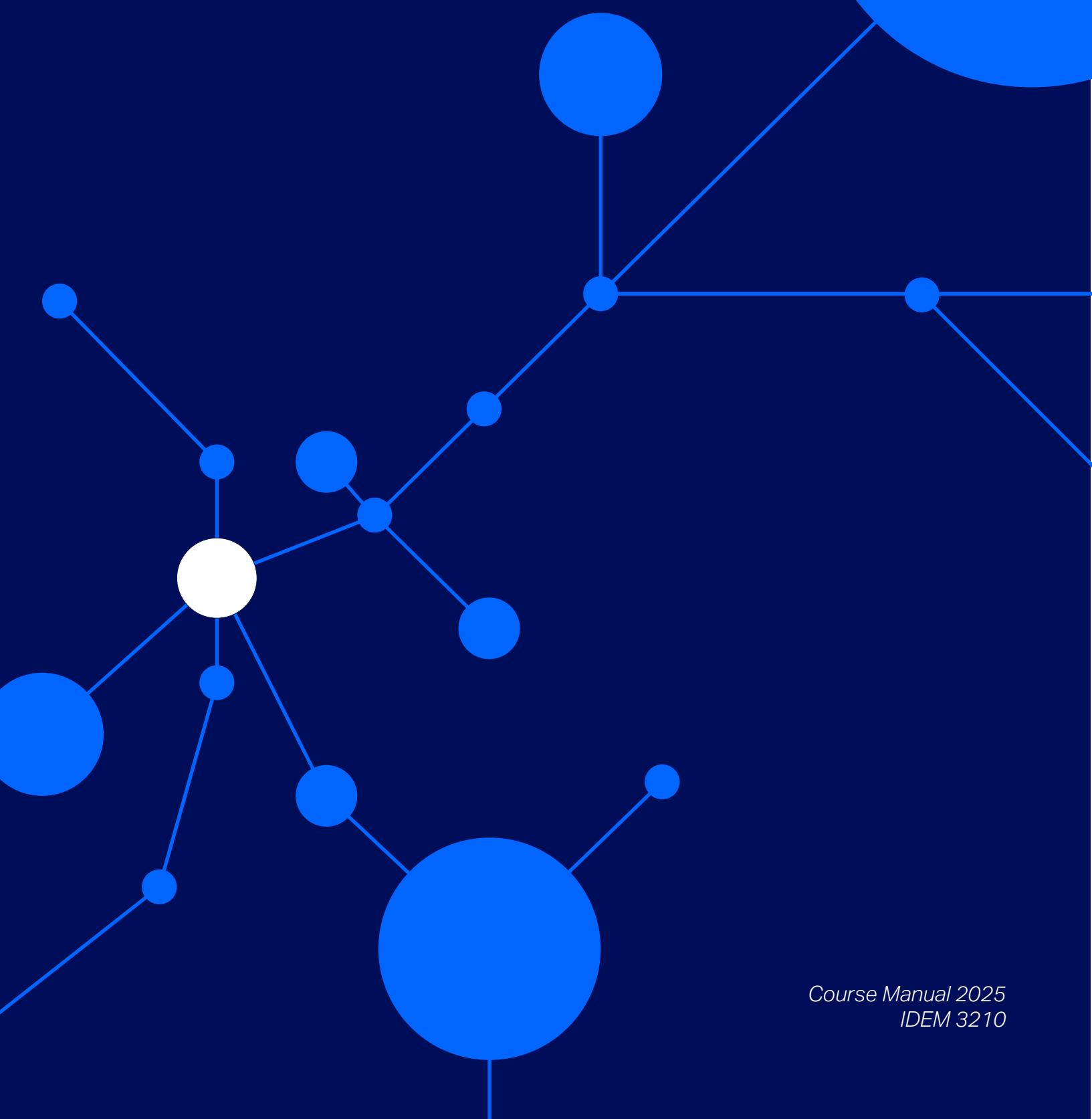


Tech-enabled Innovation Studio



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Introduction

You fancy technology. Nice, because nowadays, innovation is frequently centred around emerging technologies. Strategic design can play a central role in making sense of those emerging technologies and helping organisations and ecosystems apply those in their innovation process.

In this hands-on course students go through all the steps and challenges of a strategic design project in the context of tech-enabled innovation. You will work on real client projects focused on different technologies and on different application areas (healthcare, mobility, energy transition, finance etc), spanning from technology exploration to developing tech-enabled value propositions.

You will learn how to adapt key strategic design capabilities to this specific context and how to integrate the use of tech-enabled prototypes and experiments in the different phases of the strategic design process.

You will bring together the different perspectives needed to solve the puzzle by setting up multi-actor collaborations (i.e. designers, developers, data-analysts, product owners etc) around the project. Data is a great basis on which to motivate and justify the integration of technology into the design process and the product.

Thus, the course will also zoom in on use of data in a strategic context, by looking at how thick/thin and big/small data can be used as an input throughout the strategic design process.

You will learn how data can be used as a means of sense-making, analysis, presentation, and evaluation to facilitate strategic decision-making.

And while innovating, you will reflect on the ethical and legal aspects of the applied technology, such as GDPR and inclusivity perspective. At the end of the course, students will present their work to real-life stakeholders in a presentation and a report.

Enjoy!

Jiwon Jung, Gert Hans Berghuis, Matthijs Buijs, Sem Carree & David Quijada Fernández

The TEIS Team

Healthcare



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Guest Lecturers

AI



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Design consultant (8+ years) specializing in AI hardware. PhD researcher at TU Delft on synthetic stakeholders for decision-making.

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Ethics



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Data Visualization



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Assistant Professor at IDE. Integration of computer support tools to aid collaboration, Use of visualisation and visual analytics.

Learning Objectives

By the end of the course, students should be able to:

1

Develop society- challenge solving tech-enabled innovation outcomes.

2

Apply iterative methodologies and design-driven practices in the strategic design process both in problem framing and solution developing phases.

3

Identify different disciplines and stakeholders related to their project and analyse their own role in the overall design process.

4

Evaluate the integration of tech-enabled practices in the strategic design process and for strategic decision-making through analysis of thick/thin and big/small data.

5

Present your work with the logics of your decisions in the work as a form of a live presentation and a written text report.

6

Reflect on the ethical and legal implications and perspectives of the applied technology.

7

Evaluate the characteristics and impact of the chosen technology.

