HFNL Scriptieprijs 2025

Genomineerden

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De winnaar van de HFNL Scriptieprijs 2025, Viktoria Proffen (lionks) met juryvoorzitter Lottie Kuijt-Evers.

How people find their way in 2035

In de toekomst (rond 2035) zullen mensen zich door steeds complexere fysieke én digitale omgevingen bewegen. Zo krijgen we bijvoorbeeld te maken met steeds meer dichtbevolkte steden. Navigatiesystemen, slimme sensoren en AI-algoritmen nemen dan veel beslissingen van ons over. Dat maakt bewegen efficiënter, maar ook passiever: we hoeven zelf nauwelijks nog te oriënteren, te interpreteren of keuzes te maken. Juist dat vermogen om betekenis te geven aan ruimte, om ons te oriënteren in de wereld, staat centraal in mijn afstudeeronderzoek *How People Find Their Way in 2035*. De kernvraag luidt: hoe ziet *wayfinding* er in de toekomst uit, en hoe kan je deze ervaring op een betekenisvolle manier ondersteunen?

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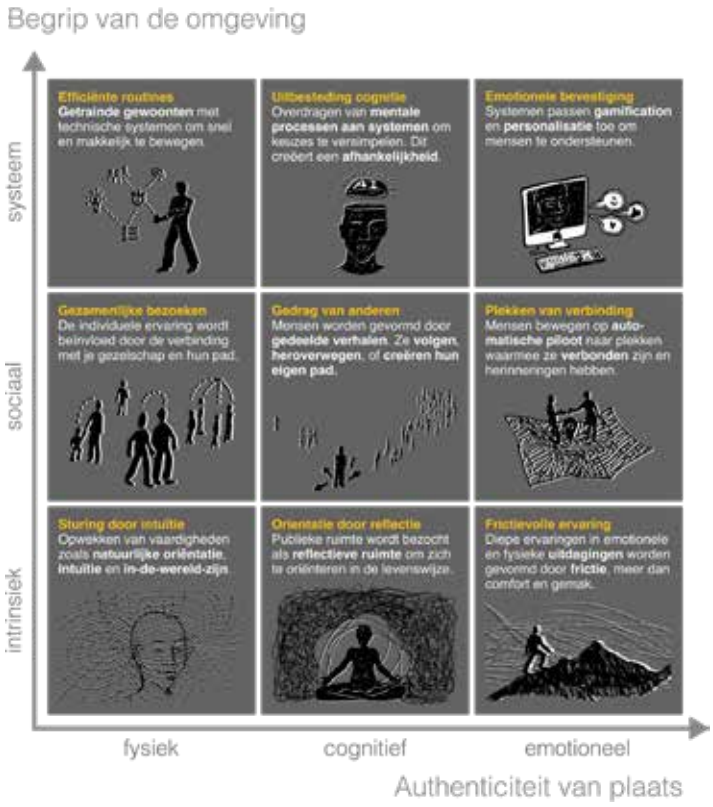
Methode

Om die vraag te verkennen heb ik de Vision in Product Design (ViP)-methode toegepast (Hekkert & Van Dijk, 2011); een ontwerpmethode die niet uitgaat van bestaande problemen, maar van een toekomstvisie op menselijk gedrag en ontwikkelingen in technologie en samenleving. De toekomstverkenning bestond uit literatuuronderzoek en expertinterviews. In lijn met de ViP-methode verzamelde ik hiervoor 150 contextfactoren uit verschillende domeinen. Verschillende factoren (zoals politieke, culturele, technologische, demografische en economische) hebben een aannemelijke invloed op hoe mensen zich in de toekomst oriënteren en hun weg vinden.

De factoren zijn geclusterd in toekomstpatronen, die de assen vormen van een 3x3 framework over de toekomstige context van wayfinding (afbeelding 1). Op de horizontale as wordt 'authenticiteit van plaatsen' benaderd vanuit de fysieke, cognitieve en emotionele ervaring. Op de verticale as wordt 'het begrip van de omgeving' gevormd door een intrinsieke, sociale, of systeembeleving. Op de kruispunten van deze assen vormen zich negen typologieën van hoe mensen hun weg vinden. Dit framework functioneert als een cognitief model: het beschrijft hoe mensen in de toekomst ruimte kunnen



Afbeelding 1. Framework wayfinding.

