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Uncovering governance culture in the Dutch railway sector between 2010 and 2020

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ABSTRACT

This paper explores how interorganisational culture shapes executive decision-making under uncertainty in the Dutch railway sector between 2010 and 2020. Addressing a gap in transport policy research, this study focuses on governance culture in this fragmented, complex, multi-actor system. The study uses a qualitative case study approach to analyse the collective responses of the Ministry of Infrastructure, NS, and ProRail to unexpected events that create uncertainty. The findings show a dominant orientation toward “being in control,” reflected in a shared belief that uncertainty should be managed through the production and analysis of precise information. In periods of declining performance, the Ministry enforced collaboration on NS and ProRail, leading to alternating patterns of collaboration and cooperation. The paper contributes a methodological approach to studying governance culture in complex sociotechnical systems and highlights its importance in shaping responses. These insights support policymakers in designing governance reforms that align with the interorganisational culture.

1. Introduction

This single-case study explores the culture of executive decision-making in the Dutch railway sector from 2010 to 2020. The Dutch governance context is often characterised as consensus-oriented (Hofstede et al. 2010, 340). The Dutch railway system is governed by three core actors: the Ministry of Infrastructure, ProRail (the infrastructure manager), and NS (the main passenger operator). The Ministry funds infrastructure and awards performance-based concessions to ProRail and NS. The arrangement has a long, shared history. The operator and infrastructure roles were separated in 1995 following EU Directive 91/440, while remaining the NS holding. ProRail, as a fully separate infrastructure manager, was established in its current form in 2005. The introduction of competitive tendering on peripheral lines brought new passenger operators onto the network (Veeneman 2016).

The issues where railway infrastructure and operations meet, and where decisions most directly shape system performance, are organised in different governance settings across Europe. Countries differ, above all, in how far they separate infrastructure from operations, and thus in where the strategic trade-offs between track and train are made (Van de Velde 2015). At one end, Switzerland manages track and train within a

single organisation, the Swiss Federal Railways (SBB), which coordinates them internally. Germany and France have vertically integrated holding groups (Deutsche Bahn and SNCF) that can manage some of the trade-offs between infrastructure and operations within a single organisation. Britain has split its railways into an infrastructure manager, franchised operators and rolling-stock companies, and is now reintegrating some of those functions into Great British Railways. In the Netherlands, infrastructure and operations are institutionally separate. ProRail and NS are linked by a stable relationship rather than a single corporate structure. This takes the form of a tripartite relationship and a practice known as “aligned steering”, under which some identical objectives and KPIs are assigned to both NS and ProRail in their concession contracts, encouraging them to work together towards the same goals. What an integrated railway company can coordinate internally, the Dutch system coordinates across organisational boundaries. Strategic trade-offs between infrastructure and operations are worked out in the triangle of NS, ProRail and the Ministry. Under continuing pressure from the European Union to open the railway market, the Dutch railway governance is now being re-examined, a change that would affect NS most as the national incumbent carrier.¹

Culture is a broad term with a plethora of definitions and uses in both

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¹ Ministry of Infrastructure and Water Management. 2025. *Voortgang Programma Toekomstige Marktordening Spoor* [Progress of the Future Rail Market Ordering Programme]. Letter to the House of Representatives, 10 April 2025. The Hague.

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everyday language and scientific work. This single-case study aims to make governance culture visible and to fill the knowledge gap in transport research, where culture is often overlooked. It provides a methodology for studying the culture of governance systems that are technologically complex, institutionally fragmented, and composed of multiple public and private actors with divergent goals, interests, and perceptions (Stamsnijder et al. 2026). We treat the railway system as a complex sociotechnical system (De Bruijn and Herder 2009), comprising physical-technical elements and networks of interdependent, reflective actors that continuously interact. Regularly, decision-makers of various interdependent organisations are confronted with unexpected events creating uncertainty, and the urgent need to decide and act. The aim of this study is to understand how culture drives these decisions. It does this by pinpointing the dominant values and beliefs driving decision-making through a coded analysis of collective responses to unexpected events that create uncertainty for the actors involved. The insights from this case study are relevant for governments that manage their (national) transportation companies and for operators and infrastructure managers preparing for future changes in policy and governance.