Course Schedule

Project Definition	Week	Date	1st Timeblock 8:45 - 09:30	2nd Timeblock 9:45 - 10:30	3rd Timeblock 10:45 - 11:30	4th Timeblock 11:45 - 12:30	Break	5th Timeblock 13:45 - 17:30
	3.1	12.02.	Lecture Introduction to TEIS Jiwon Jung IDE-Hall O - Hans Dirken	Workshop + Lecture Data-enabled Design Case 1- Patient Community Journey Map - Jiwon Jung Case 2- Synthetic stakeholder - Eric Gu IDE-Hall O - Hans Dirken	Lecture Introduction of client challenges & Decision of Challenge Jiwon Jung IDE-Hall O - Hans Dirken	Interactive Lecture How to build and monitor teamwork Gert Hans Berghuis IDE-Hall O - Hans Dirken		Go through assignment & Prepare materials for client exploration by each assigned coach IDE-studio 20/21/22
	3.2	19.02.	Lecture Interactive AI Brand Contest Sem Carre IDE-Hall O - Hans Dirken	Keynote Tech Strategies that make sense Deborah Nas IDE-Hall O - Hans Dirken	Workshop Tech-infused Context & Process Geert Christiaan IDE-Hall O - Hans Dirken	Workshop Tech-infused Product development Sem Carre IDE-Hall O - Hans Dirken		Coaching (30 mins per team) by each coach IDE-studio 20/21/22
	3.3	26.02.	Client Visit Client's physical location / Studio 12,13,14 available in the morning, Studio 20/21/22 available in the afternoon *date might change*					
	3.4	05.03.	Workshop/Lecture Design & Privacy Davide M. Parrilli IDE-Hall O - Hans Dirken	Workshop/Lecture Responsibility as a designer Marleen van Leengoed IDE-Hall O - Hans Dirken	Workshop/Lecture Value-based innovation: The Guidance Ethics Approach Marleen van Leengoed IDE-Hall O - Hans Dirken	Workshop/Lecture Value-based innovation: An overview of methods Marleen van Leengoed IDE-Hall O - Hans Dirken		Coaching (30 mins per team) IDE-studio 20/21/22
	3.5	12.03.	Synergy Week					
	3.6	19.03.	Student Presentations with the Client + Interaction with the Client IDE-studios 12, 13 and 14					Coaching (30 mins per team) IDE-studio 20/21/22
	3.7	26.03.	Interactive Lecture Lean Innovation Intro Matthijs & Gert Hans IDE Arena	Interactive Lecture How to: Hypotheses and Sprints Matthijs & Gert Hans IDE Arena	Groupwork Construct your own backlog Matthijs & Gert Hans IDE Arena	Plenary Plenary Q&A on backlogs Matthijs & Gert Hans IDE Arena		Coaching (30 mins per team) Workshop 15-17:30h Data-enabled Design Method Eric Gu & Jiwon Jung IDE-studio 20/21/22

Iterative Validation Process	Week	Date	1st Timeblock 8:45 - 09:30	2nd Timeblock 9:45 - 10:30	3rd Timeblock 10:45 - 11:30	4th Timeblock 11:45 - 12:30	Break	5th Timeblock 13:45 - 17:30
	3.8	02.04.		Option 1 for Coaching (30 mins per team) <i>IDE-studios 12, 13 and 14</i>				Option 2 for Coaching (30 mins per team) <i>IDE-studio 20/21/22</i>
	3.9	09.04.	Option 1 for Sprint Reviews with your own coach <i>IDE-studios 12, 13 and 14</i>		Feedback Session with Entire Studio Exchange Arena Gert Hans Berghuis <i>IDE Arena</i>			Option 2 for Sprint Reviews with your own coach <i>IDE-studio 20/21/22</i>
		11.04	Deadline at 18.00h - Interim group report					
	3.10	16.04.		Optional Coaching (30 mins per team) <i>IDE-studios 12, 13 and 14</i>				Rooms available for work <i>IDE-studios 12, 13 and 14</i>
	4.1	23.04.		Option 1 Coaching for Group Report with your own coach <i>IDE-studios 12, 13 and 14</i>				Option 2 Coaching for Group Report with your own coach <i>IDE-studios 12, 13 and 14</i>
	4.2	30.04.		Sprint Reviews with two coaches (30 mins per team) <i>IDE-studios 12, 13 and 14</i>				Rooms available for work <i>IDE-studios 12, 13 and 14</i>
	4.3	07.05.		Sprint Reviews with Client <i>IDE-studios 12, 13 and 14</i>	Interaction Moment with Client <i>IDE-studios 12, 13 and 14</i>			Rooms available for work <i>IDE-studios 12, 13 and 14</i>
	4.4	14.05.	Deadline at 18.00h - Interim individual report					
			Synergy Week					

	Week	Date	1st Timeblock 8:45 - 09:30	2nd Timeblock 9:45 - 10:30	3rd Timeblock 10:45 -11:30	4th Timeblock 11:45 -12:30	Break	5th Timeblock 13:45 - 17:30
Iterative Validation Process	4.5	21.05.	Option 1 for Sprint Reviews with your own coach <i>IDE-studios 12, 13 and 14</i>	Feedback Session with Entire Studio Exchange Arena Sem Carree <i>Wim Crouwel</i>				Option 2 for Sprint Reviews with your own coach <i>IDE-studios 12, 13 and 14</i>
	4.6	28.05.	Option 1 for individual report coaching (10 mins per person) <i>IDE-studios 12, 13 and 14</i>					Option 2 for individual report coaching (10 mins per person) <i>IDE-studios 12, 13 and 14</i>
	4.7	04.06.	Option 1 for Sprint Reviews with your own coach <i>IDE-studios 12, 13 and 14</i>	Feedback Session with Entire Studio Exchange Arena Matthijs Buijs <i>Wim Crouwel</i>				Option 2 for Sprint Reviews with your own coach <i>IDE-studios 12, 13 and 14</i>
	4.8	11.06.	Optional Coaching (30 mins per team) *arrangement needed with each coach* <i>IDE-studios 12, 13 and 14</i>					Optional Coaching (30 mins per team) *arrangement needed with each coach* <i>IDE-studios 12, 13 and 14</i>
	4.9	18.06.	Final Student Presentations with the Client <i>IDE-studios 12, 13 and 14 or at Client's company location</i>					Starts at 15.45h Plenary presentation & course wrap up with drinks and snacks <i>IDE-Hall O - Hans Dirken</i>
	4.10	25.06.	Deadline to submit group and individual reports by 18.00h					

Assignments

To pass the Tech-Enabled Innovation Studio course, students must successfully complete three assignments:

Group Presentation (due: June 18)

- A 10-minute live, professional presentation that includes:
 - › **Description and rationale of the tech-enabled solution:** How the solution and strategy (roadmap) addresses the client's challenge.
 - › **Description and rationale of the tech-enabled design process:** Explanation of how the design problem and solution spaces are tech-enabled and tech-supported.
 - › **Description and rationale of the chosen technology:** Its societal, economic, or environmental impacts.
- **Formative evaluation is done through:**
 - › Sprint reviews (25 minutes per group with presentation + feedback round).
 - › Group coaching sessions (30 minutes per group) held throughout the course.

Group Report (due: June 25, 18:00h)

- A 6,000–8,000-word report detailing the group's project process and outcomes, including:
 - › **Description and rationale of the tech-enabled solution:** How the solution and strategy (roadmap) addresses the client's challenge.
 - › **Description and rationale of the tech-enabled design process:** Explanation of how the design problem and solution spaces are tech-enabled and tech-supported.
 - › **Description and rationale of the chosen technology:** Its societal, economic, or environmental impacts.
 - › **Ethical considerations with respect to the solution and tech-enabled design process:** Its impact to the values of different stakeholders and how to incorporate ethics in the design process.
 - › **References:** Proper citation of sources used.
- **Formative evaluation:**
 - › Coaching sessions (30 minutes per group).
 - › Dedicated group report coaching session on **April 23** (30 minutes per group).
 - › **Interim group report submission deadline for feedback:** April 11, 18:00.

Individual Report (June 25, 18:00h)

- A max. 3,000-word professional report detailing each student's individual contributions and reflections, including:
 - › **Identification of relevant disciplines and stakeholders and own contribution:** Critical analysis of their roles and the student's own contributions to the design process.
 - › **Reflection on tech-enabled design process:** Evaluation of strategic decisions made during their tech-enabled design process
 - › **References:** Proper citation of sources used.
- **Formative evaluation:**
 - › Individual coaching sessions (10 minutes per student).
 - › Dedicated individual report coaching session on **May 28** (10 minutes per student).
 - › **Interim individual report submission deadline for feedback:** May 9, 18:00.

