation on the efficacy of interventions. Furthermore, this endeavour presents a unique opportunity to evaluate the acceptance of such virtual assistants among the younger demographic.

Stakeholder Collaboration:
In all our research endeavours, we actively engage with stakeholders who play important roles in shaping youth behaviour, including parents, schools, and most importantly, the youth themselves.

For more details on our research initiatives, please visit our website: movez-network.eu/en/research-themes/ai-movez

Dr. Dave Blok is a Researcher Behavioural Change at Erasmus School of Social and Behavioural Sciences (ESSB) and academic researcher at the Erasmus Movez Lab.

Dr. Crystal Smit is Assistant Professor in Clinical Child and Family Studies at the Department of Psychology, Education and Child Studies at Erasmus School of Social and Behavioural Sciences (ESSB) and lab manager of the Erasmus Movez Lab.

4/ Education: Skill and reskill for data and AI literacy & stimulate immersive learning

by Vanessa Abel, Programme Director at Erasmus X

4.1 ErasmusX and Immersive Education

Immersive technologies are quickly becoming integral to our contemporary society. Virtual Reality (VR) is making headway into the domains of healthcare, arts, architecture, and entertainment. As such, immersive technology has been making significant strides in higher education as well and is anticipated to continue reshaping how students acquire knowledge and engage with educational content.

Immersive technologies like VR and Augmented Reality (AR) are being integrated into higher education to create engaging and interactive learning experiences. VR can simulate real-world scenarios for training and practice in areas such as medicine, architecture, and engineering. It can also encourage interdisciplinary learning. On the other hand, AR overlays digital information onto the physical world, enhancing learning materials and providing interactive elements.

The advent and availability of immersive technologies necessitate their integration within education, or at the very least, an exploration of their potential and limitations.

Immersive education revolutionises learning by leveraging VR and AR to captivate students. It kindles curiosity, making complex concepts understandable and encouraging experiential learning through practical engagement. Fields ranging from medical simulations and architectural design, as well as global exploration of historical sites, gain from this approach. Notably, collaboration knows no borders as students unite in virtual spaces, honing teamwork, and adaptability. As technology intertwines with traditional methods, immersive education sparks creativity, customises learning, and equips learners with skills that stand the test of time in a dynamic world.

Yet, there exist some critical questions that demand introspection from innovators, designers, learners, educators, and administrators alike. Foremost among them are the privacy and ethical concerns surrounding the use of these technologies. Also, how can we ensure that the content curated for immersive learning experiences is meaningful and inclusive? It has the potential to enhance learning on an unprecedented scale, but only if we use it responsibly.

Therefore, Erasmus X wants to introduce immersive technologies to both students and teachers, elevating their overall learning and teaching experiences. Our pursuit involves conducting experiments with

real-world implications, fostering skill development, promoting interdisciplinary exploration, and cultivating collaborative problem-solving skills in virtual environments. In partnership with the Municipality of Rotterdam, technology providers, content creators, industry experts, educational institutions, and through joint ventures, funding initiatives, and knowledge exchange, a vibrant and dynamic ecosystem emerges. This synergy enriches immersive learning, facilitates resource-sharing, and accelerates the integration of cutting-edge technologies, thereby ensuring a comprehensive and innovative approach to education.

For more information or to explore potential collaborations, please reach out to us at: abel@ece.eur.nl or visit: www.erasmusx.io

4.2 Student Programmes – Some Examples

Within the curriculum of Erasmus University Rotterdam, multiple educational programmes rooted in data sciences flourish, including Business Information Management, Business Analytics and Management at Rotterdam school of Management, Data Science and Marketing Analytics, and Econometrics at Erasmus School of Economics. Together, these curricula are the breeding ground for new talent. These programmes not only embrace the latest data science techniques and methodologies, but also incorporate organisational, economic, business, and broader societal contexts. Beyond these accredited programmes, student's associations like Turing Students Rotterdam and the Erasmus Tech Community offer extracurricular activities in the context of data, AI, and digitalisation to students.

At Erasmus Centre for Data Analytics, our aim is to foster the growth and recognition of promising data and AI talent. We aim to link them to real-world data-driven challenges, connect them with our partners, and inspire them to leverage their expertise in data and AI to make a positive impact.

4.2.1 Company Challenges and Data-Driven Solutions by Students

Business Analytics Workshop (RSM)
In RSM's flagship MScBA Business Analytics & Management programme, we collaborate with companies through various avenues such as guest lectures, case studies, and thesis internships. We even offer a course that is designed around the notion of collaborating with companies, the Business Analytics Workshop. In this course, student groups develop analytics solutions for different business challenges. These challenges are presented by corporate partners actively involved in the course, offering insights through interviews that shed light on problem contexts. These partners also attend final student presentations in which they present their solutions. This past year, challenges were provided by Henkel and UTurn among others.

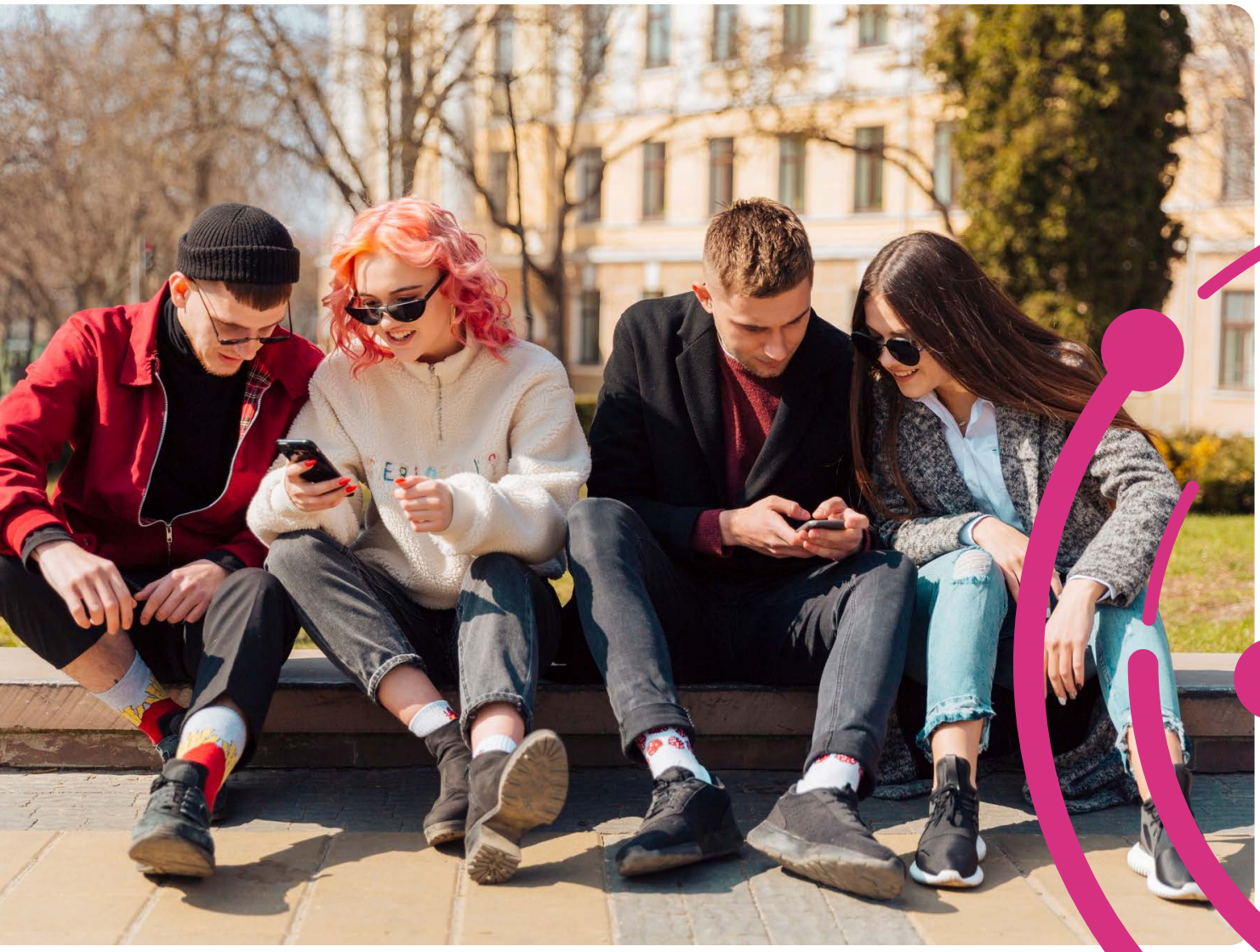
Two projects were brought forward by Henkel. The first aimed to enhance sales forecasting efficiency by exploring the integration of machine learning-based forecasts into the current manual process. Historical sales data at business unit, country, and quarter were used to train machine learning models. Three teams proposed distinct algorithms, each resulting in forecasting models that outperformed Henkel's established linear regression-based approach. The second project was centred on adhesive technologies, seeking an automated method to identify outliers in material prices. Students created user-friendly dashboards to identify these outliers, enhancing the process significantly.

The project at UTurn revolved around the development of a digital transport platform. Students analysed anonymised real-world transaction data to understand customer churn behaviour and develop predictive models. The success of these models led to their adoption by the company.

All these projects underscore the competence of student teams in devising innovative solutions that enhance company processes. The best proof is that all involved companies expressed keen interest in future collaborations with the students.