1.1. Definitions and literature

Culture has been a residual category in transport-governance research, which has centred on institutional design, market liberalisation, regulation and performance. Culture is treated as secondary, even though cultural elements such as trust, shared professional norms, and collaboration practices are important in organisations that are strongly interdependent (Stamsnijder et al. 2026). Studies of governance cultures in regional public transport find culture to be an important factor influencing the purpose, outcomes and collaborative practices (Hansson 2013; Paulsson et al. 2017), and informal institutions help actors negotiate the constraints of formal institutions and can become leading when contracts fall short (Rye et al. 2018; Dementiev and Alexandersson 2024).

For this paper, we define **culture** as: “a set of beliefs and values shared by members of organisations cooperating in a system, shaping collective behaviours and decision-making”. This definition is tailor-made for organisations working together within a complex sociotechnical system (De Bruijn and Herder 2009; Stamsnijder et al. 2026, 2). We draw on Schein's ([1985] 2017) understanding of culture. Our definition is framed in terms of shared beliefs and values and does not itself name the deepest level of underlying assumptions. We aim to reach that level analytically by inferring the underlying assumptions from the combination of coding and interviews.

We define **governance** as: “the rule sets that condition the interactions between actors with a diverse set of interest while making shared decisions”. This definition is based on Veeneman's (2021) definition, emphasising that governance exists to manage a plurality of values that often evolve over time and may conflict with one another (Stamsnijder et al. 2026, 2). These definitions sit within Williamson's framework, which distinguishes four levels of social analysis (Williamson 1999, 2000, 596–97; Veeneman 2021). Social embeddedness, encompassing culture, is the informal level that changes slowly and influences the formal institutional environment and the contractual arrangements. We believe that culture manifests itself at every governance level, and that these levels respond to one another (Erez and Gati 2004).

We define **uncertainty** as “the (shared) experience of unavailability of effective ways forward after a critical event, calling for interpretation and (collective) action”. This definition encompasses both unforeseeable events and calculable risks that produce uncertainty when they materialise. We grounded this definition and the coding responses in the literature on uncertainty and its responses. Brugnach et al. (2008) characterise uncertainty as relational and multi-dimensional, separating the type of uncertainty (unpredictability, incomplete knowledge, and multiple knowledge frames) from its object. Dewulf and Biesbroek (2018) distinguish three natures of uncertainty: ambiguity, ontological

uncertainty, and epistemic uncertainty and three objects of uncertainty: substance, strategies or institutions, and use these to yield a matrix with nine different types of uncertainties. Zandvoort et al. (2019) found that collaboration influenced the handling of uncertainty and constrained adaptive responses. Machiels et al. (2021) explain how uncertainty avoidance can be understood as an institutionalised practice, routinised in formal and informal institutions. This literature underpins the ‘cultural’ factor of uncertainty and its influence on informal institutions. Because culture is relational, it influences actor behaviour in a complex sociotechnical system. Based on McNamara's (2012) framework, we distinguished three modes of structuring interactions: cooperation, coordination, and collaboration. We adapted these modes as a basis for coding to fit the purpose of this case study, informed by Castañer and Oliveira's (2020) systematic literature review.

1.2. Research questions

We assume that interorganisational culture becomes visible in collective responses to unexpected events that create uncertainty. In such situations, predefined rules provide limited guidance, leaving underlying values and beliefs as the drivers of a response (Stamsnijder et al. 2026). By analysing both the responses and the arrangements of mutual interaction, we identify patterns that reveal the underlying culture. Our main research question is:

- How does interorganisational culture drive executive decision-making towards specific interactions and outcomes within the Dutch rail sector?