Rule for Resit the course

If a student fails to meet 'pass' in any of achieving learning objective, they may resubmit their work for re-evaluation. They will be re-evaluated when they submit four materials as mentioned below.

- Students revise their individual reports based on their own efforts to address the failed criteria. The revised sections must be clearly highlighted in a different color within the report.
- Students revise their group reports based on their own efforts to address the failed criteria. The revised sections must be clearly highlighted in a different color within the report.
- In cases where the group presentation fails to meet the required standard, students submit a 3,000-word reflection report. This report should detail what went wrong, why it happened, and how the student would have improved the presentation. In case where group presentation was successful, student can provide 3000 word reflection on what went great and why.
- Additionally, students must submit a cover letter explaining the overview of which parts have been improved and how these changes address the original shortcomings.

Once all four components—the revised individual report, the revised group report, and the reflection report (if applicable)—are submitted, each Learning Outcome (LO) will be re-evaluated to determine whether the student passes or fails.

Client Challenges

Below is an overview of the five client challenges. Please note that to work with the clients, you will need to sign an IP Rights Transfer Agreement. More details about the agreement can be found in Appendix D.

1

Healthcare - Mental Health

Develop an innovative solution to enhance Mentaal Beter's mental health care system by integrating an ML-based intervention to streamline screening and intake processes. The solution should reduce administrative workloads, improve communication between GPs and GGZ practitioners, and provide actionable feedback while ensuring empathy and competence in treatment decisions. Deliverables include a current and future-state service blueprint, a tactical roadmap detailing stakeholder collaboration and resource integration, and validated concept designs for an AI-supported referral system that aligns with existing service structure.

2

Healthcare - General Practitioner

Erasmus MC and Juvoly are collaborating to develop a Dutch medical LLM to reduce GP administrative burdens and improve care quality. GPs face high workloads, with existing LLMs lacking validation and Dutch-language optimization. The challenge is to design a seven-year roadmap for an AI-driven solution that automates tasks, supports clinical decision-making, and aligns with GP and patient needs. Deliverables include a current and future-state service blueprint, and strategic roadmap for successful implementation.

3

Finance

Rabobank, a leader in agrifinance, aims to support farmers transitioning to sustainable practices. Despite extensive expertise in sustainable agriculture, its knowledge isn't easily accessible to international farmers or adequately leveraged by account managers, creating inefficiencies. The challenge is to design a scalable solution empowering account managers to connect farmers with critical insights. Deliverables include a strategy, customer journeys for key regions/commodities (e.g., dairy in New Zealand, beef in the U.S.), concept designs, and a roadmap for implementation.

Client Challenges

4

Law & Legal

BrandMR, a Dutch legal services provider, aims to enhance social legal aid for low-income individuals by applying its transparent, fixed-fee model and user-friendly platform. Social legal aid in the Netherlands faces inefficiencies, limited resources, and accessibility challenges for clients with low digital skills and language barriers. BrandMR seeks innovative solutions to streamline processes, improve efficiency, and ensure quality services for clients and social lawyers. Deliverables include a strategy, customer journey, a roadmap and tested concept design.

5

Mobility

NS faces declining train travel kilometers due to changing habits and remote work, jeopardizing its financial health and HRN-concession obligations. To recover, NS targets “choice travelers”—individuals who choose between train and car based on context. Focusing on digitally enticing leisure travelers (e.g., seniors, families, youth) to use trains more often, NS must address barriers like cost perception and destination accessibility. Deliverables include a strategy, customer journey mapping, a roadmap and a tested concept design.

Fit with other Tech-enabled elective courses

In our SPD program, the Tech-enabled Track involves three other courses that relate to technology specifically.

1

Technology & Strategic Design

An elective running in Q3, you'll be empowered with foundational theoretical insights into the trajectories of technological innovation.

This course is your gateway to becoming a strategic designer that drives technology-enabled innovation within organizations and across ecosystems.

You can of course use that next to the practice of the Studio.

2

Tech-enabled Entrepreneurship

An elective running in Q4, you focus on intra- and entrepreneurial aspects of technology-based innovation.

Students will learn how to apply business economics theory, practices and tools to conceptualise and organise tech-enabled innovation ecosystems in a multi-actor context.

So you can deepen the intrapreneurial aspects of the Studio.

3

Brand Experience Design across Technologies

Running in the second SPD year in Q2, this course will help you understand the value of brands to organisations and consumers and learn to design compelling brand experiences across touchpoints based on different technologies. It expands your Studio work to a new dimension.

Groups and Group Fairness

Forming Groups

We ask you to create diversity within groups. Therefore, we try as much as possible to create groups with people from different semesters, different genders and different countries. We also learned that international students are best added to the groups in pairs.

You will remain in the same group for the entirety of TEIS, so pick your team members wisely.

Group Fairness

It is essential that all group members contribute fairly during this course. There is no place in professional practice for those do not contribute during group work.

We understand that challenges can occur during group work. Please notify your coaches first if you sense your group is not functioning fairly. The course coordinator can intervene to mediate if necessary.

Please be advised, where group members do not contribute fairly, it is standard procedure to ask the noncontributing member to; a) temporarily contribute more to the team to restore parity then continue to contribute fairly; b) complete the assignment on their own, or; c) consider discontinuing the course.

At the end of TEIS, week 2.10, we will conduct a peer review of our teammates to evaluate fairness of their contribution throughout the course. If a group member has not contributed based on this final peer-review, then their final grade of TEIS course will moved accordingly.

More information to come regarding this as we approach the later part of the course.

Presence and Delivery

Be there, be square!

We learned that a lot of learning comes from discussion and the interactive lectures/ workshops that we provide. We therefore expect you to be present at all the seminars, coaching sessions et cetera. When online, we ask you to turn your camera's on.

If you can't make it for whatever reason (ill, circumstances, duties etc), let your coach and your coordinator know upfront by sending an e-mail to us both at our TU Delft email accounts, with your group number and your reason for absence.

On time delivery is mandatory!

Delivering on BrightSpace too late (of one or more deliverables) is handled as follows, unless there is a technical issue with BrightSpace that can be proven.

In that case, we expect you to send the deliverable to your coach via e-mail or WeTransfer and have it arrive before the time it's due, otherwise the same measures will be taken as mentioned below.

No on time delivery = Fail!

Plagiarism / Use of AI

We need to be able to assess students on their own performance. For this reason, checks for fraud/plagiarism are made in this course.

Suspicions of any form of fraud will be reported to the Board of Examiners. Should fraud be detected, no result for this course will be recorded in any instance, and the Board of Examiners may take measures such as excluding the perpetrator from one or more assessments at TU Delft for a certain period.

The general fraud/plagiarism rules also apply to the use of generative AI. In this course, you are allowed to use generative AI, as long as you reference it correctly and include the used prompts.

