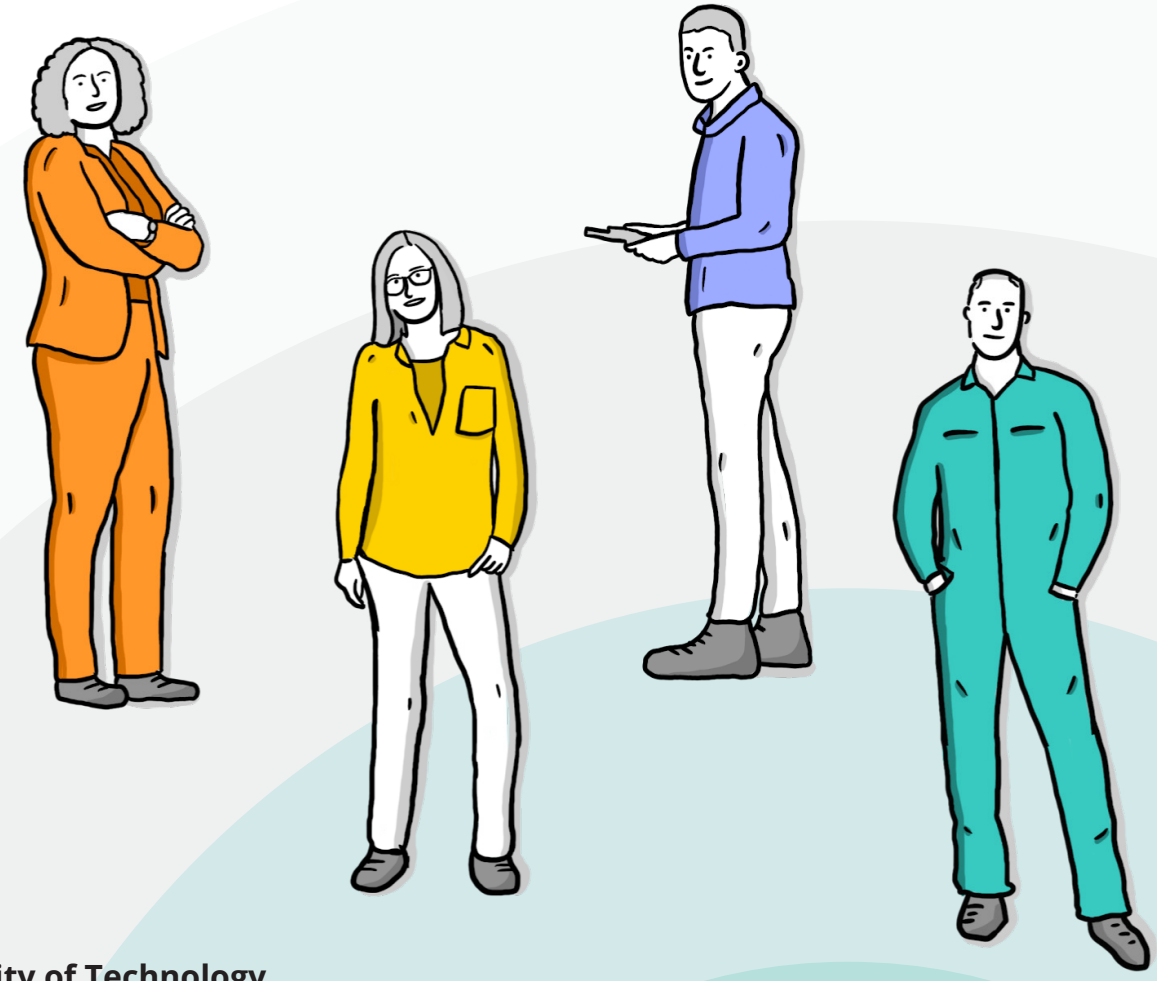
Systemically Designing Zoonotic Disease Risk Management

12/06/2024

by the GGD-Brabant-Zuidoost. To prevent introduction and spread of zoonotic diseases within livestock farms .



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Prologue

Fantastic that you're taking a look at my Final Master Project for the faculty of Industrial Design at the University of Technology in Eindhoven. I am very proud of this project in collaboration with the GGD Brabant-Zuidoost and feel like I've shown the best of my skill set which I built up the past 7 years studying Industrial Design.

The project is very complex so try to read some stuff carefully. However, with my design skills I tried to make this report as easy to read as possible. Hence the minimal use of colours to really let the stakeholders, which do have colour, pop! There are also a lot of pages, I know, but I tried to place everything quite spacious so you don't loose yourself in all the complex information.

In this project I will go over my decision for this project, the framing of the system, results of the research, conclusion and my reflection points based on all the work I did past 5 months.

Before starting this report I want to thank my coaches at the GGD Brabant-Zuidoost (**Danielle, Evelien & Didi**) for the time taken to coach me, guide me in the right direction and being critical on my work. It was a great pleasure to work with you. The atmosphere at the GGD Brabant-Zuidoost is always very welcoming!

I also want to thank my coach **Lu Yuan** for giving me great feedback from a TU/e perspective throughout this project and the rest of my masters degree. Your expertise and interest fitted greatly with my development, expertise and interest formed during my masters.

Lastly, a big thanks to all my friends and family that supported me outside of university work. Especially thanks to **Pom** who gave me critical feedback throughout this semester.

Executive summary

Zoonotic diseases are pathogens transmitted from animals to humans. Risk for zoonotic diseases is hard to predict and effect of regulations is difficult to measure. Currently, the GGD Brabant-Zuidoost tries to minimize risk for zoonotic diseases within livestock farms through means of health advice within the permitting process of municipalities and Omgevingsdiensten. To improve this advice GGD's created documents (Boer & Verstand) with regulations to minimize risk of zoonotic disease transmission. These documents, however, do not make impact within the multi-stakeholder permitting process. Following a systemic design process, pain points and needs of Omgevingsdiensten and GGD's in the permitting process are mapped.

The insights show the need to reframe the context of implementation of Boer & Verstand. This is done by looking at an expanded system view with additional stakeholders and contexts. Through a co-creation session with GGD's the expanded system view (stakeholder relationships, contexts and insights) are assessed. Resulting in a horizon strategy for transforming the Boer & Verstand documents into valuable interventions. To transition towards effective influence of GGD's to improve zoonotic disease risk management. A hypothetical intervention illustrates how Boer & Verstand can possibly be implemented in the context of policy making. Future projects have to investigate future scenario's and research various context to create validated interventions.

Figure 1 - Co-creation session conducted during this project

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Introduction

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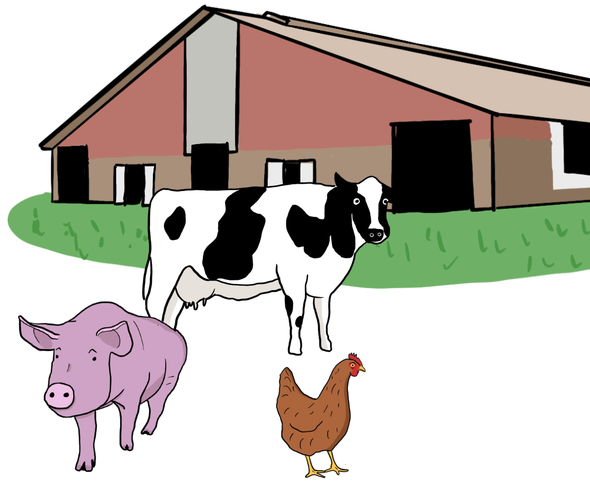
Design challenge
Theoretical background
Project approach

This process of this project is described by focusing on decisions, contribution and results. The design challenge related to the project brief and theoretical background explain the initial scenario, problem and framing of this project. The approach used within this project explains the structure and focus of the result section (the design process) which is divided in stages and a discussion.

Project decision & contribution

The decision for this project was made so incorporate knowledge about systemic, service and UX design to make impact within a complex (wicked) problem in public organisations. Where using a design approach is relatively new (U&S, T&R, B&E). Zoonotic disease risk management (RM) is such a topic. Within the M1.2 research project the potential for impact through design for zoonotic disease RM was already shown by designing a multi-stakeholder session for BrabantAdvies focused on the OneHealth framework. The decision to collaborate with the GGD Brabant-Zuidoost was made as GGD's have a legitimate executive and administrative role with clear and positive impact on society.

This project aims to expand the knowledge of application within the field of zoonoses. It aims to make impact by illustrating to stakeholders how design methodology can make a significant impact within their organisation and show a new way of working. This is done by combining existing systemic design methodology with adapted and custom visualisations (C&A). These visualisations aim to make sense of complexity through a situated co-creation session, discussion and brainstorming (U&S, B&E). Mapping the system view aims to share new light on the challenge to have stakeholders imagine more opportunities than previously assumed possible. Eventually, a pragmatic intervention/solution directs the GGD Brabant-Zuidoost towards transition which improves practices.



Design challenge

A farmer (from now entrepreneur) needs an environmental permit for a change within its business (entirely new farm, new animals, new stable etc.). Municipalities in the Netherlands approve permit requests requested by entrepreneurs. Permits are assessed on environmental factors including noise, odour & particulate matter, nitrogen emissions and zoonoses (Ruimtelijke onderbouwing veehouderij, n.d.). Within the permitting process municipalities and Omgevingsdiensten (Omgevingsdiensten, 2024) consult the local GGD for health advice in case of increased health risks. Health risks such as odour, particulate matter and endotoxins have quantified norms to predict and measure risk and effects. Risk for zoonotic disease transmission is difficult to predict and therefore measure (Bekedam et al., 2021). Risk is therefore not quantified; no legal norms exist to measure risk for zoonotic disease transmission. GGD's therefore may advise differently across permit requests (Tolsma et al., 2022).

The original project 'Boer & Verstand' (Tolsma et al., 2022) (B&V) aims to investigate which regulations are scientifically proven, are relevant and are feasible to prevent introduction, spread and emission of zoonoses within livestock farming. With the aim to provide a list of regulations, created with consensus. To improve zoonotic disease risk management (RM) within livestock farming. The project resulted lists of regulations per farm type. The PDF documents have been shared with all GGD's with the goal to be used within health advice of GGD's provided in the permitting process (Tolsma et al., 2022).

Figure 2 - Boer & Verstand documents (Tolsma et al., 2022a)

Problem definition

Currently it is unknown if the GGD Brabant-Zuidoost and other stakeholders use the B&V documents in the permitting process. The effect of the documents is therefore questionable. It is unknown if the documents decrease the risk for zoonotic disease transmission. The GGD Brabant-Zuidoost therefore seeks to understand the needs and pain points of stakeholders within the permitting process. Discovering the needs provides an opportunity to transform the B&V documents and effectively implement them into zoonotic disease RM by GGD's and other stakeholders in the system.

Research question

Based on this problem definition the research question and 5 sub questions to guide the research process are fomulated. An overview of the previous design challenge, results, current design challenge and research questions is shown in Figure 3.

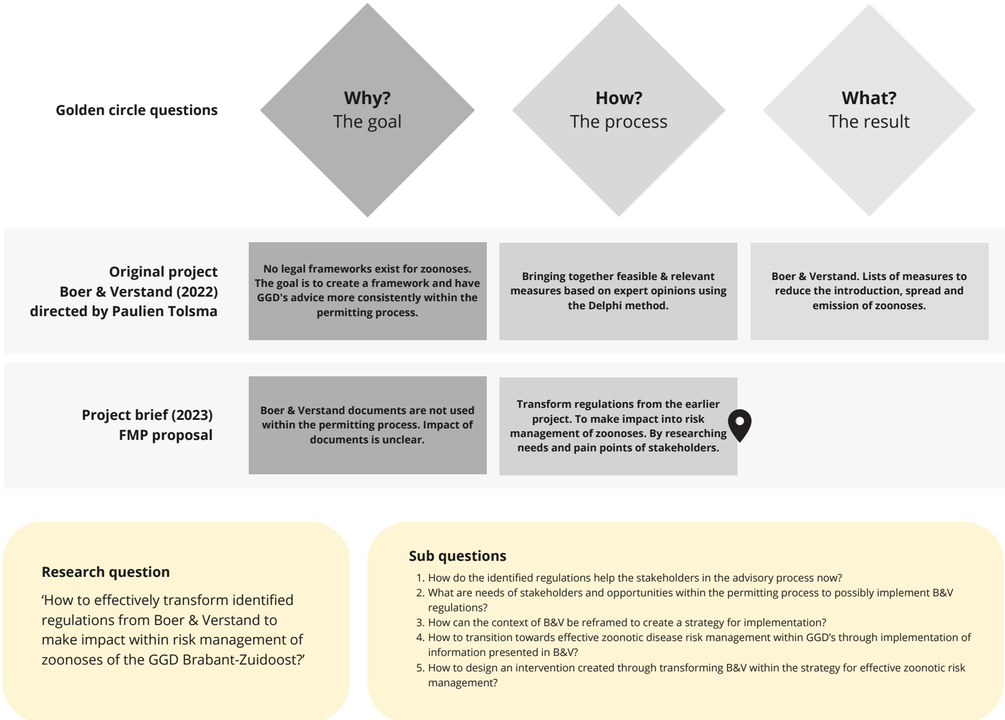


Figure 3 - Previous project, current project & research questions

Collaboration

The GGD's (municipal health services) are public organisations performing diverse tasks related to public health (GGD GHOR Nederland, 2023). Tasks include youth health care, infectious disease control, health monitoring and health education. GGD's have legal obligations, tasks may differ based on expectations of municipalities in the region. There are 25 GGD's in the Netherlands (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, n.d.). GGD's may collaborate, however, are separate organisations with different organisational structures (see stakeholders & organisation). This project is conducted in collaboration with the GGD Brabant-Zuidoost located in Eindhoven (Figure 4).

In June 2023 contact was reestablished with Danielle van Oudheusden, doctor infectious disease control at the GGD Brabant Zuidoost. After meeting the M1.2 research project for BrabantAdvies about zoonotic diseases (Van den Berk, 2022). This project is coached by Evelien van Sterkenburg (Project coordinator infectious diseases) and Didi de Gouw (Infectious disease epidemiologist and researcher public health). The project was done partly at the TU/e campus and partly at the office of the GGD Brabant Zuidoost. Bi-weekly meetings are organized to discuss updates and feedback.

Figure 4 - GGD regions in the Netherlands (GGD'en, n.d.).

Figure 5 - Office of GGD Brabant-Zuidoost in Eindhoven (DPG Media Privacy Gate, n.d.)

Theoretical background

Zoonotic diseases

Zoonoses are pathogens transmitted from animals to humans. Such pathogens may cause new, possibly deadly, diseases to emerge through transmission and mutation (Cross et al., 2019). A mutated pathogen that can spread through humans may trigger an epidemic or even pandemic (Turhan et al., 2021). Human-animal contact occurs throughout all of society. Risk for zoonotic transmission is increased through many systems and scenarios including livestock farming, keeping of companion animals, globalization, transport, wild animals, vectors (e.g. mosquitos), changes in climate/biodiversity and rewilding (Bekedam et al., 2021).

The past 20 years, precautionary measures, early detection and outbreak management have reduced the probability of a severe outbreak within Dutch livestock farming. Risk is mitigated through hygiene regulations, vaccination of animals, compartmentalization on farms and confinement duty of animals (Bekedam et al., 2021).

Risk management & risk communication

Smith et al. (2014) define risk as the measure encompassing the probability, consequences, and impact of not meeting a defined goal. Zou and Zhang (2009) describe RM as “a systematic approach to identifying areas of risk and deliberately deciding how to address each.” RM is applied in entrepreneurial, social, and ecological contexts, illustrating its highly contextual and case-specific characteristics (Alfredo, 2002; Gerkensmeier & Ratter, 2018). RM processes may include steps such as risk identification, risk analysis, risk evaluation, risk mitigation and risk monitoring (Kapuscinska & Matejun, 2014) (Figure 6). However, a large variety of RM models are used. Risk communication within organisations or towards the public is an integral part of RM (Newman et al., 2020). It is a situated social activity and values objectivity, consistency, transparency and consensus amongst involved parties (Boholm, 2019; Newman et al., 2020).

Figure 6 - Example of a risk management process (Wells, 2023)

Wicked problems & design approaches

Zoonotic disease and prevention control is a wicked problem. Wicked problems arise within contexts which are dynamic and unpredictable (Van Arkel et al., 2023). Wicked problems often include large stakeholder networks where various systems influence each other (Van Woezik et al., 2016). Hence, creating a solution for a wicked problem changes the understanding of the problem (Lucky, 2009). Predicting the risk of practices and quantifying the effect of interventions is therefore not possible (Gebreyes et al., 2014) (Van Arkel et al., 2023). This imposes challenges within public organisations which try to avoid risk through planning and by looking at linear relationships between risk and effects (Liverani et al., 2013; Van Arkel et al., 2023). It is therefore essential to encompass complexity of risk environments within livestock farming.

Design approaches such as design for social innovation and systemic design may account for complexity. Through supporting a multi-stakeholder approach focused on co-creation with stakeholders (Steen et al., 2011; Van Woezik et al., 2016). Design thinking methodology can provide new perspectives for stakeholders through emphasis on visualisation. To increase knowledge and human-centered sensemaking within complex (wicked) challenges (Van Woezik et al., 2016; Blomkamp, 2021; Liedtka, 2023).

One Health framework

The OneHealth approach (OH approach) is a framework used within public organisations to provide support within policy making related to health. The framework aims to encapsulate complexity by accounting for the health of animals, humans and the environment (Figure 7). The OH framework is, however, difficult to implement as it simplifies the complex systemic nature of societal and environmental health (Stärk & Morgan, 2015; Gebreyes et al., 2014). As mentioned by Bekedam et al., 2021 improved RM of zoonoses requires coherent policy and pragmatic implementation of the OH approach. This needs to be accompanied improved signalling and knowledge sharing between professionals (Van Woezik et al., 2016).

This project takes on the perspective of the GGD Brabant-Zuidoost. GGD’s advocate for public health (human health). This project does not directly focus on the health of animals or the environment. However, reflecting on the OneHealth approach is essential to encompass health from a larger systemic view. To include an interdisciplinary perspective and complexity (Liverani et al., 2013; Rist et al., 2014).

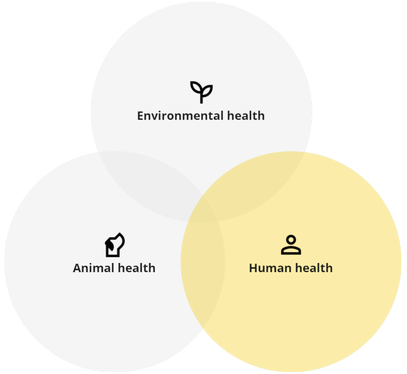


Figure 7 - OneHealth approach

Stakeholder management

To tackle wicked problems careful consideration is necessary when involving stakeholders into projects focused on wicked challenges (Van Woezik et al., 2016). Within the context of this project, permits are assessed in a highly contextual context. This is done within the multidisciplinary network of municipalities and the province (Omgevingswet - GGD GHOR Nederland, 2023). The research by Van Woezik et al. (2016) identifies and analyses stakeholders in the Netherlands related to zoonotic disease RM and their characteristics.

This project only regards a small selection of these stakeholders. To effectively manage risks, it is essential to assess the position in and relationship with other parties in the system (Rist et al., 2014). Based on this research an extensive list of stakeholders a serious game is created which educates experts within complex multi-stakeholder decision making (8D Games, 2023). The intervention introduces narratives to simulate multidisciplinary cooperation. This project, however, focuses on situated transdisciplinary cooperation. Introducing real life politics and opposing perspectives into the challenge (Bekedam et al., 2021; Metcalf, 2014).

Risk management & design approaches

Key principles within risk management and communication overlap with design principles within UX design, Service Design and Systemic design. Risk management and design approaches both support a multi-stakeholder approach, aim for strategic and responsible decision making, and provide tools to effectively process information (Fekete, 2012; Boholm, 2019; Newman et al., 2020). According to Newman et al., 2020, integrating user needs into policies and designs through a cross-departmental approach prevents risk communication to silo within legal departments.

By understanding the systemic complexity of risk management processes in a multi-stakeholder context. A design approach may orchestrate and map multi-stakeholder needs, reframe challenges within risk management and eventually design and integrate effective tools for risk communication and management (Mintrom & Luetjens, 2016; Lugnet et al., 2020; Van Arkel et al., 2023).

Conclusion

In conclusion, the challenge can benefit from a multifaceted approach that integrates a design approach with RM. To encompass the wicked nature of zoonotic disease RM. By incorporating a system view, focusing on transdisciplinary involvement and conducting co-creation the project can emphasize user-centered solutions. A system view can account for a multi-stakeholder and One Health perspective.

Similar to design approaches that emphasize human-centered interventions. Design thinking can provide a pragmatic view on complex insights through visualization. Effective RM involves systematic processes, transparent communication, and multi-stakeholder collaboration. By incorporating principles from RM and various design approaches complex, zoonotic disease RM can be enhanced to improve public health outcomes.

Project approach

As the project aims to transform and implement identified measures into RM within complex (wicked) multi-stakeholder context, the project takes on a systemic design approach. Systemic design is the 4th design domain and expands work of designers to tackle complex challenges and change society fundamentally by transforming structures and practices. System thinking aims to analyze interactions of elements within a system which mutually influence each other (Jones & Van Ael, 2022; Van Arkel et al., 2023) (Figure 8). Designing individual solutions may therefore reach opposite effects. Systemic design instead designs for problem sets and design interventions that initiate transformation (Metcalf, 2014; Van Arkel et al., 2023).

The initial phase of the project aims to frame and understand RM of zoonoses within the permitting process and a broader context. To understand the flows, relationships, and behavior of parts within a system' (Jones & Van Ael, 2022). Through design thinking methodologies the project takes a human-centered perspective. Thoroughly understanding the needs, perspectives and interests of stakeholders within the permitting process through means of qualitative analysis, mapping, visualization and discussion (Jones & Van Ael, 2022; Learning for Sustainability, 2023).

The latter phase of the project focuses on reframing of the project by expanding the system view. System sensemaking helps stakeholders reflect on system elements and provides a source for co-creating opportunities for transformation (Jones & Van Ael, 2022; Van Arkel et al., 2023). Within this project the impact of B&V within the permitting process and other contexts is reflected upon. Opportunities for transforming B&V regulations to make impact within RM are co-created in a session.

The outcome of the project is a strategy for transformation for GGD's. This strategy is supported by mapping and diagramming (Blomkamp, 2021; Jones & Van Ael, 2022; Van Arkel et al., 2023). The knowledge provided aims to support future decision making, transformation of practices and trigger discussion within GGD's and with involved stakeholders related to RM of zoonoses within livestock farms.

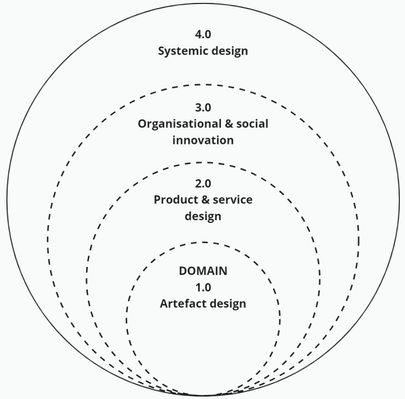


Figure 8 - Boundaries of the four Design Domains (Jones & Van Ael, 2022)

Figure 9 - Session during M1.2 research project related to zoonotic literacy (Van den Berk, 2022)

Methodological framework

The framework used within this project is based on the book 'Design Journeys through Complex Systems' by P. Jones & K. Van Ael (2022). This handbook created for the Systemic Design toolkit includes methodologies and tools divided across 7 stages and serves as a guide to navigate through complex systemic challenges (Figure 10).

1. **Framing** - This stage focuses on defining and describing the system and setting a boundary within it for the project to focus on. This stage includes inquiries and explorations to restrain the outcome and possibilities of the project. The purpose of this stage is to map trends, relations and system levels to guide the process and models used in stages to follow.
2. **Listening** - This stage takes a human-centred approach towards research within the system. Similar to other design methodologies this is done through contextual inquiries, participatory tools, field studies and ethnography. This stage aims to understand perspectives, needs, pains of actors in the system. Additionally, it may initiate engagement of stakeholders in future project steps.
3. **Understanding** - This stage aims to create a holistic understanding of the process flows, structures and relationships within the system. Various tools aim to structure insights, visualise complex challenges and provide sensemaking for stakeholders. The goal is to provide a coherent narrative which reveals stakeholder relationships and interactions.
4. **Envisioning** - The envision stage shapes desired system outcomes and encompass multiple futures. To understand what current values may be exchanged within a new system. Collaborative sensemaking and futuring exercises may result in conceptual system prototypes and a planning for system change focused on sustainment.
5. **Exploring** - After creating a strategy for interventions, an extensive range of possible opportunities and scenarios for change within the system arise. Interventions influence each other and are interconnected. This stage imagines, learns and maps the best options for future action.
6. **Planning & Fostering (In methodological discussion)** - The first 5 stages focus on creating a vision for system value and imagine possible interventions. Stage 6 & 7 in the Design Journeys methodology focus on implementation of the design strategy. The planning stage designs organisations' identities, processes and roles within teams to effectively proceed with change interventions. The fostering stage guides implementation to prevent design work from becoming a 'delivery'. It aims to prepare and advice the implementation team.

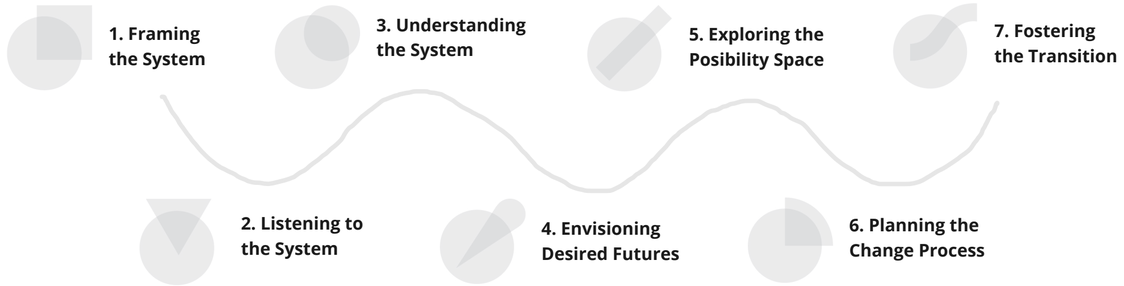


Figure 10 - Stages in project approach 'Designing Journeys through Systems' (Jones & Van Ael, 2022)

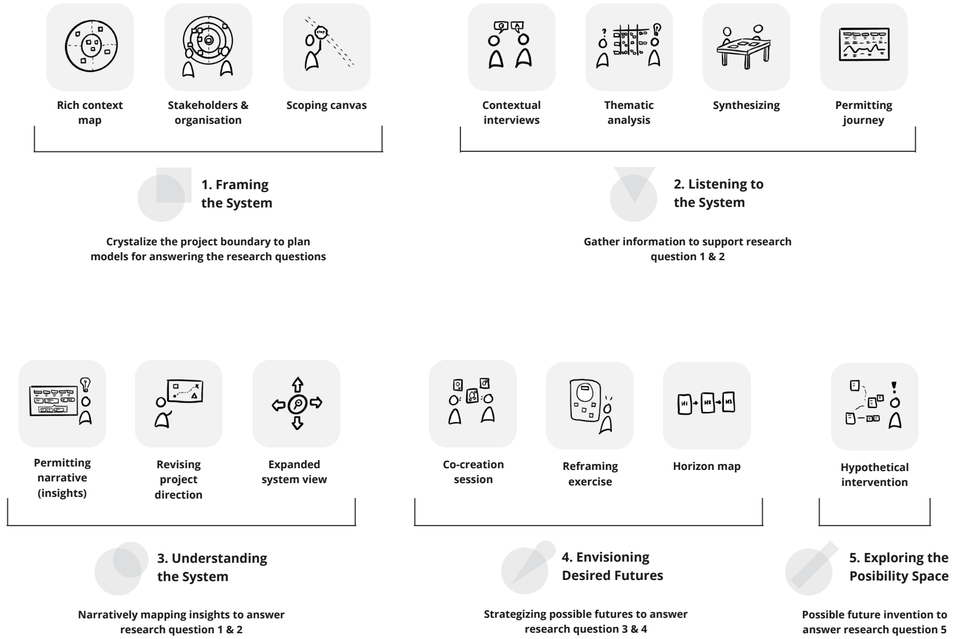


Figure 11 - Project structure and design activities conducted in this project

Project structure

This report is divided in 5 stages, described in the 'Design Journeys' book. The terminology of the 'Design Journeys' book is used for the stages. It directs the goal and activities of each phase towards a systemic perspective (Jones & Van Ael, 2022).