Our four sub-questions are:

1. What do the deliberations between the Dutch Ministry of Transport, NS, and ProRail tell us about their response to events that caused uncertainty?
2. What interaction patterns do the Dutch Ministry of Transport, NS, and ProRail exhibit in the way they organise their responses?
3. Do their responses and interaction patterns differ depending on the type of uncertainty? If so, how?
4. What are the cultural values and beliefs that underpin decision-making and collaborative practices among NS, ProRail, and the Ministry of Transport, based on the observed responses to unexpected events that create uncertainty?

2. Methodology: Single-case study, process tracing and coding

This single-case study focuses on the culture of executive decision-making of organisations that together manage a complex (socio) technological system, i.e. their interorganisational processes (Koppenjan and Groenewegen 2005). Deliberations within the relevant organisations were not studied. We chose to study the interrelations between the Dutch Ministry of Transport, NS, and ProRail, specifically from 2010 to 2020, as a case study. The formal governance overseeing their interrelations during this time frame was stable, as there were no substantial changes in legislation or concession contract-awarding procedures, and no large organisational transformations that could influence the behaviour of the actors. There were several problems with the quality of the shared delivery of rail services during this period.

Following an extensive search, we did not find any specific methodology for studying the culture of complex governance systems, and very limited literature on the culture of public transport governance (Stamsnijder et al. 2026). We considered Actor-Network Theory as an analytical lens for studying the network (Latour 2005), but set it aside because we isolated culture by holding the network stable, focusing on three actors, and keeping the analytical focus on the cultural dynamics in their negotiations over time. We used concepts and insights from the broader academic literature to build the case for the Dutch main rail

network on how culture drives actors to deal with uncertainties in a specific way. This study adopts a single-case study approach (Yin 1981, 2009; Myers 2013; Swanepoel 2019), which is appropriate in the inductive phase of this topic's empirical cycle. The case is developed through a process-tracing approach (Beach 2020) and a longitudinal analysis based on multiple sources. In line with that, we take a hybrid grounded theory approach, in which iterative coding of responses across several rounds drives theory development by filling the existing gap (Pearse and Kanyangale 2009; Swanepoel 2019). This is realised through the Gioia methodology (2013), an iterative data-theory approach recommended by hybrid grounded theory, which shows the dynamic relationships among emergent concepts derived from the data that describe or explain the phenomenon under study, and makes all relevant data-to-theory connections visible.

2.1. Data collection, coding process, and validation through interviews

The core methodology for this case study is a coded analysis of the minutes of a quarterly meeting among high-level representatives of the Dutch Ministry of Transport, ProRail, and NS, followed by interviews with participants in this tripartite consultative body. Participants in most meetings include members of the executive boards, directors of ProRail and NS, the Secretary of State, directors of the Ministry, and advisors of NS and ProRail and senior civil servants involved in preparing these meetings. These quarterly meetings were first initiated in response to significant winter weather disruptions in 2010. This regular tripartite consultative body has remained on the agendas of the three actors to the present day and has gradually developed into an informal institution. In line with Dutch culture, the agendas and minutes are developed through a collaborative process aimed at reaching agreement. We chose to end the case study in 2020 to exclude the disruptive influence of COVID-19, while also allowing participants to formulate retrospective insights during the interviews. The coding of unexpected events that created uncertainty was guided by the observed actions (what) and the arrangement of mutual interactions (how) in relation to the chosen way forward, agreed upon during these meetings. The coding is carried out in the following five steps:

1. **Longitudinal analysis through timeline construction and coding** of unexpected events creating uncertainty, based on minutes of quarterly meetings, and categorising into: 1. Operational problems, 2. Safety incidents, 3. Large projects and programmes, and 4. Governance issues. This categorisation emerged during the timeline construction of the uncertainties, and helped to present the data more effectively to the interviewees;
2. **Presentation of this timeline** in nine interviews with meeting participants and key players involved in their preparation and follow-up;
3. **Identification of the main events creating uncertainty**, based on the aggregated interview results and the minutes, while ensuring to have at least one in each of the categories identified in the first step, so we can assess if the responses differ based on the sort of uncertainty;
4. **Recoding the responses to the main events creating uncertainty** based on interviews in line with our framework, in two ways;
 - a. *Coding of actions of the actors (what)*
 - b. *Coding of the arrangement of mutual interactions (how)*
5. **Analysing the tables of coded actions and the arrangement of mutual interactions** to identify patterns and draw generalisable conclusions about the underlying cultural values and beliefs that drive these responses and interactions, to be able to infer the underlying assumptions that shape the governance culture.

The first round coded all uncertainties in the minutes to build the timeline and create an overview of responses. This was necessary because these events differ widely in scale and frequency and are not

mutually exclusive. A pattern emerged: most responses were control-oriented (either predict-and-control or damage-control). Reliability rests on triangulation of the minutes and interviews, with coding by three researchers who reasoned to consensus. The coding of these main uncertainties was enriched with interview data and documentation, where available. The interviewees were selected to represent all three organisations, thereby minimising bias. We asked the interviewees whether they agreed with the representation of events in the compiled timeline and to elaborate on what they perceived as the main unexpected events that created uncertainty during the timeframe studied. We asked about their perceptions of the experienced uncertainty, whether interorganisational 'struggles' arose, and the problems that had to be solved. In addition, the interviewees were asked follow-up questions to generate insight into the underlying values and beliefs that drove the collective responses to these unexpected events that created uncertainty. These interviews were essential in interpreting the evidence from the minutes, as minutes alone do not fully capture the actors' situational perceptions or cultural drivers. Our coding process is outlined in the flowchart in Fig. 1.

2.2. Coding the responses to unexpected events that create uncertainty

Informed by literature about uncertainty (Brugnach et al. 2008; Dewulf and Biesbroek 2018; Zandvoort et al. 2019; Machiels et al. 2021), we developed a framework with seven responses to uncertainty, which we list in our coding guide (Table 1).

2.3. Coding the arrangement of mutual interactions of the responses to uncertainty

This part of the coding process covers how actors interact and organise their joint responses to unexpected events that create uncertainty. The code is based on McNamara's (2012) framework and on Castañer and Oliveira's (2020) systematic literature review. We paid particular attention to the presence of centralised control through hierarchical decision-making structures, the degree of system integration and resource sharing among the actors, and the level of trust developed among the organisations. This gives us insight into the power dynamics. On that basis, we defined the three terms:

Cooperation is the organisation of activities to ensure they run smoothly and efficiently, thereby achieving a common goal. Each organisation follows its own internal decision-making process. Basic information is shared informally between members of the organisations involved. Partnerships develop at the lowest levels, and leaders are not involved (McNamara 2012). We did not expect to see many examples of cooperation in the minutes, as our study focuses on executive decision-making. Uncertainties that can be managed through lower-level cooperation are unlikely to be discussed in executive meetings.

Coordination is defined as formalised agreements and central decision-making through hierarchical structures. There is a form of centralised control. The policies to govern the collective arrangement may be developed by higher authorities. Resources, such as time and money, are used to pursue individual goals (McNamara 2012). The Ministry of Infrastructure is the hierarchical governance party in this case study. It has contracts with both NS and ProRail. An example of coordination is when the Ministry assigns a (joint) task to NS and ProRail.