Case Studies in Data Science and Marketing Analytics (ESE)
Students enrolled in the ESE Data Science and Marketing Analytics master programme gain a unique opportunity to address real-world management challenges using real data, collaborating closely with companies. The seminar, "Case Studies in Data Science and Marketing Analytics," underscores six data science talents that determine the success of a data science project: subject expertise, data wrangling, data analysis, storytelling, design, and project management.

In 2023 students in the ESE Data Science and Marketing Analytics master program have worked full-time to provide theoretically grounded, data-driven solutions to four real-life business cases. In these cases, students improved CLV predictions at Decathlon, enhanced the CRM strategies at Just Eat Takeaway (JET), conducted "peak analysis" to study the increase in website visits after a TV commercial and determined the causes of such



increase at CoolBlue and studied the effectiveness of communication through different channels in the lead-up to a potential travel insurance purchase at Centraal Beheer Achmea.

In a bit more detail, at JET students were provided with a pair of extensive datasets on customers purchases and the communications they received from JET. The latter included the communication type, timestamp, and whether the customers engaged with the communication (e.g., by opening an email). This communication spanned from the customer onboarding to retention, encompassing a variety of campaigns, recommendations, and loyalty initiatives. Armed with these comprehensive datasets, the students' objective was to transform the company's communication strategy into a more "customer-centric" approach. This involved exploring "what" communication should be sent to "whom" and "when." The ultimate aim was to enhance the monthly order rate, while preserving enduring customer relationships. Leveraging a diverse range of methodologies, including panel data analysis, event studies, propensity score matching, and machine learning techniques, each team delivered innovative and distinctive insights to the company.

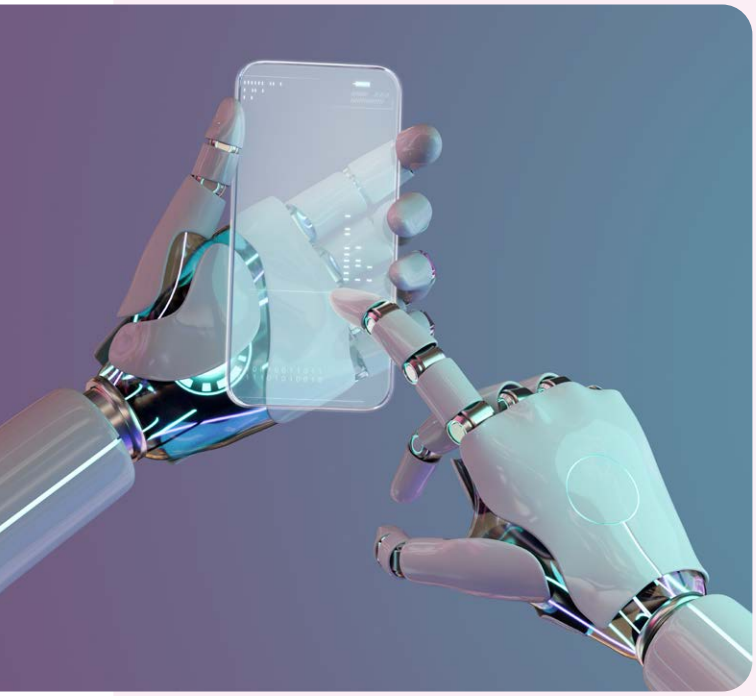
Student teams often have a strong impact on the actual business of the participating companies. They present their results at the company headquarters, which is the formal end. In practice, though, student teams are invited back to explain their analyses in more detail, are invited for internships on similar or completely new projects, or eventually join the company as an employee.

4.2.2 Minor in AI and Societal Impact

The inception of the AI Minor was rooted in the recognition artificial intelligence's (AI) profound influence, poised to revolutionise various facets of our lives. Envisioning its rapid evolution, it becomes apparent that AI has the potential to reshape professional paradigms within both private and public sectors, as well as introducing transformative methodologies for scientific research.

Erasmian Language Model (ELM)

After the launch of the popular large language model ChatGPT in November 2022, Michele Murgia (education coordinator AI Convergence) and assistant professor João Goncalves (ESHCC) envisioned a project that would harness the potential of AI-driven LLMs but make it suitable for academia. The name of this project quickly became the Erasmian Language Model (ELM).



ELM is meant to depose ChatGPT from its position in education by offering a viable and better alternative. An alternative that's open source, continually trained with a critical socio-technological perspective, safeguards privacy and labour practices and is based on community-wide participation. Anything students and teachers can do with ChatGPT (e.g. learn how prompts work, learn about factual error, critical reflection on technological output, produce rubrics etc.) can be done with ELM. In fact, ELM offers more educational and research possibilities due to providing insight into its model and data.

The idea behind ELM rests on actively democratising the means of AI production, because we ultimately want the labour by the academic community to be precisely for the academic community and possibly society at large – not the vested interests of commercial companies. ELM is accordingly a project that not only seeks to protect and foster public values from existing technologies that infringe on them, but also future ones.

The supporting team now consists of student assistants, PhDs and post-docs from various institutions and backgrounds, from computer science to law to the social sciences. ELM will be first employed in the minor AI and Societal Impact (EUR), the minor Computing Minds (ErasmusMC) and the Master Recht en Technologie (EUR).

This imminent paradigm shift has received widespread attention regarding AI's implications across society, seeping into education, including the diverse schools and curricula within Erasmus University.

As part of this endeavour, a collaborative initiative emerged, uniting a diverse assembly of educators, AI researchers, students, and specialised staff. The goal was to forge an interdisciplinary minor that delves into the societal implications of AI. Accessible to all LDE students, this innovative programme propels them to the forefront of AI discourse. Spearheaded by Erasmus X, an innovation programme of Erasmus University, the educational blueprint took shape through a co-creative process, harnessing the expertise of the expertise of involved stakeholders and seamlessly integrating the minor into the academic landscape.

In 2022, the culmination of these efforts was realised as 35 students enthusiastically enrolled in the programme. Guided by a cohort of 16 proficient instructors representing five distinct schools: ESSB, ESL, RSM, ESHCC, and ESHPM. In 2023 this has been scaled up to host 86 students.

The resounding success of this initiative not only underscores Erasmus University's foresight in embracing emerging paradigms, but also highlights education's capacity to foster forward-looking dialogues within the realm of AI and its societal impacts. With a foundation laid for holistic understanding and critical engagement, the AI-focused minor stands as a pioneering example. It demonstrates how a minor programme can catalyse substantial shifts in educational landscapes, equipping students with the wisdom and expertise to navigate the evolving AI-infused world.

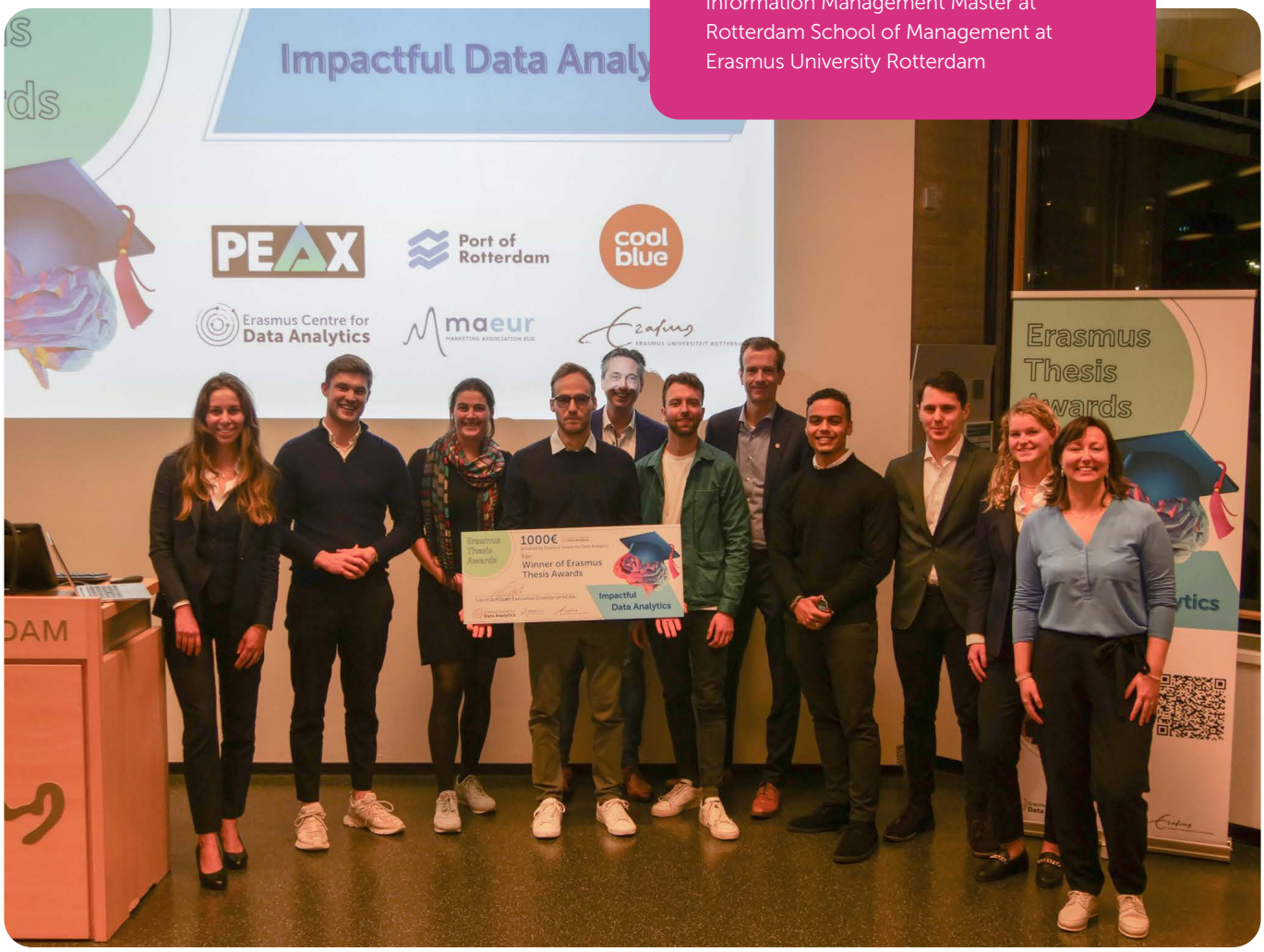
4.2.3 Erasmus Thesis Awards

The Erasmus Thesis Awards have a twofold objective. Firstly, to celebrate data and Artificial Intelligence (AI) talent at EUR and to foster connections between these talents and data and AI researchers and practitioners. Secondly, to help prepare young talent for careers that will invariably involve data and AI, guiding them in applying data analytics and algorithms with careful consideration for effectiveness and ethics.