Stage 1 systemically frames this project in relation to the FMP proposal and design challenge (see design challenge). Stage 2 gathers and structures information to support RQ 1 & 2. Stage 3 maps insights for narrative sensemaking to revise the project goal and answer RQ 1 & 2. Stage 4 reframes the project and strategize possible futures to answer RQ 3 & 4 to. Stage 5 describes a possible future intervention to answer RQ 5.

The project is conducted by one designer and focuses on research, strategy and system value. As a result, the stages 'Planning & fostering' are discussed in the methodological discussion of this project. These stages guide the future steps of the project towards planning change and fostering implementation to transform practices of GGD's. Throughout the project the system view that is initially framed in Stage 1 is expanded. The current view of the project (initial or expanded) is therefore indicated on each spread.

An overview of the design activities and related research questions is shown in Figure 11.

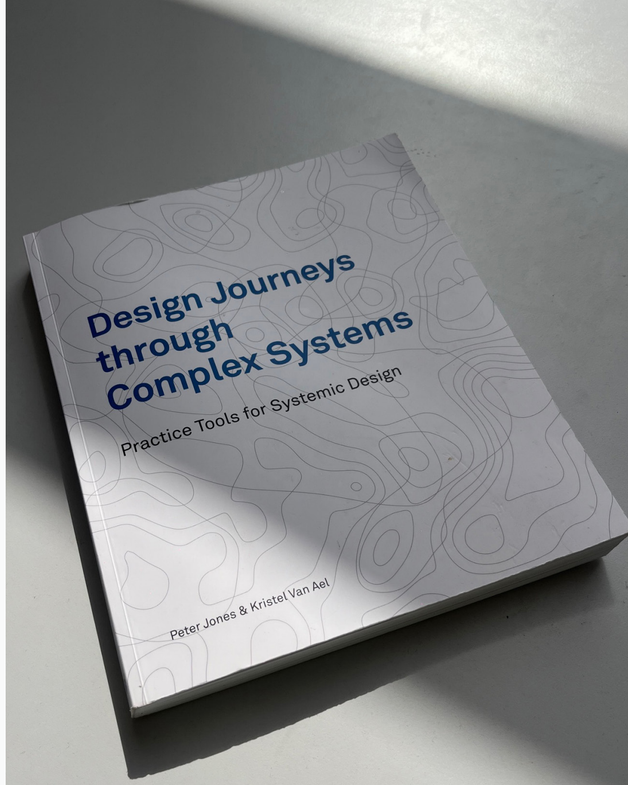


Figure 12 - The book 'Designing Journeys through Systems' (Jones & Van Ael, 2022)

Results

Content

Stage 1: Framing
Stage 2: Listening
Stage 3: Understanding
Stage 4: Envisioning
Stage 5: Exploration
Methodological discussion

Each stage explains the purpose and approach within an introduction. The results including decisions made are described under sub-headings. At the end of each stage results are concluded and shortly reflected upon based on systemic design methodology.

Figure 13 - Demo day

Stage 1: Framing

1.1 Rich context map
1.2 Stakeholders & Organisation
1.3 Project scope
1.4 Conclusion & reflection Stage 1

The process for framing this project includes the initial project for Boer & Verstand and the FMP proposal project conducted prior (Tolsma et al. 2022; Van den Berk, 2024) (1.1 Design challenge). As a result, this stage describes the broader system view, crystalizes the scope of this project and describes stakeholders and their relationship in the system. The stage concludes with a conclusion and reflection on the framing in this project through a systemic perspective.

The system in this project is the multi-stakeholder and sectoral system related to zoonotic disease risk management. Stakeholders in the system aim to minimize emergence, introduction and spread of zoonoses. This system specifically is framed within the context of livestock farming from a perspective of GGD's (Li et al., 2021; Bekedam et al., 2021)

1.1 Rich context map

To build a rich and common understanding of the broader context of the system the Rich Context Map is used. Jones & Van Ael, 2022) The map is created through desk research and discussion with coaches at the GGD Brabant-Zuidoost. The broader context describes perspectives and trends related to zoonotic diseases, farming and the political landscape (1.1 Design challenge) (Figure 14).

Livestock farming (and production of food) is a global system directly influenced by global challenges like Covid-19 and climate change (Liverani et al., 2013; Mishra et al., 2021). The Rich Context map illustrates how these challenges impact trends and practices within farming and deteriorating perspectives of farmers towards governments and organisations (Raad voor de leefomgeving en infrastructuur, 2021; NOS, 2021; NOS, 2024). Sustainability goals within policies require entrepreneurs to greatly invest in their business, whilst still staying financially stable (Ministerie van Landbouw, Natuur en Voedselkwaliteit, 2023; Jongeneel, 2024). Yet, entrepreneurs are imposed to increased legislation which has led to 'farmer protest' in the Netherlands and other EU countries (NOS, 2024b).

The effects of the Covid-19 pandemic are twofold. On one hand there is increased awareness on possible (re-)emerging zoonoses such as Q-fever or bird-flu (Bekedam et al., 2021; NOS, 2024c). On the other hand, there is increased distrust in governments and vaccinations as a result of Covid-19 (Turhan et al., 2021). This imposes a risk within farming as vaccination of farm workers is important to prevent transmission of possible zoonoses (Bekedam et al., 2021; Tolsma et al., 2022a).

In summary, the Rich Context illustrates how global challenges like COVID-19 and climate change affect farming practices and farmer perspectives. Sustainability goals require significant investments from entrepreneurs, yet legislation is increased. The COVID-19 pandemic has increased awareness of zoonoses but also created more distrust towards governments and vaccinations, posing risks for the safety of livestock farming and public health.

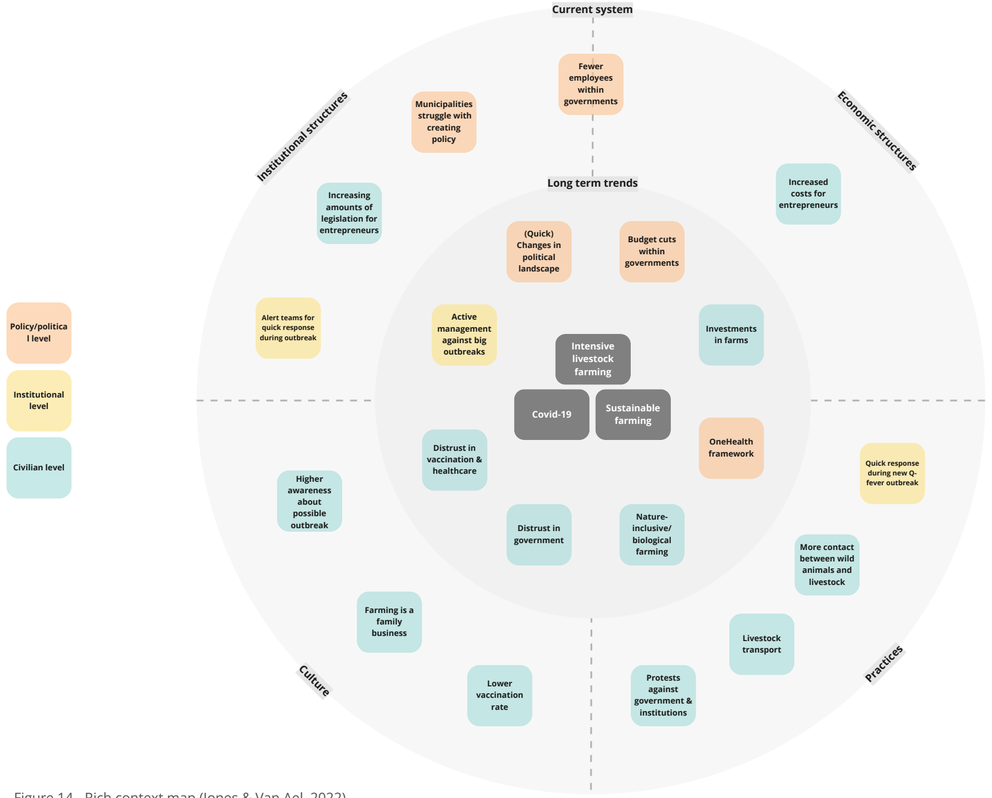


Figure 14 - Rich context map (Jones & Van Ael, 2022)

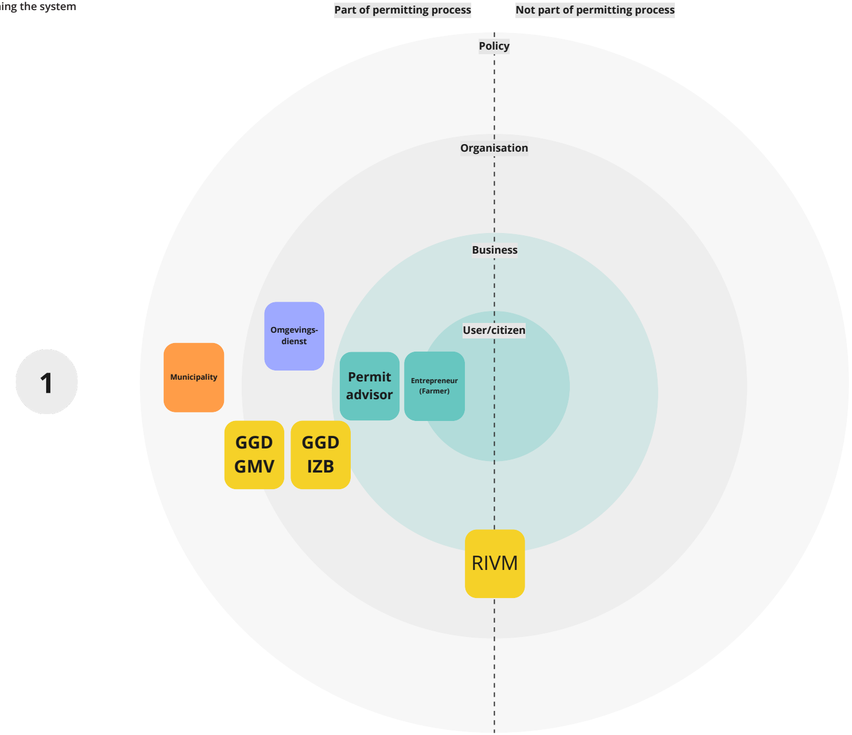


Figure 15 - Stakeholder ecosystem

Initial system view

1.2 Stakeholders & organisation

It is highly important to frame the stakeholders in the system well and get an overview of practices, relationships, organisational structures and position in the ecosystem. It is decided to visualise stakeholders in multiple ways to build upon common understanding.

1. The stakeholder ecosystem is based on the Actors Map from the book by Jones and Van Ael (2022). The map places citizens and users in the centre and expands to stakeholders in the system level of policy. In between are businesses and organisations. These levels are chosen based on relevant stakeholders in the system (Figure 15).

2. Stakeholders are also divided in groups (colours) based on their interest (perspective), expertise and level of social system or organisation (Figure 16). For improved sensemaking.

3. Stakeholder roles and practices are explained in Figure 17. The organisational structure based on the practices and roles is shown in Figure 18.

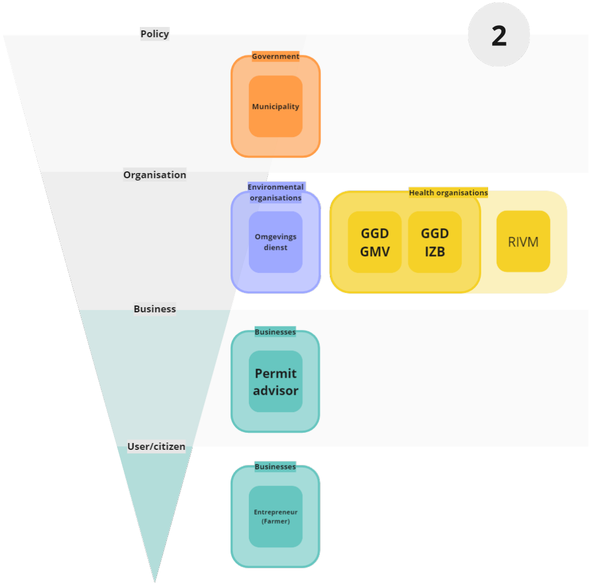


Figure 16 - Stakeholder group overview

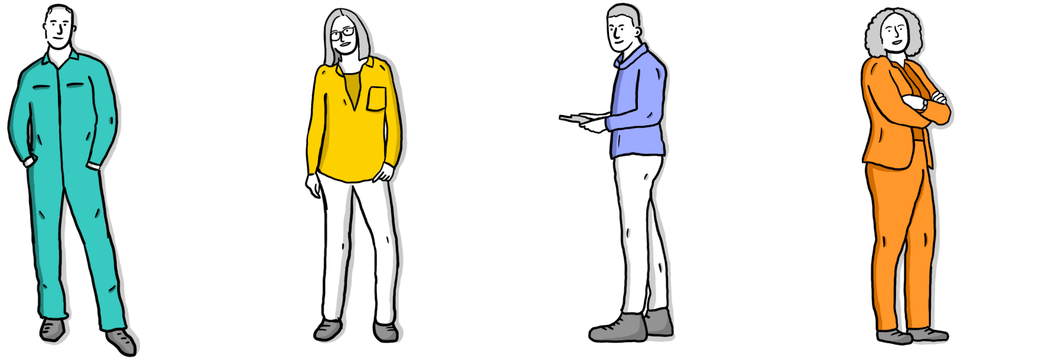


Figure 17 - Stakeholder explanations

Initial system view

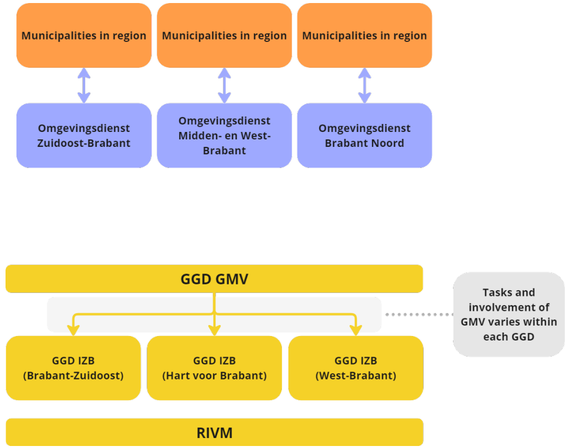
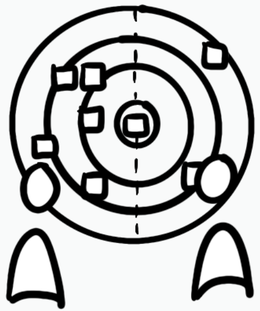


Figure 18 - Organisational overview



1.3 Scoping canvas

The scoping canvas supports the framing of the project by creating a summarized overview. The project focuses exclusively on risk communication and mitigation of (emerging) zoonotic diseases within the permitting process of public organisations. Because risks are identified and analysed in the prior project. Other processes and contexts are initially not focused on as GGD's in North-Brabant currently aims manage zoonotic disease risk through permitting.

As mentioned in the design challenge (see design challenge) the advice provided by the GGD also includes a view on environmental factors such as odour & endotoxins. It is expected to find general insights about the permitting process, and thus about environmental factors. However, the main aim is to discover opportunities to transform B&V for implementation (Figure 19).

Entrepreneurs and advisors are deliberately not approached within the project. As the project focuses on the internal legal process of public organs and organisations. Requesting and receiving permits are the start and end points of the permitting process. The exclusion of entrepreneurs and advisors will be discussed in the reflection of phase 1 and the methodological reflection (6. Methodological reflection).

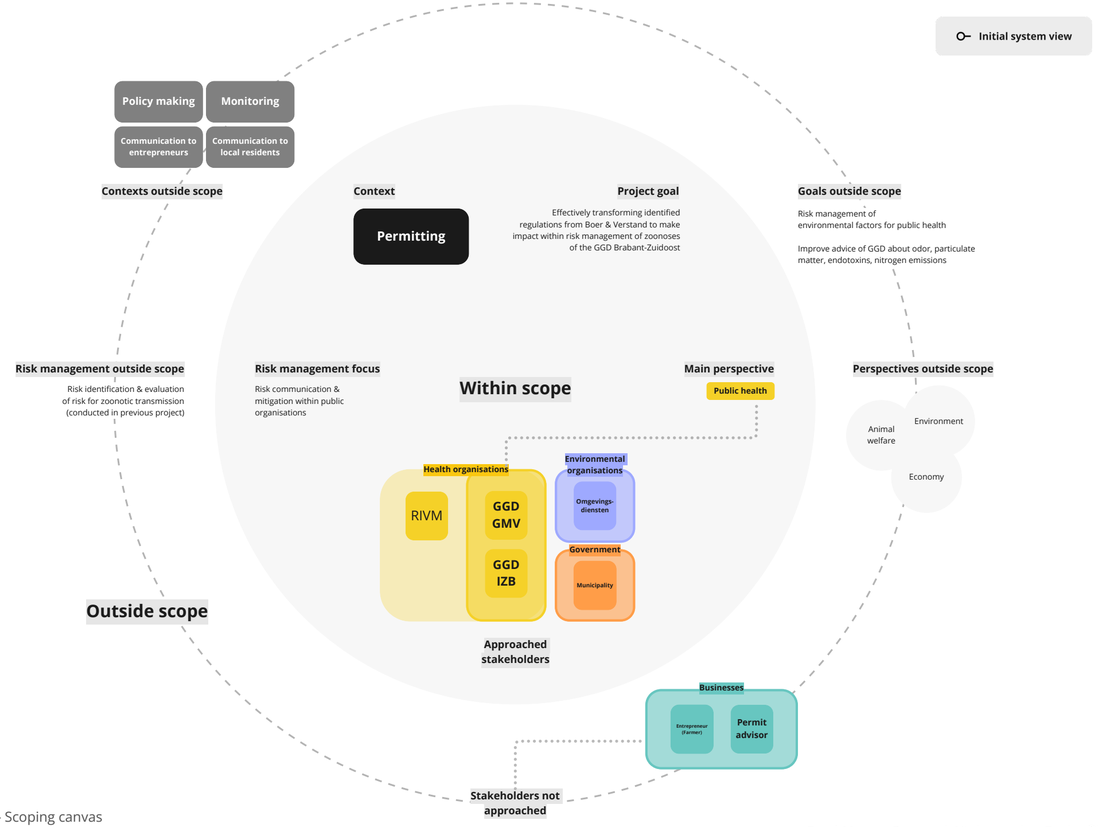


Figure 19 - Scoping canvas

1.3 Conclusion & reflection Stage 1

This stage describes the system from a holistic view (rich context map) where trends such as intensive livestock farming, sustainability goals of governments and Covid-19 are mapped. Reflecting back on trends is important within later stages of the project to understand influences and causes of insights and make sense of stakeholder relationships. The stakeholder overview provides a detailed description and overview of actors in the system. It provides a visualised model for understanding stakeholder insights (Jones & Van Ael, 2022).

The scoping canvas crystalizes the earlier defined design challenge. It serves as a clear direction for future design activities and decisions. However, a critical reflection on the framing is needed as the project is mostly scoped by the GGD Brabant-Zuidoost prior to the start of this project. The project is conducted from a top-down frame as entrepreneurs and advisors are not included in research. However, entrepreneurs play an important role and regard tense relationships with other stakeholders in the system (Raad voor de leefomgeving en infrastructuur, 2021).

Stage 2: Listening

2.1 Contextual interviews
2.2 Thematic analysis
2.3 Synthesizing
2.4 Permitting journey
2.5 Conclusion & reflection Stage 2

This stage focuses on human-centred research of stakeholder needs, pains and perspectives within the permitting process. Within systemic design contextual interviews provide a means for human-centred understanding. Through thematic analysis themes and general insights are mapped within models to uncover deeper insights in the system and process (Braun & Clarke, 2012). The stages conclude with a reflection on the validity of research and stakeholder involvement.

2.1 Contextual interviews

The goal of the interviews is to gather relevant knowledge about perspectives in the systemic context. Interviews aim to provide empathy and understanding of actors involved on a human-centred level. Contextual interviews highlight the process and stakeholders involved. (Blomkamp, 2021; Jones & Van Ael, 2022).

Research plan

The research aims to answer what the needs, pain points and challenges are within the permitting process. Multiple perspectives need to be accounted for. The outcome of the research question is unknown. As a result, qualitative contextual interviews are conducted both physically and digitally (Microsoft Teams) (Jones & Van Ael, 2022). The steps for gathering, documenting and storing the data are shown in Figure 20 .

Audio recordings

Participants provide consent through a consent form provided by the TU/e and edited for this research. An audio recording is made on the interviewers' phone (physical interview) or via a MS Teams recording (digital interview). The recording is converted to an audio recording after the interview.

Transcripts

Interview transcriptions are automatically generated using the Transcription function in Microsoft Word. Transcriptions are then manually edited to remove mistakes and improve comprehensiveness.

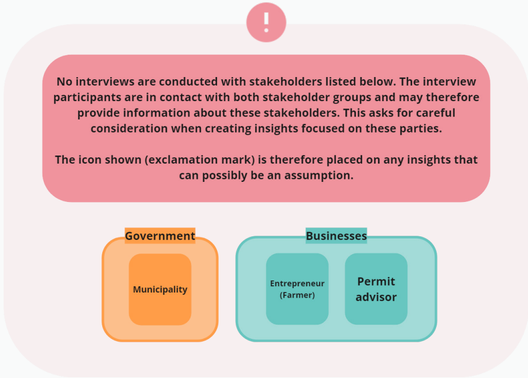
Secured storage

The interviews are stored on device and in the cloud using the protected TU/e OneDrive. All recordings are removed after the project finishes.

Figure 20 - Steps in processing Contextual Interviews

Participants

A total of 11 interviewees participate in the interviews. Figure X shows an overview of the participants. The stakeholders taking part include GGD GMV (2), GGD IZB (4), RIVM (1), Omgevingdiensten (3), Province of Brabant (1). No interviews are conducted with municipalities due to capacity problems, shifts in responsibilities and absence of the responsible. Nine municipalities in the region are contacted. (Appendix C). The consent form for recordings is found in Appendix F.



Participant number	Stakeholder	Position	Part of permitting	Knowledge Boer & Verstand
1	GGD GMV	Advisor environment & health	Part of permitting process	Knows Boer & Verstand
2	GGD IZB (Hart voor Brabant)	Doctor society & health	Part of permitting process	Knows Boer & Verstand
3	GGD GMV	Advisor environment & health	Part of permitting process	Knows Boer & Verstand
4	RIVM	Researcher, veterinarian	Part of permitting process	Does not know Boer & Verstand
5	GGD IZB (Hart voor Brabant)	Doctor infectious disease control	Part of permitting process	Knows Boer & Verstand
6	GGD IZB (West-Brabant)	Policy advisor	Not part of permitting process	Does not know Boer & Verstand
7	GGD IZB (Brabant-Zuidoost)	Nurse society & health, infectious disease control	Not part of permitting process	Does not know Boer & Verstand
8	Omgevingsdienst (ODZOB)	Coordinator permitting	Part of permitting process	Does not know Boer & Verstand
9	Omgevingsdienst (ODBN)	Coordinator permitting	Part of permitting process	Does not know Boer & Verstand
10	Province of Brabant	Stategist agriculture, health & environment	Not part of permitting process	Does not know Boer & Verstand
11	Omgevingsdienst (ODBN)	Advisor innovation & development	Not part of permitting process	Does not know Boer & Verstand

Figure 21 - Participant overview contextual interviews

Interview opzet – Boer & Verstand vervolgproject

GGD (Experts):

Introductie:

Ooit advies gedaan, Nog nooit advies gedaan

- Kun je je rol en verantwoordelijkheden binnen … omschrijven?
  - Hoe lang doe je dit werk al binnen deze functie?
- Ben je ooit onderdeel geweest van het adviseringsproces naar gemeenten over het zoönose risico binnen veehouderijen?

Proces:

Ooit advies gedaan

- Kun je me meenemen door de stappen binnen van het adviseringsproces voor aanpassingen aan en voor nieuwe veehouderijen?
  - Welke obstakels ervaar je binnen dit proces?
  - Wat gaat er goed?
  - Wat kan er beter?
- Met wie sta jij in contact binnen het adviseringsproces?
  - Van wie krijg je informatie binnen? En wat vind je hier van?
  - Wie is er verantwoordelijk voor het adviseringsproces?
- Welke middelen, kanalen of tools gebruik je momenteel om het zoönose risico in kaart te brengen? En waarom?
- Hoe beoordeel je momenteel de risico's met betrekking tot zoönose binnen aanvragen over uitbreiding van veehouderij?
- Hoe ervaar je de samenwerking tussen jouw afdeling, andere afdelingen en de gemeente?
- Waarom ben je nieuwsgierig naar het eindadvies van gemeenten naar boeren?
- Op wat voor manier zou die je die terugkoppeling willen krijgen?

Nog nooit advies gedaan

- Welke stappen zou je ondernemen als je advies zou doen over het zoönoserisico binnen veehouderijen? Heb je daar een idee over?
  - Van wie zou je informatie verwachten? En op welke manier?
  - Wie zou jij contacten binnen dit proces?
- Via welke kanalen of tools zou je het zoönose risico in kaart brengen? En waarom?

Advisering:

Ooit advies gedaan

- Hoe gaat de advisering momenteel volgens jou?
  - Wat kan er beter? En waarom?
  - Hoe kan de advisering volgens jou kwalitatief verbeterd worden?
- Hoe zorg je dat je weet wat je moet doen wanneer je een aanvraag krijgt?
- Hoeveel tijd neemt de advisering in beslag? Wat vind je hiervan?
- Wat is de frequentie van de aanvragen van aanpassingen aan of van nieuwe veehouderijen?

Figure 22 - Interview questions forGGD's

Interview questions

The interviews are semi-structured. Questions serve as a guide during interviews so they can be deviated from. Experience of participants with providing and receiving advice from GGD's within the permitting process vastly differs. As a result, knowledge of the previous Boer & Verstand project varies as well. The interview questions are therefore adjusted towards a stakeholder group (Figure 22).

The themes of each interview section are shown in Figure 23. All interview questions can be found in Appendix D.

Figure 23 - Question topics during Contextual interviews

Contextual exercise

To support interviewees with understanding the multi-stakeholder permitting process. A contextual exercise is introduced within interviews. The exercise includes a canvas with empty steps in the process and cards based on identified stakeholders (Jones & Van Ael, 2022). Participants are asked to place stakeholders on the canvas and give a description of each step (Figure 24).

The current documents of Boer & Verstand are shown to participants. In order to have participants reflect on the current documents and discuss possible improvements.

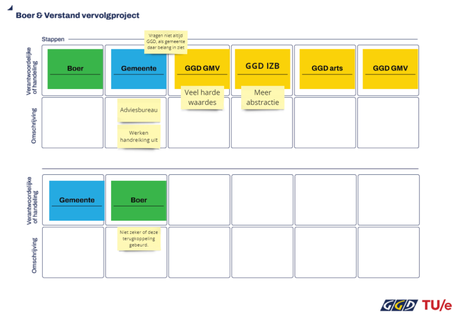


Figure 24 - Contextual exercise online and physical

2.2 Thematic analysis

In order to structurally analyse the interviews and find insights based on qualitative data, a thematic analysis (TA) is conducted (Figure X). The TA is conducted using an inductive as well as deductive approach. Meaning codes and themes are created using existing concepts as well as themes directed by content of the data (Braun & Clarke, 2012). Findings are created using a more latent way. Looking at underlying meanings in data to discover core insights of the process from different stakeholders (Braun & Clarke, 2012; Dovetail Editorial Team, 2023)

Coding

Transcriptions are first colour coded by pains, gains, needs & activities. Based on the Value Proposition Canvas to discover user needs (FDieffenbacher, 2024). These coloured codes are transferred to Miro to conduct the TA.

The RM values found within the research phase are used as deductive codes to assess findings based on the quality of RM. The values include transparency, collaboration, consistency, consensus and objectivity (see theoretical background). Inductive codes are based on overlapping answers throughout interviews. Codes are iteratively changed for better fit (Appendix E).