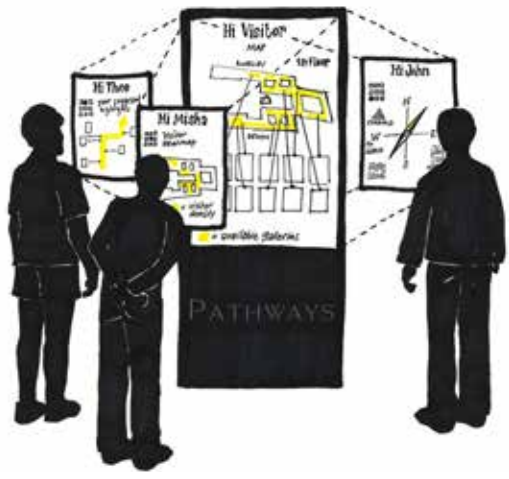
waarnemen, begrijpen en gebruiken, afhankelijk van hun mentale toestand, doelen en context.

Resultaten

Om het framework wat meer concreet te maken, is het uitgewerkt voor de context van het Louvre in Parijs. In dit iconische en complexe museum komen alle dimensies van wayfinding samen: de fysieke ruimte, de interne representatie van de ruimte in het hoofd van de bezoeker, en de persoonlijke beleving. Deze context is gekozen vanwege de grote diversiteit aan behoeften en ervaringen, waardoor alle negen cellen van het framework relevant zijn. Een bezoeker kan de Mona Lisa zoeken of vrij willen ontdekken, kan een lokale kunsthistoricus zijn of iemand die voor het eerst het Louvre bezoekt. Het framework is ook bruikbaar in andere contexten, maar niet alle cellen zijn altijd even relevant (voorbeeld: voor een vliegveld ligt de focus meer linksboven, middenboven en linksmidden).
Het concept *Pathways* (afbeelding 2) vertaalt de negen typologieën naar negen mogelijke manieren van bewegen door het museum (afbeelding 3). Bezoekers kunnen bijvoorbeeld kiezen voor een efficiënte route die hen snel langs hoogtepunten leidt (3-A/B), een intuïtieve route door te reageren op het gedrag van andere mensen, de automatische piloot of intuïtieve signalen in de architectuur (3-E/F/G), reflectief (3-H) of juist frictievol (3-I). Zo ontstaat een adaptief geheel dat aansluit bij de verschillende cognitieve strategieën en belevingsniveaus, waardoor de verschillende behoeften van de gebruikers worden voorzien. De bezoeker bepaalt niet alleen *waar* hij/zij naartoe gaat, maar ook *hoe* hij/zij zich wil oriënteren.

Conclusie

Dit thesisproject laat zien dat wayfinding niet alleen een ruimtelijk, maar ook een cognitief en emotioneel proces is. Cognitief omdat mensen zich oriënteren, interpreteren en keuzes maken in complexe omgevingen, en emotioneel omdat het vinden van je weg verbonden is met gevoel van controle, verwondering,



Afbeelding 2. Pathways concept voor Louvre

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The thesis is very innovative and inspiring and stimulates to think about how technology affect our lives.

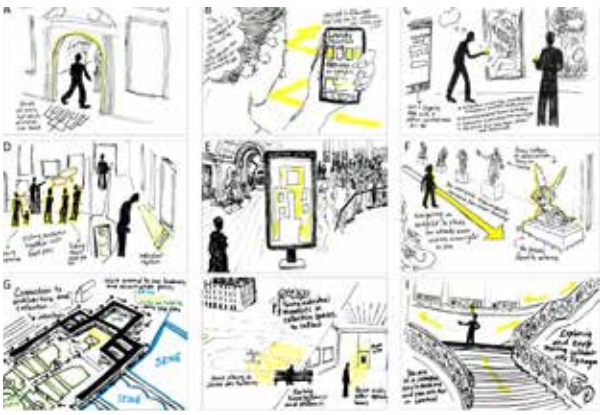
comfort en betrokkenheid. Wanneer systemen steeds meer beslissingen overnemen, wordt het ontwerpen van 'vrije keuze' een kerntaak voor ontwerpers en human factors-specialisten.