The Erasmus Thesis Awards are made possible by the Erasmus Centre for Data Analytics, student associations Maeur and Faector, trusted industry partners, and the academic and student community around data and AI at Erasmus University Rotterdam. Four recent graduates of EUR, nominated by their respective master programmes (BIM, BAM, DSMA, and Econometrics), are given the chance to present their master thesis research and the applicability of their findings to a jury of data and AI experts from the industry, the broader academic community, and current EUR students.

"The Erasmus Thesis Award was a memorable experience, recognising my research on novel data representations for financial time series data in trading. By combining computer vision with financial markets, image-based trading strategies immediately captivated my interest. The results showed a 2.4x higher risk-adjusted return over a passive index investment, demonstrating its potential to enhance investment outcomes. Participating and having the opportunity to present my research to industry experts and practitioners pushed me beyond my comfort zone and helped me develop invaluable communication and presentation skills. Equally inspiring was the chance to witness the exceptional talent and innovative ideas of fellow nominees. I am sincerely grateful for being part of the inaugural Erasmus Thesis Awards and excited to continue exploring the intersection of machine learning and finance."

Sven Tellemanns, winner of the Erasmus Thesis Awards '22-23 - Impactful Data Analytics, and alumnus of the Business Information Management Master at Rotterdam School of Management at Erasmus University Rotterdam



This year's winner of the Erasmus Thesis Awards was Sven Tellemanns, an alumnus of the master's programme in Business Information Management at Rotterdam School of Management. Sven's work on stock market prediction garnered him the grand prize of 1000 euros. His innovative approach entailed encoding 10 years' worth of stock market data into 1.41 million multichannel images, enabling the use of new model architectures in the financial domain.

The other nominees included Rowan Doesburg (a recent graduate of Data Science and Marketing Analytics at Erasmus School of Economics), Stan Hennekes (a recent graduate of Econometrics at Erasmus School of Economics) and Mathijs Barendse (a recent graduate of Business Analytics and Management at Rotterdam School of Management, Erasmus University).

These nominees had already won the selection processes within their own respective master programmes. Their research focused on current topics such as customer recommendations through neural networks in the retail sector and anomaly detection in forensic data via machine learning. The discussions delved deeply into the effectiveness, applicability, and crucially, ethical dimensions of their work.

The jury of data & AI experts comprised:
Karin de Boo Product Owner Data Driven Change at Port of Rotterdam
Olrik van Dam Head of Marketing Data & Insights at Coolblue
Guus van Heijningen Founder and CEO of Peax Data
Marcel van Oosterhout Deputy Executive Director at Erasmus Centre for Data Analytics

Next Erasmus Thesis Awards
Let us know if you would like to participate in this year's Erasmus Thesis Awards - Impactful Data Analytics, taking place on **23 November 2023** and/ or Erasmus Thesis Awards – Impactful Marketing Analytics, scheduled for **28 November 2023**.
Please don't hesitate to get in touch with us for the data & AI thesis awards at: thesisawards@ecda.eur.nl and for the marketing analytics thesis awards at: data@maeur.nl.

4.2.4 Erasmus Tech Community

Since 2017, the Erasmus Tech Community (ETC) has consistently pursued its mission to inspire and educate students from various backgrounds about the disruptive technological changes underway in society. As the largest student-led tech organisation in the Benelux, ETC actively collaborates with prominent private-sector companies, including Google, Microsoft, and IBM. These collaborations result in meticulously organised events and workshops where industry experts share their insights on the latest technologies and trends.

In addition to hosting large-scale conferences and tutorials, ETC also offers long-term learning platforms that enable students to gain a deeper understanding of a specific area of tech. Furthermore, ETC's Consulting division helps companies solve real-world business challenges by linking them to the bright talent available at the university. Through these initiatives, ETC aims to equip students with the tools and knowledge they need to effectively apply their skills in their future careers.

At its core, ETC's overarching objective is to empower its community members to emerge as adept participants in the tech-centric world of tomorrow. For more information: www.erasmustech.io/

4.2.5 Turing Students Rotterdam –Tech Courses by and for Students

Turing Students Rotterdam is a technology association created for students, by students. Their main mission is to demonstrate the accessibility of technology to everyone. Rooted within the Erasmus University campus, they are building a community of students that are interested in technology at a non-tech university. Throughout the year, they offer courses, organise networking events, career fairs, and social gatherings. Aligned with the Turing Society, a student network organisation, their shared aim is to cultivate the next generation of accomplished coders.

In our ever-evolving world, technology is becoming more and more important. Turing Students Rotterdam contributes to this evolution by offering introductory courses that democratise programming. Additionally, for the more experienced students, advanced courses give extra depth to the exciting world of technology. These include Python for Data-science, Intro To Cs5o, Web Design, Turing Machine & Deep Learning, and R For Data-science. These courses connect perfectly to the curriculum of different studies at Rotterdam School of Management, Erasmus School of Economics, and other faculties.

For additional information, please visit:
turing-students.squarespace.com/

4.3 Programmes for Professionals – Some Examples

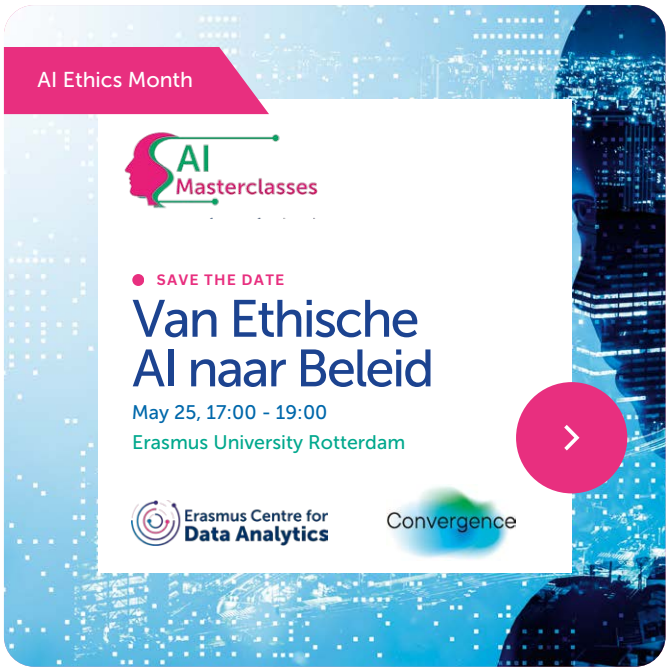
4.3.1 AI Master Classes and AI Mixers

The AI Masterclasses and AI Mixers serve as in-depth events centred around Artificial Intelligence (AI). At these events, experts from our ECDA expert practices and our wider network of knowledge institutions convene with a diverse group of professionals to discuss contemporary contextual subjects and perspectives related to AI. These events are designed to explore the bigger questions surrounding AI, including questions related to ethics, policy formulation, security, representation and decolonisation of data, and the impact of (generative) AI on our culture. Crucially, they delve into the repercussions on our society—how we interact, lead, work, create, and establish AI-related policies—making them indispensable. During these masterclasses, we continuously revisit these tough questions, allowing our experts to challenge and guide discussions with our participating professionals. We discuss the upcoming challenges, the intended and unintended outcomes of decisions regarding data and AI, and strategies for fostering AI for the greater good.

Following the initial expert presentation, participants can participate in hands-on workshop sessions, discussions, and, finally, some networking over drinks. The AI Masterclasses and Mixers are organised by the AI, Data & Digitalisation Convergence, in collaboration with Erasmus University Rotterdam, Delft University of Technology, Erasmus Medical Centre, and Leiden University. We are pleased to share that the recent AI series explored the following topics:

> These masterclasses offer an important venue to deepen our understanding of AI. Whether inexperienced or well-versed, everyone can learn something through guided interaction.