Collaboration is a deeper process where actors share power arrangements. It does not arise autonomously. Policies governing a collective arrangement are developed jointly by the participants. There is open and frequent communication through formal and informal channels. Decision-making is participatory, and system integration is used to achieve a collective outcome that might not be possible individually. Trust between participants is needed to sustain relationships (McNamara 2012). Collaboration is the most intense form of working together. The actors need to share power, and collaboration places high

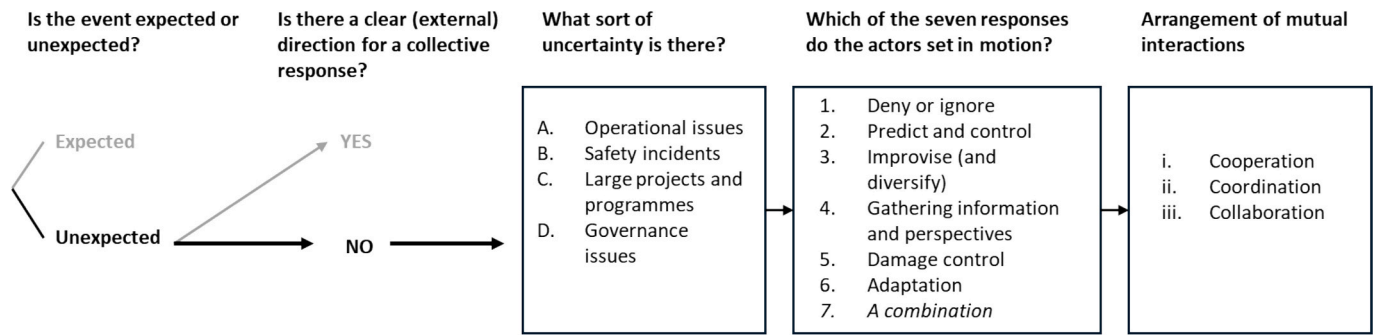


Fig. 1. Flowchart for coding the events, sort of uncertainty, responses, and the organisation of the responses.

Table 1

Framework with seven responses to events causing uncertainty.

Potential reactions	Actions
1. Deny or ignore	<i>The actors do not discuss an issue that is present on the agenda, or do not put an issue on the agenda</i>
2. Predict and control	<i>The actors formulate analyses of costs, benefits, effects and risks to subsequently invest heavily in a shaping of reality towards the outcomes of that framed analysis.</i>
3. Improvise (and diversify)	<i>The actors follow a strategy that is not planned beforehand but thought up and implemented as the events unfold. The measures taken can be diverse and multiple in order to make sure that at least one or more of the measures taken will be effective.</i>
4. Gathering information and perspectives	<i>The actors invest in information-gathering activities that could help them identify possible and adequate strategic directions to take. This can include gathering more data, using simulation models, and consulting (expert) opinions. These activities are meant to add to their body of knowledge, such as to create a better understanding of the consequences of the unexpected event and of the impact of various potential actions.</i>
5. Damage control	<i>The actors take (joint) measures for managing the backlash caused by an earlier unexpected event. For example, joint communication after an incident, writing (lobby) letters to the government about priorities and concerns and firing responsible people. The measures taken can deal with both the consequences of the event and/or the event itself.</i>
6. Adaptation	<i>The actors decide to adapt the organisational structure and/or the organisational processes to a changing situation after an event to ensure that the organisation will be (more) effective in the future when the (same) event arises again.</i>
7. A combination of the above	<i>A combination of the actions above, simultaneously or sequentially. These responses can be combined simultaneously, and a response can also be followed in time by one or other responses. For example, a response can start with gathering information and perspectives, then use a predict-and-control approach, and finish with adaptation.</i>

demands on joint communications and decision-making. Collaboration occurs when NS and ProRail establish collective organisational structures in which they share power arrangements to manage a specific topic. The Ministry can participate in these structures or retain the role of a hierarchical party coordinating the outcome.

3. Findings

The main events that caused uncertainty during the 2010–2020 period included:

- Substantial **train disruptions** due to wintery weather, resulting in train delays and cancellations. There were disturbances within the train tunnel beneath Schiphol Airport and substantial issues on the high-speed train line from Amsterdam to Breda.