Figure 25 - Steps in Thematic Analysis (Braun & Clarke, 2012)

Risk management principles (Newman et al., 2020)

- Quality & consistency of process
- Transparancy & collaboration
- Objectivity within process
- Consensus of perspectives

Themes related to Boer & Verstand

- Boer & Verstand documents
- Digital information sharing
- Targeting of measures

Other themes

- Business operations
- Role of stakeholders

Figure 26 - Final themes from contextual interviews

Themes

Themes are deducted by grouping codes in a table in Miro, to keep an overview of corresponding interviewee comments (Figure 26). Themes are iterated upon several times. The RM values appear to fit multiple codes and therefore be described as themes. The RM values may therefore illustrate the quality of risk management, or lack thereof, within each stage (Newman et al., 2020). Focusing on risk management values connects findings to improving risk management in the permitting process.

Other themes focus on quality, usefulness, form and target audience of B&V as the B&V documents are currently not implemented in the permitting process. More general themes focus on the role of stakeholders and business operations.

2.3 Synthesizing

In order to transform themes into holistic insights and create clear narrative three synthesizing exercises are conducted. The exercises are used as support for system sensemaking.

1. The contextual exercise is used to place themes onto phases of the process. To understand under which phase pain points occur and needs are present (2.1 contextual exercise).

2. The stakeholder relationship matrix shows the general relationship between stakeholders in the process. The relationships are deducted from the interviews with stakeholders. Within interviews, stakeholders assumed several relationships from not stakeholders not participating in this project. Assumed relationships are marked red. Various relationships can not be derived from interviews because several stakeholders are not involved (Figure 29).

3. The Actants map maps themes and insights from multiple stakeholders to illustrate and compare the experience of multiple stakeholders (Jones & Van Ael, 2022). The Actants map compares the insights between GGD's & Omgevingsdiensten, the two main stakeholders interviewed. (Figure 28).

Figure 27 - Stakeholder relationship matrix

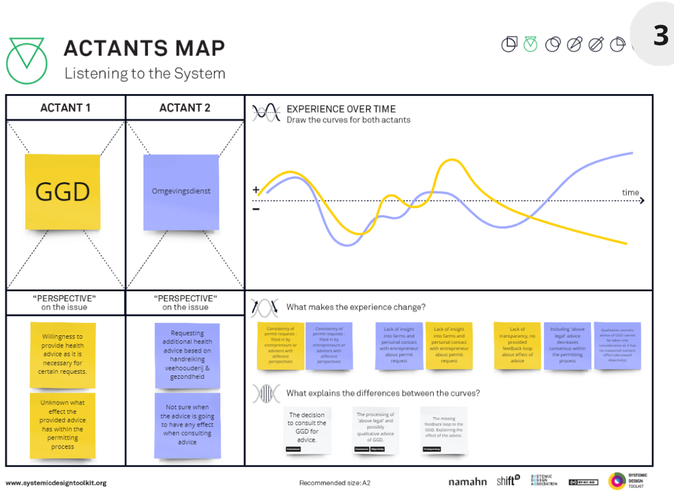
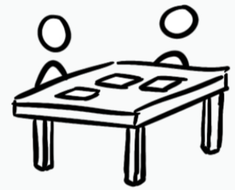


Figure 28 - Actants map (Jones & Van Ael, 2022)



2.4 Permitting journey

The journey is used to combines the interview findings and synthesizing exercises into one visualisation. It illustrates the permitting process with relevant phases, steps, actors (stakeholders), pains, gains, needs, quotes, an emotion curve and channels used. The journey map shows a detailed overview of the experience within the permitting process of both actors (Figure 29).

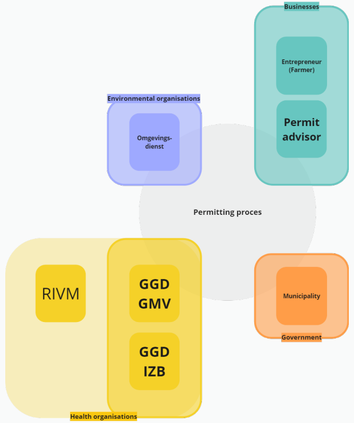
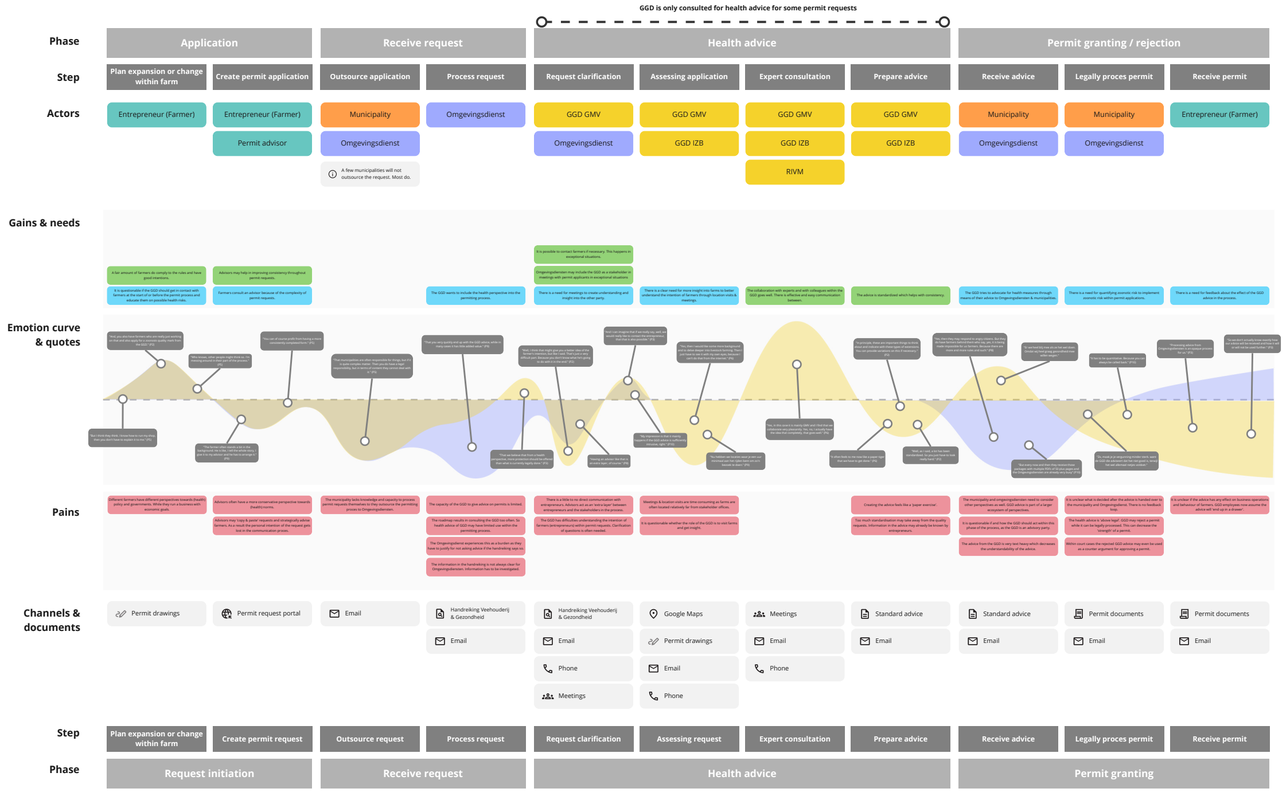


Figure 29 - Permitting journey & stakeholder overview



Permitting process explanation

1. The permitting process starts with the application by entrepreneurs and permit advisors. Entrepreneurs consult an advising company. Together they create the application which is sent to municipalities and Omgevingsdiensten.

2. Depending on the municipality, either the municipality itself or the Omgevingsdienst of the region processes the request (Omgevingsdiensten, 2024). While processing a request one of the actors decide whether additional health advice, provided by GGD's, is needed. A tool called 'Handreiking Veehouderij & Gezondheid' contains application information and a roadmap which supports municipalities & Omgevingsdiensten with this decision (Provincie Noord-Brabant et al., 2018) . As a result, GGD's provide health advice in exceptional situations. This accounts to around 4 requests per month for the entire province of Brabant, where GGD's are consulted.

3. In the case of consultation GGD GMV is the main point of contact. GGD GMV assesses applications based on environmental risks. GGD GMV consults GGD IZB for assessment on health risks. GGD employees assess applications with the use of application documents (drawings & Handreiking) and through online research (Google Maps). For complicated applications, experts at for instance the RIVM are consulted. Information is brought together and GGD GMV composes a textual advice document. GGD GMV forwards this document to the municipality and Omgevingsdienst of the region.

4. The municipality or Omgevingsdienst incorporates the advice into the permit. This is mostly done as an attachment. The Omgevingsdienst grants or rejects the permit through a legal process. Afterwards, the municipality or Omgevingsdienst forwards the permit to the entrepreneur.

2.5 Conclusion & reflection Stage 2

This stage describes the research through contextual interviews with two stakeholders in the permitting process and two additional stakeholders. The thematic analysis and mapping exercises provide support for creating in-depth insights. The mapping exercises provide a system view by comparing stakeholder experience, relationships and activities. The permitting journey illustrates detailed findings in relation to the process. However, the complexity of findings is difficult to capture within a journey model which shows separate needs, perspectives and pains.

Various findings within the thematic analysis and mapping exercises mention municipalities and entrepreneurs. As a result, findings include assumptions from interview participants about stakeholders not included in the research. Future findings therefore indicate possible assumptions within to retain research validity and show need for additional research in future projects.

Stage 3: Understanding

3.1 Permitting narrative (insights)
3.2 Revised project goal
3.3 Expanded system view
3.4 Conclusion & reflection Stage 3

This stage represents a narrative of various stakeholders in the permitting process and possible implementation of Boer & Verstand. The insights describe complex dynamics and effects in system. From the narrative a visualisation shows a coherent summary capturing the essence of the challenge (Jones & Van Ael, 2022). The challenge shows the need for an expanded system view and revised project goal as a result. The Stage describes the expanded view similarly to the framing stage to support continuity. The conclusion reflects on the implications of the revised goal and expanded scope.

3.1 Permitting narrative

The mapping exercises and journey map illustrate several insights separately across multiple visualisations. The findings drawn from these tools and activities appear to be too detailed. Insights are both relate to the permitting process and broader system. As mentioned by Waltner-Toews (2017), complexity and wicked problems are best understood using (contending) narratives. Narratives provide a way to explain issues from an observer dependant view. Enabling to shift between contexts and show actor relationships (Zellmer et al., 2006; Waltner-Toews., 2017)

As a result, insights are placed into the permitting journey and written out as a narrative. Each insight (part of the narrative) connects back to an interview theme (RM value) (Boholm, 2019; Newman et al., 2020). Important stakeholders' needs are listed below each narrative part. B&V insights are described with a separate narrative as insights are separate from the process (Figure 30).

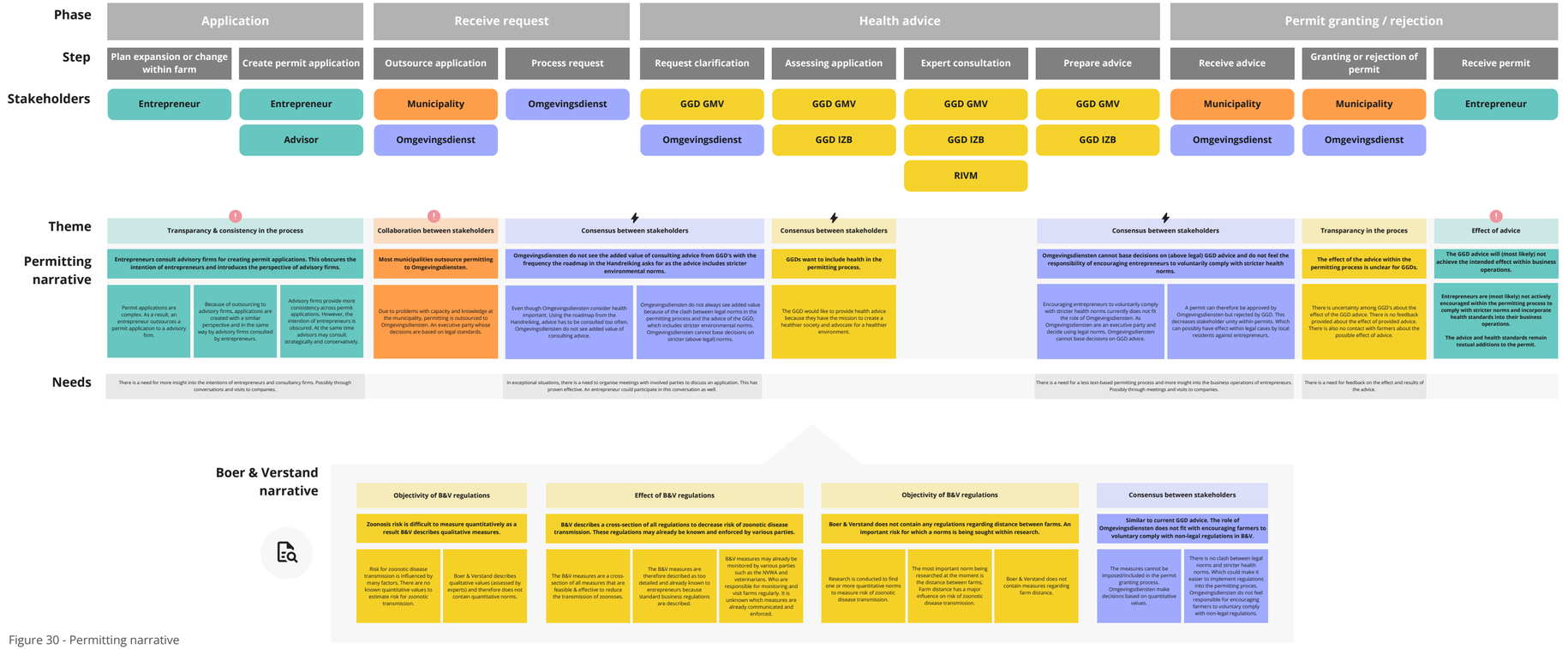


Figure 30 - Permitting narrative

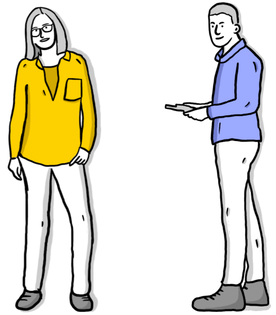
Current process insights

The goal of the GGD within the current permitting process is to advocate for health, so entrepreneurs pursue stricter health norms within business operations. The core problem for reaching this goal lies with contending interests and roles of stakeholders and norms used within the permitting process.

- GGD's advocate for and have expertise in public health. They act within an advisory role in the permitting process.
- Omgevingsdiensten have expertise in environment. They act within an executive role for municipalities. They process information through a legal process (quantitatively): "It has to be legally correct, otherwise we can't do anything with it." (P8)
- Municipalities consider multiple system perspectives (e.g. economy, sustainability, animal welfare) and therefore consider multiple stakeholders in society (e.g. civilians, companies, institutions, national government) within decision and policy making. Municipalities therefore have an administrative role.

GGD's advice through stricter health norms. Omgevingsdiensten grant or reject permits based on less strict legal norms. Only if municipalities impose stricter health norms within policy, Omgevingsdiensten can base decisions on stricter norms than legally indicated. However, participants mention municipalities lack knowledge and therefore struggle with creating policy that advocates for stricter health norms: "But that also means that the municipalities need knowledge, and it is not always the case that municipalities have that knowledge." (P10).

Because of contending interests and norms used by stakeholders' entrepreneurs are (likely) not actively encouraged to comply with stricter health norms. The GGD advice therefore (likely) does not achieve its intended goal within business operations of entrepreneurs. Management of Omgevingsdiensten and GGD's are currently in discussion to include health norms in permitting.

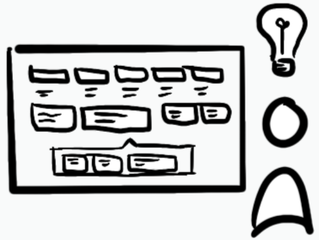


It is important to mention 'likely' as entrepreneurs and municipalities are not included in this research which can indicate a possible assumption. The actual reason for the permitting insight cannot be confirmed. The actual effect of B&V is not measurable within this research.

Boer & Verstand insights

Boer & Verstand is not used by stakeholders in the permitting process: "It is questionable what we can do with these documents" (P9). Omgevingsdiensten need quantitative norms for legal decisions. B&V currently describes a cross section of qualitative regulations focused on business operations of entrepreneurs "These regulations are quite specific and maybe do not belong within permitting" (P1). Research aims to look for quantitative norms to estimate risk of zoonotic transmission. An important norm being sought after is distance between farms "We need a norm for distance between farms" (P10) (Hagenaars et al., 2023). B&V currently does not contain information about distance between farms.

As a result, similar to the challenge imposed within the current permitting process. The role of Omgevingsdiensten does not fit with encouraging farmers to voluntary comply with non-legal (qualitative) regulations described in B&V.



Conclusion

The main challenge within the context of permitting focuses aligning the perspectives and roles of GGD's and Omgevingsdiensten. So Omgevingsdiensten will take an active role in encouraging entrepreneurs to comply with stricter environmental norms and health regulations (Figure 31). GGD's and Omgevingsdiensten are in discussion to include such regulations. The challenge of aligning stakeholder relationships with focus on environmental norms lies outside the scope of this project. Such project requires a different design approach and intervention.

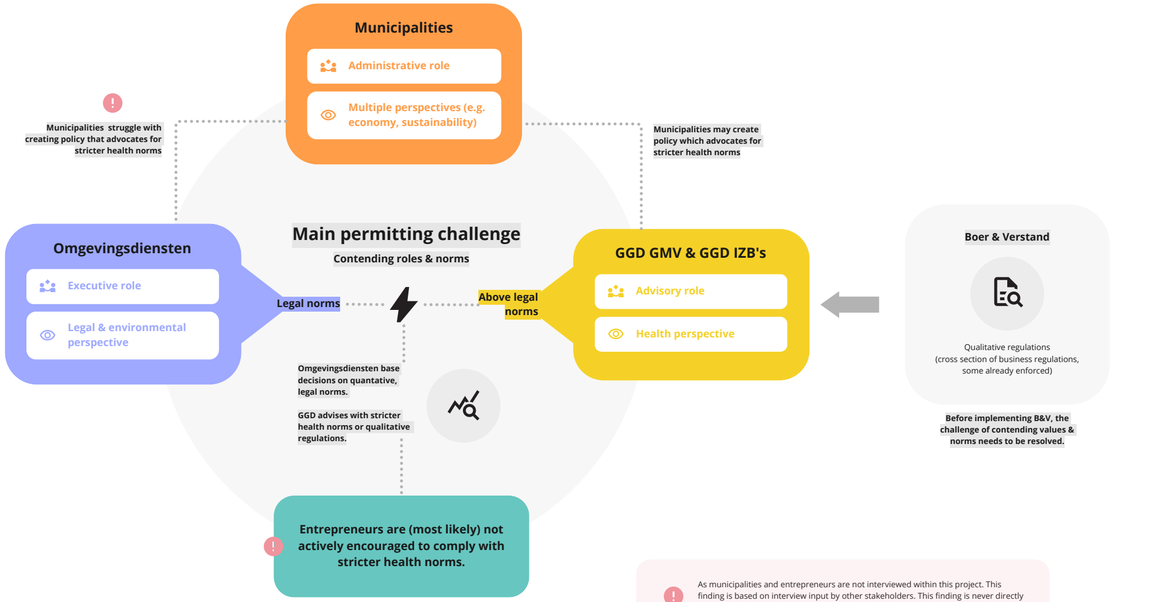


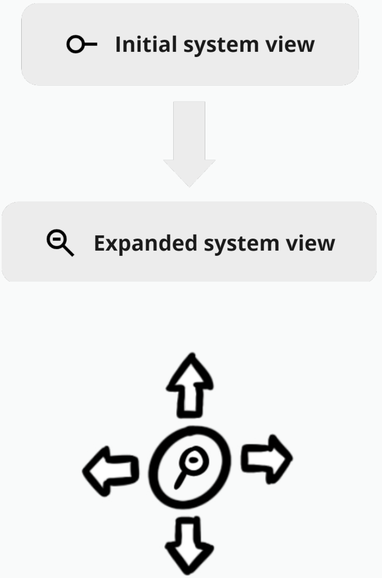
Figure 31 - Summary visualisation permitting narrative

3.2 Revised project goal

The essence of the permitting challenge lies with contending roles of stakeholders about environmental norms (outside the project scope). Transforming B&V does not directly affect stakeholder alignment about environmental norms in the permitting process. The permitting challenge is like a barrier that first needs to be overcome before B&V can make impact within permitting.

It is decided to maintain the original goal of the project; transforming B&V to make impact within zoonotic disease RM. Through extensive consideration and discussion it is decided to expand the system view of the project and revise the project goal (Figure 32).

The project therefore includes additional contexts and stakeholders (derived from interviews). An expanded view enables stakeholders to assess B&V from a systemic view and therefore gather additional insight (Jones & Van Ael, 2022) (Figure 33). The project therefore takes a step back and focuses on strategy. Reassessing the 'why' and 'how' of B&V First must be discovered how and in what context(s) GGD's can effectively improve RM of zoonotic diseases through means of B&V. A following strategy then provides understanding on how B&V can be transformed into effective intervention(s) (Jones & Van Ael, 2022).



Golden circle questions	Why? The goal	How? The process	What? The result
Original project Boer & Verstand (2022) directed by Paulien Tolsma	No legal frameworks exist for zoonoses. The goal is to create a framework and have GGD's advice more consistently within the permitting process.	Bringing together feasible & relevant measures based on expert opinions using the Delphi method.	Boer & Verstand. Lists of measures to reduce the introduction, spread and emission of zoonoses.
Project brief (2023) FMP proposal	Boer & Verstand documents are not used within the permitting process. Impact of documents is unclear.	Transform and implement identified regulations into permitting for improved risk management of zoonoses. By researching needs and pain points of stakeholders.	Original plan for next step Creating a risk management tool based on insights about Boer & Verstand within the permitting process.
Revised project goal (2024) FMP project	No legal frameworks exist for zoonoses. The context in which Boer & Verstand can make an impact needs to be reframed.	Understanding the advantages & disadvantages of and relationship between different contexts through means of a co-creation session.	A strategy for transforming Boer & Verstand into effective interventions for risk managment of zoonoses. Delivering a roadmap and scenarios.

Figure 32 - Revised project goal in relation to original project and project proposal

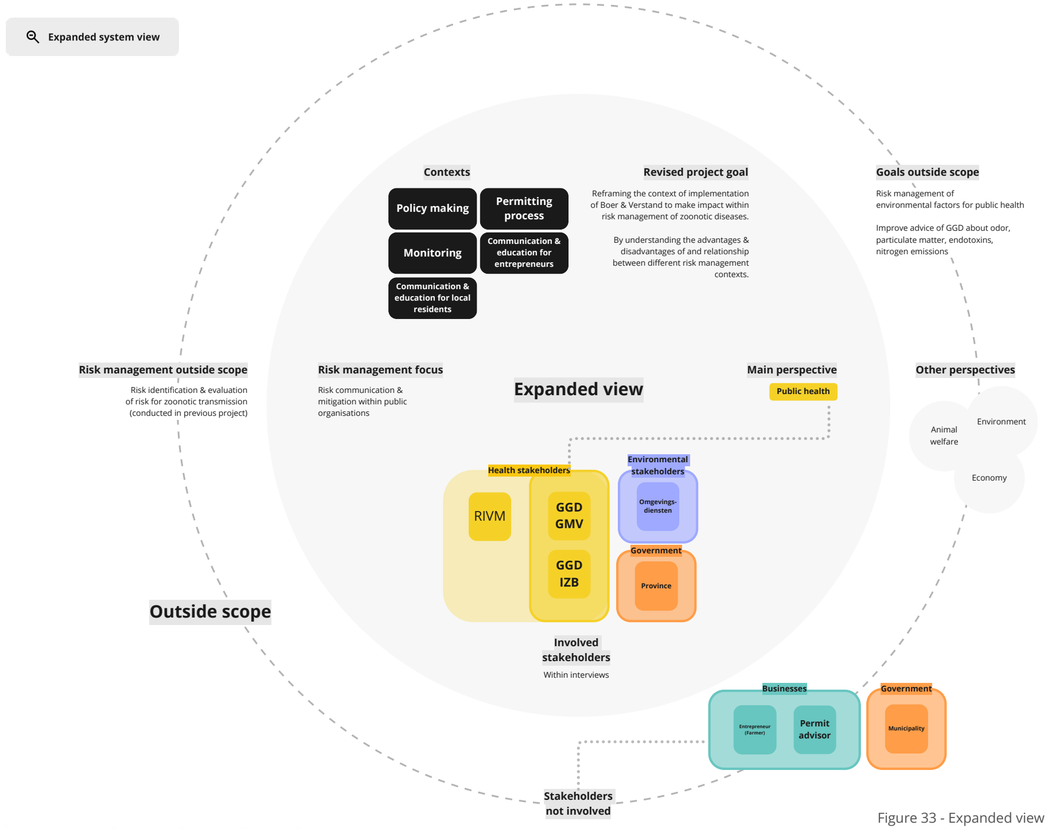


Figure 33 - Expanded view in scoping canvas.

3.3 Expanded system view

Expanded stakeholder ecosystem

Broadening the scope of the project results in an expanded stakeholder ecosystem. The process includes stakeholders in the new ecosystem based on insights from earlier interviews. The expanded ecosystem includes stakeholders not part of the permitting process (Figure 34 & 35). The stakeholders are shown similarly to the earlier framing to maintain continuity.

The stakeholders are grouped based on level of social system and perspective (Jones & Van Ael, 2022). To illustrate perspectives of stakeholders and understand relationships within the OneHealth framework. Stakeholder groups are named after OneHealth (Stärk & Morgan, 2015).

Expanded contextual view

The expanded contextual view is derived from interview insights focused on contexts other than permitting. The view includes four additional contexts where GGD's could possibly advocate for health and communicate B&V regulations. Contexts include processes and stakeholders' networks. The stakeholder ecosystem places contexts based on stakeholder practices and responsibilities within contexts. (Figure 35). Processes within contexts, however, are not exclusive to the ecosystem level.

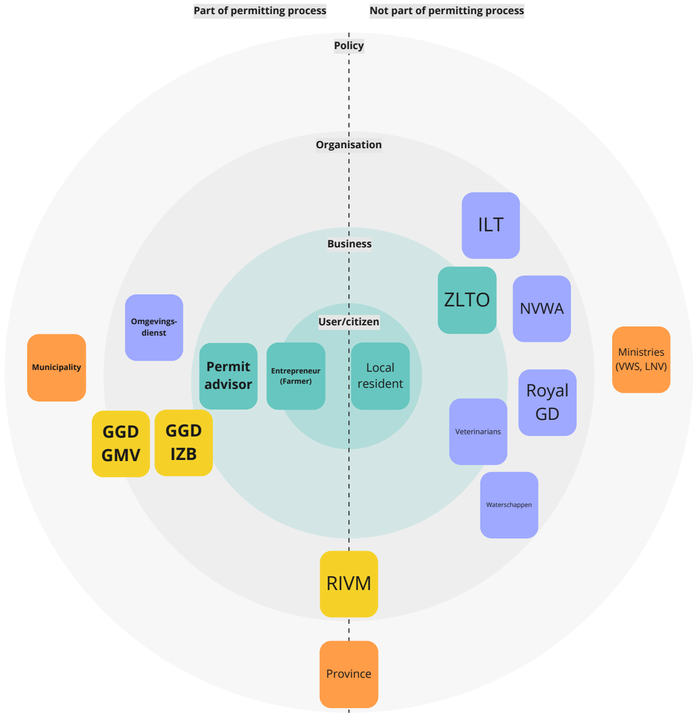


Figure 34 - Expanded stakeholder ecosystem (based on interviews)

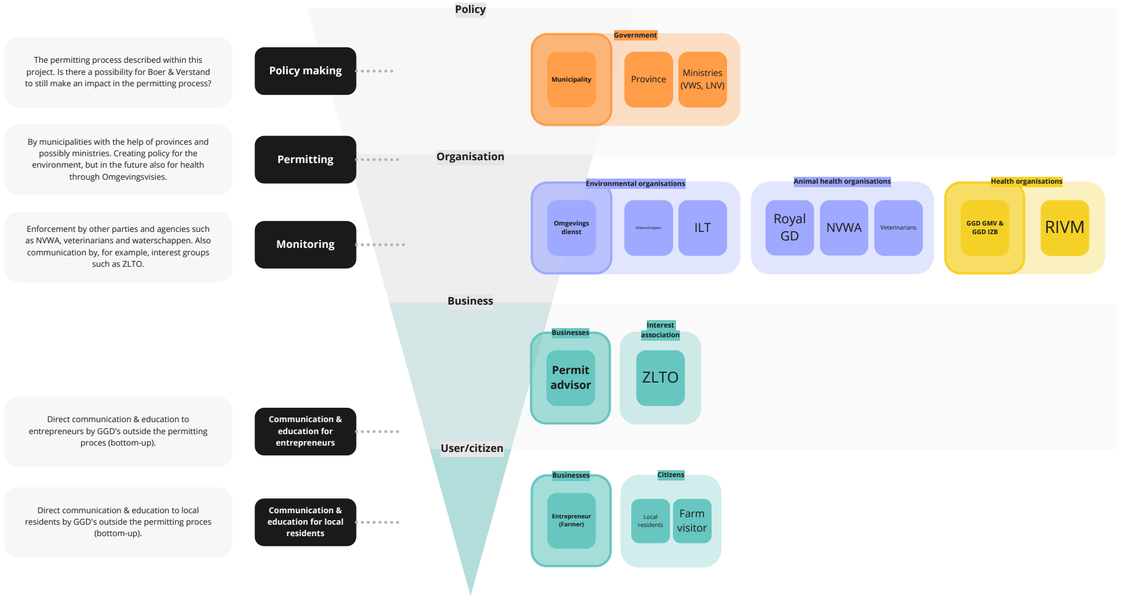


Figure 35 - Expanded stakeholder groups with contexts mapped

Expanded stakeholder ecosystem

Within interviews two important insights are found based on contexts outside of permitting and used to describe the contexts in future design activities. However, the insights include stakeholders not included in the research, are not validated and are therefore assumptions. The two insights are visualised within the broadened stakeholder ecosystem (Figure 36 & 37).