Michele Murgia
Education Coordinator Artificial Intelligence

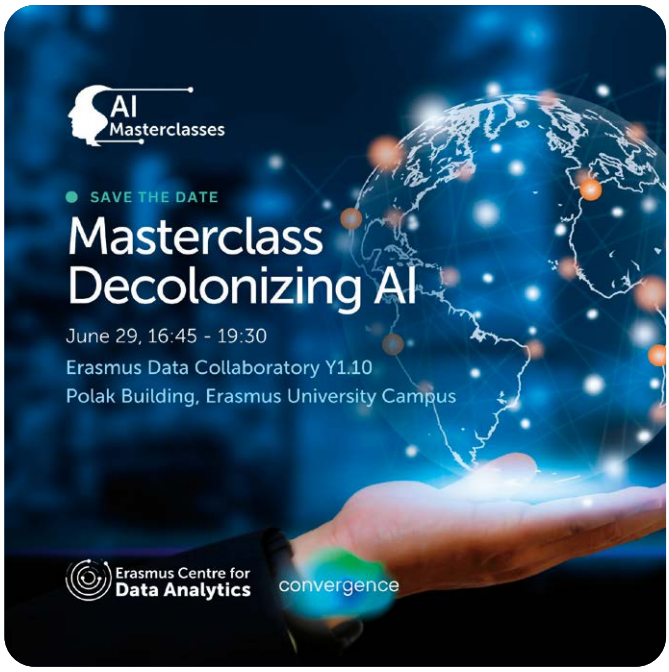


AI Masterclass: From Ethical AI to Policy
Apart from its many benefits, AI also brings potential risks. Its use can lead to a lack of human control, discrimination, and unexplained outcomes, among other concerns. These ethical risks must be identified in advance to mitigate them. However, translating these ethical concerns into clear AI policies and systems within our organisations can be challenging.

Our Expert Speaker:
Stefan Buijsman obtained his PhD in the philosophy of mathematics at 20. Since then, he has continued research on how we learn mathematics and has authored three popular science books on mathematics and AI, one of which is available in over 20 countries. Stefan is currently researching the philosophy of AI at TU Delft, focusing on explainability and the information that different stakeholders need to responsibly develop and use AI systems.

The masterclass addressed insights and tools for the following challenges:

- Which ethical principles should guide the development and use of AI?
- How can we ensure that AI systems are transparent and verifiable?
- How can we prevent AI from perpetuating existing prejudices and discrimination?
- What are the potential social effects of AI and how can we limit negative effects?
- How can we ensure that AI is developed and deployed in a way that is inclusive and fair?
- How can we ensure that AI is developed and used in a way that respects privacy and data protection?
- How can we ensure that AI is used in a way that complies with human rights and ethical standards?
- How can we increase public awareness and understanding of AI and its ethical implications?



AI Masterclass: Decolonising AI
This masterclass took a closer look at the social impact of AI systems. AI systems can reflect and perpetuate prejudices and inequalities in society. Preventing institutional racism and discrimination in AI systems requires understanding two very important but often ignored aspects. The first is the relationship between inclusion and technology. The world of diversity and inclusion often doesn't link well with the world of digitisation and automation, while the two are often strongly intertwined. The second is the burgeoning study of colonisation in this meeting of worlds. In this masterclass, we go beyond the ethical perspective that often overlooks these two aspects and provide insight into how colonial histories play a role in AI today.

Our Expert Speaker
Oumaima Hajri is a researcher at the Knowledge Centre Creating 010, focusing her work on the intersection of AI and ethics. She explores how AI can be used responsibly and ethically, including ethical implications throughout the design process. Hajri is also a board member of Public Spaces and initiator of the Alliance against Military AI consortium. The masterclass addressed the following challenges:

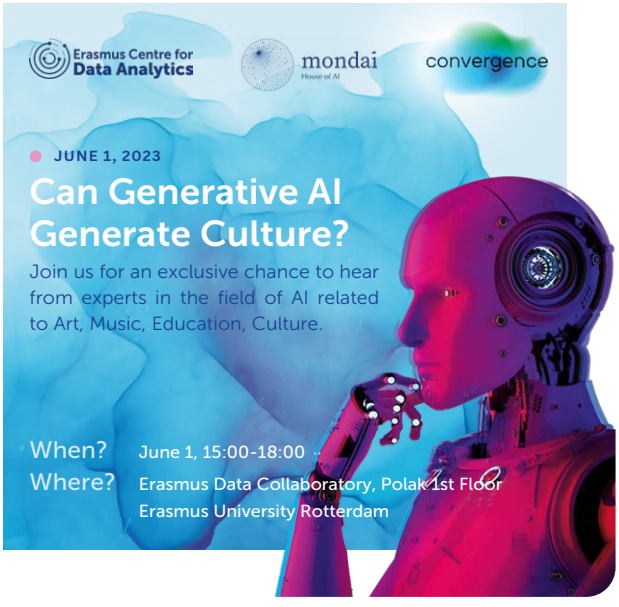
- The social impact of AI on issues such as discrimination, social inequality, and climate change.
- Strategies and techniques to identify and mitigate these problems in AI systems.
- The role of diversity and inclusion in advancing AI development for the greater good.
- Considerations for policy makers, regulators, developers, and designers in driving AI development for the greater good.
- Current research areas and future directions for promoting social justice in AI.

AI Mixer: Can Generative AI Shape Culture?
This event offered our community with an exclusive opportunity to hear from experts in the field of arts, music, education, and culture in relation to AI. Generative AI can create a wide array of outputs, including art, music, literature, and other cultural artifacts. Whether these creations can be considered "culture" is a subject of debate. While some argue that AI-generated content lacks the human touch and context necessary to be considered part of a cultural tradition, others view it as a valuable addition to the ongoing evolution of culture. Ultimately, the influence of generative AI on culture will depend on how it is used and integrated into the broader social and cultural fabric.

Our Expert Speakers:
Renée van Holsteijn - AI Speaker & Moderator
Roel Lutkenhaus - Founder of New Momentum
Cynthia Liem - Associate Professor at the Multimedia Computing Group at the Faculty of Electrical Engineering, Mathematics and Computer Science (EEMCS) and the pianist of the Magma Duo.
Ksenia Fedorova - Assistant Professor at Leiden University Centre for the Arts in Society
Sonia de Jager - Doctoral Researcher on Philosophy of AI, Lecturer Willem de Kooning Academy

During this mixer, the following questions were addressed:

- What is the effect of generative AI on cultural norms and values?
- What are the ethical implications of using generative AI to create art, literature or music?
- How has generative AI changed the way we approach and understand the concept of originality in creative works?



Don't miss our upcoming AI Masterclasses:
Our forthcoming AI Masterclasses will focus on:

Smart cities and Digital Surveillance,
featuring experts: Professor Marc Schuilenburg and Professor Evert Stamhuis
Location: Erasmus Data Collaboratory
October 2023

AI & Health
with expert: Professor Diederik Gommers
Location: Erasmus Data Collaboratory
November 2023

4.3.2 Changemakers in Education: Leadership Challenge in Data Analytics Education Track

About
The education sector is undergoing several major changes and challenges, such as flexibilization, blended education, and the use micro-credentials. The transformation of the educational landscape requires a change in the way people in those institutions handle (study) data. The focus is on placing students at the core of all processes and programmes. This necessitates cultivating data literacy, an integrated understanding of how data yields valuable insights in administrative, strategic, and educational contexts. Moreover, it demands pioneers who can seize opportunities and involve others within their institutions. To support these pioneers, the programme focuses on enhancing data literacy and the use of analytics and Artificial Intelligence (AI) in education.

The programme's aim is to initiate tangible changes in how (study) data is managed within an institution, transcending departmental boundaries. The programme consists of 16 half-day modules in which experts from academia and the educational practice provide an overview of the latest advancements in various fields: analytics, machine learning, stakeholder engagement, transformation, privacy, and ethics. These modules include practical examples from education. Participants collaborate in multidisciplinary teams on a practical case from their own organisation, guided by dedicated coaches. They navigate the entire 'wheel of data science'— from defining a client's needs, uncovering underlying questions, accessing data, analysing insights, to presenting them. The programme culminates in a competition-style pitch of their proof of concept. Internal sponsors/executives join their teams at the programme's outset and during the final pitch day and programme closure session.

Lessons Learned in the 'Leadership Challenge with Data Analytics Education Track'

This text is produced in collaboration with SURF.

Testimonial by Jaap Jan Vroom, Senior Policy Advisor on Educational Innovation and Technology-Supported Learning, Strategic Expert on Data-Supported Education at Deltion College, Senior Advisor on Data-Supported Education, MBO Council | MBO Digital.

In secondary vocational education (MBO), numerous institutions are dedicated to realising data-supported education. This is also the case at Deltion College. We were the first MBO institution to participate in the second edition of the Leadership Challenge with Data Analytics Education track. What insights did we gain from this experience and how are we applying them in our organisation?

Data-Supported vs. Data-Driven
For clarification, a brief distinction: data-supported education (DOO) employs data, data analysis, and insights to achieve educational goals, enhance educational processes' efficiency, and improve education's effectiveness. This is not the same as data-driven education.

At Deltion, we employ DOO in an agile and step-by-step manner. As we do not yet have a complete blueprint for this type of education, we're proceeding by taking small steps. We experiment, learn, and refine, using methods such as experiments and pilots. Our objective is to enhance the organisation's data maturity– which is more of an organisational challenge than a technical one.

Thus, our participation in the aforementioned programme aligned perfectly with our approach of ongoing learning. Over 16 half-days sessions, we engaged in addressing a self-selected institutional issue, in our case an educational matter, through lectures, workshops, and coaching sessions. This structure highlighted the organisation's diverse needs in handling study data. Our Deltion team focused on developing a career development guide (LOO) dashboard, which we successfully designed and demonstrated by programme's end.