- Several **safety incidents occurred**, including a fatal accident stemming from a Signal Passed at Danger (SPAD), the fall out of the high-speed Fyra train due to safety issues, and collisions with vehicles on the tracks.
- Unexpected issues, such as **delays and increasing costs, arose within large projects and programmes**. The sector worked on a long-term agenda, the LTSA (Long-Term Rail Agenda). Two major programmes aimed at enhancing rail system performance were discussed: PHS (Programme Hoogfrequent Spoor), which seeks to enable higher frequency train operations, and ERTMS (European Rail Traffic Management System), focused on its implementation. Additionally, smaller programmes were undertaken to upgrade level crossings and improve safety.
- **Initiatives aimed at altering sectoral governance** emerged from both the Ministry of Transport and external entities. A new concession period commenced for both NS and ProRail in 2015. There was uncertainty about the prospect of directly tendering the upcoming railway concession for NS in 2025 and about the form this future concession might take, explored through various scenarios. Competing regional rail operators, unified in FMN, devised a plan to increase competition on regional rail services. The Ministry proposed transforming ProRail from a government-owned private entity into a ZBO (autonomous administrative authority). The governance overseeing station operations between NS and ProRail underwent evaluation. The irregularities in the tendering process for a railway concession in Limburg raised a governance issue, as the integrity of NS was compromised.

Based on our analysis, the five main uncertainty-generating events, covering all categories, were:

- Wintery-weather-related train disruptions (2010–2012)
- The train collision at Westerpark (2012)
- Parliamentary enquiry Fyra (2013–2015)
- Implementation of a higher frequency on the A2 corridor, in the Better and More programme (2015–2017)
- Initiative to transform ProRail into a ZBO (2018–2020)

The top three were issues that drew significant media attention and public dissatisfaction. The last two uncertainties were less prominent in the public debate but were considered important moments, because these issues were perceived as determinants of the sector's future functioning and performance. In the minutes, these five issues were on the agenda for several years, showing that they were not fleeting but fundamental. Below, we summarise the events that led to the uncertainty and give the results of our coding.

3.1. Wintery weather-related train disruptions

The first major uncertainty stemmed from significant wintery weather-related delays in 2010 and 2011. These disruptions were

perceived as a serious issue by the public and the Ministry, who judged the railway sector to be ‘out of control’. This was exacerbated by blame-shifting between the NS and ProRail organisations. In response, the sector initiated a series of interventions to improve control, coordination, and performance (see Table 2). The Ministry emphasised the importance of ‘aligned steering’. This was introduced earlier in governance and is perceived as foundational to improving the rail system’s functioning in the coming years. The organisation was adapted to improve future train services in severe weather, using the joint Operational Control Centre Rail (OCCR) for disruption management and to adjust train service during incidents, and also centralising travel information services. Over time, collaboration between NS and ProRail intensified, supported by increased joint problem-solving and information sharing.

The overarching goals were to restore control over winter operations, improve the functioning and quality of the train system, reduce passenger disruptions, and avoid unfulfilled political commitments.

Arrangement of mutual interactions.

The Ministry shifted to a more hierarchical role, tightening governance structures and introducing the possibility of sanctions if KPIs were not met. The desired cultural transformation emphasised improved collaboration between NS and ProRail and a shift towards a more shared focus on passenger needs. NS and ProRail collaborated while the Ministry coordinated. NS and ProRail also started sharing power arrangements, for example, by developing policy together. There was open and frequent communication through formal and informal channels. The decision-making was participative, and participants did build trust. These actions and the trust that was built were perceived as foundational to improving the train system and achieving the good results realised in

Table 2

Overview of responses and intentions to wintery weather-related train disruptions.