Rubric

Tech-enabled Innovation Studio (Evaluated collectively through Group Presentation-GP, Group Report -GR & Individual Report -IR)

TEIS Rubric		Team Name & Team Members:		
		Coach:		Date:
LO	Insufficient- 'Fail' Coach Feedback and justification	Evidence of Learning Objective being met through learning assessment. [what evaluation is based on]	Sufficient- 'Pass' Coach Feedback and justification	Advanced Coaches were very impressed by...
1		Students created innovative, technology-enabled solutions in response to a client's challenge. [based on Group Presentation & Group Report]		
2		Students apply iterative approaches and strategic design principles to frame problems and develop solutions. [based on Group Presentation & Group Report]		
3		Students identify relevant disciplines and stakeholders while critically evaluating their own role in the design process. [based on Individual Report]		
4		Students assess the integration of technology into design processes and strategic decisions. [based on Individual Report]		
5		Students articulate the rationale behind their decisions through structured live presentations and professionally written reports. [based on Group Presentation, Group Report & Individual Report]		
6		Students critically analyze the ethical and legal dimensions of the technologies applied in their projects. [based on Group Presentation & Group Report]		
7		Students evaluate the features and broader societal, economic, or environmental impacts of their chosen technology [based on Group Presentation & Group Report]		
Policy for determining overall pass/fail threshold:		Coaches' Concluding Remarks:		Final Decision:
A pass occurs when ALL LOs are sufficient and above. A fail occurs when at least one LO is insufficient. Student can resubmit revised IR, GR, 3,000-word reflection report to improve GP, and cover letter (details are in course manual on page 009)				

Literature

Giaccardi, E., & Redström, J. (2020). Technology and more-than-human design. *Design Issues*, 36(4), 33-44.

Jung, J., Kim, K., Peters, T., Snelders, H. M. J. J., & Kleinsmann, M. S. (2023). Advancing design approaches through data-driven techniques: Patient community journey mapping using online stories and machine learning. *International Journal of Design*, 17(2), 19-44.

Jung, J., Kleinsmann, M., & Snelders, D. (2022). A vision for design in the era of collective computing. *Journal of Engineering Design*, 33(4), 305-342.

Mortati, M., Magistretti, S., Cautela, C., & Dell'Era, C. (2023). Data in design: How big data and thick data inform design thinking projects. *Technovation*, 122, 102688.

Nas, D. (2021). *Design Things That Make Sense*

Speed, C., & Oberlander, J. (2016). Designing from, with and by Data: Introducing the ablative framework.

Stoimenova, N., & Price, R. (2020). Exploring the nuances of designing (with/for) artificial intelligence. *Design Issues*, 36(4), 45-55.

Appendix A - Client Challenge

Healthcare - Mental Health

Introduction

Mentaal Beter is a mental health care provider (GGZ) that focuses on offering accessible Basis-GGZ (common mental health disorders) services with therapists, psychologists and psychiatrists throughout the Netherlands. These professionals offer a wide range of psychological support for people with mild to moderate complaints, including therapy, counselling and mental health assessments. Mentaal Beter is committed to making mental health care more accessible and effective for people of all ages by combining professional expertise with a personalised, client-centred philosophy, involving patients in their choice of treatment, keeping waiting times short and customer satisfaction high.

Current care paths

To be treated by a mental health care provider, patients must receive a referral letter from a general practitioner (GP). They first may receive guidance from a GP's assistant with expertise on the GGZ (POH-GGZ), who attempts to provide initial treatment and guide patients to cope with their complaints. In some cases, a referral to a more specialised GGZ may be necessary, or the underlying problem may be better addressed by social care services. This can also happen after the next step, the referral to and registration with Mentaal Beter. The referral is done through the Zorgdomein platform. The patients are placed on a waiting list and eventually receive a screening through a telephone call. The screening questions are from standardised questionnaires. The GGZ care provider evaluates the patient and either a) rejects them and sends them back to their GP, or b) meets them for intake, diagnosis and consultation appointments. The subsequent treatment sessions ultimately become evaluation sessions to determine the patient's need for further treatment at the clinic.

Problem statement

The screening and intake processes for GGZ may represent long and cumbersome stages for patients, as well as a significant workload for GGZ professionals and GPs. Patients frequently encounter long waiting lists before a GGZ professional evaluates their situation. These processes entail extensive administrative work for GGZ professionals, who must assess the severity of the mental health concerns and the care type and intensity needed. This waiting period may result in patients looping back to their GP if they do not fit into the care pathways provided by Mentaal Beter. For example, if the patient's severity is deemed too low or their situation necessitates more specialised GGZ treatment from another provider (e.g., treatment for bipolar disorder). Mentaal Beter estimates that around 20% of patients are misreferred to their clinics. Simultaneously, even after patients have been referred to GGZ, the already-overburdened GPs often remain responsible for providing advice and support to patients while they are on the waiting list¹.

New strategies are emerging to relieve the burden in GP and GGZ care and reduce the size of waiting lists. One such strategy is the "exploratory consultation" (in Dutch: "verkennend gesprek"), which consists of multidisciplinary meetings with the patient to discuss the root of the issue and signpost the patient to a GGZ provider or social care services. Nevertheless,

Healthcare - Mental Health

further developments are needed to optimise current service processes and guide patients with mental health complaints more efficiently.

Machine learning (ML) models may facilitate a more efficient transfer from GP to GGZ care, yet their successful adoption remains a challenge². A survey on the impact of AI on the healthcare workforce has indicated that AI/ML programs can significantly reduce healthcare practitioners' administrative burdens². Mentaal Beter is actively investigating how to integrate AI/ML techniques to develop a smart triage system that reduces the administrative workload of GGZ professionals and, parallelly, decreases time on waiting lists. The dataset for this research currently consists of self-report questionnaires used in the screening and intake phases. The aim is that the ML algorithm automatically detects exclusion criteria and provides predictions on the most suitable care pathway. Mentaal Beter is also exploring including the referral letter from GPs in this dataset to improve the ML algorithm's performance, but this is still in the early phase, as the quality of the referral letter is highly variable.

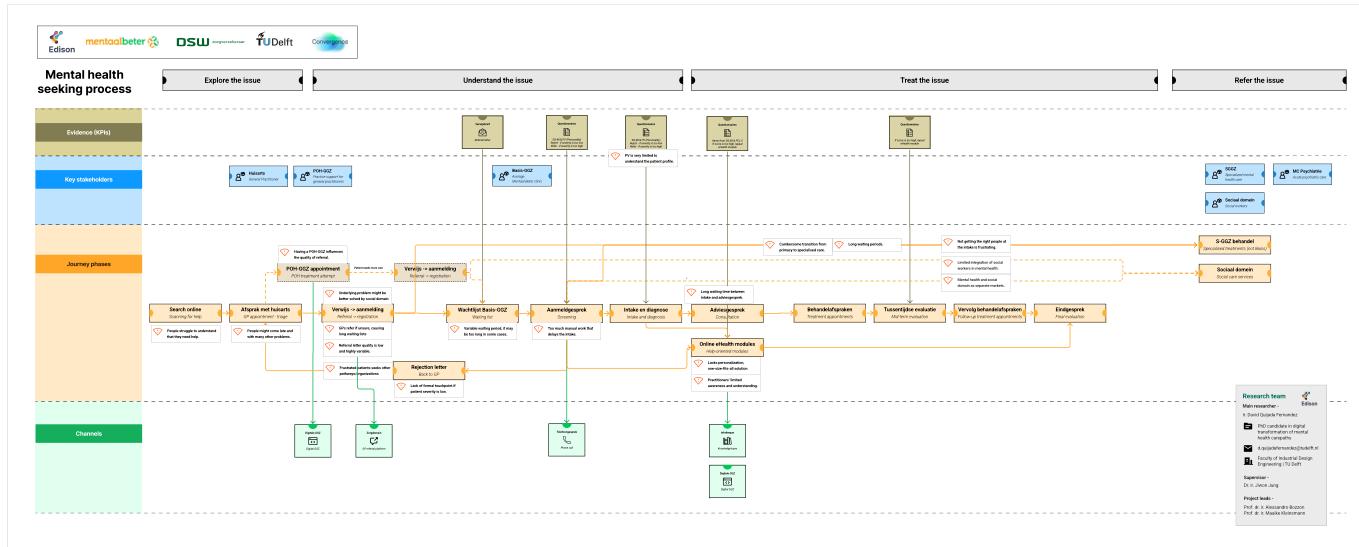
To successfully adopt this technology, we must consider the humans receiving actionable feedback at each end of the information flow. How does an ML-supported triage/referral system fit within the current system and the needs of all stakeholders? The overarching goal of the ML integration and feedback flow should be to reduce labour for the GGZ and GPs and streamline the current processes; otherwise, the intervention will not be accepted by the care professionals.