Multidisciplinarity is the key, but together with education.

Half of our team consisted of colleagues who are directly linked to the primary process: a teacher, the team manager, and an education advisor. In addition, someone from Education & Quality, someone from technology and myself as project leader have been added. This team composition, which explicitly includes teaching staff, turned out to be the key to our success in this course.

What did we learn overall?

- Education should take precedence. The use of study data should lead to better education, for example in the form of better student guidance or increased student success. This is only possible if education experts take the lead in the design process.
- In general, Education wants to know a lot, 'because that is useful'. Our approach naturally led to a reduction in data sources. Conversations with fellow teachers often revolved around essential information needed to guide students effectively.
- Education often doesn't yet know what it requires. Articulating questions is important: how do we extract the right questions from education?
- Having conversations with Education about dashboards results in educational conversations. What information is needed and why? When should signals be raised to support specific students (e.g., when something is good or not)? What interventions are taken upon receiving such signals?
- Data maturity cannot be achieved at once. Growth requires incremental steps. The first step is often the most challenging.
- As a data product requester, it's important to quickly understand whether your data application is feasible. Privacy considerations must be included right from the outset using self-assessment documents.

Impact of the LCDA Programme:

1. Genuine administrative support within our institution.
2. Insights into the elements that must be included in the process from data application to implementation within education.
3. A motivated education team enthusiastic about working with data.
4. And, of course, winning first prize at the programme finale—an encouraging motivator. We are now moving forward full steam ahead.

Other educational institutions that participated in the LCDA programme Education Track included teams from Universities (TU Delft, Eindhoven University of Technology, Tilburg University, University of Groningen, Utrecht University, Vrije Universiteit Amsterdam), Universities of Applied Sciences (Aeres Hogeschool, Hogeschool Rotterdam, Hogeschool Leiden, Hogeschool Utrecht, Hogeschool Anhem en Nijmegen, Inholland, Christelijke Hogeschool Ede, NHL Stenden Hogeschool, Fontys Hogescholen, Hogeschool InHolland,), secondary vocational education (Deltion College), and other educational institutes (LOI/NTI).

4.3.3 Changemakers in Cities: Urban Digital Innovation (UDI) Executive Leadership Programme; Working Towards Climate-Neutral Cities and the European Green Deal

Building a Better Urban Future is a Choice
By Dr. Jonathan Reichental, CEO of Human Future, Adjunct Professor University of San Francisco, Pepperdine University, and Menlo College, Adviser, best-selling author.

Over a decade ago, driven by an insatiable curiosity and a desire to make a bigger difference in the world, I accepted a government position as a technology leader in a Northern Californian city. This opportunity was unique, nestled within the heart of Silicon Valley. It served as an exceptional platform to explore the potential of technology's role in delivering a better government experience for the community.

My team and I spent the next few years challenging the status quo by experimenting, rethinking, and redesigning conventional approaches. We had both success and failures along the road, but an unexpected outcome began to unfold.

My goal from the beginning was to immerse myself in local issues and loyally serve the city on a daily basis. I certainly did that, arriving early each day at city hall and often being the last to leave every evening. The work began to pay off. Soon, we were named the number one digital city in the United States, collecting multiple awards and numerous accolades.

Yet, something unexpected happened to me. While my focus was on contributing to positive change within the city, it was the city itself that changed me. Over months and then years, I developed a completely new appreciation for the role of urbanisation. Importantly, the predominant influence of cities on our planet's destiny became increasingly evident with each passing day. I began to recognise that the future belonged to cities, irreversibly altering my perspective on the world. The human experience was becoming inherently urban and building a better world would need to take that in consideration.

Today, I am even more convinced of the critical role that urbanisation will play in how the majority of humanity will live, work, and play in the decades ahead. Only by being deeply engaged in city operations did I truly grasp what has now become so apparent.

This unexpected journey led me to a conscious decision to help create better cities worldwide. Certainly, few may have the chance for a governmental experience that facilitated this personal revelation. Nevertheless, we all possess the capacity to contribute towards addressing the intractable challenges that lie ahead. Let's not underestimate the urgency of the issues encompassing domains like energy, climate, transportation, and more. Solutions will demand exceptional leadership, as well as bold new ideas and competencies.

Whether involving local initiatives or broader initiatives like the European Green Deal and the efforts of the United Nation's Sustainable Development Goals (SDGs), the endeavour to shape a better urban future for every one of us is already underway. The most important question now is, what will be your chosen path?

About the Programme
The Urban Digital Innovation Executive Leadership Programme provides an in-depth, multidisciplinary, and holistic exploration of Smart & Resilient Communities. It frames the future of our cities within the context of the Fourth Industrial Revolution. The programme introduces the building blocks for successful digitalisation and innovation strategies applicable to communities, cities, and regions, with a particular focus on sustainability and the ambitions of the EU Green Deal. Encompassing themes include leadership centred on innovation, adaptive governance, cyber resilience, innovation for scale, public engagement, digital inclusivity, flexible regulations, ethical frameworks, digital fundamentals, and emerging technologies, funding strategies, and scaling.

Representatives from cities across Europe join this programme, working in small teams and applying insights to their own urban innovation challenges. Alongside contributions from internationally renowned experts in Smart Cities and faculty members from the Erasmus University Rotterdam, the programme features many speakers from practice, sharing insights within the context of digital innovation projects in their cities. Participants receive an evaluation of their digital innovation capabilities and gain actionable frameworks to accelerate digital innovation within their urban landscapes.

We take pride in this exceptional programme, the first of its kind in Europe. We are especially grateful for and welcome the intense collaboration with many different experts and partners. Furthermore, we are very happy with the active support from European initiatives forming the smart cities community in Europe, including Living in EU, Eurocities, Enroll, and OASC.

4.3.4 Diploma Programme in Digital Transformation for Managers (RSM)

The Rotterdam School of Management, Erasmus University (RSM), offers the Diploma Programme in Digital Transformation. This programme equips managers with knowledge and tools needed to become better digital transformation advisors within their organisations. It offers practical approaches, insights, and competencies to drive organisational change. The diploma programme comprises four open modules. Completing any three of these modules, in any sequence, forms the basis for the RSM Digital Transformation Diploma. The programme culminates in an Impact Project. The five modules include:

1. **Digital Leadership and Change (3 days)**: Explore the essential capabilities and requisite cultural elements for successful digital transformation. Gain insights into personal leadership and change management through immersive experiences.
2. **Digital Strategy (3 days)**: Become a better strategic advisor who can influence, drive, and implement effective digital strategies. Learn to assess the dynamics of the digital landscape and harness emerging disruptive technologies.
3. **Digital Analytics and Customer Insights (3 days)**: Acquire data management methods, tools, and strategies to optimise performance and business intelligence. Build a solid understanding of trends and developments, methods for data collection, analysis, and management.

4. **Digital Innovation (3 days)**: Acquire the tools and frameworks to foster innovation-focused business opportunities and models, alongside cultivating a culture of innovation for organisational leadership.
5. **Impact Project (mandatory)**: The Impact Project serves as the capstone module of RSM's Diploma Programme in Digital Transformation. It offers a unique experiential learning opportunity to apply the knowledge and skills honed during the diploma modules to a real-world business challenge within your own working environment. Upon successful completion of the Impact Project and three chosen modules, you'll be eligible to receive your diploma.

For additional information, please visit:
www.rsm.nl/education/executive-education/short-courses/digital-and-data/diploma-programme-in-digital-transformation/

4.3.5 Data Science & Business Analytics program for Data Scientists (EQI)

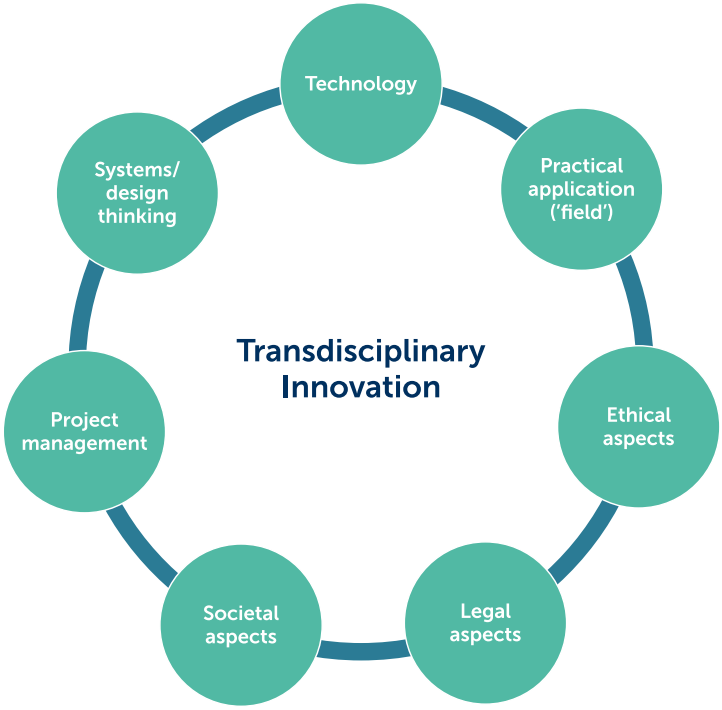
The one-year part-time post-master's degree in Data Science & Business Analytics is the leading program for Data Scientists who aspire to excel in their field. In this data science programme, participants undergo a year-long training to attain expertise in employing advanced (data) analysis methods, extracting insights from Big Data, and applying artificial intelligence to address business and organisational challenges. This course revolves around hands-on engagement with cutting-edge software, fostering a strong connection to participants' respective domains of work. Afterwards, participants will be able to independently employ advanced analysis techniques, extract insights from Big Data, and make well-grounded decisions through analytics.