1. Policy making: The newly introduced Omgevingswet (Environment law) makes municipalities responsible for creating policy around environment & health. The deadline for delivering Omgevingsvisies (Environment visions) is 2027 (Informatiepunt Leefomgeving, n.d.). Municipalities struggle to create policy focused on health as they need to consider many stakeholder perspectives and (most likely) have little capacity. In addition, the introduction of the Omgevingswet shifts the organisational structure of municipalities. Responsibilities of civil servants may therefore be unknown at the time of this project.

2. Monitoring: Other institutions and organisations such as the NVWA or veterinarians may already communicate and enforce regulations described within B&V (NVWA, 2023). These institutions regularly visit farms. Omgevingsdiensten enforce environmental regulations. It is unknown which regulations stakeholders currently communicate and enforce. It is unknown how entrepreneurs experience this communication.

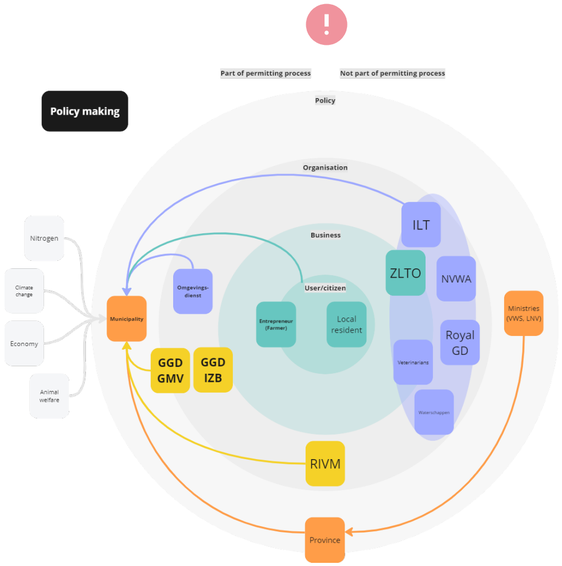


Figure 36 - Policy making insight (Expanded stakeholder ecosystem)

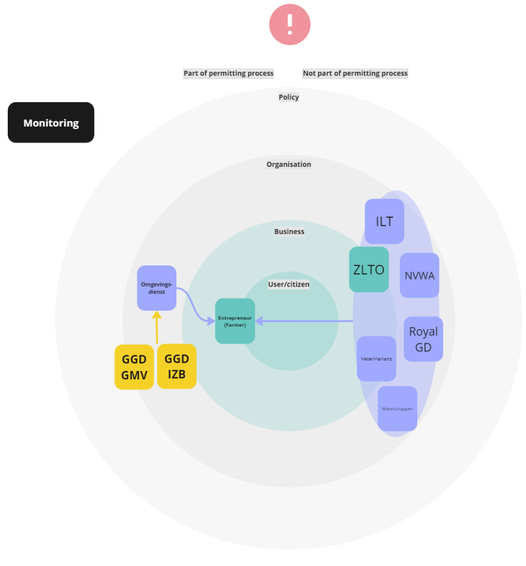


Figure 37 - Monitoring insight (Expanded stakeholder ecosystem)

3.4 Conclusion & reflection Stage 3

This stage uses a permitting narrative for sensemaking of the complex challenge within the multi-stakeholder system. It describes focused insights about the current process and implementation of Boer & Verstand. The summary encapsulates stakeholders do not use Boer & Verstand within permitting because of contending interests (executive and advisory) and norms (legal and above legal) used for decision making of Omgevingsdiensten and within health advice of GGD's (RQ 1&2). To solve the challenge within permitting, stakeholder perspectives related to environmental norms need to be aligned. A challenge outside of the project scope. Resulting in a revised project goal with an expanded stakeholder and contextual view.

The revision of the project goal shows the project is initially not well systemically framed (see methodological discussion). This results in various permitting insights becoming irrelevant to this project which focuses on implementation of B&V. GGD's may use these insights to improve stakeholder experience within permitting. The number of relevant insights within the revised goal, however, is decreased. Again, addressing the need for possible later validation with relevant stakeholders. Various insights are already known by GGD's. Yet, mapping and visualisation improves sensemaking for stakeholders.

Research questions 1 & 2

1. How do the identified regulations help the stakeholders in the advisory process now?
2. What are needs of stakeholders and opportunities within the permitting process to possibly implement B&V regulations?

Stage 4: Envisioning

4.1 Co-creation session
4.2 Reframing exercise
4.3 Horizon map
4.4. Conclusion & reflection stage 4

This stage describes the results of a co-creation session with employees from different GGD's. The session reframes the context of implementation for Boer & Verstand by collaboratively assessing contexts within a system view. Resulting from the session the horizons map envisions futures and a strategy for transition. Which aims for effective transformation of Boer & Verstand.

4.1 Co-creation session

A co-creation session is organised with employees of GGD's in North-Brabant. A co-creation session provides a highly collaborative environment and provides opportunity for discussion, sensemaking and creative ways of working (Van Woezik et al., 2016).

The session only includes participants of GGD's as the revised goal of the project focuses on implementing and transforming Boer & Verstand, a product from GGD's in North-Brabant (Tolsma et al., 2022b). A transdisciplinary perspective becomes relevant once GGD's have reframed the context of B&V and envisioned a strategy for impact within various contexts (Jones & Van Ael, 2022; Van Arkel et al., 2023).

Audio recordings

Participants provide consent through a consent form provided by the TU/e and edited for this research. An audio recording is made on the interviewers' phone (physical interview) or via a MS Teams recording (digital interview). The recording is converted to an audio recording after the interview.

Transcripts

The co-creation session transcription is automatically generated using the Transcription function in Microsoft Word. Transcription is then manually edited to remove mistakes and improve comprehensiveness.

Secured storage

The transcription is then stored on device and in the cloud using the protected TU/e OneDrive. All recordings are removed after the project finishes.

Figure 38 - Steps in processing Co-creation session

Participant number does not correspond to the interviews

Participant number	Stakeholder	Position	Participation in interviews	Knowledge Boer & Verstand	Offline/online	At evaluation
1	GGD GMV	Advisor environment & health	Yes	Knows Boer & Verstand	Offline	Yes
2	GGD IZB (Brabant-Zuidoost)	Doctor society & health	No	Knows Boer & Verstand	Offline	Yes
3	GGD IZB (Brabant-Zuidoost)	Nurse society & health, infectious disease control	Yes	Knows Boer & Verstand	Offline	No
4	GGD IZB (Brabant-Zuidoost)	Infectious disease epidemiologist & researcher	No	Knows Boer & Verstand	Online	No
5	GGD IZB (Brabant-Zuidoost)	Infectious disease control & researcher	No	Knows Boer & Verstand	Offline	Yes
6	GGD IZB (Hart voor Brabant)	Doctor society & health	Yes	Knows Boer & Verstand	Offline	No
7	GGD IZB (West-Brabant)	Doctor infectious disease control	No	Does not know Boer & Verstand	Online	No
8	Researcher	/	/	/	Offline	/
			Only at evaluation			
9	GGD IZB (Limburg-Noord)	Doctor society & health	No	Knows Boer & Verstand	/	Yes
10	GGD IZB (West-Brabant)	Policy advisor	Yes	Knows Boer & Verstand	/	Yes

Figure 39 - Participant overview co-creation session & evaluation

Participants

A total of seven participants participate in the session. Of which three participated in the contextual interviews. Figure 39 shows an overview of participants. As the session is set-up as a co-creation session the researcher participates within exercises as well.

Session setup

The session is set up both physically at the GGD Brabant-Zuidoost and online via Microsoft Teams. The session lasts 1,5 hour and includes a presentation about the project and relevant insights found so far (30 min), a reframing exercise (30 min) and a discussion about the reframing exercise (30 min).

The session is recorded. Several pictures are taken under consent of all participants (Appendix F).

Evaluation

Following the co-creation session an evaluation is conducted with three participants of the session and 2 additional participants from different GGD's previously invited but unable to attend (Figure 39).

The evaluation is set up digitally via Microsoft Teams and lasts 1,5 hours. The evaluation includes a presentation about the project results so far, an evaluation of the Horizon map, and discussion on the hypothetical intervention created in 'Stage 5: exploration'. The session is recorded under consent of all participants (Appendix F).

Expanded system view

4.2 Reframing exercise

The reframing exercise explores alternative interpretations of the design challenge, expands the boundaries of the system designed for and get an overview of solution directions (Van Arkel et al., 2023). The contextual view is discussed with session participants. Possible changes are processed within results.

Within the reframing exercise session participants assess contexts by brainstorming about possible influence of GGD's. Influence may be exerted through Boer & Verstand, (new) stakeholder networks or other activities. An open view is essential to create a strategy with focus on possible future interventions (Jones & Van Ael, 2022).

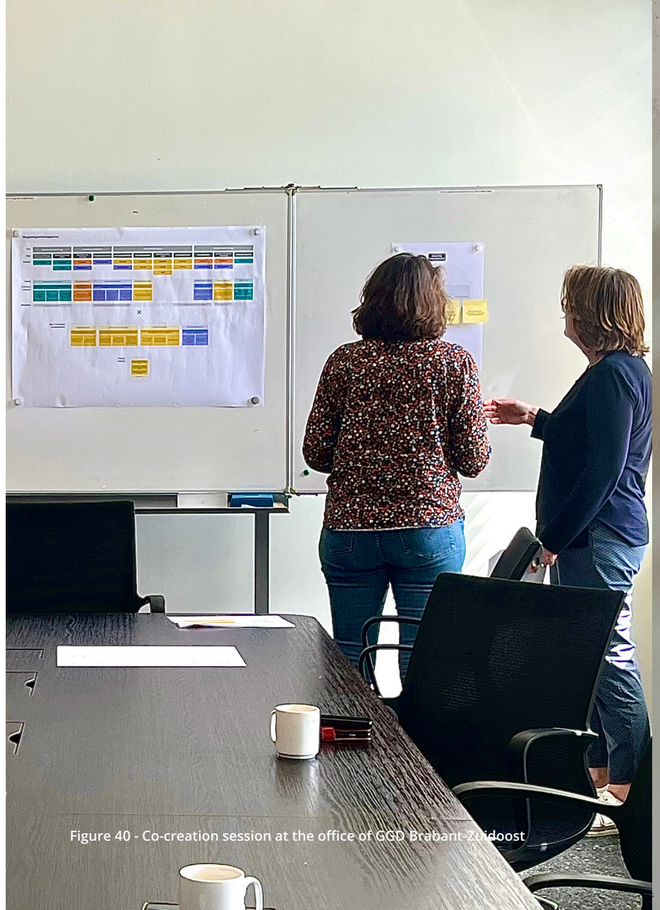
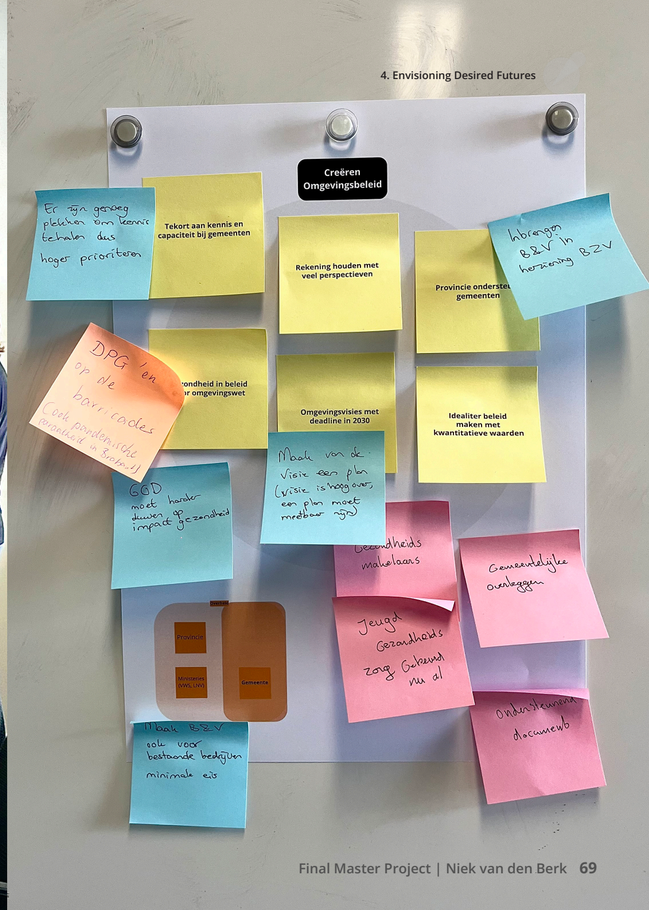


Figure 40 - Co-creation session at the office of GGD Brabant-Zuidoost



Expanded system view

Reframing exercise results

According to participants the expanded contextual view corresponds with the systemic view and possible influence of GGD's. The exercise provides additional insights for each context (Figure 41) (Appendix G). Participants are able to deduct relevant findings for future steps (see Horizon map).

During the discussion participants most notably mention contexts strongly influence each other. There is consensus amongst participants that various interventions within various contexts should be researched, created, and tested within GGD's to make impact on risk management of zoonotic diseases.

This shows the need for an overarching strategy which explains how change within current practices (contexts) can enable transition towards preferred future outcomes (Jones & Van Ael, 2022; Van Arkel et al., 2023).

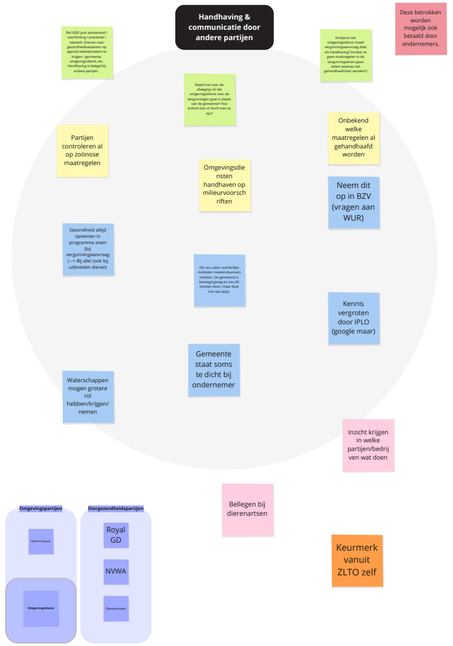


Figure 41 - Digitized results reframing exercise co-creation session

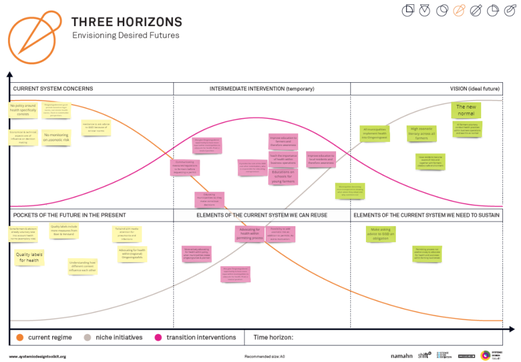


Figure 42 - Insights from co-creation session mapped onto the three horizon map

4.3 Horizon map

In Systemic design the Horizon map is a core methodology to define a vision for change planning. It includes three overlapping time horizons. Within the Envisioning stage the horizon map is used for defining value and possible future interventions for change (Jones & Van Ael, 2022).

The insights from the reframing exercise and following discussion are mapped onto the horizons (Figure 42) (Appendix F). Consequently, of the reframing exercise, insights are clearly related to contexts. To illustrate contextual relationships and improve sensemaking, contexts are mapped onto levels of the social system (see stakeholder map) (Figure X). The corresponding social level is decided based on possible stakeholder influence of GGD's within each context.

Horizon map results

The horizons describe a strategy for transitioning towards effective risk management of zoonotic diseases through interventions created from Boer & Verstand (Figure 43). En explanation of each horizon is placed in the figure.

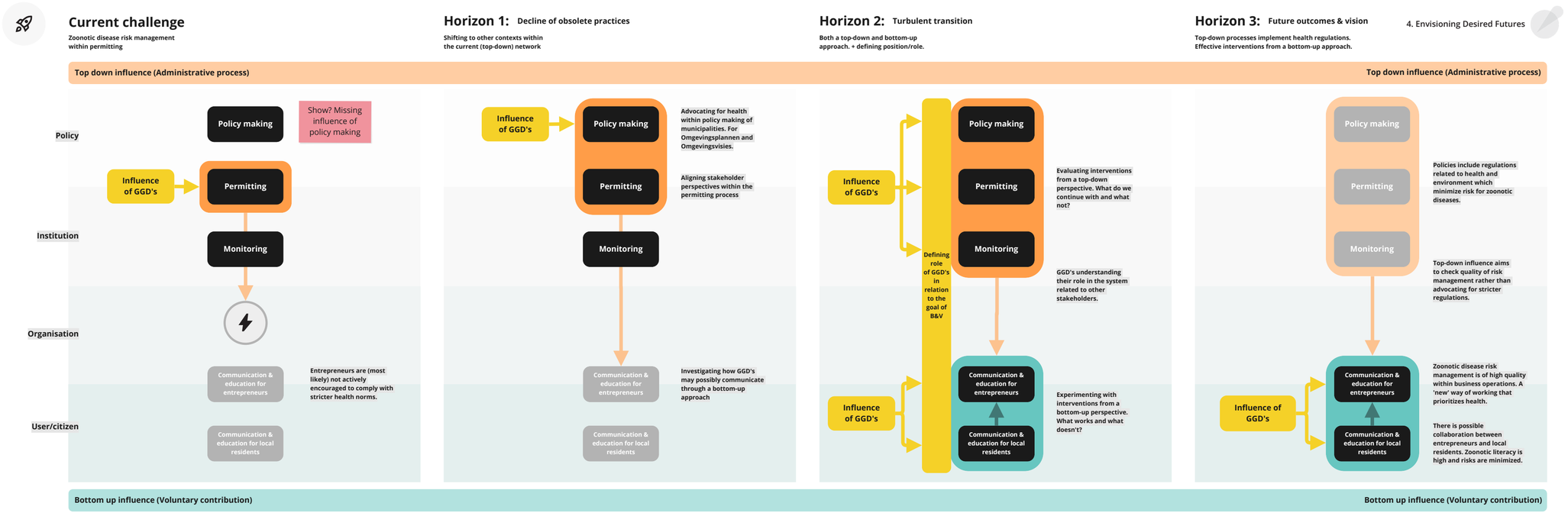


Figure 43 - Adapted Horizon map for this project

Conclusion Horizon map

The main trend represented in the Horizon map is the transition of risk management of GGD's from entirely top-down towards increasingly bottom-up. Top-down risk management processes involve governments and organisations providing information to the end user. If not included in policy, permitting and monitoring, this may result in passive ways of communication with limited effect (Fekete, 2012) (3.1 Permitting narrative). It is essential to not silo risk communication within legal departments (Newman et al., 2020).

The strategy envisions bottom-up risk management of zoonoses by GGD's. Where entrepreneurs voluntarily comply with stricter health norms. Bottom-up risk management includes principles found in community-based approaches for prevention and surveillance (Edwards, 2009; Hassan et al., 2023). However, transitioning to this future outcome (vision) requires GGD's to define their role in the system related to practices of other stakeholders (see expanded contextual view). Like the challenge in permitting, other stakeholders in the system communicate to entrepreneurs. The transition therefore requires investigation of collaborations and relationships with stakeholders as well (Figure 44).

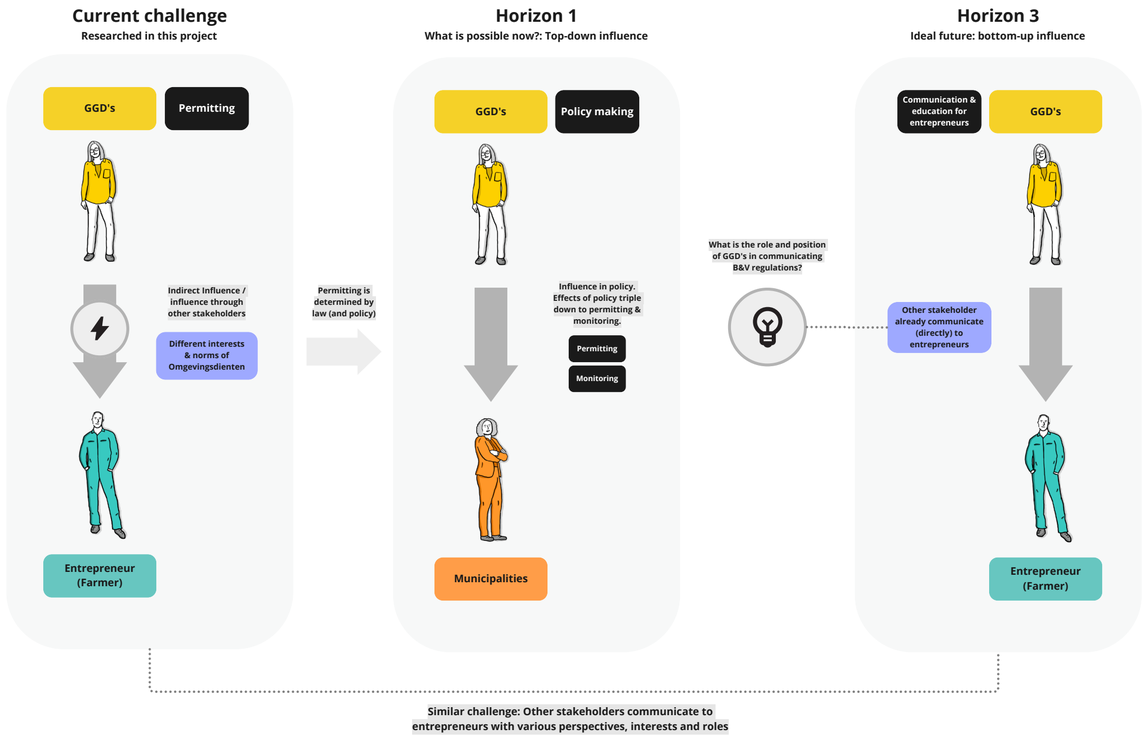


Figure 44 - Summary Horizon map insights

4.4 Conclusion & reflection Stage 4

This stage describes how the co-creation session provides consensus between participants and insight into the interconnectedness of contexts. The resulting horizon map describes how practices of GGD's may shift from current top-down influence towards an ideal bottom-up scenario where entrepreneurs voluntarily comply with health regulations of GGD's (Horizon 3). The transition towards a bottom-up influence requires GGD's to define their role and position in the system regarding communication of regulations in B&V. Like the current challenge in permitting, various stakeholders communicate to entrepreneurs directly with different interests and perspectives (RQ 3 & 4).

The horizon map is evaluated effectively with GGD's. However, co-creating the horizons within an additional session would have implemented a clearer goal and nuance from the start. As a result, validity of the horizon map would have been improved. It is essential to address the purpose of the horizon map as a guideline for change including possible futures. Instead of a roadmap with goals. The desired path towards the future outcome is difficult to imagine, as the effect of interventions can not be fully predicted (Van Arkel et al., 2023).

Research questions 3 & 4

3. How can the context of B&V be reframed to create a strategy for implementation?
4. How to transition towards effective zoonotic disease risk management within GGD's through implementation of information presented in B&V?

Stage 5: Exploring

5.1 Hypothetical intervention
5.2 Conclusion & reflection Stage 5

This stage focuses on exploring the possibility space within the context of policy making in Horizon 1. It includes a hypothetical intervention created from desk research and experience in research project. This stage illustrates how a hypothetical intervention provides inspiration for GGD's. As the stage is initiated at the end of the project, the stage describes and reflects on potential future systemic design activities. Focused on scenarios and problem sets (Jones & Van Ael, 2022).

Expanded system view

5.1 Hypothetical intervention

The possibility space is explored by creating a hypothetical intervention for Horizon 1. This horizon describes ‘policy making’ as a context for impact of Boer & Verstand. Within the co-creation session and evaluation session, participants addressed the need for showing a concept which can make impact within current practices. According to participants such concept could inspire future projects within all 3 horizons, ground the work conducted in the project and illustrate the power of design methodology (Figure 45).

The context of policy making includes different processes and stakeholders. The project did not focus on this context. The intervention is therefore not supported by research or insights. Instead, the intervention is created through desk research (Theoretical background), experience within M1.2 research project and discussion within the evaluation (4.2 Evaluation results).

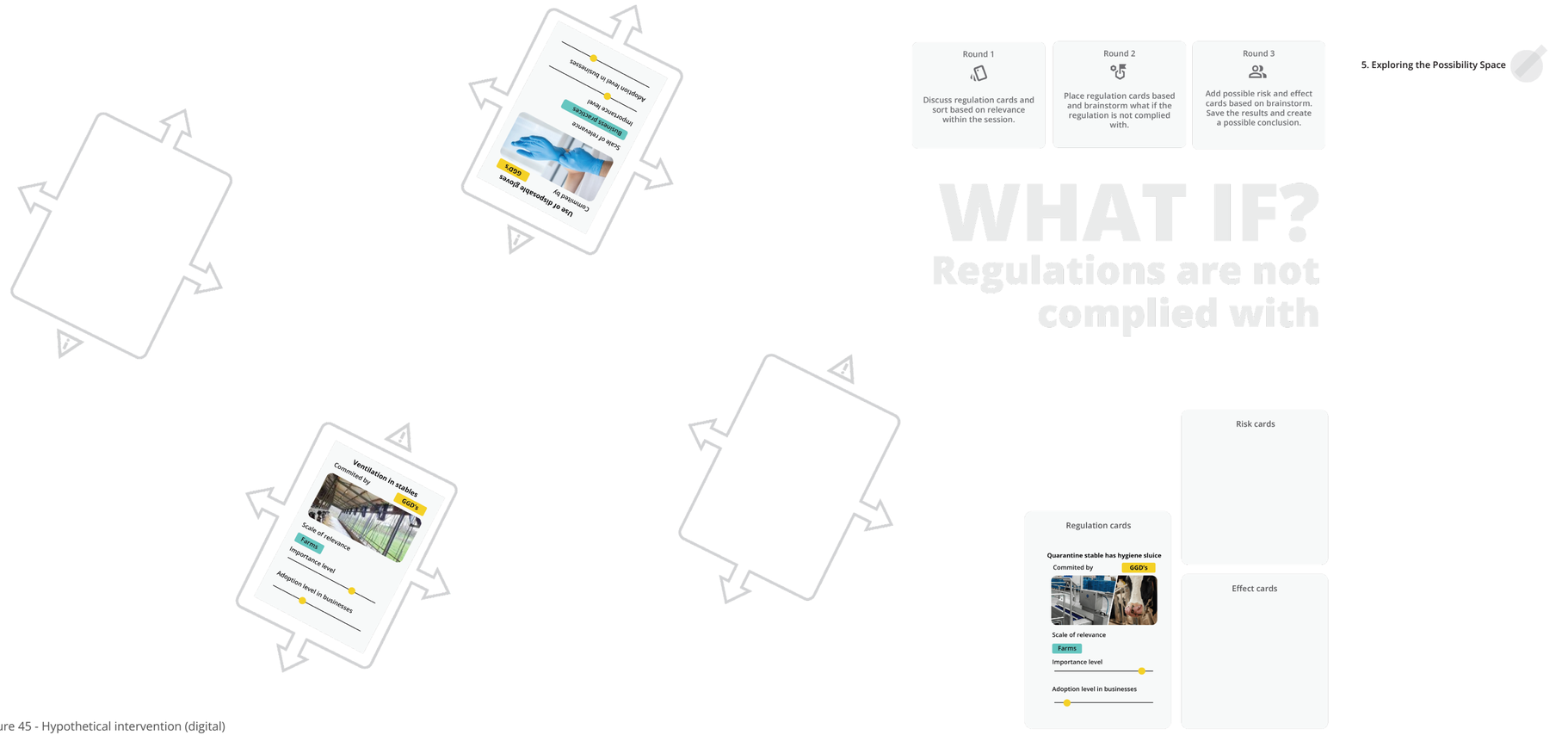


Figure 45 - Hypothetical intervention (digital)

Expanded system view

Results Hypothetical intervention

Through the evaluation session the intervention was iterated on to focus less on OneHealth perspectives. According to participants regulations should not be sorted and again assessed on feasibility. GGD's mention B&V incorporates a OneHealth as it is created with consensus of various stakeholders with different OH perspective.