Together with Mentaal Beter, we want to explore new strategies or service processes to strengthen and enrich the communication and feedback system between GPs and the GGZ professionals at Mentaal Beter. How can we support the interaction between GPs and the GGZ professionals in their role to co-define the care pathway? How can we design ML-supported screening/intake processes that enable better collaboration between GPs and GGZ professionals? You can imagine this as new referral support tools or feedback mechanisms that assist GGZ practitioners and GPs in their decision-making process. Two aspects to take into consideration are:

- Tailor to low AI/ML literacy. Interpretability is a key facilitator/barrier to ensure the acceptance of ML models in psychiatric care³. The recommendations from the ML model may not be compelling and trustworthy for GGZ professionals if the ML-based decision-making process is not explained clearly³. To cater to most practitioners, you might consider designing for professionals with low digital skills and AI literacy, and including methods for the explainability of ML-based predictions.
- Consider data privacy and protection regulations and ethical implications. Integrating AI or ML algorithms comes with risks. In the context of the GGZ, this entails dealing with sensitive private data of people in vulnerable stages of their lives. Some regulations that can be highlighted to guide your design intervention are the GDPR and the EU AI Act. Furthermore, we must also factor in ethical considerations when manual labour in healthcare is transformed into a collaboration between clinicians and ML-based tools⁴⁻⁷.

Healthcare - Mental Health

The figure below shows results from our preliminary research through expert interviews on the current struggles and bottlenecks in mental health service processes. It can help you understand our current understanding of the challenges in the mental health care journey from a multi-organizational perspective, although focusing on the context of Mentaal Beter.



Users & Stakeholders

We should consider the perspectives of patients, GGZ professionals (psychologists and planning specialists) and GPs.

Patient is a legal term that refers to the people navigating healthcare services who are not only consumers of healthcare but also likely in vulnerable and sensitive periods of their lives. However, people may not see themselves as patients in a healthcare agreement with the mental care provider, but simply as individuals searching for improved mental well-being (mental health seekers)⁸. Moreover, patients are not the only subjects of the treatment. Even when choices are limited, patients are partners in finding a care pathway that fits their needs and accelerating the speed of the treatment. Even though Mentaal Beter also counts on child and adolescent psychologists, we will focus on adult patients for this project.

Mentaal Beter relies on several GGZ professionals throughout their service journey. First, the planning agency (in Mentaal Beter called "planbureau"), consists of people who do not have a medical/psychology background but are trained to screen the referral letters and detect mistakes or exclusion criteria. They will also schedule an intake meeting with the GGZ practitioners at Mentaal Beter. If the patient screening leaves doubts, the psychologists/psychotherapists at Mentaal Beter will decide whether to accept or reject them. After screening and intake, the psychologists/psychotherapists will determine a personalised treatment plan together with the patient in a consultation appointment. The therapists monitor the patient's progress through feedback points and questionnaires and will organise an interim and a final interview/evaluation, after which the patient is discharged.

GPs signpost patients with moderate and severe complaints to the appropriate GGZ provider, and are responsible for offering treatment to mild mental health complaints. Most of the GPs

Healthcare - Mental Health

in the Netherlands receive assistance from a POH-GGZ to provide treatment for mild mental health complaints through in-person consultations and the Digitale GGZ platform. However, a recent survey on GPs' digital means showed that only 4% make use of the Digital GGZ⁹. Mentaal Beter might ask the GPs to provide more information to adequately assess the patient's situation and be able to accept them in their care pathways.

Deliverables

The final deliverable should justify how and why the proposition fits within the current service system and how it creates value for stakeholders.

0. Current-state service blueprint

- › Provide an overview of the current situation and ways of working/service processes.
- › What are the stakeholders involved and current feedback flows?

1. To-be service blueprint.

- › Illustrate how your intervention concept is integrated within the current context.
- › Describe how you envision technology improving feedback loops among GPs and GGZ professionals and how these actors collectively make sense of care pathway needs.

2. Tactical roadmap

- › Show the actors/stakeholders' journey to co-develop your envisioned intervention.
- › How will the different actors/stakeholders integrate or reconfigure resources?
- › Is it possible with the existing resources and data sources of Mentaal Beter?
- › Is it necessary to integrate new capabilities, what are the key partnerships then?

3. Concept designs to realise horizons, preferably validated with potential users

Abbreviations

GGZ - Geestelijke Gezondheidszorg, or the Dutch Association of Mental Healthcare and Addiction Care Providers.

GP – General Practitioner/Practice, or Huisarts in Dutch.

ML – Machine learning.

POH-GGZ - Praktijkondersteuning voor Huisartsen Geestelijke Gezondheidszorg, or Practice Support in Mental Healthcare for General Practitioners.

Healthcare - Mental Health

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Healthcare - General Practitioner

Introduction

Erasmus MC General Practice Department & Juvoly

The Erasmus MC General Practice Department is a leading institution in the Netherlands responsible for training future general practitioners (GPs) and conducting innovative research to improve primary care. Their mission focuses on enhancing the quality, accessibility, and efficiency of Dutch general practice through education, cutting-edge research, and technology integration. Erasmus MC plays a pivotal role in shaping the future of healthcare by addressing systemic challenges, such as GP workload, and advancing patient-centered solutions. Juvoly is an innovative AI company specializing in developing scalable, human-centered technologies for healthcare. Their focus on creating practical AI solutions, such as speech-to-text and now large language models (LLMs), aligns with their mission to reduce healthcare practitioners' administrative burdens while improving the quality of patient care. The partnership between Erasmus MC and Juvoly aims to transform Dutch primary care by leveraging AI to support GPs in their clinical and administrative tasks, ultimately enhancing patient experiences.

Current Landscape

In the Netherlands, GPs face increasing workloads, with 68% reporting unsustainable pressure and 18% experiencing high stress levels. Much of this pressure stems from administrative tasks, such as documenting medical records, transcribing consultations, and preparing referral letters. These tasks reduce the time GPs can dedicate to patient care, exacerbating accessibility issues and compromising quality of care.

Although LLMs, like ChatGPT, offer promising solutions for automating tasks, existing models are expensive, lack validation for healthcare, and are not optimized for the Dutch language or general practice workflows. Addressing these gaps requires the creation of a specialized LLM, co-developed with GPs and tailored for Dutch medical contexts.

Problem Statement

The current system places a significant administrative burden on GPs, reducing their availability for patient care. Existing LLMs are not designed for Dutch healthcare workflows and do not align with the language and cultural context of general practice. GPs require a solution that integrates seamlessly into their daily workflows, enhances their efficiency, and provides safe, validated support for clinical and administrative tasks.

The goal is to develop a roadmap/strategy for Dutch medical LLM development that can be achieved in next 7 years:

- Automate administrative tasks such as referral letters, medical history summaries, and consultation transcriptions.
- Provide accurate, context-aware support for clinical decision-making.
- Align with the specific needs and values of GPs, patients, and supporting staff in Dutch healthcare.