The curriculum, characterised by its practical orientation, includes sections in statistics, management science, computer science, and privacy law. Furthermore, the programme offers the opportunity to pursue the internationally recognised title of Certified Analytics Professional (CAP).

For further details, please visit:
www.eur.nl/eqi/post-master-opleidingen

5/ Transdisciplinary Innovation Projects & Valorisation Highlights

by Margo Strijbosch, Director of Erasmus Research Services



Introduction

It's essential to take on a transdisciplinary approach to tackling societal challenges related to AI. Collaborating with our research and societal partners at regional, national, and European levels is central to our research and education efforts. Erasmus Research Services (ERS) serves as a support pillar for Erasmus University Rotterdam (EUR), faculties, and researchers, offering guidance and assistance in grants, business development, knowledge transfer, and open and responsible science. ERS builds bridges between EUR and the external ecosystem, connecting the wealth of knowledge and scientific expertise within our institution to the needs and aspirations of society. With dedicated support from ERS in the domains of AI, data, and digitalisation, Erasmus University researchers have been able to engage in external influential networks and established externally funded public and private collaborations.

Erasmus University is an active partner in the Netherlands AI coalition (NL AIC), forming the Zuid Holland AI hub alongside Delft University of Technology and Leiden University. Our hub's activities are centred in domains such as of AI for Port and Maritime, Peace, Justice & Security, Energy & Sustainability, Health & Care, technological industry, all grounded in human-centric AI. Within these domains, we're actively cultivating public-private collaborations funded by convergence and NL AIC coalition resources (within AINed). Our focus is on ELSA labs - Ethical Legal and Societal Aspects of AI - and the Innovation Centres for AI (ICAI-labs). For the ELSA lab, we are coordinating an initiative on AI and public safety, AI Maps. For ICAI-labs, we're partnering up with Robust, STROKE, and TIMRI.

In the Convergence Collaboration on AI, Data & Digitalisation, ERS and ECDA have facilitated the establishment of four Innovation Centres: Energy Systems Intelligence Centre, AI Port Centre, Convergence Centre for Digital Ethics in Healthcare and Convergence Centre for FinTech.
Erasmus University, represented by Professor Moniek Buijzen, Dr. Esther Rozendaal, and Professor Ting Li , is a central partner in the Algorithmic Society (ALGOSOC) consortium, a recipient of a Zwaartekracht grant, attesting to our researchers' and scientific collaborations' prominence in this field.

At the European level, we contribute to shaping Europe's digital future. Engaging with the Digital Europe Programme and Horizon Europe, we've secured notable achievements. The recently awarded €10 million SEISMIC project, led by Dr. Jason Pridmore, exemplifies this. Erasmus University Rotterdam is also a core member of the Science Business Platform on Data and AI Rules.

Erasmus Research Services has been instrumental in realising these external partnerships and projects.

MKB Data Studio

MKB Data Studio is a joint initiative run by Erasmus University Rotterdam and TU Delft. This exciting programme takes root with one precise mission: to empower small and medium-sized enterprises in South Holland. It guides them through a seamless transition to digitalisation while unlocking the full potential of their data. Notably, this endeavour establishes an alliance between these forward-looking companies and university talent. Talented students embark on projects thoughtfully tailored to address the unique challenges that each business faces. The ultimate goal? Boosting business value across the board.

by Dr. Kristiaan Glorie

5.1 AI and Analytics Consulting via Erasmus Quantitative Intelligence (EQI)

Since 2015, Erasmus University Rotterdam (EUR) has been providing top-tier Artificial Intelligence (AI) and analytics consulting services, including software development, through Erasmus Quantitative Intelligence (EQI). EQI is a unique initiative that consists of a dedicated team of data science consultants, developers, and AI-experts collaborating with scientific researchers. This partnership aims to assist organisations in achieving their objectives through advanced analytics and AI implementation.

EQI provides organisations with a key advantage: EUR researchers from ECDA's expert practices (most notably the Econometric Institute of the Erasmus School of Economics) provide access to the latest academic insights and state-of-the-art methodologies. Simultaneously, the EQI consulting and development team has the expertise and experience to dig deep into business challenges and craft fully operational solutions.

EQI's unique proposition has generated tremendous business and societal impact, as exemplified by the following three cases:

FCast™ – AI for Demand Forecasting and Inventory Management
EQI has pioneered FCastTM, an AI-powered solution for demand forecasting and inventory management. This software harnesses AI to make accurate demand predictions and formulate effective inventory management strategies. Adopted by diverse industries, including food (e.g., Bieze Food Group) and cultural organisations (e.g., Van Gogh Museum), FCastTM has enabled these entities to reduce inventory levels, minimise wastage, improve delivery reliability (Bieze Food Group), and cut down queues and waiting times (Van Gogh Museum).

Equal Pay
Equal payment of men and women is an important value. EQI has conducted pay gap analyses since 2017, collaborating with various organisations (e.g., APG and the Municipality of Amsterdam), to issue equal pay certification. Utilising analytical methods, pay gap calculations consider variables such as employee experience, role, and workload (e.g., part-time, or full-time). Following up on these measurements, EQI utilises analytics to unearth underlying causes of pay gaps, enabling organisations to devise strategies for reduction.

EQI's certification proves invaluable for organisations complying with the European pay transparency directive. Furthermore, EQI's newly introduced equal pay dashboard facilitates real-time monitoring of pay gap analytics with drill down capabilities and diagnostics, enhancing transparency and actionability.

Museum Design – Simulation of Visitor Streams
For the iconic Boijmans Van Beuningen depot, renowned for its unique architectural design, EQI played a pivotal role in optimising visitor experiences. The building, with its bowl-shaped façade covered with mirrors, is the world's first fully accessible museum depot. Behind the impressive façade lies an equally impressive interior design. EQI was asked to help the architect and design team to

get insight into visitor streams that would result from architectural choices. EQI identified bottlenecks and offered valuable insights for smart design decisions. The success of this initiative led to EQI's involvement in the redesign of the Boijmans Van Beuningen museum itself.

If you are interested in learning more about these cases or about the services offered by EQI, please visit www.eur.nl/eqi.

Dr. Kristiaan Glorie is Academic Director for the data science expert practice in ECDA. He also leads Erasmus Quantitative Intelligence as Executive Director.

5.2 ELSA Lab on AI in Public Safety and Security (AI-MAPS)

What is ethical and responsible artificial intelligence (AI)? The Covid pandemic and unrest surrounding forced migration and farmers' protests have underscored the importance of public safety. Achieving public safety poses an ongoing challenge, involving the delicate balance between freedom and security.

In September 2022, the ELSA Lab AI-MAPS (AI for Multi-Agency Public Safety Issues) embarked on a mission to cultivate and implement research practices that foster comprehensive knowledge into the Ethical Legal and Social Aspects (ELSA) of AI's role in public safety and security. AI MAPS adopts a perspective of freedom and social well-being and revolves around three central themes to address key security challenges:

1. Monitoring crowds in public spaces
2. Addressing unrest in vulnerable residential areas
3. Dealing with high-impact crime

AI algorithms can support institutions in decision-making and public safety initiatives. For instance, video-based pattern recognition can automatically detect anomalous patterns in local gatherings, while semantic pattern recognition in textual content can detect rising tensions within social media groups. Consequently, AI algorithms can provide guidance for local authorities in optimising intervention activities. AI MAPS focuses on the ethical, legal, and social dimensions of AI development and application, ensuring that solutions do not exacerbate existing problems.

> We believe that AI-MAPS can make a real difference. Our hope is to jointly create powerful tools and insights with hybrid intelligence solutions for public safety. We work towards innovative and inclusive approaches that address the root causes of social unrest, with the ultimate goal of contributing to a free and secure society for all.

Professor Gabriele Jacobs

Approach
AI MAPS will create a mutual-learning ecosystem of quadruple helix agents to responsibly guide the growing use of AI applications. The quadruple helix comprises 20 partners from academia, government, business, and civil society. Together, they'll combine their knowledge, experiences, and perspectives to formulate ELSA guidelines that align with diverse citizen needs. Additionally, an investment framework will be developed to offer guidance on worthwhile AI investments. We thus take a transdisciplinary approach towards innovation.

We approach AI from an AI-cology perspective, where we scrutinise AI systems, methods, and applications through the lens of hybrid intelligence, which combines human and artificial intelligence. Rather than aiming to replace humans, our focus rests on enhancing human well-being through collaborative human-AI interactions. Furthermore, we are exploring the integration of nature as a stakeholder in our use cases, promoting cross-species justice.

> Venturing into unchartered territory, our collaboration and multi-actor scenarios have been notably prominent among researchers and societal players alike. Not only have we been able to attract junior researchers from diverse disciplines—ranging from law and ethics to sociology and technical design—we've also engaged with a great diversity of societal partners, who participated in separate workshops and collective stakeholder meeting.

Professor Evert Stamhuis

The climate manifestations in late spring 2023 in The Hague served as an excellent opportunity for the first experimental deployment of our research methodology. While it was a learning curve for all involved, the experience of encountering a multitude of facets and navigating complex communication across partners proved to be an exhilarating experience. The project continues in its highest gear, with ongoing research, reporting, and dialogues with societal stakeholders on the public safety concerns specific to this case.