Persoonlijke impressie

Terugkijkend was dit project voor mij een ontdekkingstocht in het spanningsveld tussen mens en systeem. Wayfinding en de publieke ruimte zijn naast fysieke en sensorische ergonomie, ook heel nauw verbonden met cognitieve ergonomie. Het liet me zien dat wayfinding niet alleen over efficiëntie gaat, maar ook over autonomie en betekenisvolle ervaringen: over hoe we, zelfs in een wereld vol navigatiehulpmiddelen, onze eigen weg blijven vinden.

Referenties

Hekkert, P., & Van Dijk, M. (2011). *Vision in Design: A Guidebook for Innovators*. BIS Publishers.



Afbeelding 3. Negen wayfinding-ervaringen voor het Louvre.

CropKit: Facilitating Precision Farming Adoption in Smallholder Agriculture

Across Europe, small-scale farms form the foundation of food sovereignty, biodiversity, and rural resilience; yet they are rapidly disappearing. Industrialised agriculture, while efficient, has contributed to ecological degradation and the erosion of rural communities. This research project examines how Precision Agriculture Technologies (PATs) can support – rather than undermine – the autonomy, resilience, and sustainability of smallholder farmers. This study challenges the prevailing techno-solutionist approach in Agri-technological innovation, showing that current PATs often reproduce structural inequalities by favouring large agribusiness and creating new dependencies for farmers. The central question is how technologies like automation and AI can empower – rather than replace – farmers by easing daily work, avoiding new dependencies, and providing an adaptable smart tool for all routine farm tasks.

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Method

A mixed-methods study integrated multiple data sources. An exploratory literature review examined current developments in agriculture – especially smart farming – and the drivers and barriers to adopting existing solutions. A quantitative online survey of small-scale farmers in Austria, Germany, and the Netherlands (44 valid responses) explored attitudes toward PATs using descriptive and correlation analyses. Eight semi-structured interviews with agriculture experts from the same countries offered diverse perspectives on agricultural technologies and practices. Participatory feedback sessions with farmers on desired features, usability and physical ergonomics informed prototype development. A full-scale prototype was built and tested to refine user interaction and ergonomics using the Think-Aloud Method to assess manual steerability, comfort and ergonomic positioning in the float configuration. Subsequently, farmers contributed to the design process through augmented reality sessions, allowing them to 'sketch' feedback on the design in the virtual space. A detailed digital overlay allowed feedback on form and aesthetics, while the physical prototype enabled physical testing of ergonomics (see figure 1).

Figure 1. Farmer Feedback and AR Session.

Uit het juryrapport
A very impressive amount of work was done, in performing research, building and testing prototypes in a relatively short period of time.

Results

The research culminated in the creation of CropKit (see figure 2), an electric 'micro-tractor' designed for everyday farm tasks (e.g. ploughing) that can be enhanced through modular extensions – expanding both its functional capabilities (e.g. weeding) and its intelligence (e.g. AI-based pest scouting). Designed to ease the everyday work of smallholder farmers in multiple ways – ranging from physical relief through more ergonomic weeding, to advanced features such as automated logbook keeping – the system allows farmers to decide which modules and functions they need. Built around a compact electric platform (see figure 3), the concept enables gradual integration of automation-driven (e.g. autonomous ploughing) and data-driven (e.g. pest scouting) precision functions and supports different levels of machine autonomy (manual, remote and fully autonomous operation). Findings from the mixed-methods study showed that farmers place high importance on maintaining control and authority over decision-making, rather than delegating these functions to AI. The results further indicate that incremental adoption is key to fostering trust in PATs. Gradual integration keeps the system affordable and allows smallholder farmers to progressively adapt to increasingly intelligent machinery. Through this human-centered design approach, CropKit demonstrates how technology can augment farmers' skills; such as through CropKit IQ, which provides deeper insights into field parameters, or CropKit Float, where the farmer becomes an integral 'module' of the machine.