Responses	Intention
Introduction of frequent (tripartite) meetings	Adaptation
Reporting on improvement projects	Predict and control
Exception reporting (interim reporting of deviations or changes in planned activities)	Predict and control
Organising site visits and in-depth sessions on the themes of operational control, travel information, and a robust railway system	Gathering information and perspectives
Putting the passengers’ needs first in both organisations’ charters through a passenger charter (to support cultural change)	Predict and control
Measures to improve operational control when there are alterations in the timetable	Adaptation
Strengthening governance: improving shared KPIs	Adaptation, and predict and control
Option: introducing sanctions for not meeting KPIs	Predict and control
Implementation of travel information within one organisation (NS) to improve the provision of travel information for passengers	Adaptation
Agreement to develop a new and collective approach for a “more robust railway system”	Adaptation, and predict and control
Introduction of an adapted (winter) timetable for extremely cold days	Predict and control
Involvement of international experts	Gathering information and perspectives
Wintery weather exercises combined with the development of an improved communication strategy	Predict and control

2019.

3.2. The Westerpark train collision

The second major uncertainty arose from the head-on train collision at Amsterdam Westerpark in April 2012. This resulted in > 100 injuries and one fatality. In the aftermath, the Human Environment and

Transport Inspectorate (ILT) placed NS and ProRail under ‘heightened supervision’,² urging them to take responsibility for safety improvements. This supervisory measure significantly increased motivation for collaboration between NS and ProRail. According to interviewees, the heightened supervision served as a turning point amid wintery weather disruptions, reinforcing the need for shared ambitions, mutual understanding, and joint fact-finding. A joint STS (Signal Passed at Danger) improvement plan was developed as part of the response. It aimed to prevent future signal violations by aligning safety systems and addressing both human and technical causes. The joint responses are mapped out in Table 3.

Arrangement of mutual interactions.

The collision reinforced the perception that the Dutch railway sector was ‘out of control’. The Inspectorate (ILT) and the Ministry created urgency for establishing the improvement plan. That developed as a collaborative effort among ProRail, NS, and other carriers. They acted under the direction of the Ministry, which maintained a hierarchical position and coordinated the efforts. External pressure acted as an incentive for collaboration. Collaboration was driven by a shared focus on improving the predictability and controllability of the railway system using joint professional expertise.

3.3. The Fyra parliamentary inquiry

The third uncertainty concerns safety and operational issues with the Fyra high-speed train, which was dubbed the ‘Fyra debacle’ in the media. This train did not operate as expected, with floor plates falling off during operation and initial reliability problems that led to frequent service cancellations (van Silfhout and van den Berg 2015). Although not discussed, only mentioned in the minutes of the tripartite meetings analysed, the Fyra situation, which culminated in a parliamentary inquiry, created substantial uncertainty, mostly for NS. After the parliamentary inquiry’s findings were released, a comprehensive improvement plan was developed. The aim of the responses was to find blame and regain control to get the operations on the high-speed line running according to plan. The responses are mapped out in Table 4.

Arrangement of mutual interactions.

During this period, the three actors cooperated from siloed roles. The cooperation focused primarily on communication. The Ministry did not assume a coordinating role, given the inquiry’s parliamentary ownership. NS was the principal subject of scrutiny. ProRail, which was not involved in Fyra’s procurement or construction of the high-speed line, remained peripheral. In this case, the Ministry, NS, and ProRail refrained from collaborating because a ‘higher authority’, in this case, parliament, takes control. Then they await their assignments. Without an assignment, NS and ProRail will primarily cooperate, showing a culture of ‘staying in your lane’, by strongly adhering to their own

Table 3

Overview of responses and intentions to the Westerpark train collision.

Responses	Intention
Coordination of communication with victims, employees, and the media	Damage control
Investigation into how this could have happened	Gathering information and perspectives
STS (Signal Passed at Danger) improvement plan	Predict and control

² Inspectie Leefomgeving en Transport. 2014. *Rapportage over het verscherpt toezicht op NS Reizigers en ProRail, naar aanleiding van de botsing te Amsterdam Westerpark op 21 april 2012* [Report on the enhanced supervision of NS Reizigers and ProRail following the collision at Amsterdam Westerpark on 21 April 2012]. Inspection report, April 2014. The Hague.

Table 4
Overview of responses and intentions to the Fyra parliamentary inquiry.