Healthcare - General Practitioner

Design Challenge

Design the roadmap and strategic planning how we can create a Dutch medical LLM that:

1. Supports GPs in automating clinical and administrative tasks, reducing their workload.
2. Aligns with the needs and values of GPs and patients through user-centered design.
3. Ensures safe, effective, and equitable use while fostering trust and adoption among healthcare professionals with varying AI/ML literacy levels.

Users & Stakeholders

- **General Practitioners (GPs):** End-users who will rely on the LLM for task automation and clinical decision support.
- **Supporting Staff:** Key stakeholders assisting GPs in administrative and operational tasks.
- **Patients:** Individuals benefiting indirectly through improved care quality and accessibility.
- **Dutch Healthcare Organizations:** Entities overseeing system implementation and alignment with policy and reimbursement frameworks.

Deliverables

1. **Current state Service Blueprint & To-be Service Blueprint**
 - › Illustrate workflows before and after the integration of the Dutch medical LLM.
 - › Highlight how the LLM improves efficiency, reduces administrative burdens, and supports clinical tasks.
2. **Roadmap**
 - › Define key milestones for developing and validating the LLM.
 - › Identify necessary partnerships and resources for implementation.
 - › Detail how existing datasets and technologies can be leveraged.
3. **Concept designs to realise horizons, preferably validated with potential users**

Healthcare - General Practitioner

Considerations

- **AI/ML Literacy:** Ensure the LLM is designed with intuitive interfaces and minimal technical barriers for users.
- **Reimbursement System:** The solution must fit within existing Dutch healthcare reimbursement policies.
- **Stakeholder Inclusion:** Engage diverse stakeholders, including GPs, supporting staff, and patients, through co-creation to ensure the system meets their needs.

By focusing on these aspects, students can contribute innovative solutions for reducing GP workloads and enhancing Dutch healthcare through AI-powered tools.

Finance

Introduction

Rabobank is a Dutch multinational banking and financial services company headquartered in Utrecht, Netherlands. It is best known for its cooperative structure and strong position in the global agrifinance space, founded in 1898 by farmers.

Its Wholesale and Rural (W&R) division is a key part of its international operations, focusing on food and agriculture-related industries. This specialisation aligns with Rabobank's mission of fostering sustainable growth in global food systems.

Problem Statement

International farmers striving to adopt more sustainable practices often seek funding and guidance from Rabobank. The bank possesses extensive knowledge and expertise on sustainable transitions in agriculture in departments like Food & Agri Research (FAR) and W&R innovation (W&Ri). This knowledge can range from identification of climate risk mitigation interventions for certain regions or commodities, to the carbon accounting requirements for low-carbon commodities that are marketed to consumers.

These valuable resources aren't easily accessible to the farmers who need it most. Relationship managers who are the primary points of contact are not adequately equipped to address the wide range of complex and technical questions related to these transitions. This gap creates inefficiencies, limits the impact of Rabobank's support, and hinders farmers' ability to effectively navigate their sustainability journeys.

To address this, Rabobank requires a solution to bridge the knowledge gap, empower account managers, and streamline access to its expertise, enabling better outcomes for farmers and advancing the bank's mission of fostering the transition to sustainable food systems.

Design Challenge

How might Rabobank create a seamless and scalable solution that empowers local account managers to connect international farmers with the knowledge and expertise they need to successfully transition to sustainable practices? And how should the knowledge be presented to relationship bankers and clients, and which formats or technical tools could support the two target groups in their collective goal of fostering the transition to sustainable agricultural practices?

Please choose one of the following target segments:

- Soy & corn in Brazil
- Dairy in New Zealand
- Beef in the US
- Coffee in the Global South

Finance

Deliverables

- Strategy on how to achieve this goal
- Context and Customer journey of selected target segment in a region + commodity
- Concept design validated with potential users from the target group
- Roadmap for implementation

Law & Legal

Accessible Justice for All: Innovative Solutions for Social Legal Aid

Introduction

BrandMR is a legal services provider in the Netherlands that focuses on offering accessible and affordable legal aid to individuals and small businesses. Their mission is to bridge the gap in access to justice by providing expert legal advice and representation at predictable, fixed fees. BrandMR operates with a client-centric approach, emphasizing clear communication and practical solutions to make legal services more approachable and transparent for those who may otherwise struggle to afford traditional legal assistance. Their areas of expertise include employment law, family law, consumer disputes, and other civil matters.

Social Legal Aid

In the Netherlands, the social legal aid system is under significant pressure. This system, which aims to provide legal assistance to people with low incomes, faces inefficiencies and limited financial resources. This undermines access to fair and adequate legal aid.

BrandMR has already demonstrated that legal services can be more transparent, accessible, and efficient. With fixed fees, clear steps, and a user-friendly online platform, BrandMR has transformed commercial legal aid. Now, BrandMR seeks to apply these principles to social legal aid, creating a new and sustainable model that addresses the unique needs of this sector.

Design Challenge

Your challenge is to design an innovative solution that improves the current social legal aid system, making legal help more efficient and accessible for everyone in need.

Develop an innovative solution that:

- Applies BrandMR's model to social legal aid.
- Utilizes and/or expands BrandMR's existing online platform.
- Accounts for the profile of individuals seeking social legal aid: limited digital skills, language barriers, and a reliance on legal support.
- Maintains the quality of legal services while improving efficiency in time management.

Law & Legal

Accessible Justice for All: Innovative Solutions for Social Legal Aid

Users and Stakeholders

Stakeholders in this context are:

- **Clients of Social Legal Aid:** Individuals with low incomes, limited digital skills, language barriers, and a high dependency on legal support.
- **Social Lawyers:** Professionals working within tight financial constraints, who would benefit from a more efficient system.
- **Government and Institutions:** Organizations involved in funding and regulating social legal aid.

Deliverables

- Strategy on how to achieve the goal
- Customer journey of selected target group
- Concept design, validated with potential users from the target group
- Roadmap for implementation

Inspiration and Background Information

- BrandMR: [Website](#)
- Social Legal Aid in the Netherlands: Research the challenges and inefficiencies in the current system:
 - » <https://npo.nl/start/serie/de-onmisbaren>
 - » [Gesubsidieerde rechtsbijstand en mediation - Raad voor Rechtsbijstand - Rechtsbijstand](#)
 - » [De arbeidsmarkt voor de Sociale Advocatuur | Rapport | Rijksoverheid.nl](#)

Contact Information

For questions and feedback, you can reach out to:

- Name: Peter Hoitinga
- Email: peter.hoitinga@brandmr.nl
- Phone: +31 6 818 98 431

Law & Legal

Accessible Justice for All: Innovative Solutions for Social Legal Aid



BRANDMR

**VOOR EEN
GELIJKE STRIJD**

Voor het recht is iedereen gelijk. Maar voor het systeem niet. Om het rechtssysteem voor iedereen toegankelijk te maken strijden wij op **drie fronten**:

FRONT 1

DE SAMENLEVING

We strijden voor een rechtvaardige samenleving. Bij veel juridische geschillen is sprake van machtsongelijkheid tussen partijen. Burgers met een middeninkomen en kleine ondernemers moeten te vaak kiezen om niet voor zichzelf op te komen. Die strijd willen wij gelijk maken door kwalitatieve juridische dienstverlening door advocaten toegankelijk en betaalbaar te maken voor iedereen, door pro-actief naar groepen mensen die benadeeld worden bij te staan en door gratis juridische kennis te delen om mensen bewuster te maken van hun rechten.