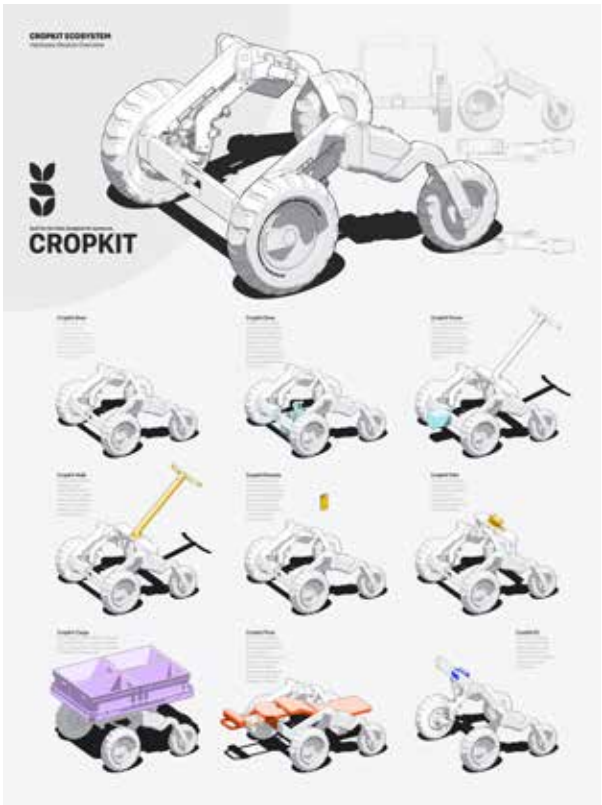

Figure 2. Physical Ergonomics Evaluation (CropKit Float and Walk).

Conclusion

This study positions precision agriculture as a socio-technical challenge that requires a human-centred, participatory approach. Rather than optimising isolated functions, it focuses on empowering farmers as active stewards of complex agroecological systems. Grounded in human factors principles, CropKit offers a framework for 'farmers-centered' technology development through an open-source, modular design that prioritises small-scale farmers, affordability, data sovereignty, and community-driven innovation.

Personal impression

Designing CropKit has been both a scientific and personal journey. Collaborating with agriculture experts across Europe showed that genuine innovation arises when technology respects and builds upon human expertise and the socio-cultural context in which it is applied. Reframing innovation as a social and systemic process, rather than a purely technical one, deepened my understanding of how human-centred design can yield solutions that align with the needs, values, and practices of the target community. I learned that if you want to design for farmers, you need to design with farmers.

Figure 3. CropKit Hardware Module Overview.

Designing Inclusive Pathways: Revealing Barriers and Reimagining Accessibility at TU Delft

Universities are meant to foster learning and belonging, yet their physical and institutional structures can exclude. Accessibility is still too often treated as a matter of compliance rather than a question of participation, equity and belonging. This thesis explored how accessibility is understood, experienced and governed within TU Delft and how it might evolve into a more connected and inclusive practice. It focused on the lived experiences of students and staff with disabilities, examining how institutional structures, spaces and everyday interactions shape those experiences. Accessibility here encompasses physical, social and institutional barriers, as well as the cultural aspects of belonging. While grounded in disability, the systemic lens also revealed broader mechanisms of exclusion that intersect with other forms of marginalisation. The findings suggest that inclusive institutional design must recognise intersectionality and that sustainable accessibility requires shared ownership rather than isolated initiatives or individual effort.