The iterated hypothetical intervention is a serious game for policy making. A serious game is used to increase stakeholder knowledge and discuss strategy (Jones & Van Ael, 2022; 8D Games, 2023). The intervention transforms Boer & Verstand regulations into cards with additional information and metrics. The game serves as a discussion tool within multi-stakeholder meetings to discuss risks and effects when regulations are not complied with. The intervention may highlight which regulations are important for specific surroundings of the municipality when creating Omgevingsplannen (Informatiepunt Leefomgeving, n.d.) (4.3 Horizon map). The tool aims to address the importance of integrating regulations into policy.

OneHealth perspective

Based on relevance and feasibility of regulations. Within the evaluation session participant X addressed Boer & Verstand should be communicated as a product created collaboratively with consensus of various stakeholders and therefore with a OneHealth focus (Tolsma et al., 2022b).

Incorporating OneHealth requires cooperation and collaboration of all stakeholders in the system. Disagreements within multi-stakeholder meetings with municipalities and stakeholders may still arise (Maddock, 2019). Municipalities and provinces should therefore support an environment where stakeholders can share knowledge, engage in a system view, and speak the same language through sensemaking. Interventions of GGD's should embrace the complexity of creating OneHealth policy and support a pragmatic view of the OneHealth framework (Van den Berk, 2022).

For example, as illustrated by participant 11 in the interviews. Boer & Verstand includes regulations about sufficient natural ventilation in stables. Which is beneficial for animal and human (employee) health. However, Omgevingsdiensten take up regulations requiring air washers. These investments clean air and decrease environmental emissions. Air washers need closed environments to work and thus do not improve human or animal health.

Figure 46 - Hypothetical intervention (physical)

5.2 Conclusion & reflection Stage 5

This stage describes the hypothetical intervention created for Horizon 1 within the current top-down network of GGD's through policy making. The intervention is a serious game, a researched and tested approach for discussion and communication within policy making. The game transforms B&V regulations into cards and asks stakeholders to imagine the risks and effects if regulations are not complied with. To address importance of regulations created from a OneHealth perspective (RQ 5).

Although no research is conducted within the context of policy making and the intervention is only evaluated. The hypothetical intervention serves as a tool to inspire imagination of stakeholders. It is essential to communicate the purpose of this design activity towards GGD's through a systemic design perspective. Positioning the intervention in relation to the horizon map and strategy. Addressing that the transition is guided by multiple projects and interventions which tackle problem sets (Metcalf, 2014; Van Arkel et al., 2023).

Research question 5

5. How to design an intervention created through transforming B&V within the strategy for effective zoonotic risk management?

Methodological discussion

Future steps

As the exploration stage only illustrates a hypothetical intervention. Several design activities should be conducted to imagine scenarios of future action to fit systemic options and interventions into. Preferably in a collaborative manner through co-creation and codesign (Steen et al., 2011, Van Woezik et al., 2016). Activities may include Future State Scenario's and Intervention Strategy (Jones & Van Ael, 2022). Future design research projects at GGD's should work towards interventions described in the strategy.

As described in the Methodology section (see methodology) the planning and fostering stage focus on implementation rather than creating a vision for system value. In this project the designer takes on a consultant role. The project is conducted with a fixed time span. Consecutive projects in the horizon should still focus on creating system value (exploration stage). However, planning and fostering require longer term collaboration with designers. Preventing design work from becoming 'delivery' to transform the organisation structures and practices (Jones & Van Ael, 2022).

Integrating designers within organisations is challenging. It requires organisational change and an open mindset towards innovation. Research shows the possible impact of design within public organisations and governments (Holierhoek & Price, 2019). Moving beyond the consultant model by creating longer term partnerships and expanding project proposal scoping. The GGD Brabant-Zuidoost does not employ a designer in their research team yet. This creates as serious opportunity for future impact by designers at GGD's (see reflection).

Systemic Design methodology

Systemic design methodology as the described by Jones and Van Ael (2022) addresses systemic designers are teams. Design activities and decisions in this project are discussed with other design students, coaches at the GGD, GGD employees and coaches at the university. However, one designer individually makes decisions. Collaboration is essential to navigate through complexity, conduct co-creation activities and make sound design decisions.

As a result, the process was adapted to fit the individual setup. For example, the horizon map is partly co-created with GGD's and later evaluated. The project therefore summarizes the horizon map and other design activities into easy to comprehend visualisations which capture the essence of insights (Figure X & Figure X). Currently, the project moves detailed insights from interviews and co-creation to the background as many do not contribute significantly to the holistic results of the revised project goal. Additional co-creation activities would support relevant results.

In addition, the project brief (proposal) focuses on a service design approach. Systemic design methodology was incorporated after scoping (framing) the design challenge. Assessing the project proposal from a critical systemic view would have steered the project towards the revised goal and expanded contextual earlier on. Essential as 'changing direction is hard' (Jones & Van Ael, 2022).

A well-defined systemic frame defined earlier on, would also provide more time to research and test an intervention in a systemically defined context. The process now focuses on illustrating an (hypothetical) intervention. Because the initial goal of implementing B&V remained after revising the project direction. Providing solutions or interventions defines (systemic) design methodology. The intervention sparks imagination at the GGD Brabant-Zuidoost for potential future design projects. An opportunity explored in the reflection (see reflection).

The process works from a top-down perspective as entrepreneurs were not involved. A result of the earlier defined framing and current network of GGD's (see Horizon map). In addition, the expanded view looks at more stakeholders and contexts. One could argue that because of the systemic view the project also became more assumption based. Various findings can not be concluded. As a result, assumptions are clearly indicated and mentioned during activities. Future projects and interventions should conduct additional qualitative research to confirm or understand stakeholder relationships, needs and pains. Essential to create a full systemic perspective. The resulting strategy exemplifies to not silo RM within legal (administrative) departments and the importance of thorough stakeholder assessment and inclusion (Van Woezik et al., 2016; Newman et al., 2020; Blomkamp, 2021).

This project focuses solely on qualitative data as it regards a small group of employees at different stakeholders. Future projects should investigate incorporating a mixed methods approach regarding data analysis. Including quantitative data is essential to connect deep-human centred insights with scientifically valid results on a large scale. Quantitative data within systemic design can provide a holistic view of demographics, the environment, behaviour, and trends (Hall & Howard, 2008).

Ethical implications

The M1.2 research project argues the OneHealth framework creates hierarchy by prioritizing human health above animal and environmental health (Van den Berk, 2022). The project therefore applies a post-human perspective onto the OH framework. Regarding all three OH perspectives as equal (Friese & Nuyts, 2017). This perspective partly conflicts with the description of OH in this project.

Participants of the evaluation feel B&V already encompasses OneHealth. B&V should be presented as an independent tool. However, the system of livestock farming (and thus food production) exists for human benefit (Maddock, 2019). A post-human perspective to OneHealth may therefore never fit this system. It raises the question how designers can and should play a role in this ethical challenge. In future interventions of GGD's it is interesting to assess to what extend GGD's (focused on public health) should concern itself with this issue.

Reflection

My Final Master Project feels like a cumulation of my design knowledge and skills gathered over the past 7 years studying Industrial Design at the Eindhoven University of Technology. The project results show me I am ready to make impact as a designer within the work field in collaboration with organisation and companies. Where I aspire to work for complex (social) challenges (User & Society) in a multi-stakeholder environment (Business & Entrepreneurship) (see PIV). To orchestrate systemic insights and pragmatic solutions/interventions (Technology & Realization). Yet, much of my work can be improved.

C&A T&R

The project crystalized my thoughts on how design work can make impact within organisations not familiar with design. I learned that narratives and visualised insights, although previously known, help with sensemaking of stakeholders. I learned to incorporate my UX design knowledge when visualising to create structured and aesthetically pleasing results. However, visualising insights and structuring narratives (synthesizing) individually is highly complex and requires many iterations. Future projects are ideally conducted (more) collaboratively with other designers and stakeholders to design more effective and clean visualisations. In future projects, I want to improve my writing skills to create structured narratives with high focus on incorporating nuance.

MD&C

In addition, I aspire to incorporate more data-driven ways of working in future projects as mentioned in the methodological discussion. Within this project I noticed the need of quantitative data within administrative processes and decision making of stakeholders (e.g. distance between farms). In the future, I want to develop myself outside my job to become more skilled in quantitative data analysis. Especially as data (and AI) are increasingly relevant (see PIV).

U&S DRP

Regarding design methodologies used in the process. I thoroughly enjoyed working from the methodology in the book 'Design journeys through complex systems' (Jones & Van Ael, 2022). It guided me in using relevant terminology related to the approach. I learned it is essential to find a sustainable balance between using existing methodologies and 'reinventing the wheel' (see metaphor). I feel I managed to balance this. However, in future work, I would more critically plan which methodologies to use through discussion. In addition, I would adapt and transform methodologies based on co-creation rather than reflection and evaluation.

> It is like racing on new terrain each project you follow; you do not want and need to redesign a wheel from scratch. But adjusting the vehicle and its wheels is essential to be able to drive the terrain efficiently.

U&S

An increased focus on co-creation would incorporate more nuance into insights as well (see methodological discussion). Authoring the report was challenging as insights are complex and highly influence each other. I learned that each presentation moment serves as a sensemaking exercise for the designer as well. In retrospect, I needed more time to implement feedback from the evaluation and presentations into project results. To create a more nuanced and consistent narrative.

B&E

As discussed in the methodological discussion (see methodological discussion). Two key stakeholders were not involved into the project and the project goal was revised for an expanded systemic view. To get all stakeholders in the system on board in future projects. I would enable more resources and convince the client to start looking for participants in time, conduct systemic framing session and do exploratory interviews. To choose an applicable design approach and methodologies for the challenge. In addition, I would focus extra on familiarizing the client with design methodology through examples within sessions or workshops.

T&R DRP

Changing the direction of the project towards an expanded system view, in favour of a service design approach focused on implementation first disappointed me. I aimed to gather more experience in implementing digital solutions. Later, however, the change direction taught me the value of being in full service of the project and its insights. During this phase I let go of my preconceived desired outcome (a UX design) and listened holistically to what the challenge needed. Something I highly aspire to continue with in future projects and now see as an essential design skill.

I am proud of the results within my Final Master Project. I feel I made sound decisions based on methodology and stakeholder reflection. I learned to treat a university project like a (consultant) job. Incorporating a healthy work/life balance. The project confirmed my interest in and directed my interested in designing for complex challenges with social impact. Service and UX design still interest. As a result, within my job I want to integrate my systemic thinking skills with a pragmatic design thinking approach to create digital solutions. Aiming to facilitate, strategize, imagine, and create within a (public) organisation or as a consultant.

An opportunity could be a position at a GGD. The collaboration with the GGD Brabant-Zuidoost was very fruitful. They are highly interested to continue with design focused projects. With my current expertise this could be a serious option for a future position. As a result, I will present my design work at the management of GGD's in Brabant. I am planning additional presentations to communicate the power of my design work within the health network.

Professional Identitiy & Vision

Professional identity

I am a critical, assertive, and realistic designer with skills in visual communication, effective facilitation and creating grounded solutions. I orchestrate processes through synthesizing perspectives and opinions of various stakeholders. Using design approaches to present insights as structured overviews and summaries. Capturing the essence of insights to support making strategic decisions with stakeholders. I have work experience within various design disciplines: UX design (CM.com), Service designer (Koos Service Design) and Systemic Design (GGD Brabant-Zuidoost) (Jones & Van Ael, 2022). As a result, I work on wicked challenges through systems thinking and use design thinking to create pragmatic (digital) interventions or solutions. I highly value working both holistically and pragmatically to inspire a change mindset with stakeholders and demonstrate innovation.

I aspire to work on design questions which last a positive impact on society. I therefore often collaborate with public organizations, where design is a new way of working. Through my experience within acquisition for the ID study association and as a student educator. I can effectively communicate the value of design and get clients or stakeholders on board. I am therefore especially interested to work on challenges and within organisations where design methodology has yet to show potential. An example is zoonotic disease risk management. A highly complex challenge with a large stakeholder network. Which I focused on during my research and final master project.

Vision

I believe the power of design lies with its ability to arrange, imagine, and communicate. The Japanese word for designer means ‘arranger.’ Within UI design designers arrange elements and graphics. Within Service and UX design designers arrange processes and experiences. Within social innovation and systemic design designers arrange perspectives, collaboration, and complex information. Throughout arranging, designers imagine by asking themselves ‘How can the future be better than today?’ Creativity and hypothetical reasoning are essential in this practice (Van Arkel et al., 2023). Designers arrange and imagine with a human-centred mindset, communication through designed results enables sensemaking and understanding of otherwise complex insights. I believe good designers have knowledge of and have skills in various design disciplines. Good designers can seamlessly switch between disciplines to create results through consideration within the right scale (micro, meso, macro. (Holierhoek & Price, 2019). If thoroughly communicated and carefully implemented results can provide change and innovation.

I imagine design approaches will play a significant role in tackling complex social challenges within public organisations and governments (Sanders & Stappers, 2014). These challenges for example include migration, health, poverty, and sustainability. Transformation is initiated by embracing complexity and orchestrate communication between stakeholder networks: “Saving our planet is now a communications challenge” (Arnavutian, 2024). Integration of co-creative ways of working will be essential. Designers can facilitate and manage the transition to new (digital) products, organisational structures and stakeholder relationships. In addition, design brings knowledge of available technology and relevant trends to stakeholders.

Data driven design and Artificial Intelligence are examples of technologies which can and will help to navigate complex problems. These developments bring many challenges in and of itself. Designers, however, can bridge the gap between humans and the implementation of innovative technology by taking a critical and ethical perspective. The power of combining skills, perspectives and knowledge of the design disciplines should be effectively communicated to public organisations and governments. I imagine this will open the door for new and additional challenges where design work can make significant impact in society.

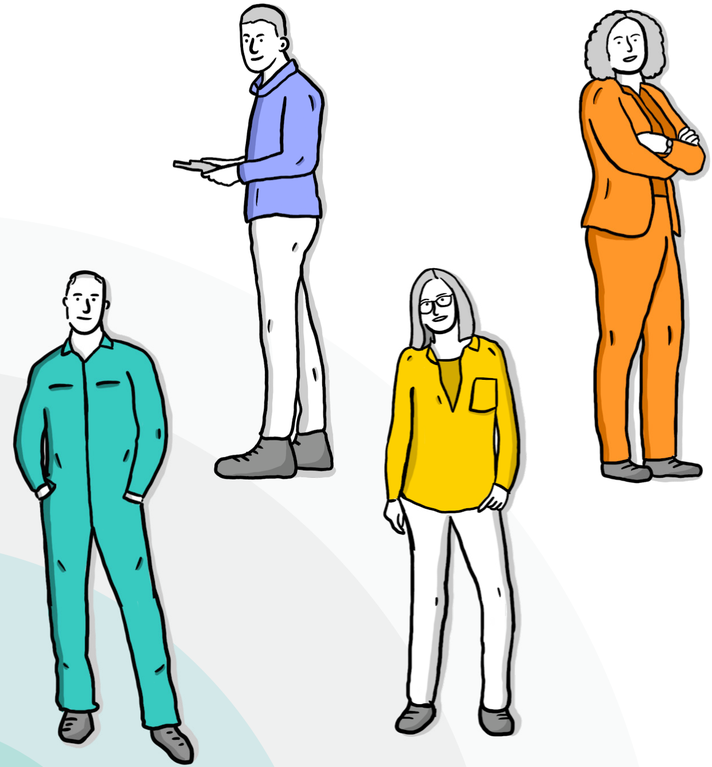
Conclusion

To conclude, this project answers the research question ‘How to effectively transform identified regulations from Boer & Verstand to make impact within risk management of zoonoses of the GGD Brabant-Zuidoost?’. The project describes how systemic design methodology enables GGD’s to look at implementation of Boer & Verstand from a systems view. Assessing possible scenarios and futures to create an intervention strategy for implementation of Boer & Verstand. The project results in the strategy accompanied by a hypothetical intervention which illustrates a pragmatic example of implementation.

The process describes how the project initially focuses on transforming and implementing Boer & Verstand into the permitting process. A context where GGD’s currently advice with a perspective on health using stricter health norms. Through interviews with Omgevingsdiensten, GGD’s, RIVM and the province of Brabant it is found that Boer & Verstand currently does not make impact within the permitting process (RQ1). Caused by contending roles and interests of, and environmental norms used by stakeholders in the process (legal & stricter than legal) (RQ2). Focusing on this challenge lies outside of the goal and possible impact of Boer & Verstand.

As a result, an expanded system view looks at additional stakeholders, contexts and insights gathered in interviews and research. A co-creation session with GGD’s envisions possible futures within the expanded contextual view. By assessing stakeholder relationships and opportunities for implementation (RQ3). From synthesized session results a strategy for interventions and implementation of Boer & Verstand is created. The strategy explains how Boer & Verstand may make impact in policy making in the current top-down network of GGD’s in Horizon 1. The strategy envisions how practices and influence of GGD’s can possibly transition towards a bottom-up influence by defining their role in the stakeholder network. Discovering if and how GGD’s may communicate directly to entrepreneurs related to practices of other stakeholders (RQ4). A hypothetical intervention illustrates a serious game for policy making. Illustrating pragmatically how Boer & Verstand can be transformed into a card game which triggers discussion for stakeholders what happens if regulations are not complied with (RQ5).

Future steps for this project focus on exploring possible scenarios and futures related to the intervention strategy of implementation. Careful planning is required to trigger system change within organisations. Fostering is essential to implement interventions into practices of stakeholders and the organisation.



Epilogue

To end my report I received an acknowledgement from the GGD Brabant-Zuidoost. Provided by my coaches Evelien, Didi & Danielle. The original text is in Dutch, so a translation is included.

“Niek is een gedreven student. Hij had ambitieuze plannen bij aanvang van het project, waarbij wij dachten dat het wellicht te groot zou zijn. Uiteindelijk is het project wat anders gelopen dan vooraf bedacht door een aanpassing in de doelstelling, maar Niek heeft dit goed aangepakt en heeft alle betrokken professionals weten te enthousiasmeren met zijn bevindingen en ideeën. Niek heeft gezorgd voor nieuwe inzichten en een andere, verfrissende manier van aanpak dan dat we gewend zijn vanuit de publieke gezondheid. Met zijn aanpak heeft Niek de GGD op een heel prettige manier laten kennismaken met Industrial Design. Dit is met veel enthousiasme door ons en onze collega’s ontvangen. Een puntje van aandacht is het schrijven. Niek heeft alles heel beeldend aangepakt, wat erg fijn is ook voor de uitleg, maar daardoor ligt er veel druk aan het eind om alles goed op te schrijven en te beschrijven.”

“Niek is a driven student. He had ambitious plans at the start of the project. We thought the plans might be too ambitious. In the end, the project turned out somewhat differently than we imagined due to an adjustment in the goal, but Niek handled this well and managed to create enthusiasm with all professionals involved through his findings and ideas. Niek has provided new insights and a different, refreshing approach than we are used work with in public health. With his approach, Niek has introduced the GGD to Industrial Design in a very pleasant way. This has been received with great enthusiasm by us and our colleagues. One point of attention is the writing. Niek took a very visual approach to everything, which is very nice for the explanation. However, because of this there is a lot of pressure at the end of the project to document everything well.”

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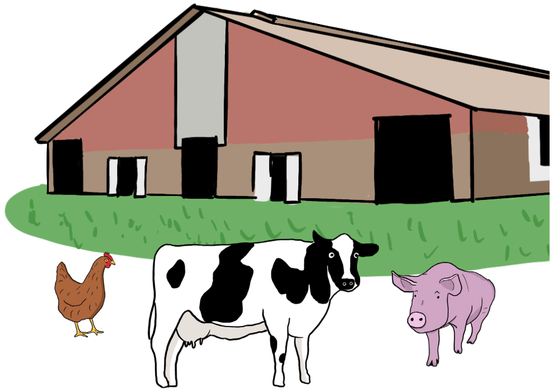
A.

Final master project proposal

Designing a risk communication tool for GGD's and municipalities.
To prevent introduction and spread of Zoonotic diseases within livestock farming.



Niek van den Berk
Graduation coach: Lu Yuan
Expert examiner: Emilia Barakova
Client: GGD Brabant-Zuidoost

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Introduction

If a farmer needs an environment permit to set-up or change its farm (e.g. entirely new farm, new animals, new stable type), a municipality in the Netherlands needs to approve this request. The permit includes different (risk) factors for spatial development such as: noise, smell, nitrogen emissions, air quality, location and zoonoses (Ruimtelijke onderbouwing veehouderij, n.d.). For this reason, the municipality requests advice from different public organs. In the case of zoonoses the advice is provided by the local GGD. This causes inconsistent advice across permit requests (RIVM, 2022).

Within the research project 'Boer en Verstand' conducted by three GGD's in Brabant suitable measures were analyzed and identified to mitigate risks for different types of livestock farming (RIVM, 2022). The identified measures are listed in documents per farming type (GGD Brabant-Zuidoost et al., 2022) (Figure 1). It is, however, unknown if these documents conform to the needs of the stakeholders involved and therefore reach the desired effect of improved risk management, communication and its consistency.


MAATREGELEN OP
GEITENHOUDERIJEN
TER VOORKOMING VAN ZOÖNOSEN

GGD Brabant-Zuidoost
GGD Hart voor Brabant

MAATREGELEN TER VOORKOMING VAN INSLEEP, VERSPREIDING EN UITSTOOT VAN ZOÖNOSEN

Aanleiding: Gemeenten vragen steeds vaker om een advies van de GGD over een uitbreiding of nieuwvestiging van een veehouderij(bedrijf). Waar er bij vergunningsaanvragen voor milieufactoren, zoals geur, fijnstof en endotoxinen wettelijke kaders en gezondheidskundige normen zijn, zijn die er voor zoönosen niet. Om een eenduidige advisering door GGD'en te bevorderen zijn de GGD Brabant-Zuidoost, GGD West-Brabant en GGD Hart voor Brabant in 2019 gestart met het project "Boer en Verstand".

Vraagstelling: Welke maatregelen om de insleep, verspreiding en uitstoot van zoönosen op veehouderijen te voorkomen, zijn (wetenschappelijk) onderbouwd en worden relevant en haalbaar geacht door experts?

Methoden: We voerden een literatuuronderzoek uit en hadden maatregelen uit relevante rapporten en checklists. Vervolgens werden experts 3 keer bevraagd over de relevantie en haalbaarheid van de maatregelen met behulp van de Delphi-methode. De expertgroep bestond uit dierenartsen, veehouders, medewerkers van kennisinstituten (RIVM, faculteit diergeneeskunde, WUR) en GGD-medewerkers betrokken bij de gezondheidskundige advisering veehouderij.

Resultaten: De maatregelen zijn onderverdeeld in de volgende thema's: hygiëne, aankoop nieuwe dieren, contact andere dieren en ongedierte, ziektemanagement en vaccinatie, eigenschappen erf en stal, watergebruik, kadavers geboorteproducten en mest, lucht en ventilatie en toegang effectreders. Aan het einde van de 3 consultatierondes zijn er 38 relevante en haalbare maatregelen die van toepassing zijn op alle veehouderijsectoren. Aanvullend zijn er 20 maatregelen specifiek voor varkensbedrijven, 19 voor pluimveebedrijven, 13 voor geitenbedrijven en 5 voor rundveebedrijven.

Conclusie: De GGD'en kunnen deze lijst met maatregelen per diersoort gebruiken bij de advisering over veehouderijbedrijven aan gemeenten.

- 2 -

GEITEN

Hygiëne

Reiniging en desinfectie

- De desinfectiebaden worden minimaal twee keer per week verschoond, ook al lijkt het bad nog schoon
- De desinfectiebaden worden altijd verschoond als ze zichtbaar verontreinigd zijn
- Bedrijfsvreemd materiaal (bijvoorbeeld transportmanden) wordt gereinigd en gedesinfecteerd vóór gebruik in de stal
- Transportwagens worden tussen transporten van dieren grondig gereinigd en gedesinfecteerd
- De juiste concentratie en inwerktijd van desinfectiemiddelen zoals door de fabrikant aangegeven wordt gebruikt
- Het bedrijf heeft protocollen voor bedrijfshygiëne, bijvoorbeeld een schoonmaakprotocol
- Het bedrijf heeft protocollen voor reiniging en desinfectie
- Stallen worden na elke ronde gereinigd en gedesinfecteerd voordat er nieuwe (jonge) dieren in komen
- Na het werkstaken van dieren worden gangen gereinigd en gedesinfecteerd
- Verlostangen/ hulpmiddelen bij verlossingen worden na gebruik gereinigd en gedesinfecteerd.

GGD

Figure 1 - Identified measures in documents from project 'Boer en Verstand'

Professional identity & vision

Identity

I am a critical, assertive and realistic designer who tries to communicate ideas, processes and designs in a visual way. I have a passion for designing for and with people. Orchestrating a process while taking different stakeholder opinions and perspectives into account. Through my experience in working as both a service designer (Koos Service Design) and UX designer (CM.com) I learned to imagine and create system and service experiences. Looking at the problem on a holistic as well as a detailed level, thinking about every step in the process. I work structurally but try to shift through different perspectives quickly to understand what effect a design change has on the project goal. As a result, I am passionate about creating user-friendly solutions for complex challenges in the form of digital services or products.

I aspire to work on design questions which last a positive impact on society. I therefore often collaborate with public organizations, where design is a relatively new way of working. I learned to effectively communicate the value of design, in order to make design (processes) accessible and get clients or stakeholders aboard. Through visual communication I try to clarify complex ideas and align different stakeholders and their understanding of the project. As a result, I often communicate through scenarios, journeys, illustrations and diagrams. I learned this within projects as well within my extra-curricular work as an acquisition person and student educator. Seeing how stakeholders change their perspective or are surprised by certain solutions motivates me to create societal impact through design work. Especially within challenges where design methodology has yet to show its potential. Like I recognized within my research project about zoonotic risk awareness.

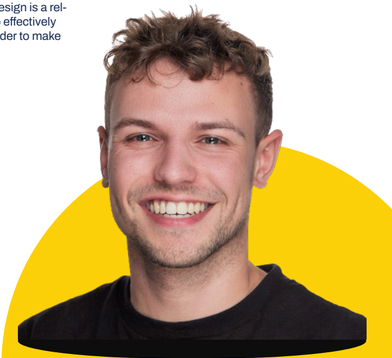


Figure 2 - Multi-stakeholder session conducted during Master Research Project about Zoonotic risk awareness

Vision

The Japanese word for designer is 'arranger'. Within social innovation designers arrange collaboration, communication and perspectives. Within service and UX design they arrange information processes and ideas. Within UI design it is elements and graphics. I believe the strength of designers lies with their ability to seamlessly switch between these activities and combine the knowledge of these approaches into a unified end result. Which is implemented and looked after carefully to create change. I envision a world where design and design processes help to navigate through complex problems by creatin manageable, user-friendly and practical solutions. As challenges within public organizations are often complex (wicked) of nature, the solutions ought to be designed with this complexity in mind.