FRONT 2

DE JURIDISCHE WERELD

We strijden voor verandering binnen onze eigen, vaak conservatieve, branche. Want rechtshulp door advocaten kent voor de meeste Nederlanders hoge drempels. Moeilijke taal, een afstandelijke houding, ouderwetse werkwijzen en hoge uurtarieven met een onzeker eindafrekening. Daarom werken we aan innovatieve benaderingen en zetten we ons in voor alternatieve bedrijfsstructuren, transparantie en eerlijkheid in de juridische sector.



FRONT 3

DE KLANTEN

We strijden voor het recht van onze klanten. Heb je een probleem of conflict? We staan voor je klaar. We voorzien je direct van alle benodigde kennis om grip te krijgen op de situatie. We geven juridisch inzicht in de zaak, helderheid over kosten en een realistische inschatting van je kansen op een positieve uitkomst.



Bij Brandmeester willen we ervoor zorgen dat toegang tot kwalitatieve juridische dienstverlening door advocaten niet langer beperkt is tot een kleine groep. Samen strijden we voor een rechtvaardigere samenleving waarin de toegang tot recht en gerechtigheid voor iedereen gegarandeerd is.

Mobility

Introduction

Since corona NS has seen a decrease in travel kms compared to 2019. Less people travel in general, also by train, due to working from home and changed habits with the use of different travel modalities. In effect, the income and financial health of NS is under pressure. To commit to the agreements made in the HRN-concession (right to travel for the main train network in the Netherlands), NS needs to be financially healthy, and show a sustainable performance operating the train network in the Netherlands.

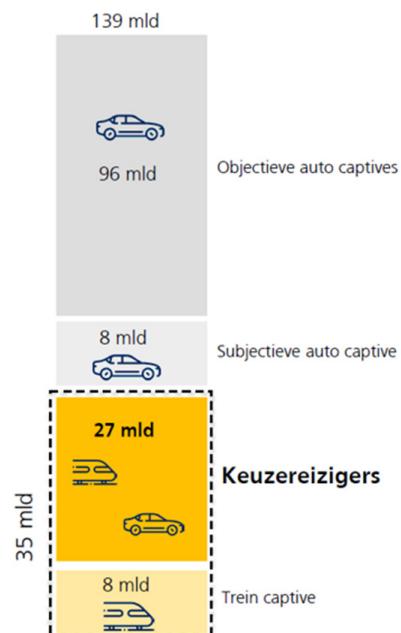
In recent years, NS has investigated how it can secure its financial profitability and position in the train market in the Netherlands. One of these perspectives has been to increase the number of travel kilometers per year and to look at a specific travel group: the so called 'choice traveler'.

The choice traveler

Not a surprise, car and train are the main modalities people use for traveling. Most travelers are less of interest for this case, since they stick with their modality of preference.

The choice traveler is a traveler with interest in both modalities and makes his/her choice based on context/emotion etc. This traveler has at least traveled 1-2 times per year by train, and has option to use both modalities.

As you can see in the travel data from 2022, it is a large group of travelers that all together travels 27.000 million kms on yearly basis, of which almost all kms by car: a group with high potential!



Design Challenge

Currently, the choice traveler only chooses for the train once or twice per year, and the challenge is to find ways how we entice this group to use more often the train. For this assignment we want to specifically look at the digital potential:

How can NS be digitally present on choice-traveler's phone (or other touchpoint) to entice the her/him to opt for traveling by train instead of using their car?

Mobility

Users & stakeholders

Choice-travelers: People who travel (more than 10 km) within the Netherlands and that can choose between the train and car.

There are different segments within Choice Travelers, that can be business or pleasure oriented. This assignment focuses on the pleasure orientation, since this group has more potential and also can contribute to increase occupancy during quiet hours.

For these journeys with a social and/or recreational goal, NS identifies the following choice-travellers target groups that you can choose for your project:

- seniors (65+)
- families with children
- groups of 2+ people
- young people (15-18 years old)

Although these target groups differ in behavior and the choices they make, we also see clear commonalities between all groups:

- The accessibility of the final destination is crucial in the choice of transportation mode; The train is especially often chosen for outings in the city center. The advantages of the train are significant here: destinations in the city center are easily accessible by train. Traveling by train is considered easier and more relaxing. Travelers experience barriers to driving to such destinations by car, particularly finding a parking spot and high parking costs.
- Types of outings that are especially popular by train are mainly those in the city center: visiting a city, shopping, or cultural activities in the city (such as a museum or theater).
- Price perception is a significant barrier to choosing the train. Generally, the perception is that the train is expensive. Overall, we see that awareness of discount subscriptions and products among these four target groups is still limited, and these groups are not yet making optimal use of them. An exception is the seniors, who are more price-conscious and better informed about options to travel more cheaply.
- Other important barriers to train travel, which are often mentioned, lie more outside NS's sphere of influence: the accessibility of the destination by train, the (longer) travel time, and the dependency on train schedules are frequently mentioned general barriers to choosing the train. Especially for destinations outside the city center, traveling by car is often faster and easier (better accessibility, door-to-door travel). Additionally, traveling by train provides a greater sense of independence (not being dependent on train schedules).

We also have insights into the specific motivations and needs for each individual target group and we will share this knowledge with you during the project.

Mobility

Deliverables

- Strategy on how to achieve the goal
- Customer journey of selected choice-traveler target group
- Concept design, validated with potential users from the target group
- Roadmap for implementation

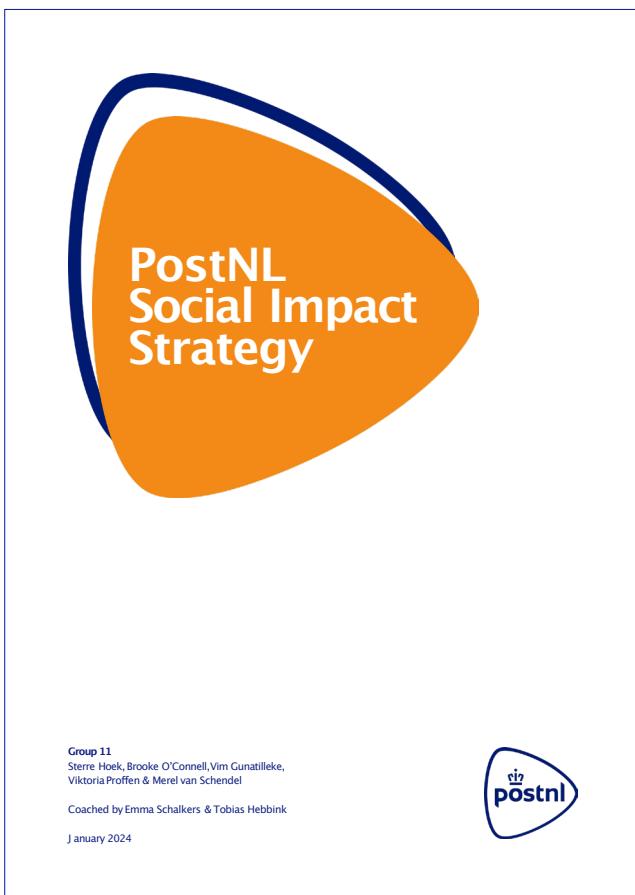
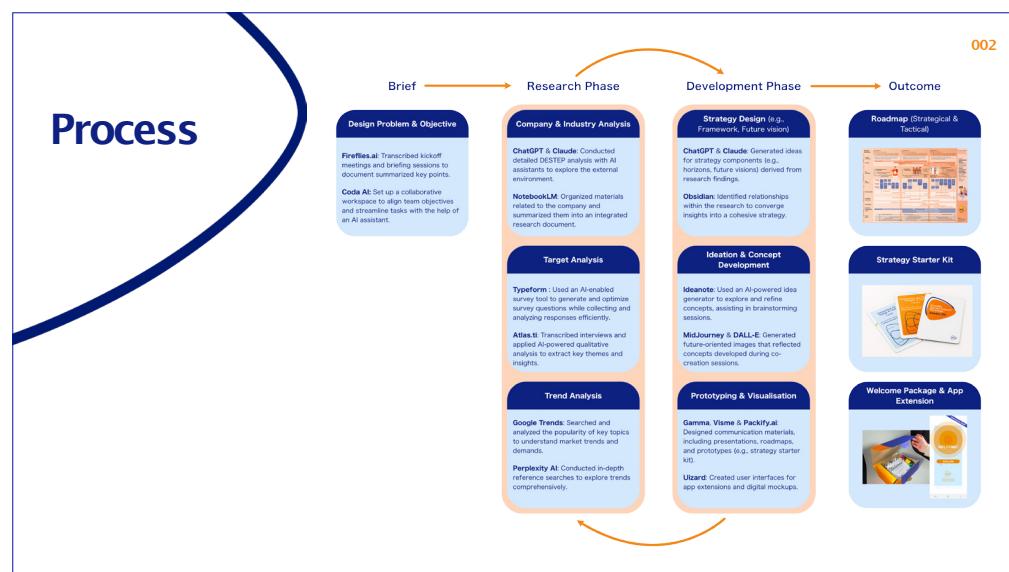
Appendix B - Example Deliverables