Project details
AI MAPS is funded by NWO as part of the Call for Proposals Synergy theme Artificial Intelligence: Human-Centred AI for an inclusive society – Towards an Ecosystem of Trust. The project consists of six implementation partners, a Consortium Advisory Board (comprising stakeholders with decision-making authority) and a Sounding Board (comprising stakeholders without decision-making power). AI MAPS is part of the ELSA Network.
For more insights, the team shares its experiences through blogposts at www.eur.nl/en/research/research-groups-initiatives/artificial-intelligence-multi-agency-public-safety

Professor Gabriele Jacobs is Professor of Organisational Behaviour and Culture at the Erasmus School of Social and Behavioural Sciences and Academic Director "AI in public safety and security" expert practice at ECDA.

Professor Evert Stamhuis is Professor of Law and Innovation at Erasmus School of Law, Senior Fellow at Jean Monnet Centre of Excellence on Digital Governance and Academic Director "Law & Digital Compliance" expert practice at ECDA.

5.3 ICAI Lab on AI-Based Models for Clinical Practice (STROKE)

The STROKE Lab is dedicated to improving the outcome of stroke patients by developing AI-based models for various stages of the patient journey and assessing their applicability in clinical practice. This collaborative effort involves Erasmus MC and Erasmus University of Rotterdam, contributing clinical domain and academic expertise, along with Philips, which is invested in developing products for clinical decision support.

The STROKE lab focuses on improving outcomes for stroke patients, a medical and socio-economic challenge impacting around 1 million Europeans annually, with a 25% lifetime risk. Stroke carries a 30% overall mortality rate and stands as a leading cause of death in developed countries, with up to half of patients experiencing permanent disabilities. Currently, over 6 million Europeans live with the effects of stroke, incurring substantial treatment and rehabilitation costs amounting to €38 billion annually in Europe. Moreover, stroke incidents are increasing among the younger population, with an estimated 1.5 million strokes expected to occur per year in Europe by 2025.

We aim to improve the well-being of stroke patients, benefitting them directly, while also curtailing the socioeconomic burden linked with stroke. To achieve this, we'll support healthcare professionals with data-driven AI modelling tools that assist in decision-making, thereby improving the efficiency and effectiveness of the entire stroke patient journey from emergency response to rehabilitation.

Erasmus MC will provide clinical domain expertise throughout the patient journey, encompassing neurology, neuroradiology, and rehabilitation. Collaboration with data science researchers and biomedical image analysis experts, possessing substantial expertise in AI and biostatistics, will be central. Philips, which is involved in this research, aims to develop products facilitating clinical decision support across the stroke patient journey. Together, we will establish models that can learn from data without accessing raw data, setting up a sandbox environment that permits such learning methodologies.

Stroke Lab is part of the ROBUST programme, focusing on Trustworthy AI-Based Systems for Sustainable Growth, which receives funding through the NWO LTP funding scheme.

For more details, visit: www.icai.ai/icai-labs/stroke/

5.4 ICAI Lab on Trustworthy AI for Magnetic Resonance Imaging (TAIMRI)

The research of Trustworthy AI for Magnetic Resonance Imaging (TAIMRI) Lab aims to improve the accuracy and cost-effectiveness of MRI-based diagnosis using AI methods, particularly targeting neurological and musculoskeletal (MSK) diseases. TAIMRI Lab is a collaboration between Erasmus MC, General Electric Healthcare, and Erasmus University of Rotterdam.

What is the Trustworthy AI for MRI Lab about?
Our primary objective is to improve the quality of MRI-based diagnosis with trustworthy AI methods. We aim to optimise the entire process, from image acquisition and prescription to image analysis and the integration of AI-assisted diagnosis into clinical practice. This could greatly improve the diagnostic accuracy while reducing costs. Initially, we focus on neurological and MSK diseases. The TAIMRI Lab encompasses five distinct research projects, where we will:

- develop smart, adaptive Magnetic Resonance (MR) imaging protocols for precise diagnosis.
- develop end-to-end deep-learning-based MR image reconstruction.
- develop trustworthy AI for integrated brain tumour diagnostics.
- develop trustworthy AI methods for improved diagnosis of bone and soft-tissue lesions on MRI.
- develop an approach to ensure AI technology acceptance in everyday clinical radiology settings.

The smart adaptive protocols combined with deep-learning-based MR image reconstruction will form the basis for future clinical MR scanning. Key insights for these improvements come from our clinical expertise and experiences in the AI-assisted diagnostic approaches for brain tumours and bone/soft-tissue lesions. Specifically, in these approaches, image-based disease biomarkers will be created, serving as potential targets for protocol adaptation. By focusing on these two clinical domains, we ensure broad applicability across various disease categories, enhancing the adaptability of our developed methods.

Contribution to Sustainable Development Goals
The TAIMRI Lab is dedicated to advancing Sustainable Development Goal 3, Targets 4 and D. We achieve this by leveraging AI to improve the accuracy and efficiency of MRI-based diagnosis for neurological and MSK conditions. These non-communicable diseases place a significant burden on healthcare systems and patients. Integrating AI into diagnostic processes has the potential to improve patient outcomes, reduce costs, and accelerate treatment timelines.

Furthermore, the TAIMRI Lab aligns with Sustainable Development Goal 10, Target 10.2. Our aim is to eliminate bias in data sets and promote social, economic, and political inclusion through AI implementation in healthcare. We acknowledge that low functional health literacy can lead to passive decision-making and resistance to AI-assisted methods (Naik et al., 2011), a factor we consider in our research.

The Trustworthy AI for MRI Lab is part of the ROBUST programme on Trustworthy AI-Based Systems for Sustainable Growth, funded through the NWO LTP funding scheme.

For further information, visit: www.icai.ai/icai-labs/trustworthy-ai-for-mri/

5.5 Safeguarding Public Values and Human Rights in Algorithmic Societies (AlgoSoc)

A Gravitation Programme Award grant of €21.3 million has been awarded to a consortium that includes Professor Moniek Buijzen and Associate Professor Dr Esther Rozendaal of the Erasmus School of Social and Behavioural Sciences (ESSB), along with Professor Ting Li of Rotterdam School of Management, Erasmus University (RSM). This project, the Algorithmic Societies Project (ALGOSOC), investigates how the development of automated and semi-automated processes can safeguard public values and human rights. The University of Amsterdam, serving as the Dutch project lead, along with EUR, Utrecht University, TUDelft, and Tilburg University, are the participants in this project. ALGOSOC is a response to the urgent need for an informed societal perspective on automated decision-making. Funded by the Ministry of Education and five participating universities for a period for 10 years (2023-2033), this research will be grounded in a deep understanding of the systemic changes that automated decision-making entails for core public institutions, society, and the realisation of public values.

Project Scope

This research project is centred around four key areas. To address these questions, the research programme spans three sectors: justice, health, and media.

Advancing a societal perspective on Automated Decision Systems (ADS) and studying the realisation of public values in the algorithmic society requires interdisciplinary commitment. AlgoSoc leverages the expertise of some of the world's leading groups in communication, law, governance, health, human-centric AI, computer and data science, along with an extensive network of university-based research groups and initiatives.

The research on public values in an mHealth World will focus on user perceptions of the (potential) impact of automated decision systems in their daily health app on public values (e.g., #privacy, #autonomy, #selfgovernance, #integrity, and #solidarity) and the effects on user well-being. To address these challenges and ensure safeguards, the project emphasises the importance of fair, accountable, and transparent AI-based automation to help people achieve their desired outcomes in life and well-being. Special attention will be given to social equality and inclusion. The project will adopt on a multimethod citizen science approach, including co-creation, panel surveys, and mobile tracking.

	/ JUSTICE	/ HEALTH	/ MEDIA	/ SYNERGY
ECOLOGY	How are patterns of institutional and individual decision-making power shifting in the algorithmic society?			
VALUES	How do these changing patterns affect the way core values are conceptualized and articulated?			
EFFECTS	What are the effects of ADS on the realization of public values for individuals and society?			
GOVERNANCE	How can responsibility for public values be organized, and decision-making power regulated, in the algorithmic society?			

> The AlgoSoc project is crucial because it addresses the pressing need for a human-centric approach to automated decision-making in our increasingly algorithmic society. Through our interdisciplinary collaboration spanning law, health, governance, and technology, we aim not just to understand but to shape how public values can be embedded in the fabric of algorithmic systems. We are not just exploring questions; we are crafting the frameworks that will guide society in an age where algorithms have as much say in our choices as we do. Our goal is to ensure that as we advance technologically, we also progress ethically and socially, creating an algorithmic society that truly serves the public good

Professor Ting Li

The research on public values in media will investigate both the positive and negative aspects of emerging technologies in the media sector. This project focuses on understanding the impact of advanced enabling digital technologies for the #Metaverse (such as #AI, #AR, #VR, #Web3.0, #IoT, #NFT and edge computing) on changing the landscape of news organisations and media industries. These abundant possibilities of embedding information in both the physical and virtual world create countless opportunities, and this project will explore both the bright and dark side of these emerging technologies.

For more information, please visit:
www.algosoc.org

Professor Moniek Buijzen is Professor of communication and change at the Erasmus School of Social and Behavioural Sciences (ESSB) and Erasmus professor AI in Society. She is academic lead of the Movez network, the Erasmus Initiative Societal Impact of AI (AiPact), and the health sector of the nationwide program Public Values in the Algorithmic Society (Algosoc). She is Academic Director "AI, Digital Communication and Behavioural Change" at ECDA.