In the future, design processes will therefore play a central role in tackling problems within public institutions. This will result in more co-creative ways of working and use of better processes, systems and products. Designers can facilitate co-creation, orchestrate processes and manage the change to new (digital) systems and products. In addition, design brings knowledge of available technology and trends to stakeholders. Data driven design and Artificial Intelligence are examples which can help in navigating complex problems. These developments bring many challenges in and of itself. Designers, however, can bridge the gap between these challenges and the implementation of new technology by taking on a critical and ethical perspective. I imagine this will open the door for new fields where design work can contribute significantly to society.

M2.1 semester

In September 2022 I started my initial M21 semester at CM.com. A software company providing a B2B platform for digital communication. I conducted a UX design project with the goal to integrate different apps in the Mobile Marketing Cloud solution (Mobile Marketing Cloud for Omnichannel Marketing Automation, n.d.). Within this project I learned that many limitations arise when working with developers. Much coordination is needed to create a highly feasible solution with sound usability.

As I felt I missed out on international experience throughout my study I decided to extend my masters with a year and do my actual M21 semester in Wellington, New Zealand. I conducted a UX design project about biosecurity of Kauri trees in New Zealand. This project focused on risk communication towards exchange students in New Zealand (public risk communication) to protect Kauri trees from Kauri Dieback (Kauri Disease, n.d.). A pathogen killing the indigenous tree. I gathered more experience in working for a non-human perspective, breaking through the human-centered hierarchy found in policies implementing the OH approach (Forlano, 2017) (Figure 3).

Other insights of the project include:

- rightly timing communication is key in creating a moment of attention
- using the adoption ladder in order to assess and achieve change in practice (Adoption Ladder, n.d.)

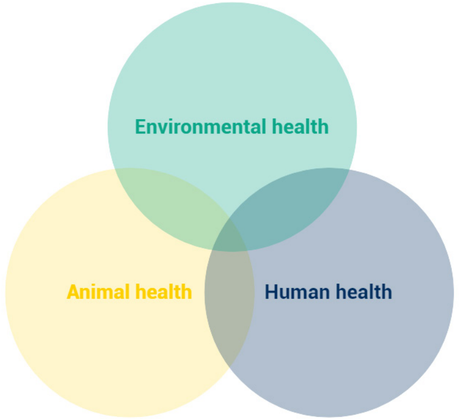


Figure 3 - OneHealth framework

Collaboration

During my master research project in collaboration with BrabantAdvies (BrabantAdvies, 2023) I was invited to a Zoonotic expert meeting. At this meeting I met Danielle van Oudheusden, medical doctor society and health in infectious disease control at GGD Brabant- Zuidoost. In our conversation we noticed an opportunity for a possible design project for the GGD.

I chose to reestablish contact with GGD last June as the GGD is an important stakeholder in the Dutch public health network. The GGD is divided in 25 regions and has the goal to protect, monitor and improve public health of the region (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, n.d.). In addition, the GGD values an inclusive, people-centered perspective and uses data to support its research and services (GGD GHOR Nederland, 2023).

Through several meetings with the GGD two projects were proposed. I chose this project so I can integrate the expertise of my research project with my interest in service and UX design. I will work for GGD Brabant- Zuidoost which head office is located in Eindhoven. Brabant- Zuidoost consists of the region shown in Figure 4 I will be coached by two GGD employees : Evelien van Sterkenburg (project lead infectious disease control) and Didi de Gouw (researcher and infectious disease epidemiologist). The project will be conducted partly from the TU/e campus and partially at GGD Brabant-Zuidoost in Eindhoven. This project will collaborate with a yet to determined municipality in the region Brabant-Zuidoost. The municipality should contain much farming land.

Figure 4 - The 25 GGD regions in the Netherlands (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, n.d.)

FMP proposal - Niek van den Berk

Background

Zoonotic diseases

Zoonoses are pathogens transmitted from animals to humans. These pathogens can cause new, possibly deadly, diseases to emerge (Cross et al., 2019). Humans interact with animals in many different scenarios, hence zoonotic risk is present through all of society. Risk areas include, livestock farming, the keeping of companion animals, globalization and transport, wild animals, vectors, changes in climate/biodiversity, and rewilding (Bekedam et al., 2021). Within the last 20 years, preventative measures, early detection and outbreak management have helped to decrease the risk of zoonoses within Dutch livestock farming. Risk is decreased through hygiene measures, vaccination for animals, compartmentalization on farms, confinement duty of animals, and, in some cases, lowered density of farms with less animals (Bekedam et al., 2021).

Wicked problem & OH approach

Disease and prevention control of zoonoses is a wicked problem which involves many stakeholders (Van Woezik et al., 2016). This project regards two main stakeholders which are part of the larger stakeholder network. The risks caused by emerging zoonoses are hard to predict, and clearly defined solutions are difficult to find (Gebreyes et al., 2014). The OneHealth approach (OH approach) is a widely used paradigm within policies and tries to take into account the health of animals, humans, and the environment (Figure 3). Effectively executing the OH approach is a challenge because of its complexity (Stärk & Morgan, 2015). Zoonotic risk management needs implementation of coherent policy with a pragmatic view of the OH approach. (Bekedam et al., 2021). In addition, improved collaboration and communication are needed for better signaling and knowledge sharing between professionals (Van Woezik et al., 2016). This is relevant within this project, as permits are assessed in a highly contextual context through the multidisciplinary safety network of the province (Omgevingswet - GGD GHOR Nederland, 2023).

Risk management

According to Smith et al. (2014) risk is the measure of probability, consequences and impact of not achieving a defined goal". Risk management (RM) is "a systematic way of looking at areas of risk and consciously determining how each should be treated." (Zou & Zhang, 2009). It is used within entrepreneurial as well as social and ecological challenges and is described as highly contextual and case-specific (Alfredo, 2002) (Gerkensmeier & Ratter, 2018). RM consists of several steps in order to create a strategy for risk reduction (Stoneburner et al., 2002). There is no universal model for risk management. Risk management processes generally include risk identification/assessment, risk analysis, risk evaluation, risk mitigation and risk monitoring (Kapuscinska & Matejun, 2014). This project focuses on risk evaluation and mitigation. More specifically on the evaluation of risks within a specific context and the communication of risk mitigation strategies between stakeholders.

Figure 5 - Example of a risk management process (Wells, 2023)

Risk communication

Throughout the RM process, and consequently within risk mitigation and evaluation, risk communication is vital but often mismanaged (Newman et al., 2020). Risks or measures can be communicated to the public or within organizations. This project focuses exclusively on communication within public organizations. Research shows that the goal of risk communication is to create shared (multi-stakeholder) understanding, help stakeholders make responsible and strategic decisions and provide tools to effectively use information (Newman et al., 2020) (Fekete, 2012). Responsible risk commu-

nication includes several values: objectivity, consistency, and transparency (Boholm, 2019). With the goal to create trust, certainty and consensus amongst involved parties (Newman et al., 2020). Like risk management, there is no standardized model for risk communication. Different practices may be conducted simultaneously. This shows risk communication is a situated social activity involving complex processes like meaning creation and interpretation (Boholm, 2019).

Risk management & design approaches

Key principles within research on risk management and risk communication overlap greatly with design approaches such as UX design, Design for Social Innovation and Service Design. Risk management and design approaches both aim to create multi-stakeholder alignment, understanding and collaboration (Boholm, 2019). According to Newman et al. (2020), it is important to integrate user needs into designs and policies to not silo risk communication within (legal) departments. User-centered design processes can therefore support responsible risk communication by actively involving all users and stakeholders (Lugnet et al., 2020). Design methodologies provide structure through means of mapping, sensemaking and strategizing (Mintrom & Luetjens, 2016). Interpreting risk communication values as design principles helps creating solutions that support stakeholders with meaning creation.

Design challenge

The results of the previous project 'Boer en Verstand' have not been discussed in regard to the communication of GGD Brabant-Zuidoost towards municipalities. The risks have been identified; however, it is unknown if and how the identified measures are currently used in the advisory process of the GGD. Currently, the GGD Brabant-Zuidoost uses the national RIVM/GGD guideline for its advisory process (RIVM, n.d.). The project 'Boer en Verstand' is not part of this guideline yet. As a result, this project aims to create a user-friendly solution that helps municipalities and GGD's to utilize the measures identified by the project 'Boer & Verstand' (RIVM, 2022) in an easy, efficient and effective manner. This is done by understanding the needs of the stakeholders involved. As a result, the design (research) question is formulated as follows:

Main question

How to design a risk management tool for municipalities and the GGD using the identified measures by the earlier project 'Boer en Verstand', to prevent introduction and spread of Zoonotic diseases within livestock farms ?

In order to guide the design process, 5 sub-questions were created:

Sub questions

1. **How do the identified measures help the stakeholders in the advisory process now?**
2. **What are the needs of GGD's and municipalities regarding the advisory process from GGD's to municipalities on the permit approval?**
3. **How to design a risk management tool to make use of the information presented in the documents effectively?**
4. **What resources and development activities are needed to realize the solution?**
5. **How can the created tool be used within similar risk management processes regarding several (public) stakeholders?**

The project contributes to both design knowledge as well as risk management knowledge by using design methodology to improve a risk management process within a multi-stakeholder environment.

Project management

Approach

This project is situated on the interface of social innovation, service design and UX design. Design for social innovation often tackles complex or wicked societal issues by orchestrating multi-stakeholder collaboration (Schaminée, 2019). Service design orchestrates and improves end-to-end processes and helps to strategize opportunities (Zomerdijk & Voss, 2009). UX design focuses on the interaction of users with a product or interface (Schmidt, 2017). This project will use a 'Service Design as a way for Social innovation' approach. This approach fits the project scope as the complex, multi-stakeholder issue of zoonotic risk management and communication needs to be captured in a practical solution that serves involved users. The approach encapsulates system thinking, cross-section collaboration and long-term impact (Yang & Sung, 2016) (Montijn, 2023). With the ability to create trust, collaboration, sharing and profitable relationships (Joly & Cipolla, 2013).

The Double Diamond Double Donut (DDDD) approach proposed by Koos Service Design will be used as a guiding process (Montijn, 2023). The DDDD approach is an iteration on the Double Diamond process which is an effective approach widely used within design projects (Johansson- Sköldberg et al., 2013). The DDDD approach includes 4 phases (understand, imagine, create and scale), various feedback cycles, a minimum viable service/ product, and measures, learns and improves the proposition iteratively (Montijn, 2023).

Planning

The four phases of the DDDD approach guide the planning: understand, imagine, create and scale. Each phase includes several design activities and iterations. These activities will be done consecutively or in parallel to each other. Each phase is supported by one or more of the sub design research questions (Figure 6).

Understand - The 'understanding' phase focuses on understanding the current risk management process, how the risk mitigation documents are currently used and what the needs of different stakeholders are regarding the process. Within this phase knowledge about the situation is broadened by doing desk research, stakeholder mapping and stakeholder interviews.

In this phase, gathered knowledge is analyzed to create a user journey, prioritize user needs, and identify risk management opportunities. Subsequently, a channel strategy is created. These activities aim to refine the problem statement to create a design brief with principles.

- 1. How do the identified measures help the stakeholders in the advisory process now?
- 2. What are the needs of GGD's and municipalities regarding the advisory process from GGD's to municipalities on the permit approval?

Imagine - The second phase starts with a design sprint partially conducted with stakeholders of the project. Within this design sprint the insights from the first phase will be turned into concepts through ideation and conceptualization methodologies in a short time frame (Banfield et al., 2015).

Concepts will be prioritized in collaboration with the stakeholders. After selecting one concept based on the prioritization, user tests will be conducted focusing on the main features of the concept. The concept is validated and a first version of a value proposition is proposed.

- 3. How to design a risk management tool to make use of the information presented in the documents effectively?

Create - The 'create' phase focuses on realizing the concept into a product or service through wireframing, prototyping in UX design software and later coding. If applicable, a service blueprint will be created to show background processes. Throughout this phase the concept is iteratively tested.

- 4. What resources and development activities are needed to realize the solution?

Scale - Within the 'scale' phase a strategy is created explaining how to implement the solution within other risk management cases. A roadmap will be made for implementation into the daily practice of users and what steps need to be taken for the solution to be scaled onto other risk management processes.

Question:

- 5. How can the created solution be used within similar risk management processes regarding several (public) stakeholders?

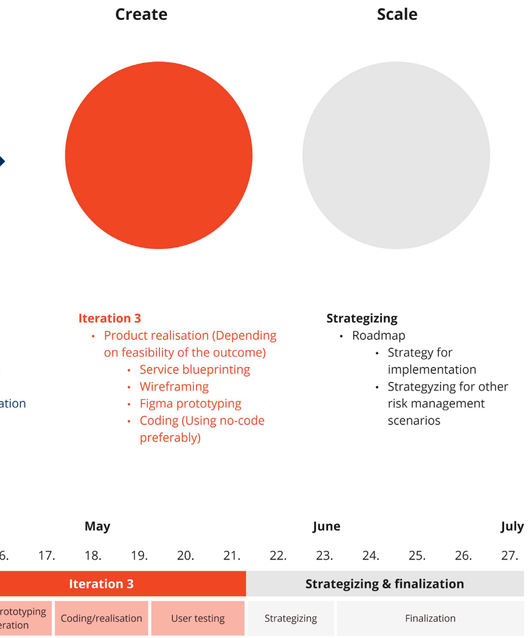


Figure 6 - Design process, activities and planning for the project

First iteration

As a first iteration a pressure cooker was conducted following from a benchmark and followed by a feedback session from the coaches at the GGD. The pressure cooker consisted of a stakeholder mapping (Figure 7), brainstorm, idea mapping based on risk communication values (Figure 8) and conceptualization (Figure 9).

Benchmark

Digital risk management tools found show how a system should be transparent and collaborative. By, for example, creating a dynamic and open-source platform (Grange et al., 2021) or by creating a collaborative decision-making tool within a multi-disciplinary environment (Rist et al., 2014). Dynamic Risk assessment (DRA) tools use automation to make risk management actions more contextually appropriate (Collen et al., 2022). As a result of the benchmark and background research (See page 8, risk management), four design principles were used to assess the ideas in the first iteration: objectivity, consistency, transparency and collaboration.

Insights: Stakeholder map

The stakeholder map shows the stakeholder relationships to the GGD Brabant-Zuidoost, the collaborative partner of this project. Internally within the GGD there are several departments involved in the communication towards the municipality. All needs of these departments should be taken into account. The main stakeholder externally is the municipality. The RIVM supports the GGD as a national institute of the government (Vademecum Zoönosen, n.d.). The permit applicants are not involved in this project as the designed tool is used internally.

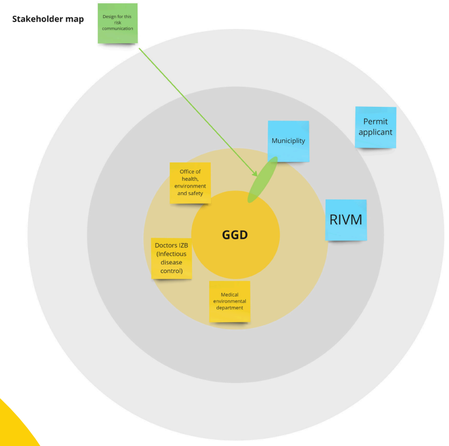


Figure 7 - Stakeholder map

Figure 8 - Idea mapping based on design principles

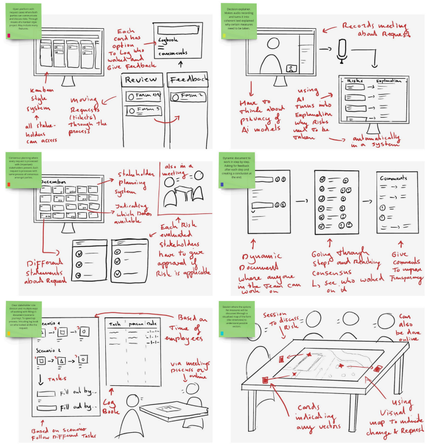


Figure 9 - Conceptualisation

Insights: Concepts and feedback GGD

Through feedback and discussion with my coaches at the GGD Zuidoost-Brabant it was mentioned that the solution should ideally fit within an existing product of the GGD Brabant-Zuidoost. A product that helps municipal officials to consider health within spatial development is the portal; www.ggdomgevingsadvies.nl (GGD Brabant-Zuidoost et al., 2023). This portal may be consulted for inspiration and advise while working for spatial development (Figure 10). The solution may become part of this portal. Additionally, it was mentioned the solution should be functional, simple, easy to reach and easy to use.

Reflecting back on the concepts within the pressure cooker, concepts like a puzzle or game (Figure 9: bottom right) would take too much time nor would fit in the portal environment. Other concepts focus a lot on interaction through a digital platform. The portal, however, does not allow for digital interaction or communication. As it is purely an informative webpage. This raises the question if the solution should be a medium for interaction between the 2 stakeholders. Or for the solution to be a guiding communicative tool, like the documents with identified measures currently used.

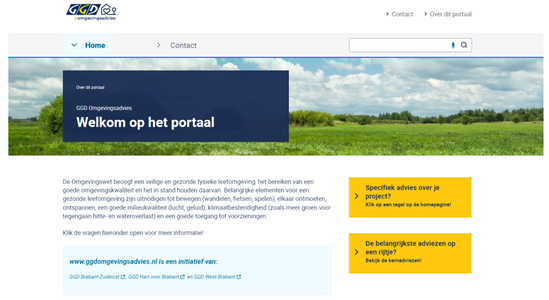


Figure 10 - GGD omgevingsadvies portal (GGD Brabant-Zuidoost et al., 2023)

Project risk management

The project includes several stakeholders, some of which I am not directly in contact with at the start of the project. Therefore, clear communication and timely planning is necessary. As a result, I plan to start scheduling interviews prior to the start of the project. So, the understand and imagine phase can be concluded in a shorter period of time. To reflect more thoroughly on this faster paced work, I will conduct weekly retrospective exercises used within a design sprint setup. Possibly in a setup with other graduation students (UXspot, n.d.).

As this project mainly focuses on an interaction between the GGD and municipality, the permit applicant is not directly involved in this project. However, permit applicants (farmers) bring measures into practice once permits granted. New regulations might cause resistance from this stakeholder group (NOS, 2022). It is therefore important to reflect on the solution and its effect on farmers. This reflection will be done by including an applicant's perspective in the user journey in the form of a scenario (Yoo & Younghwan, 2014). The scenario will be used in the imagine phase and reflected back upon throughout the process.

One of the focus points of this project is implementation of the solution. As it is unclear how complex the proposition will become, it is difficult to say how far the solution can be realized and implemented during the project duration. For this reason, the pressure cooker conducted before the project will show what possible solutions look like. Through discussion with experts, expectations about implementation are aligned, so the project work and scope remain focused and manageable.

Motivation

Within my master's degree I focus on User & Society (US) and Business & entrepreneurship (BE). With a focus on service design, social innovation and UX design. This project fits my interest as it designs for a user process with different user needs (US) and includes stakeholder management and strategizing (BE). This is done with stakeholders in the public sector to create societal impact.

Goals

Within this project I want to develop myself by conducting a design process focusing holistically on a societal problem, while creating a feasible and effective solution (systemic design). This requires me to move more efficiently through the design phases. I therefore want to learn how to set up and conduct a design sprint. Following the design sprint, I want to carefully to choose the right deliverable for realization suitable for the project duration. While managing expectations well with stakeholders.

I tend to prefer quantity over quality when conducting design activities. My goal is therefore to more carefully choose design activities. I therefore hope to stick to the design activities proposed in here and work each one out in more detail.

I am familiar with multi-stakeholder projects; however, I hope to improve my level of communication towards stakeholders. My goal is to deliver a well-considered, clear and useful project. Including a strategy that can effectively be used by the GGD to fully implement the solution.

B.

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

Ethical Review Form

(Version 2.1)

This Ethical Review Form should be completed for every research study that involves human participants or personally identifiable personal data and should be submitted to ethics@tue.nl. For more information about how this process works please click here. Please check if you are using the correct form: Ethical Review Form (version 2.1). Please click here to obtain this latest version.

Part 1: General Study Information

1	Project title / Study name	Designing a risk management tool for GGD's and municipalities. To prevent introduction and spread of Zoonotic diseases within livestock farming.
2	Name of the researcher / student	Niek van den Berk
3	Email of the researcher / student	n.j.a.j.v.d.berk@student.tue.nl
4	Supervisor(s) name(s) *Additional explanation: Please write down the name of your direct supervisor. You can mention several supervisors if appropriate, but at least one supervisor should be mentioned.*	Lu Yuan
5	Supervisor(s) email address(es) *Additional explanation: Please give the email address of the supervisor(s) mentioned in question 4.*	y.lu@tue.nl
6	Department / Group *Additional explanation: Please specify group if relevant e.g. JADS or HTI*	Industrial Design Systemic Change
7	What is the purpose of this application?	☐ Scientific study ☐ Bachelor education. Course:…… ☒ Master education. Course:…… ☐ Other (e.g. external, following external regulations):……
8	Research location *Additional explanation: Where will the data collection take place? On campus, in a company, in public space, online, etc.*	☒ Eindhoven University of Technology campus ☐ Other, name organization(s):…… ☐ Public space ☐ Online
9	Start date data collection *Additional explanation: Please state when your data collection will start. Please note that you do not have to provide information about your complete (PhD) project, but only on this particular sub-study that you are submitting for approval in this form.*	23-02-2024
10	End date data collection	03-02-2024
11	Does your project receive external funding (e.g., NWO, relevant for special regulations from funders)?	☐ Yes. Name Funder: ☒ No

12	Which internal and external parties are involved in the study? Think about sharing data or information between TU/e and other universities, commercial companies, hospitals, etc. *Additional explanation: Describe all internal and external parties that are involved in the study or project, including;* • *researchers or research groups at the TU/e who participate in the study;* • *(Researchers at) other universities/institutions that provide data/services, help analyzing the data, etc.;*	Internal parties • Researcher(s): • Supervisor: Lu Yuan

	• *(commercial) partners, companies, government bodies, municipalities, consultancy firms, hospitals or care institutions that provide data (e.g., contact details of participants, data for further analysis).* *Indicate which role each party plays: who defines the means and purposes in the study, who will supply the data (external parties?), who will process/handle the data, who will be able to access the data during and after research (only researchers at TU/e or also others)?*	External parties • Other universities/institutions: • Others: GGD Brabant-Zuidoost, Municipality in Brabant (yet to determine)
13	Have any special agreements already been made with an external party, such as a Non-Disclosure Agreement (NDA) or a data sharing agreement?	☐ Yes, namely: ☒ No
14	Has your proposal already been approved by an external Ethical Review Board or Medical Ethical Review Board? *Additional explanation: For example, when you are collaborating with another university and the project has been approved by their Ethical Review Board, or when you received a WMO-waiver from a Medical Ethical Review Board.*	☐ Yes ☒ No
15	If yes: Please provide the name, date of approval and contact details of the ERB. Please also include the registered number for your project approval. Additionally, please send in the Ethical Review Form upon which ethical approval was granted together with this form.	/
16	If you process personal data that are likely to result in high privacy risks for participants, you need to perform a Data Protection Impact Assessment (DPIA). Have you done this for this or a very similar project? ***Please read the information below: a DPIA is not the same as a regular privacy impact assessment. More detailed questions on privacy will follow in the section below.*** *Additional explanation: A Data Protection Impact Assessment (DPIA) is a formal document that must be drafted under the guidelines of the General Data Protection Regulation (GDPR). Think of research with vulnerable people, high-risk medical research, The Dutch DPA (Autoriteit Persoonsgegevens) and our website provides more information about a DPIA.*	☒ Not applicable (no high privacy risks) ☐ Yes (the form is attached to the application) ☐ No
	Part 2: Medical study	
1	Does the study have a medical scientific research question or claim? *Additional explanation: Medical/scientific research is research which is carried out with the aim of finding answers to a question in the field of illness and health (etiology, pathogenesis, signs/symptoms, diagnosis, prevention, outcome or treatment of illness), by systematically collecting and analyzing data. The research is carried out with the intention of contributing to medical knowledge which can also be applied to populations outside of the direct research population. If your research contains questions about health and health related parameters (such as well-being, vitality, feelings of anxiety or stress) but your research question is not primarily medical, then you can answer 'no' to this question.*	☐ Yes* ☒ No *If yes or in doubt, please contact Susan Hommerson via s.m.hommerson@tue.nl

	Part 3: Use of (medical) devices in the study	
1	Does your research include a device? *Additional explanation: A device is a complete piece of physical hardware that is used to compute or support computer functions within a larger system. Devices can be divided into input-, output-, storage-, internet of things-, or mobile device.*	☐ Yes, not self-made ☐ Yes, self-made ☒ No
2	Please describe your device or link to an online description of the device	
3a	Will you use a device that is 'CE' certified for **unintended use** (meaning you will use existing CE certified devices for other things than they were originally intended for) or use a device that is not 'CE' certified? *Additional explanation: You can find more information about CE certification here*	☐ Yes ☒ No ☐ ☐
3b	If no: Please explain to what extent the device was assembled according to relevant standards and provide a risk assessment *Additional explanation: You can find more information about a risk assessment here*	/
3c	If yes: Do you use a device or software that has a medical purpose such as diagnosis, prevention, monitoring, prediction, prognosis, treatment or alleviation of disease or injury?	☐ Yes, my device or software currently has a medical purpose ☐ Yes, my device or software could have a medical purpose in the near future ☒ No ☐ I'm not sure
	Part 4: Information about the study	
1	What are your main research questions? *Additional explanation: You need to provide at least one clear research question.*	How to design a risk management tool for municipalities and the GGD using the identified measures by the earlier project 'Boer en Verstand', to prevent introduction and spread of Zoonotic diseases within livestock farms ?
2a	Please check the box that indicates the relevant study population *Additional explanation: Please select which persons are eligible for your study.*	☐ Students ☒ General healthy population ☐ General population with specific feature, e.g., pregnancy, specifically ..... ☐ Patients, specifically ……..... ☐ Other, specifically ……
2b	Age category of participants	☐ Younger than 12 years of age ☐ Older than 11 and younger than 16 years of age ☒ 16 years or older
3	Description of the research method (select all that applies)	☒ (Semi-structured) interviews ☐ Surveys

	Additional explanation: Please specify your research method. Note that you need to provide information about the research method in an additional file that you attach to the ERB form. E.g., for interviews you provide the interview questions, for surveys you provide the survey questions, etc.	☒ Group workshops/roundtable discussions ☐ Diary studies ☐ Behavioral observations ☐ Building sensor data ☐ Wearable device (e.g. Fitbit watch, on-skin sensors) ☒ User testing ☐ Pilot study ☐ GPS tracking/location data ☐ Living Lab ☐ Other, namely ……
4	Description of the measurements and/or stimuli/treatments *Additional explanation: Think about your outcome measures and the variables you will be collecting and describe them in a way such that another person understands what the participant will experience. For example: Participants will perform task A and see pictures from database B, and we measure validated Scale 1.*	Participants will map out a process with a paper exercise showing the process of current risk management. Participants will perform several exercises in a group to brainstorm ideas to create a risk management tool. This will be done using paper and pen exercises. Participants will use a digital, UX prototype and give feedback on the prototype and discuss the solution.
5	Describe and justify the number of participants you need for this study. Also justify the number of observations you need, taking into account the risks and benefits. *Additional explanation: Think about if you need 3 or 30 participants for example, and why? Do they need to provide their input once, or several times, and why? If relevant, specify the duration of the study per participant and the compensation that is needed for the study.*	Around 10 participants. 6 from the GGD/RIVM 4 from the municipality. Not many employees at both GGD and municipalities are involved in the advisory process so it is an expert focused research.
6	Explain why your research is societally important. What benefits and harm to society may result from the study? *Additional explanation: What benefit will the results of your study have to society in general?*	The research is societally important as it can help with the prevention of infectious disease spreading within livestock farming. The harm it may cause is risks not being assessed thoroughly through which infectious diseases can spread within livestock farming. Causing animals to be killed.
7	Describe the way participants will be recruited *Additional explanation: How will you recruit participants for your study? For example, by using flyers, personal network, panels, etc.*	☐ Survey link posted online, e.g., social media platforms ☐ On campus flyers ☐ Personal network ☐ Via a company, namely …….. ☐ Via a hospital, namely …….. ☒ Via an organization GGD ☐ By a Consortium Partner, namely …….. ☐ Other, namely …….
8	Provide a brief statement of the risks you expect for the participants or others involved in the study and explain. Also take into consideration any personal data you may gather and associated privacy issues. *Additional explanation: Risks for the participants can be anything from risk of data breach to risk of safety or well-being (think about stress, extreme emotions, visual or auditory discomfort). Describe these possible risks and describe the way these risks are mitigated.*	Data sharing risks between stakeholders. If stakeholders ask for any data of the interviews the results will either be completely anonymized or checked by my coaches at the GGD for any conflicting data. My coaches at the GGD are not participants themselves. Privacy sharing risks: all information will therefore be stored on TU/e systems and removed after the dates indicated on the consent form.