The example deliverables can be found on Brightspace under the following path:

Content > Table of Contents > Assignment example, alternatively it can be found with this link:
<https://brightspace.tudelft.nl/d2l/le/content/681564/Home?itemIdentifier=D2L.LE.Content.ContentObject.ModuleCO-4074537>

Please note that this example was originally created for a different course, with the AI component added later to align with the context of this course.

You can find one example of a group presentation and one example of a group report.



Appendix C - Additional Information on Rules and Standards

How is the course assessed?

The assessment for this course consists of the following summative assessment(s), namely:

- **Group Presentation**
- **Group Report**
- **Individual Report**

As well as these summative assessments, the course also offers formative assessments. These formative assessments are intended to give you and your lecturer insight into your progress: how far have you progressed in relation to the learning objectives, and what is still needed to achieve the objectives. Formative assessments do not count towards the final mark and are not compulsory. As formative assessments are part of the learning process designed by the lecturer, they contribute to achieving the learning objectives and successful completion of the course. You are therefore strongly advised to take part. The following formative assessments are offered:

- **Sprint Reviews**
- **Coaching**
- **Interim Group Report**
- **Interim Individual Report**

Calculating the final mark

The **Group Presentation** is assessed with a pass, a fail or a fail with option to improve.

The **Group Report** is assessed with a pass, a fail or a fail with option to improve.

The **Individual Report** is assessed with a pass, a fail or a fail with option to improve.

The results of the summative assessment(s) are taken into account when determining the final mark for the course. In doing so, the following applies:

You pass the course if you receive a pass for the summative assessment. If you receive a 'fail with the option to improve', read the information about resit opportunities.

You pass the course if all components are graded with at least a pass.

If you register for the course or the course exam but do not take part, 'NV' will be registered for the course/assessment component in OSIRIS. Your final result in OSIRIS will thus be 'NVD' (= niet voldaan, fail). If you fail to participate in or submit a summative assessment, 'NI' will be entered. Your final result in OSIRIS will thus be 'NVD' (= niet voldaan, fail).

How can I resit?

If you received a 'fail with option to improve', for the **Group Presentation**, the **Group Report** and the **Individual Report** you have the right to additional work. With an additional opportunity, you can upgrade your mark to a pass in the case of a 'fail with option to improve'. You can see the details of the additional opportunity on Page 009 of the Manual. This additional opportunity must be submitted no later than August 15th at 18.00h. Assessment will be done by 1st of September.

Validity period of marks obtained

If the final mark for the course is a pass, you have passed the course.

For this you need to pass each of the three summative components, namely the Group Presentation, the Group Report and the Individual Report.

Passed results cannot be carried over to the next year. If you fail any component and either miss or fail the resit, you will need to retake the entire class. It is not possible to extend a passing grade for any component to the following year.

Consequences of failing to meet deadlines

If you fail to meet the submission deadline for a summative assessment, your work will not be assessed.

In case of unforeseen circumstances that lead to not be able to meet the deadline, you need to contact the course coordinator immediately.

Inspection and discussion

After the mark for the summative assessments has been published, you have the right to inspect and possibly discuss your assessed work (within 20 working days).

To have your work inspected or discussed, please email your coach and ensure you cc the course coordinator.

Checking for fraud/plagiarism and use of AI

We need to be able to assess students on their own performance. For this reason, checks for fraud/plagiarism are made in this course. For more information about what is meant by fraud/plagiarism, click [here](#).

Suspicions of any form of fraud will be reported to the Board of Examiners. Should fraud be detected, no result for this course will be recorded in any instance, and the Board of Examiners may take measures such as excluding the perpetrator from one or more assessments at TU Delft for a certain period.

The general fraud/plagiarism rules also apply to the use of generative AI. In this course, You are allowed to use generative AI, as long as you reference it correctly and include the used prompts.

What should you do if you are ill?

If you are ill, you are responsible for taking action. If you cannot be present because you are ill (or for any other reason), you are expected to inform the person with whom you have a meeting. If you have a coaching meeting, for example, you should inform your coach of your absence; and if you are working with a group on an assignment, you should report your absence to the group. Also check with your fellow students whether you have missed any important information and be sure to update your planning to make up for the missed study hours.

Formally registering as ill

There are a number of occasions when a report of illness is required. These are the following: The first contact moment of the course; this is when you confirm your participation in the course. Contact moments involving an activity that contributes to the final mark for the course, such as a (final) presentation or exam.

For this course, it is compulsory to mail to the course coordinator/course mail address that you are ill if illness prevents you from attending on the following dates/times:

- The 25th of June - The day of the final deliverable

In case of long-term illness

If you are ill for longer than a week, contact your coach to discuss what should be done and how, in order to catch up with the planning. If necessary, the coach can discuss your situation with the course coordinator. You will be referred to one of the academic counsellors if need be.

You can also make an appointment yourself with one of the academic counsellors to discuss your situation and planning.

Appendix D - IP Rights Transfer Agreement

IP Rights Transfer Agreement - What is it?

In TEIS we work with actual partners, to make the course as 'real' as possible. But that also means that these companies require confidentiality and Intellectual Property. Therefore, we ask you to sign the **IP(R) transfer agreement** before the start of the TEIS course on February 12th. Only then, partners are willing to share (confidential) information with you.

You have to sign only once for all collaboration courses in your BSc and MSc curriculum at TU Delft, faculty IDE. Some or most of you probably have signed it already. If you have not signed the **IP(R) transfer agreement** yet, or doubt you did, make sure you:

1. Sign the IP(R) transfer agreement you can find [here](#).
2. Make a PDF scan of both sides of the document
3. Send it by e-mail with 'TEIS' in the e-mail title to StudentIP-IO@tudelft.nl at latest February 11th

In our experience, most students highly value the input of the „real“ external parties. However, if you do not want to sign the agreement, please inform the staff so they can schedule you in an assignment where IP is not an issue. This could be an assignment in which staff acts as collaboration party to give (fake partner) feedback.