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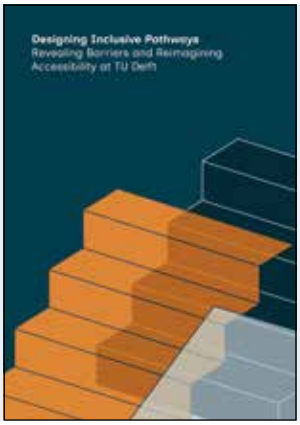

Method

The study followed a modified Systemic Double Diamond, integrating systemic design, design futuring and co-creation to connect institutional analysis with participatory, future-oriented change. The exploratory phase combined literature on inclusive design and accessibility in higher education with empirical methods: 12 interviews, a small survey (n = 17), and two process probes tracing how accessibility barriers travel through TU Delft. Systemic design uncovered organisational complexity and power relations, while design futuring used speculative scenarios to question current practices and imagine alternative pathways. These possible futures were discussed and translated into strategies and leverage points for transformation in two co-creation workshops with stakeholders (a.o. students, faculty, researchers, the Diversity & Inclusion Office and Facility Management), among whom were participants with lived experience of disability. At the end of the project, the output was reviewed in separate evaluation sessions with stakeholders (see figure 1).

Figure 1. Stakeholder Evaluation Session, Walking through the Pathways of Access workshop.

Uit het juryrapport

Each chapter ended with a take-away, making it easy to read.

Results

The findings indicate that accessibility at TU Delft is fragmented and reactive, driven by the individual commitment of staff and students and external pressure rather than coordinated strategy. Responsibilities are diffuse, feedback mechanisms limited, and initiatives disconnected across faculties. Although both top-down policies and bottom-up actions exist, they rarely align or reinforce one another.

Three tools translate these insights into strategic instruments for institutional reflection and action. The first of the three is the Accessibility Framework (see figure 2). The Agency × Understanding Matrix maps how different stakeholder groups – people with lived experience, students, staff, management, diversity officers and policy teams – relate to accessibility in terms of understanding and agency, identifying leverage points for change. Building on the matrix, two entry points were developed: the *Access Follows Who*? campaign (see figure 3) makes exclusion visible and reframes accessibility as a shared responsibility, and the *Pathways of Access* workshop, which builds on insights from the Matrix and walks participants through barriers identified beforehand by people with lived experience. A Strategic and Tactical Roadmap connects these tools, translating insights into sequenced actions that align long-term vision with immediate institutional steps.

Conclusion

Accessibility is not a checklist or afterthought but a form of institutional hospitality and justice. Integrating systemic inquiry, co-design and design futuring helped uncover hidden barriers and propose a starting point for inclusive change at TU Delft. The tools demonstrate how accessibility at TU Delft can shift from individual concern to collective responsibility, anticipating barriers in planning rather than merely responding to them, and embedding inclusion as a continuous institutional practice.

Personal reflection

Working on accessibility at TU Delft went far beyond a graduation project. It touched on questions of justice, care and belonging. Most people have experienced exclusion in their lives, yet for people with disabilities these barriers are constant, deeply embedded in everyday systems and interactions. This revealed how easily environments can exclude and how much persistence is required to remove those barriers.

The process challenged me as a designer and confirmed that inclusive design can only happen through co-design. I also realised that accessibility is never absolute but an ever-evolving space. Total accessibility may be impossible, yet striving toward it is part of institutional responsibility.

Would you like to find out more about the *Designing Inclusive Pathways* Tools? Download the documents here: https://resolver.tudelft.nl/uuid:efaf75c9-e1f3-41d0-900e-2a4bb4316b4f.

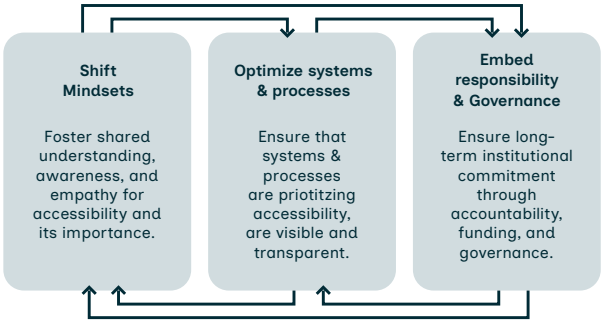

Figure 2. Simplified Accessibility Framework.

Figure 3. Posters from the Access Follows Who? campaign.