Part 5: Self-assessment checklist

	Note: answers in the blue boxes indicate that your research is eligible for fast-track approval	Yes	No
1a	Does the study involve human material? (e.g., surgery waste material derived from non-commercial organizations such as hospitals)		x
1b	Will blood or other (bio)samples be obtained from participants? (e.g., hair, sweat, urine or other bodily fluids or secretions, also external imaging of the body)		x
2	Will the participants give their consent – on a voluntary basis – either digitally or on paper? Or have they given consent in the past for the purpose of education or for re-use in line with the current research question?	x	
3	Are the participants, outside the context of the research, in a dependent or subordinate position to the investigator? Additional explanation: Think about doing research on your own students or on your own employees. When there is a dependency or power imbalance between you and the research participants, you need to answer 'yes' to this question.		x
4	Does the study involve participants who are particularly vulnerable or unable to give informed consent? (e.g., children (<16 years of age), people with learning difficulties, patients, people receiving counselling, people living in care or nursing homes, people recruited through self-help groups)		x
5	Will participating in the research be burdensome? (e.g., requiring participants to wear a device 24/7 for several weeks, to fill in questionnaires for hours, to travel long distances to a research location, to be interviewed multiple times)?		x
6	May the research procedure cause harm or discomfort to the participant in any way? (e.g., causing pain or more than mild discomfort, stress, anxiety or by administering drinks, foods, drugs, or showing explicit visual material)		x
7	Will financial inducement (other than reasonable expenses and compensation for time) be offered to participants? Additional explanation: For an explanation of what is considered a reasonable compensation, see the topic participant fees from the HTI group		x
8a	Will it be necessary for participants to take part in the study without their knowledge and consent at the time? (e.g., covert observation of people)		x
8b	If yes: Will you be observing people without their knowledge in public space? (e.g. on the street, at a bus-stop)		x
9	Will the study involve actively deceiving the participants? (e.g., will participants be deliberately falsely informed, will information be withheld from them, or will they be misled in such a way that they are likely to object or show unease when debriefed about the study)		x
10	Will participants be asked to discuss or report sexual experiences, religion, alcohol or drug use, suicidal thoughts, or other topics that are highly personal or intimate? Additional explanation: Think about your research population. For some participants, particular topics can be considered sensitive or intimate, whereas the same topics will not be perceived as such by other participants.		x
11	Elaborate on all boxes answered outside of the blue boxes in part 5. Describe how you safeguard any potential risk for the research participant.		

Part 6: Self-assessment on privacy

The following questions (1-11) concern privacy issues, as laid down in the General Data Protection Regulation (GDPR). The Data Stewards and – if necessary – privacy team of TU/e will assess these questions. In some cases, more information is required to assess the privacy risks. If this is the case, you will be notified that the Data Stewards team will contact you.

The GDPR defines 'personal data' as any information relating to an identified or identifiable natural person ('data subject'). Personal data also includes data that indirectly reveals something about a natural person. Personal data can lead to the physical, physiological, genetic, mental, economic, cultural or social identity of a natural person. There are two main categories of personal data: regular personal data and special category personal data.

If you are not sure whether some of these questions below should be answered with a Yes or No, please contact a Data Steward first through rdmsupport@tue.nl.

	Note: answers in the blue boxes indicate that your research is eligible for fast-track approval	Yes	No
1	Will the study involve discussion/collection/processing of **regular** personal data, or will you collect and (temporarily) store video or voice recordings for the purpose of conducting interviews? *Additional explanation: For example, name, address, phone number, email address, IP address, gender, age, video or interview recordings? If you are not sure whether your data contains personal data, please contact the Data Stewards Team (rdmsupport@tue.nl).*	x	
1A	If yes: Please describe which regular personal data you will collect in this study?	Name, email, phone number, audio recording of the interview, photos (will be anonymized and just used for the academic report)	
2	Will the study involve discussion/collection/processing of **special category** personal data or other **sensitive data**? *Additional explanation: Examples of special category personal data are race, religion, health information, political views, genetic or biometric data for the unique identification of a person, sexual preference, etc. Health information concerns personal data of the physical or mental health of persons, including the provision of health care. Examples of other sensitive data is information such as communication data, financial records or credit scores, camera surveillance data, location/GPS data, internet-of-things data, employee monitoring, observing or influencing behaviour, criminal records, data of vulnerable persons (children, people with disabilities, refugees), BSN number etc. Please be aware that the use of special category personal data in research requires extra security measurements in order to safeguard the privacy of data subjects and to comply with the GDPR. Processing of this special category data is prohibited, except for specific purposes and under certain circumstances. If you need to process special category data, please consult the data stewards at rdmsupport@tue.nl.*		x
2A	If yes: Please describe which special-category personal data and/or sensitive data you will collect in this study?		

If you answered yes to either question 1 or 2, please answer the questions below. If you answered no to both questions, you can skip this part and continue onto part 7. Also, if an answer to any of the following questions is 'yes', please contact a Data Steward at rdmsupport@tue.nl

		Yes	No
3	Will your project involve the processing of personal data on a **large scale**? *Additional explanation: In general, any processing that involves more than 10.000 data subjects should be considered "large scale". However, if the data of approximately 1000 persons (or more) are involved, the data processing may still be considered large scale. In that case, besides the number of persons involved in the study, one should also assess (i) the amount of data collected from these persons taking into account the type/risk level of the personal data, (ii) the duration of the data processing, (iii) the geographic scope or extent of the processing. For example, if you would collect and process data across several European countries with 10+ socio-economic data items of 1200 individual persons for several years in a row, that is likely "large-scale processing". Other examples of a large-scale processing activity are:* • *Monitoring driving behavior of road users on Dutch highways* • *Collecting data of Covid patients* • *A hospital that processes patient data as part of its usual operations*		x

	• *A transport company that processes travel information of people who travel by public transport in a certain city. For example, by tracking them through travel maps.*		
4	Does this processing activity involve the use of new or innovative technologies? *Examples of a new technology: combining fingerprints and facial recognition for physical access control, the use of bodycams in public spaces, the use of new technical methods in conducting research such as AI. This question also refers to new technologies that have not been deployed by TU/e so far.*		x
5	Does your study involve systematic (c.q. automated) monitoring of persons? *Additional explanation: Consider data processing activities that have the purpose of observing, monitoring or controlling individuals, for example in circumstances where the individuals are not aware by whom their personal data is collected and how it is used. Examples of such activities are using camera systems to monitor driving behavior on highways, monitoring email inactivity or employee phone use, certain applications of machine learning and artificial intelligence.*		x
6	Does the study involve collaborations (with third parties) in which data are shared or exchanged in order to link or combine data? *Additional explanation: This may often apply in a collaboration between the university and a commercial party, contract research, etc. It is important to assess this for all data in the entire project, not just your own data. An important consideration in this situation is whether the person whose data is involved could have expected that data from these different databases or sources of information were to be combined. For example, it is less likely for data subjects to expect that databases from different parties will be combined and the results are used for different purposes than one could reasonably expect; this may apply for example in a collaboration between the university and a commercial party.*		x
7	Will the study include data processing activities that prevent data subjects from exercising their rights or using a service or contract? *Additional explanation: Examples include processing operations carried out in public places that people cannot avoid (train station, airport, shopping mall, public university premises, etc.) or processing operations whose purpose is to allow or not allow data subjects to use a service or enter into a contract (examples: by refusing to pay a benefit, not being able to apply for a loan, etc.).*		x
8	Will the study process personal data to score, rank or profile persons? *Additional explanation: Examples: monitoring (highway) roads to give road users a "score" based on their detected driving behavior, a bank assessing its customers based on their creditworthiness, or an organization building behavioral and marketing profiles based on use of their website or navigating their website.*		x
9	Does your data processing include activities that involves composing "**blacklists**" – and, in particular, in relation to sensitive or special category data, such as communication data, financial records or credit scores, genetic data, biometric data, health data, camera surveillance data, location/GPS data, internet-of-things data, employee monitoring, observing or influencing behaviour, etc. *Additional explanation: This situation will not be a common occurrence in research, but you may indirectly be involved in this. In general, this typically concerns processing operations involving personal data relating to criminal convictions and offences, data relating to unlawful acts, data concerning unlawful or annoying behaviour or data concerning bad payment behaviour by companies or individuals are processed and shared with third parties (blacklists or warning lists, as used, for example, by insurers, hospitality companies shopping companies, telecom providers as well as blacklists relating to unlawful behavior of employees, for example in the healthcare sector or by employment agencies, etc.).*		x
10	Will personal data be transferred or shared outside the EU/EEA? EU data protection rules apply to the European Economic Area (EEA), which includes all EU countries and non-EU countries Iceland, Liechtenstein and Norway. *Additional explanation: The GDPR has drafted additional requirements for transfers data outside of the EU/EEA. Typically, additional safeguards must be implemented to protect the personal data of residents in the European Union. For example, if you collaborate with an American, Indian or Chinese university or other third party outside the EU/EEA, you must first check whether this is allowed and under which conditions this is allowed. Another typical example is storage of data on American providers of cloud (storage) services. Please contact the data stewards first to discuss this.*		x
11	Will any raw or anonymized personal data or any other sensitive data or research results from the project possibly be transferred to a high-risk country*? ***High risk countries**: China, Russia, Iran, Turkey, and North Korea.* *If personal data or other potentially sensitive data is exchanged with one of these countries, or if part of the data processing takes place in one of these countries: **an advice from the Data Protection Officer, the kennisveiligheidsteam (Knowledge Security team), and the CISO (Chief Information Security Officer) is ALWAYS required.***		x

Part 7a: Processing of research data

1	Is consent your legal basis for processing the personal data in your study? *Additional explanation: What is a legal basis? One of main principles in the GDPR is to ensure that personal data is processed lawfully, fairly, and transparently. To comply with this principle, the processing of personal data also requires that you have a valid legal basis for the personal data processing activity.* *In research projects, the legal basis is often but not always consent. However, it is possible that it is not clear or not possible to establish whether to use consent as a legal basis.* *Some examples where consent may not be applicable as legal basis are covert research, data collection in public spaces, secondary data analysis of existing data, data that are transferred to you by a third party, consent is not possible or would require disproportionate effort, etc. In that case, please indicate which legal basis you think that applies or (preferably) contact a data steward first.*	☒ Yes and it will be obtained via …… An informed consent template* is attached to this application. ☐ No, I will use another legal basis to process the data. Namely, …….. * You can download a suitable template **here**.
2	Where will the data come from?	☐ Data obtained from another party (secondary data use) ☒ New data collected only by my research team ☐ New data collected together with collaborators
3	Which of the following tools will you use to process personal data?	**Surveys** ☐ Qualtrics ☐ Limesurvey ☐ MS Forms ☐ Other, namely …….. **Interview/workshop recordings** ☐ Voice/video recorder ☒ Phone in a flight mode ☐ MS Teams ☐ Other, namely …….. **Transcription** ☐ Manual transcription ☒ Microsoft Office software (e.g. Word, Teams) ☐ Other, namely …… **Statistical analysis** ☐ SPSS ☐ R ☐ Other, namely …… **Other tools**, specifically……..
4	Where will the data and in particular the personal data be stored during and after completion of the study? If you have already uploaded your Data Management Plan, you can refer to your Data Management Plan.	☐ SURF drive ☒ Onedrive ☐ Research Drive ☐ Network Drive

	Additional explanation: University supported-storage facilities are SURFdrive, SURF Research Drive, departmental drives (this includes BE Project Drive), and the TU/e instance of Microsoft OneDrive. For most personal data, the use of SURF Research Drive, departmental drives (including BE Project Drive) and SURFdrive is required.	☐ Research Manager ☐ Other, namely ……

Part 7b: Safety and security measures

1	Will you pseudonymize/anonymize the data? *Additional explanation:* *Anonymization: remove all direct identifiers (name, address, telephone number etc.) but also indirect identifiers (age, place of birth, occupation, salary) that, linked with other information, can lead to a person's identification. Anonymization to the point that a data subject is no longer identifiable means that the anonymized data is not considered to be personal data anymore.* *Pseudonymization: replacing the unique identifier of a data subject with an artificial pseudonym. This means that identification is still possible with the identification key. The identification key needs to be stored securely and separately from the pseudonymized data. If the data subject can be identified by combining data with additional information, the data is also called pseudonymous.*	☒ Yes ☐ No If yes, describe how: All personal information will be removed from the interview transcriptions. Only questions will be asked about the employee function. Not about personal situation. The function of the participant will be removed from the interview data and stored separately. In this way the interview data will be fully anonymized.
2	Is access to (personal) data restricted? (Select all that apply)	☐ No ☐ Yes, via access control ☐ Yes, via password protection ☐ Yes, access only given to TU/e research team ☒ Yes, access only given to research team, including non-TU/e collaborators ☐ Other, specify……
3	Who will have access to the data during and after completion of the project? (Select all that apply)	☒ Main researcher ☒ TU/e supervisor(s) ☒ External supervisors ☐ TU/e research team ☐ Other, specify……
4	Will you store data for future research?	☐ No ☐ Yes, in a public data repository ☒ Yes, in a public data repository under restricted access ☒ Yes, in a TU/e-recommended storage (SURF Research Drive, Network Drive)
5	Will you share data outside the TU/e?	☐ No ☒ Yes, in a fully anonymized form ☐ Yes, raw or pseudonymized data* *If you selected this box, make sure that a suitable data agreement is put in place. You can contact the Data Stewards for support in preparing such an agreement
6	How long will data be stored after the end of the project?	Not, all data will be removed after the project is graded and finished.

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

Ethical Review Form

Part 8: Closures and Signatures

1	Enclosures (tick if applicable and attach to this form):	☒ Informed consent form ☐ Informed consent form for other agencies when the research is conducted at a location (such as a school) ☐ Text used for ads (to find participants) ☐ Text used for debriefings ☐ Approval other research ethics committee ☐ The survey the participants need to complete, or a description of other measurements ☐ Data Protection Impact Assessment checked by the privacy officer ☐ Data Management Plan checked by a data steward
2	Signature(s)	Signature(s) of applicant(s):  Date: 19-02-2024 Signature research supervisor:  Date: 19-02-2024

Berk, Niek van den

Van: Severens, Marjolein namens Ethics
Verzonden: Tuesday, 20 February 2024 14:23
Aan: Berk, Niek van den
Onderwerp: RE: ERB form M22 project - Niek van den Berk

Dear Niek,

Your application (ERB2024ID14) has been approved by the ERB.

We assume that you have answered all questions correctly. We will perform regular spot-checks so you need to keep your documentation (ERB form, informed consent forms, surveys/interview questions, description of experiment/prototype etc.) available for at least 6 months.

Good luck!

Dear regards,

Marjolein Severens
ERB student assistent

From: Berk, Niek van den <n.j.a.j.v.d.berk@student.tue.nl>
Sent: Tuesday, February 20, 2024 2:16 PM
To: Ethics <Ethics@tue.nl>
Subject: RE: ERB form M22 project - Niek van den Berk

Dear Ethics,

Excuse me! Forgot that. It is attached.

Kind regards,
Niek van den Berk

Van: Severens, Marjolein <m.j.e.severens@student.tue.nl> **Namens** Ethics
Verzonden: Tuesday, 20 February 2024 14:14
Aan: Berk, Niek van den <n.j.a.j.v.d.berk@student.tue.nl>
Onderwerp: RE: ERB form M22 project - Niek van den Berk

Dear Niek,

Thank you for you application. Could you send the informed consent form to complete you application?

Dear regards,

Marjolein Severens
ERB student assistent

From: Berk, Niek van den <n.j.a.j.v.d.berk@student.tue.nl>
Sent: Monday, February 19, 2024 4:53 PM
To: Ethics <Ethics@tue.nl>
Subject: ERB form M22 project - Niek van den Berk

Dear Ethics TU/e,

Hereby my ERB form for my Final master project for Industrial Design. It is signed by my coach Lu Yuan.
I hope everything is okay.

Kind regards,
Niek van den Berk

C.

GGD:

IZB:

- Nog meerdere onafhankelijke artsen spreken hiernaast, Bij meer collega's in de rest van Nederland van IZB navragen.

Functie	Status	Expertise project
Arts MG BZO	Meeting gehad	Zat in klankbord groep
Verpleegkundige BZO	Interview gehad	Nog nooit advisering gedaan
Arts MG, Limburg Noord	Wil niet meewerken aan project	Expert
Hart van Brabant, Arts	Interview gehad	
Hart van Brabant, Arts	Interview gehad	
West-Brabant	Interview gehad	
West-Brabant	Gemaild misschien langere tijd afzwezig	

GMV:

- Nog meer experts spreken bij GMV die niets van het project weten
  Even nagaan of ik nog meer mensen van GMV moet spreken, IZB en GMV is vrij gescheiden. In Brabant Zuidoost wordt er wel veel samen gewerkt met GMV.

Functie	Status	Expertise project
Trekker van de advisering	Interview gehad	Weet minder van het project af Weet veel over advisering

- Mensen bij ruimtelijke ordening. Aanvraag komt bij ruimtelijke ordening of omgevingsdienst.
- Contacten: Landelijke werkgroep Veehouderij en Gezondheid?

Functie	Status	Expertise project
Gemeente Someren	Teruggeverd, nu teamleader dus wil/kan niet meewerken	
Gemeente Deurne	Geinteresseerd maar uitgevallen dus wachten tot April met interview Nog steeds terugbelverzoek	
Kempengemeenten	Terugbelverzoek	
Gemeente Oisterwijk (1 dag) Omgevinsdienst Midden- en West Brabant		
Gemeente Son en Breugel	Mail doorgestuurd naar collegas	
Gemeente Asten vergunningaanvragen	Re-direct	
Beleidsmedewerker Gemeente Asten	Geen interesse	
Gemeente Deurne	Gemaild vanuit Lu Yuan	
Gemeente Nederweert	Gemaild vanuit Lu Yuan	
Gemeente Aan en Maas	Gemaild vanuit Lu Yuan	

Gemeente Gemert-Bakel	Gemaild	
Gemeente Asten	Gemaild	

Omgevingsdienst

Functie	Status	Expertise project
Coordinator vergunningverlening Omgevingsdienst Zuidoost Brabant	Interview gehad	
Omgevingsdienst Midden West Brabant	Mail ontvangen	
Omgevingsdienst Noordoost Brabant	Gemaild	
Coördinator Vergunningverlening	Gemaild	

Provincie

Interessant voor BZV

Functie	Status	Expertise project
Team leader health & Policy	Gemaild	

veehouderij en ook nu voorzitter van de GGD werkgroep veehouderij		
Adviseur Milieu & Gezondheid	Interview gehad	Expert
MMK deskundige bij GGDrU		

RIVM (Nog niet zeker):

Functie	Status	Expertise project
Zit nu op Zoönose stuk, onderzoeker, dierenarts	Interview gehad	
MD public health infectious disease control	Mailen → Kan mail niet vinden	
Topexpert bij Z&O op het gebied van zoonosen, en trekker van de VGO projecten		
Dierenarts en werkzaam bij de LCI van het RIVM		

Gemeente:

advisor agriculture		
Strategist Agriculture, Health and Environment	Gemaild	
Brabantse Zorgvuldigheids score	Mailen (Later?)	

D.

- Wat zijn de belangrijkste uitdagingen bij de advisering?
- Wanneer zou de advisering tussen de GGD en de gemeente volgens jou verbeterd zijn?

Nog nooit advies gedaan

- Waarom hou je je op dit moment niet bezig met advisering voor aanpassingen van of nieuwe veehouderijen?
- Hoe denk je dat je in de toekomst betrokken kunt zijn bij de advisering?
- Waar zou de advisering voor jou aan moeten voldoen? Heb je daar een idee over?

Maatregelen:

Ooit advies gedaan, Nog nooit advies gedaan

Bij deze vragen ligt de focus op de werkwijze met de documenten van het project 'Boer & Verstand', niet op de inhoud van de documenten zelf.

- Ben je bekend met de resultaten en maatregelen geïdentificeerd in het project 'Boer en Verstand'?
  - Zo ja, gebruik je deze richtlijnen?
    - Zo ja, hoe heeft dit de werkwijze veranderd? En hoe ervaar je dit? Waar vind je deze documenten?
    - Zo nee, waarom niet?
- Wat vind je van de documenten met maatregelen die zijn opgesteld?
  - Hoe kun je deze documenten in de werkwijze toepassen? En in welke vorm?
  - Wat zou je verbeteren aan de documenten?
  - Op welke plek zou je deze maatregelen willen vinden? Hoe zou je deze documenten willen vinden?
  - Voor welke partijen vind je dat de maatregelen toegankelijk moeten zijn?

Betrekken van boeren:

Ooit advies gedaan

- Hoe ziet de communicatie naar boeren eruit naar aanleiding van het advies van de GGD? Heb je daar een idee over?
- Wat zou er verbeterd kunnen worden aan de communicatie naar boeren n.a.v. het advies van de GGD?

Interview opzet – Boer & Verstand vervolgproject

GGD (Experts):

Introductie:

Ooit advies gedaan, Nog nooit advies gedaan

- Kun je je rol en verantwoordelijkheden binnen … omschrijven?
  - Hoe lang doe je dit werk al binnen deze functie?
- Ben je ooit onderdeel geweest van het adviseringsproces naar gemeenten over het zoönose risico binnen veehouderijen?

Proces:

Ooit advies gedaan

- Kun je me meenemen door de stappen binnen van het adviseringsproces voor aanpassingen aan en voor nieuwe veehouderijen?
  - Welke obstakels ervaar je binnen dit proces?
  - Wat gaat er goed?
  - Wat kan er beter?
- Met wie sta jij in contact binnen het adviseringsproces?
  - Van wie krijg je informatie binnen? En wat vind je hier van?
  - Wie is er verantwoordelijk voor het adviseringsproces?
- Welke middelen, kanalen of tools gebruik je momenteel om het zoönose risico in kaart te brengen? En waarom?
- Hoe beoordeel je momenteel de risico's met betrekking tot zoönose binnen aanvragen over uitbreiding van veehouderij?
- Hoe ervaar je de samenwerking tussen jouw afdeling, andere afdelingen en de gemeente?
- Waarom ben je nieuwsgierig naar het eindadvies van gemeenten naar boeren?
- Op wat voor manier zou die je die terugkoppeling willen krijgen?

Nog nooit advies gedaan

- Welke stappen zou je ondernemen als je advies zou doen over het zoönoserisico binnen veehouderijen? Heb je daar een idee over?
  - Van wie zou je informatie verwachten? En op welke manier?
  - Wie zou jij contacten binnen dit proces?
- Via welke kanalen of tools zou je het zoönose risico in kaart brengen? En waarom?

Advisering:

Ooit advies gedaan

- Hoe gaat de advisering momenteel volgens jou?
  - Wat kan er beter? En waarom?
  - Hoe kan de advisering volgens jou kwalitatief verbeterd worden?
- Hoe zorg je dat je weet wat je moet doen wanneer je een aanvraag krijgt?
- Hoeveel tijd neemt de advisering in beslag? Wat vind je hiervan?
- Wat is de frequentie van de aanvragen van aanpassingen aan of van nieuwe veehouderijen?

Interview opzet gemeenten en Omgevingsdiensten – Boer & Verstand vervolgproject

Introductie:

Ooit advies gedaan, Nog nooit advies gedaan

- Kun je je rol en verantwoordelijkheden binnen … omschrijven?
  - Hoe lang doe je dit werk al binnen deze functie?
- Ben je ooit onderdeel geweest van het proces met GGD'en en ondernemers over het zoönose risico binnen veehouderijen?

Proces:

Ooit advies gedaan

- Kun je me meenemen door de stappen binnen van het adviseringsproces voor aanpassingen aan en voor nieuwe veehouderijen?
  - Welke obstakels ervaar je binnen dit proces?
  - Wat gaat er goed?
  - Wat kan er beter?
- Met wie sta jij in contact binnen het adviseringsproces?
  - Van wie krijg je informatie binnen? En wat vind je hier van?
  - Wie is er verantwoordelijk voor het adviseringsproces?
- Welke middelen, kanalen of tools gebruik om het advies van de GGD te verwerken? En waarom?
- Hoe beoordeel je momenteel de risico's met betrekking tot zoönose binnen aanvragen over uitbreiding van veehouderij?
- Op welke manier wordt het zoönose risico gecommuniceerd naar de verschillende partijen binnen het proces?
- Hoe ervaar je de samenwerking tussen jouw afdeling, andere afdelingen en de GGD?
- Hoe weet je wat je moet doen met het advies vanuit de GGD? Is het proces duidelijk?

- Waarom ben je nieuwsgierig naar het advies van GGD'en?
- Op wat voor manier zou die je terugkoppeling willen krijgen van verschillende partijen?

Nog nooit advies gedaan

- Welke stappen zou je ondernemen als je advies zou doen over het zoönoserisico binnen veehouderijen? Heb je daar een idee over?
  - Van wie zou je informatie verwachten? En op welke manier?
  - Wie zou jij contacten binnen dit proces?
- Via welke kanalen of tools zou je het zoönose risico in kaart brengen? En waarom?

Advisering:

Ooit advies gedaan

- Hoe gaat de advisering momenteel volgens jou?
  - Wat kan er beter? En waarom?
  - Hoe kan de advisering volgens jou kwalitatief verbeterd worden?
- Wat zijn de belangrijkste uitdagingen bij de advisering?
- Hoeveel tijd neemt de advisering in beslag? Wat vind je hiervan?
- Wat is de frequentie van de aanvragen van aanpassingen aan of van nieuwe veehouderijen?
- Wanneer zou de advisering tussen de GGD en de gemeente volgens jou verbeterd zijn?
- Hoe verhoud het zoönose advies zich tot de advisering op andere gebieden die de GGD beoordeeld?

Nog nooit advies gedaan

- Waarom hou je je op dit moment niet bezig met advisering voor aanpassingen van of nieuwe veehouderijen?
- Hoe denk je dat je in de toekomst betrokken kunt zijn bij de advisering?
- Waar zou de advisering voor jou aan moeten voldoen? Heb je daar een idee over?