Esther Rozendaal is Associate Professor of Communication and Behavioural Change at the Erasmus School of Social and Behavioural Sciences (ESSB) and Academic Director "AI, Digital Communication and Behavioural Change" at ECDA.

Ting Li is Professor of Digital Business at Rotterdam School of Management, Erasmus University (RSM). She is the founding member and Academic Director of the "Digital Business" expert practice at ECDA.

5.6 Living Lab on Urban Smart Mobility (BMW & the City of Rotterdam)

Cities cover approximately two percent of the earth's surface, yet they house almost 60 percent of the global population. That is almost five billion people today – and the trend is upward. Within the confines of urban areas, people, industry, and traffic converge, with enormous environmental repercussions: cities contribute to over 70 percent of the world's greenhouse gas emissions. This underscores their importance in combatting climate change. Clean, emission-free urban centres contribute greatly to global climate protection. New technologies that facilitate more efficient traffic and sustainable individual mobility have the potential to significantly reduce emissions.

The BMW Group and the City of Rotterdam have united until 2027 to devise solutions that enhance urban living: Rotterdam serving as a model for global urban environments. This partnership involves researchers from the Erasmus Centre for Urban, Port and Transport Economics (UPT) and ECDA, who are affiliated as research partners for various pilot projects, with a focus on innovative urban mobility solutions.

Several pilots fall under the city lab's collaboration on smart sustainable mobility, spanning from 2021 to 2027. These include:

1. **"Multimodality"**: Choosing the most efficient means of transportation by facilitating a shift to public transport in city centres through a dedicated navigation and parking system.
2. **Traffic Management and Safe Drive Zones**: Rotterdam plans to introduce safety zones where vehicles will advise drivers to reduce speed on specific occasions. This applies, for instance, when vehicles approach an accident scene or enter a temporarily traffic-calmed zone.
3. **"Parking & Charging"**: Enabling access to available charging stations at any time and reducing undue occupation of charging stations.
4. **Green charging**. Vehicle to Grid (V2G) will explore how batteries in e-vehicles can be used to store surplus energy from solar and wind power plants, subsequently feeding it into the electricity grid.

The pilot's results are important for the City of Rotterdam as they aspire to be at the forefront of smart sustainable mobility, creating a healthier, safer, and more liveable city.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CHANGE DIRECTION
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> Rotterdam envisions a future where mobility is safe, clean, healthy, and sustainable. Our collaborative pilots on smart sustainable mobility from 2021 to 2027 are forging a path towards a city that embraces efficient transportation, safer streets, reduced emissions, and a vibrant urban environment.

Iris Ruysch
Mobility advisor, City of Rotterdam

For BMW group, these pilots provide an opportunity to test new concepts and validate new services before scaling them up for the market.

> The new pilots mark the continuation of a partnership that began in 2018. The City Drive service, also validated by EUR researchers in a 2018 Rotterdam-based field test, was introduced to the market in 2020, effecting significant changes in a short period. All BMW plug-in hybrids automatically switch to electric driving mode in 'eDrive zones' within city centres, resulting in zero local emissions. Following Rotterdam's example, these eDrive zones have now been introduced in over 140 European cities.

Andrew Mason
Manager of Corporate Communications, BMW Group Netherlands

The pilots and research involve extensive data collection and processing, such as in-car data, behavioural data (responses to nudges and incentives), data from the BMW App, and survey data. Therefore, a thorough data governance process was developed from the outset.

> Every pilot project is accompanied by a detailed data management plan and a data processing addendum. EUR's data privacy officers were instrumental in formulating the right governance approach for data collection and processing. To maintain flexibility, a legal framework agreement was developed by EUR's legal team at the start of the collaboration, fostering long-term collaboration among public, private, and academic entities and creating a foundation of trust. The framework also facilitated the possibility of tailored arrangements for each pilot project in an agile manner, while minimising the administrative and contractual requirements.

Dr Marcel van Oosterhout
ECDA

Throughout the various research projects, we have garnered insightful observations that can contribute to more sustainable and liveable cities.

> So far, three key learnings from the pilots are:
> - In-car dashboard messages can decrease average speed and increase safety awareness in specific urban areas like school zones or busy traffic spots.
> - Social nudges delivered through mobile applications can help reduce the issue of charging station hoarding, enabling cities to accommodate the growth of electric vehicles.
> - Drivers may be more inclined to use Park and Ride facility when they are unfamiliar with the city they are visiting.

Dr. Giuliano Mingardo
Senior Project Leader, Erasmus UPT

5.7 Developing Energy Communities with Intelligent and Sustainable Technologies (DE-CIST)

On the 28th of June 2023, the Developing Energy Communities with Intelligent and Sustainable Technologies (DE-CIST) project was launched in Rotterdam. Led by Dr. Rebecca Moody, the consortium includes Erasmus University Rotterdam (EUR), Technical University Delft, Institute of Housing and Urban Development Studies (IHS), Resilient Delta Initiative, the Erasmus Centre for Data Analytics, and the City of Rotterdam. Supported by a 1 million Euro grant funding from Google.org through ICLEI Europe's Action Fund 2.0, DE-CIST aims to collect data on individual buildings, combining it with meteorological, air quality, emission, and socio-economic data.

An AI solution will categorise neighbourhoods and buildings based on their current energy sustainability and potential, whilst incorporating citizens' input. Additionally, the project seeks to involve citizens, communities, researchers, and governments in co-creating a fair energy transition, facilitating citizen-driven energy communities, and fostering connections among communities, governments, and energy companies.

The research will not only be theoretical but will actively engage citizens and stakeholders, enabling them to use the project's generated information, fostering community development, and mitigating energy inequality.

> Our goal is to develop a comprehensive solution, both technically and socially, that empowers citizens, communities, housing corporations, municipalities, and other stakeholders to effectively and inclusively build and maintain an energy-sustainable future.

Dr. Rebecca Moody

The ICLEI Action Fund, supported by ICLEI Europe and Google.org, focuses on promoting data-driven environmental and climate action at the local level. As a member of ICLEI, the City of Rotterdam is actively committed to advancing local sustainability goals.

For more details, visit: www.iclei-europe.org/funding-opportunities/action-fund

Dr. Rebecca Moody is an Assistant Professor at the Department of Public Administration at the Erasmus School of Social and Behavioural Sciences (ESSB)

5.8 Strategic Prescriptive Response for Immediate Needs Through Empowered Residents (SPRINTER)

Emergency response in the Netherlands is set to undergo a transformative shift in an innovative new project, which aims to enhance emergency services through community first responders (CFRs). It aims to improve the use of volunteers in emergency services by developing mathematical models based on data and data analysis for Community First Responders (CFRs) systems. The project is entitled Strategic prescriptive response for immediate needs through empowered residents (SPRINTER)

Community first responders (CFRs)
Reducing emergency response times is a paramount objective, with studies linking quicker response to increased survival rates and reduced damage. Traditional emergency services, including ambulances, firefighters, and police, may soon be complemented by CFRs – trained volunteers dispatched via a smartphone app.

> Reducing emergency response times is of paramount importance, as there is a direct relation between response time and survival or damage. While traditional emergency services are fast, your neighbour might be faster. The SPRINTER project recognizes this and prepares the Netherlands for a wide-spread use of community first responders. This empowers the local volunteer community to take an active role in emergency preparedness and relieves work pressure from overloaded emergency services. SPRINTER includes the scoping of volunteer tasks, assessing impact and boosting the efficiency of volunteer response by leveraging data and analytics.

Dr. Pieter van den Berg

Several existing CFR systems, such as HartslagNu for cardiac arrests, Burgernet for police support, and Ready2Help for general assistance, are already making an impact in the Netherlands. In addition, a growing trend is emerging, with organisations like the Fire Department Amsterdam-Amstelland and the Red Cross showing a strong commitment to introduce a CFR network.

Collaborative project for more impact
The SPRINTER project, a collaborative endeavour between knowledge institutes, emergency services, and volunteer dispatch systems, promises to introduce prescriptive analytics. These analytics will optimise CFR systems through innovative mathematical models utilising optimisation and machine learning algorithms. The project aims to quantify the impact of volunteers, determine optimal recruitment and training strategies, and optimise real-time alerting decisions.

SPRINTER not only presents opportunities for scientific advancement but also seeks to prepare the Netherlands for widespread CFR integration, ultimately revolutionising the country's emergency response capabilities.

About the project
Dr Pieter van den Berg from Rotterdam School of Management, Erasmus University (RSM) and researchers Dr Caroline Jagtenberg (VU Amsterdam) and Professor Rob van der Mei (Centrum Wiskunde & Informatica and VU Amsterdam) were awarded Dinalog funding of €500,000 for their application SPRINTER. This 36-month collaborative project will be funded as part of the TKI Toeslag call 2022 – Supply Chains for Society. The project will be co-ordinated by VU Amsterdam, and also partners with Centrum Wiskunde & Informatica, Red Cross, Fire Department Amsterdam-Amstelland, Veiligheidsregio Rotterdam-Rijnmond, Burgernet, Beep For Help, LIVES, NIPV, and Axira.

Pieter van den Berg is an Associate Professor of transportation and logistics at the Rotterdam School of Management, Erasmus University (RSM) and researcher in the ECDA expert practice "AI in Ports and Global Supply Chains".


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