Maatregelen:

Ooit advies gedaan, Nog nooit advies gedaan

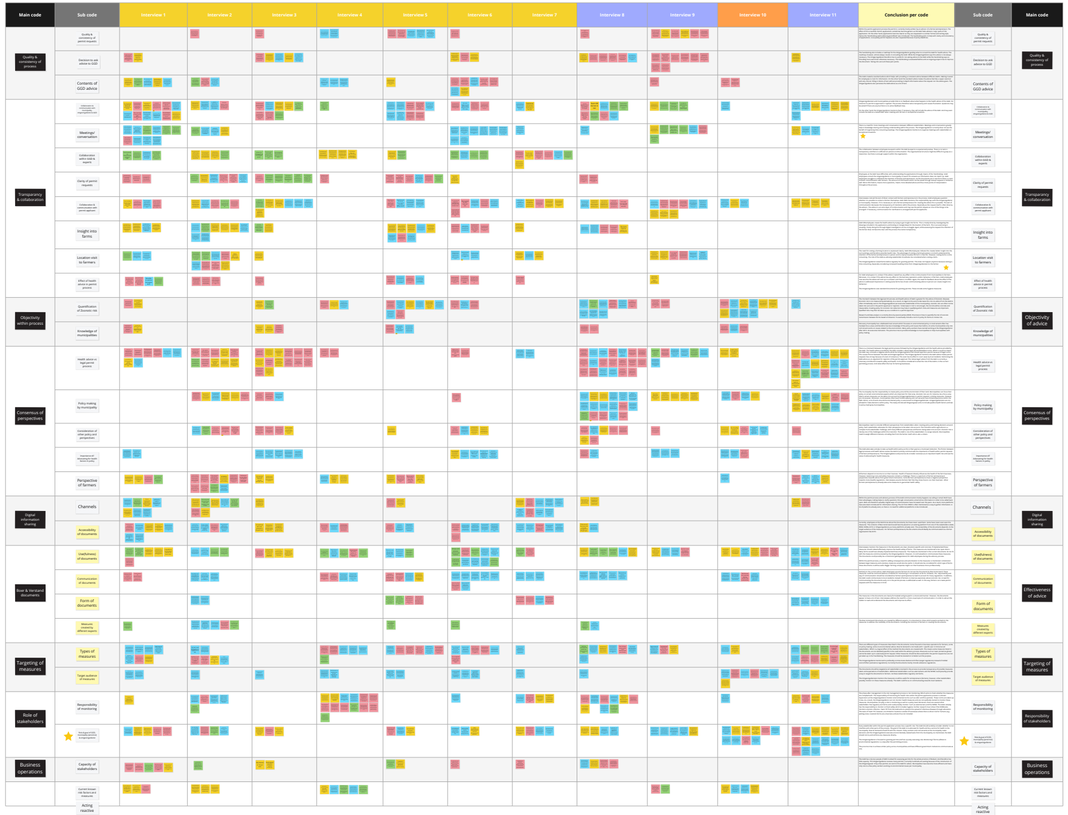
- Ben je bekend met de resultaten en maatregelen geïdentificeerd in het project 'Boer en Verstand'?
  - Zo ja, gebruik je deze richtlijnen?
    - Zo ja, hoe heeft dit de werkwijze veranderd? En hoe ervaar je dit? Waar vind je deze documenten?
    - Zo nee, waarom niet?
- Wat vind je van de documenten met maatregelen die zijn opgesteld?
  - Hoe kun je deze documenten in de werkwijze toepassen? En in welke vorm?
  - Wat zou je verbeteren aan de documenten?
  - Op welke plek zou je deze maatregelen willen vinden? Hoe zou je deze documenten willen vinden?
  - Voor welke partijen vind je dat de maatregelen toegankelijk moeten zijn?

Betrekken van boeren:

Ooit advies gedaan

- Hoe ziet de communicatie naar boeren eruit naar aanleiding van het advies van de GGD? Heb je daar een idee over?
- Wat zou er verbeterd kunnen worden aan de communicatie naar boeren n.a.v. het advies van de GGD?

E.



F.

Interviews

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

Toestemmingsformulier

Dit document biedt informatie over het interview binnen het vervolgproject 'Boer & Verstand', welke onderdeel is van een individuele opdracht die wordt uitgevoerd door Master afstudeer student Niek van den Berk voor de GGD Brabant-Zuidoost en de faculteit Industrial Design aan de Technische Universiteit Eindhoven. De studentgroep die dit onderzoeksproject uitvoert bestaat uit de volgende leden: Niek van den Berk. Voordat we beginnen is het van belang dat u weet wat de procedure gedurende het interview en dat u uw toestemming geeft voor vrijwillige deelname. Gelieve dit document zorgvuldig door te lezen.

Het doel van het interview is om informatie te verzamelen over de behoeftes van medewerkers bij verschillende afdelingen van de GGD en andere betrokken partijen. Om zo het adviseringsproces tussen de GGD Brabant-Zuidoost en gemeenten te verbeteren voor zoönose risico binnen veehouderijen.

Uw deelname aan dit onderzoek is geheel vrijwillig. U bent vrij om deelname te weigeren zonder enige reden hiertoe te geven, en u kan uw deelname gedurende elk moment tijdens het interview ontzeggen. Zulke beslissingen zullen geen negatieve consequenties met zich meebrengen.

Het interview bevat geen risico's of nadelige bijwerken.
Het interview zal waarschijnlijk 30 minuten duren.

Vertrouwelijkheid

Wij zullen geen persoonlijke informatie over u delen met iemand buiten dit onderzoeksteam. De informatie die we van u verspreiden op basis van het interview zal worden gebruikt voor het itereren op de tool en het maken van bevindingen. Ook zullen sommige bevinden misschien alvorens gepresenteerd worden aan verschillende betrokken partijen. Deze informatie zal geheel anoniem worden verwerkt en kan niet terug worden getraceerd naar u. Alleen de onderzoekers zullen uw identiteit kennen. Een audio opname zal tijdens het interview worden gemaakt die u kunnen identificeren. De opnames zullen worden opgeslagen op systemen goedgekeurd door de TU. De opnames zullen na het project is afgelopen (begin Juli) worden verwijderd. Er worden eventueel foto's gemaakt tijdens het interview. De onderzoeker zal er voor zorgen dat u niet herkenbaar op beeld staat. Mocht dit wel het geval zijn wordt u geanonimiseerd op de foto's door middel van digitale software. Als u ontevreden bent over de manier waarop er met de privacy van uw data wordt omgegaan, kunt u een klacht indienen bij de Chief Information & Security Officer, de Privacy & Security Officer en/of de Data Protection Officer van de Technische Universiteit Eindhoven via privacy@tue.nl, of door contact op te nemen met de Dutch Data Protection Authority.

Meer informatie

Als u meer informatie over het project wil opvragen waar dit onderzoek onderdeel van uitmaakt, kunt u contact opnemen met mijn begeleider y.lu@tue.nl

Certificaat van toestemming

Ik geef toestemming om mijn gegevens te gebruiken voor educatie en onderzoek doeleinde. Ik begrijp gegevens deze data anoniem zullen worden verwerkt.

- Ik **geef toestemming** aan de onderzoeker om audio op te nemen ten behoeve van transcriberen en analyse. Ik begrijp dat deze gegevens geanonimiseerd zullen worden verwerkt.
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- Ik **geef toestemming** aan de onderzoeker om beeldmateriaal te maken tijdens het interview. Ik begrijp dat deze beelden geanonimiseerd zullen worden verwerkt.
- Ik **geef GEEN toestemming** aan de onderzoeker om beeldmateriaal te maken tijdens het interview. Ik begrijp dat deze beelden geanonimiseerd zullen worden verwerkt.
-

Ik, (naam)..... heb dit toestemmingsformulier gelezen en begrepen en ik heb de kans gekregen om vragen te stemmen. Ik stem in met vrijwillige deelname in dit onderzoek dat wordt uitgevoerd door de master afstudeer student Industrial Design aan de Technische Universiteit Eindhoven.

Handtekening participant

Datum

Co-creation session

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

Toestemmingsformulier

Dit document biedt informatie over de sessie binnen het vervolgproject 'Boer & Verstand', welke onderdeel is van een individuele opdracht die wordt uitgevoerd door Master afstudeer student Niek van den Berk voor de GGD Brabant-Zuidoost en de faculteit Industrial Design aan de Technische Universiteit Eindhoven. De studentgroep die dit onderzoeksproject uitvoert bestaat uit de volgende leden: Niek van den Berk. Voordat we beginnen is het van belang dat u weet wat de procedure gedurende het interview en dat u uw toestemming geeft voor vrijwillige deelname. Gelieve dit document zorgvuldig door te lezen.

Het doel van de sessie is om informatie te verzamelen over de nieuwe richting van Boer & Verstand om deze zo impact te laten maken binnen een bepaalde context. Om zo de insleep, uitstoot en verspreiding van zoönosen binnen veehouderijen te verminderen.

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Vertrouwelijkheid

Wij zullen geen persoonlijke informatie over u delen met iemand buiten dit onderzoeksteam. De informatie die we van u verspreiden op basis de sessie zal worden gebruikt voor het creëren van bevindingen en scenario's om zo de documenten uit Boer & Verstand te implementeren. Deze informatie zal geheel anoniem worden verwerkt en kan niet terug worden getraceerd naar u. Alleen de onderzoekers zullen uw identiteit kennen. Een audio opname zal tijdens het interview worden gemaakt die u kunnen identificeren. De opnames zullen worden opgeslagen op systemen goedgekeurd door de TU. De opnames zullen na het project is afgelopen (begin Juli) worden verwijderd. Er worden eventueel foto's gemaakt tijdens de sessie. De onderzoeker zal er voor zorgen dat u niet herkenbaar op beeld staat. Mocht dit wel het geval zijn wordt u geanonimiseerd op de foto's door middel van digitale software. Als u ontevreden bent over de manier waarop er met de privacy van uw data wordt omgegaan, kunt u een klacht indienen bij de Chief Information & Security Officer, de Privacy & Security Officer en/of de Data Protection Officer van de Technische Universiteit Eindhoven via privacy@tue.nl, of door contact op te nemen met de Dutch Data Protection Authority.

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Handtekening participant

Datum

Evaluation

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

Toestemmingsformulier

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Het doel van de evaluatie is om informatie te verzamelen over de strategie die gemaakt is n.a.v. de strategische brainstorm sessie gefocust op interventies die GGD'en kunnen nemen om zo de insleep, uitstoot en verspreiding van zoönosen binnen veehouderijen te verminderen. Deze strategie zal geëvalueerd worden binnen deze sessie.

Uw deelname aan dit onderzoek is geheel vrijwillig. U bent vrij om deelname te weigeren zonder enige reden hiertoe te geven, en u kan uw deelname gedurende elk moment tijdens het interview ontzeggen. Zulke beslissingen zullen geen negatieve consequenties met zich meebrengen.

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Het interview zal waarschijnlijk 30 minuten duren.

Vertrouwelijkheid

Wij zullen geen persoonlijke informatie over u delen met iemand buiten dit onderzoeksteam. De informatie die we van u verspreiden op basis de sessie zal worden gebruikt voor het evalueren van de strategie (Horizon kaart). Deze informatie zal geheel anoniem worden verwerkt en kan niet terug worden getraceerd naar u. Alleen de onderzoekers zullen uw identiteit kennen. Een audio opname zal tijdens het interview worden gemaakt die u kunnen identificeren. De opnames zullen worden opgeslagen op systemen goedgekeurd door de TU. De opnames zullen na het project is afgelopen (begin Juli) worden verwijderd. Er worden eventueel foto's gemaakt tijdens de sessie. De onderzoeker zal er voor zorgen dat u niet herkenbaar op beeld staat. Mocht dit wel het geval zijn wordt u geanonimiseerd op de foto's door middel van digitale software. Als u ontevreden bent over de manier waarop er met de privacy van uw data wordt omgegaan, kunt u een klacht indienen bij de Chief Information & Security Officer, de Privacy & Security Officer en/of de Data Protection Officer van de Technische Universiteit Eindhoven via privacy@tue.nl, of door contact op te nemen met de Dutch Data Protection Authority.

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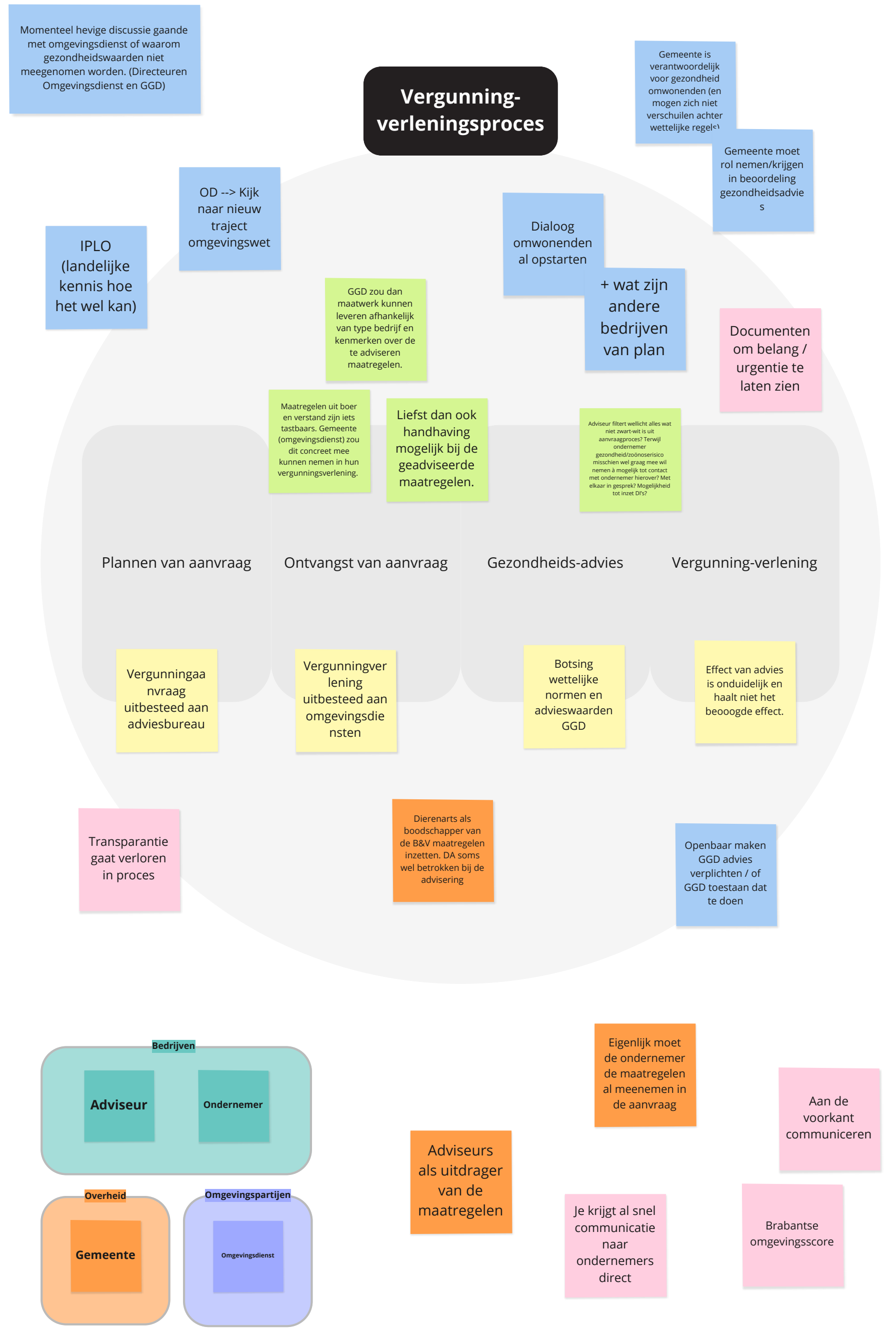
Handtekening participant

Datum

F.

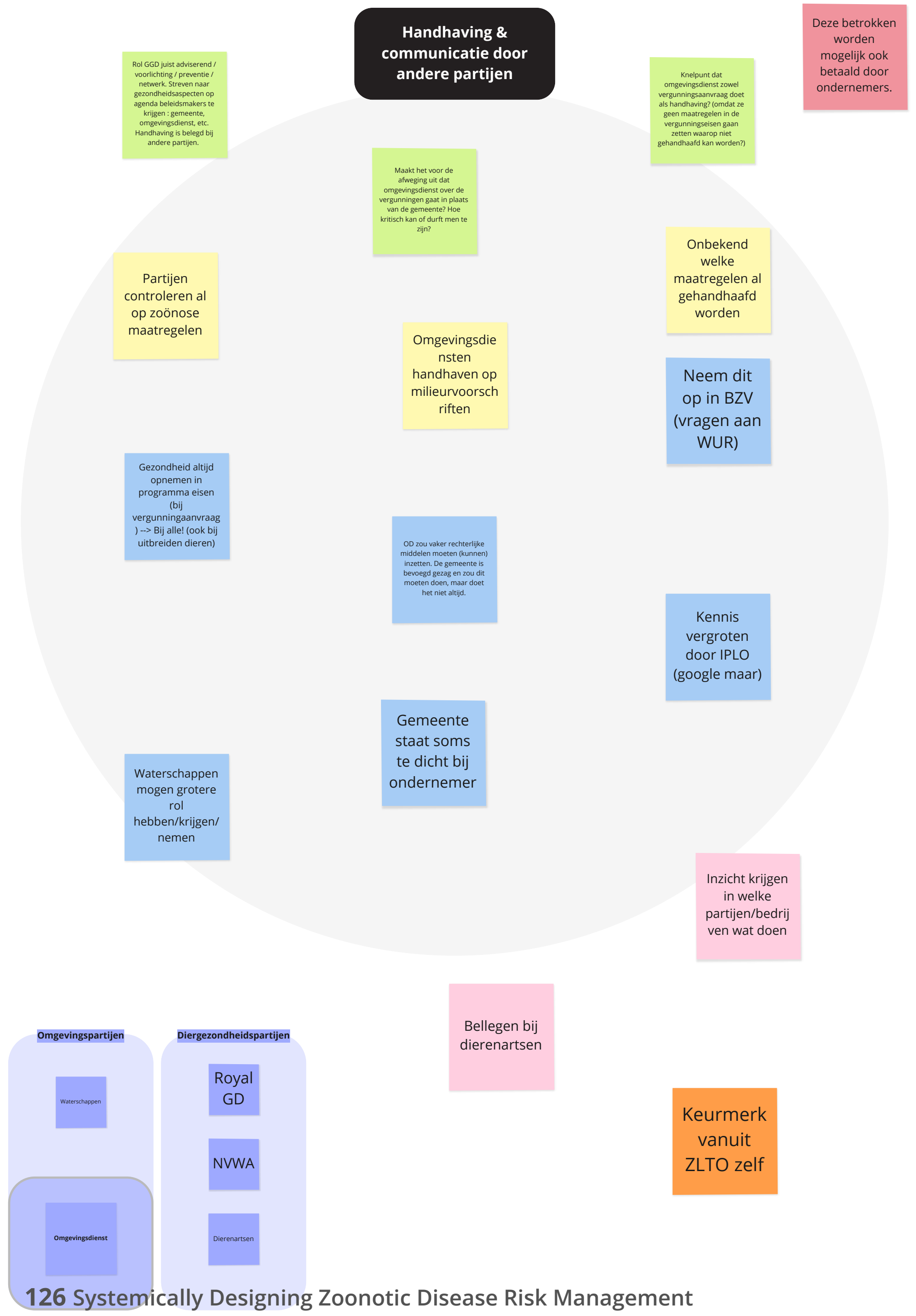
Creeëren Omgevingsbeleid
Er zijn genoeg plekken om kennis te halen dus hoger prioriteren
Tekort aan kennis en capaciteit bij gemeenten
Rekening houden met veel perspectieven
DPG'en op de barricades (ook pandemische paraatheid in Brabant)
Provincie ondersteunt gemeenten
Inbrengen B&V in herziening BZV
Daarnaast IZA/GALA en recent media-aandacht voor onderzoeken pneumonie/luchtvervuiling rondom veehouderijen à Momentum mee.
Gezondheid in beleid door omgevingswet
Omgevingsvisies met deadline in 2030
Idealiter beleid maken met kwantitatieve waarden
Nu juist window of opportunity om gezondheidsaspecten vergunningen veehouderij op het netvlies van gemeente en provincie te krijgen. (vanwege omgevingsbeleid en omgevingswet).
GGD moet harder duwen op impact gezondheid
GGD actief (evt ongevraagd) visie naar gemeenten blijven uitdragen.
Maak van de de visie een plan (visie is hoogover, een plan moet meetbaar zijn)
Als GGD'en in Brabant (+L) samen optrekken in dit onderwerp: Top onderwerp voor de DPG'en
Gemeentelijke overleggen
Maak B&V ook voor bestaande bedrijven minimale eis
Gezondheids-makelaars
Doen al dingen bij jeugdgezondheidszorg
Ondersteunend document
Overheid
Provincie
Ministeries (VWS, LNV)
Gemeente



Momenteel hevige discussie gaande met omgevingsdienst of waarom gezondheidswaarden niet meegenomen worden. (Directeuren Omgevingsdienst en GGD)
Vergunning-verleningsproces
Gemeente is verantwoordelijk voor gezondheid omwonenden (en mogen zich niet verschuilen achter wettelijke regels)
Gemeente moet rol nemen/krijgen in beoordeling gezondheidsadvies
IPLO (landelijke kennis hoe het wel kan)
OD --> Kijk naar nieuw traject omgevingswet
Dialoog omwonenden al opstarten
+ wat zijn andere bedrijven van plan
GGD zou dan maatwerk kunnen leveren afhankelijk van type bedrijf en kenmerken over de te adviseren maatregelen.
Documenten om belang / urgentie te laten zien
Maatregelen uit boer en verstand zijn iets tastbaars. Gemeente (omgevingsdienst) zou dit concreet mee kunnen nemen in hun vergunningsverlening.
Liefst dan ook handhaving mogelijk bij de geadviseerde maatregelen.
Adviseur filtert wellicht alles wat niet zwart-wit is uit aanvraagproces? Terwijl ondernemer gezondheid/zoönoserisico misschien wel graag mee wil nemen à mogelijk tot contact met ondernemer hierover? Met elkaar in gesprek? Mogelijkheid tot inzet DI's?
Plannen van aanvraag
Ontvangst van aanvraag
Gezondheids-advies
Vergunning-verlening
Vergunningaanvraag uitbesteed aan adviesbureau
Vergunningverlening uitbesteed aan omgevingsdiensten
Botsing wettelijke normen en advieswaarden GGD
Effect van advies is onduidelijk en haalt niet het beooogde effect.
Transparantie gaat verloren in proces
Dierenarts als boodschapper van de B&V maatregelen inzetten. DA soms wel betrokken bij de advisering
Openbaar maken GGD advies verplichten / of GGD toestaan dat te doen
Bedrijven
Adviseur
Ondernemer
Overheid
Gemeente
Omgevingspartijen
Omgevingsdienst
Eigenlijk moet de ondernemer de maatregelen al meenemen in de aanvraag
Adviseurs als uitdrager van de maatregelen
Aan de voorkant communiceren
Je krijgt al snel communicatie naar ondernemers direct
Brabantse omgevingsscore

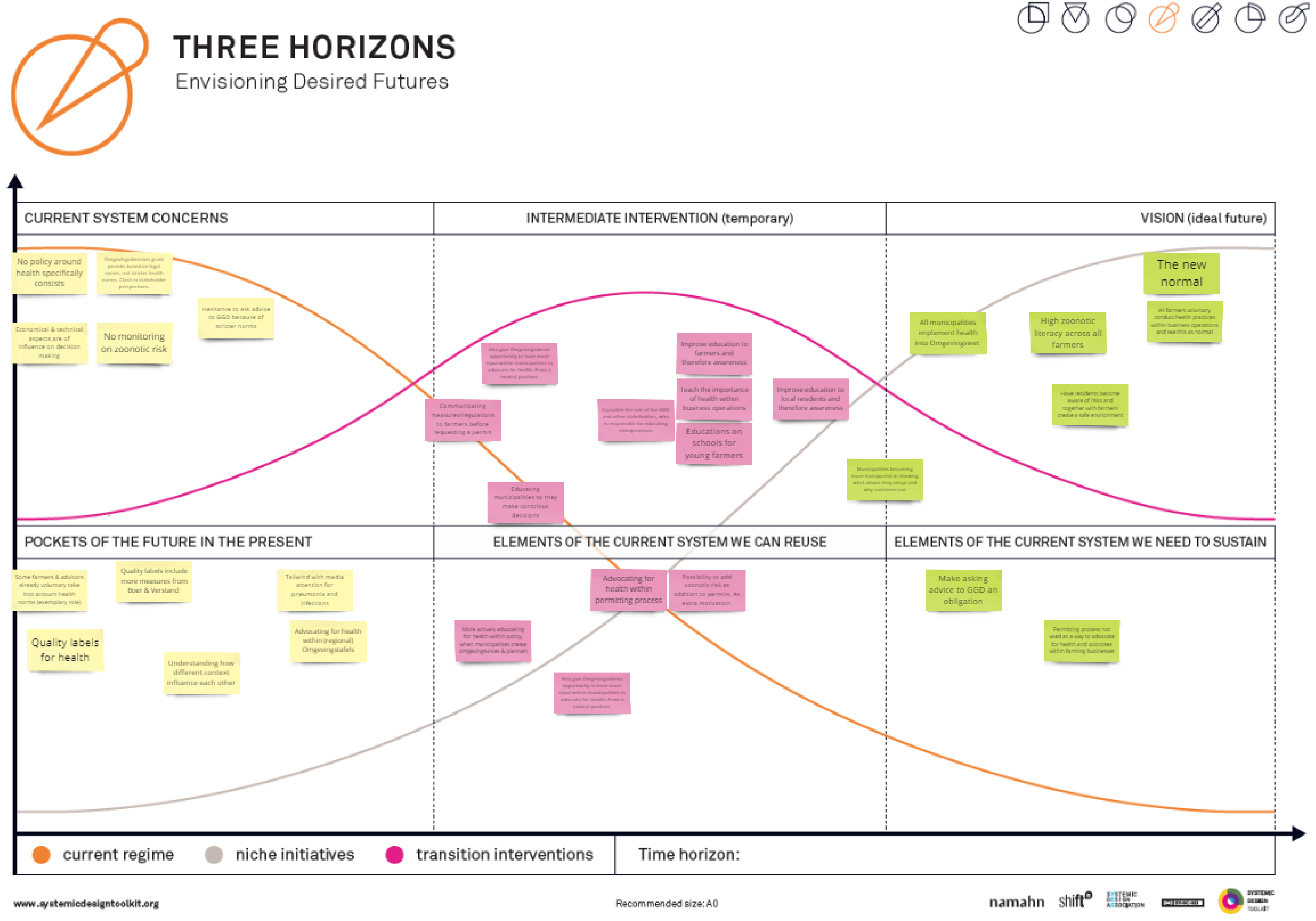
Communicatie & voorlichting voor ondernemers
Wat is het voordeel voor de ondernemer? Voelt de ondernemer dit ook?
Samen met 1 of 2 ZLTO ondernemers scholen over maatregelen uit B&V
Nagaan waar de ondernemer op zit te wachten in plaats van direct zenden
Onderwerp maken voor de HAS gastles
Organiseren van bedrijfsbezoeken naar voorbeeld bedrijven
Vooraan het vergunning proces
'Koe' die-bags voor de ondernemer
"Positieve gezondheid in de leefomgeving" dialoog instrument bij knelpunten
DMV ZLTO cursus of aansporing
E-learning of iets anders dat aansluit bij de ondernemers
Partijen communiceren al
Infectiepreventie en zoönoserisico's voorlichting algemeen (los van vergunningsaanvraag
Belangenorganisatie
ZLTO
Bedrijven
Adviseur
Ondernemer

Communicatie & voorlichting voor burgers
Publiek/buren kunnen de 'controleur' van de maatregelen zijn
Ondernemers: "Wij werken op deze manier"
Zichtbaar (= reclame voor je zorgvuldigheid) maken voor publiek dat je je aan de maatregelen houdt, kan aantrekkelijk zijn.
Omwonenden krijgen een stem
Kunnen burgers er iets mee?
BKZ??
Zoönosegelleterdheid bij burgers
Meer de dialoog opzoeken (open bedrijf voor omwonenden)
Maatregelen opnemen in keurmerk zoönosen (GD)
Taak gemeente
Welke bedrijven zorgen voor het grootste risico?
Burgers
Omwonenden
Bezoekers



Handhaving & communicatie door andere partijen
Deze betrokken worden mogelijk ook betaald door ondernemers.
Partijen controleren al op zoönose maatregelen
Omgevingsdie nsten handhaven op milieurvoorsch riften
Onbekend welke maatregelen al gehandhaafd worden
Neem dit op in BZV (vragen aan WUR)
Kennis vergroten door IPLO (google maar)
Gemeente staat soms te dicht bij ondernemer
Waterschappen mogen grotere rol hebben/krijgen/ nemen
Inzicht krijgen in welke partijen/bedrijven wat doen
Bellegen bij dierenartsen
Keurmerk vanuit ZLTO zelf
Omgevingspartijen
Diergezondheidspartijen
Royal GD
NVWA

G.



THREE HORIZONS
Envisioning Desired Futures
CURRENT SYSTEM CONCERNS
INTERMEDIATE INTERVENTION (temporary)
VISION (ideal future)
No monitoring on zoonotic risk
The new normal
Educations on schools for young farmers
POCKETS OF THE FUTURE IN THE PRESENT
ELEMENTS OF THE CURRENT SYSTEM WE CAN REUSE
ELEMENTS OF THE CURRENT SYSTEM WE NEED TO SUSTAIN
Quality labels for health
Make asking advice to GGD an obligation
current regime
niche initiatives
transition interventions
Time horizon:
www.systemicdesigntoolkit.org
Recommended size: A0
namahn