Responses	Intention
Communicating about operational issues and the way forward	Damage control
Coordinated response to the Parliamentary inquiry	Damage control
Integrated improvement plan following the Parliamentary inquiry (to enhance performance, punctuality, and reliability)	Adaptation, and Predict and control
Three audits were conducted by I&M (Ministry of Infrastructure), ProRail, and NS on the integrated improvement plan	Gathering information and perspectives

specific role.

3.4. Increasing service frequency on the A2 corridor (Better and more programme)

The fourth uncertainty concerned raising the service frequency on the A2 corridor to ten-minute intervals. That target came from the High-Frequency Rail Programme (PHS). NS and ProRail pursued the increase through their joint programme Better and More. One key goal was to increase train frequency on the A2 corridor (Amsterdam–Utrecht) to ten-minute intervals. In 2015, the decision was made to delay implementation by a year, prompting the Ministry to request additional assurances and periodic progress updates. The Ministry had limited interest in the technical details that ProRail and NS wanted to explain and mainly sought assurance about the timing of realisation. This delay caused frustration and led to the introduction of stricter control mechanisms through additional studies and reporting cycles. Eventually, the new service frequency was successfully implemented in the timetable 2018 and is regarded as a success in the sector. The responses are mapped out in Table 5.

The implementation of higher frequencies on this corridor was an important project to show that ProRail and NS had regained control of the rail system. That is why ProRail and NS sought certainty and had little margin for error, leading to “predict and control” as the intended outcome of their responses. This uncertainty of increasing service frequency demonstrates how predictability and control can mean different things to the Ministry, NS, and ProRail. The Ministry wanted to be predictable in delivering on a promise to parliament. NS and ProRail sought assurance that the timetable would remain predictable, operating at a higher frequency.

Arrangement of mutual interactions.

According to the interviewees, the strength of the “Better and More” programme lay in its joint execution. NS and ProRail shared responsibilities, authority, finances, and personnel, operating as a single organisation. Strategic decisions were made jointly by the directors of both entities, with the Ministry maintaining an oversight and approval role. NS and ProRail collaborated, with the Ministry taking on a coordinating role.

3.5. Proposed transition of ProRail to a ZBO

The fifth major uncertainty concerned the Ministry’s proposal to

Table 5
Overview of responses and intentions to increasing service frequency on the A2 corridor (Better and More programme).

Responses	Intention
A2 corridor pilot as a development model for future corridors, combined with target values	Gathering knowledge, and predict and control
Postponement of A2 frequency increase for the 2017 timetable, demand for extra reporting	Predict and control
Implementation of A2 frequency increase for the 2018 timetable	Predict and control

convert ProRail, a private entity owned by the State, into a ZBO (autonomous administrative authority). When this governance reform was on the agenda, it was only referred to, or information about the process was shared. Because there were no joint responses, we did not code them. This topic, however, did feature prominently in bilateral and informal discussions among the Ministry, NS, and ProRail. The proposal followed the presentation of the Fyra inquiry report and was justified by the Ministry on the basis that public funds should be managed by public bodies. The announcement caught the sector off guard and is perceived to be politically motivated. According to interviewees, this transformation could position ProRail closer to the Ministry and put ProRail in the role of ‘trusted advisor’. It encountered opposition from both NS and ProRail. One reason was that it could disrupt the balanced “aligned steering” model. Under the governance studied, both organisations are treated equally within the Ministry’s framework, allowing trade-offs between rail infrastructure and train services to be managed collaboratively. It was feared, mainly by NS, that a shift to ZBO status for ProRail would transform ProRail into an executive arm of the Ministry and erode the sense of joint ownership of sector performance. NS would then be seen as one of the carriers rather than the main carrier on the Dutch railway network.

Arrangement of mutual interactions.

There were no joint responses or initiatives. NS and ProRail participated only from within their formal institutional roles. Therefore, we coded this as cooperation between ProRail and NS. The Ministry led the process unilaterally, taking on a coordinating role.

4. Analysis

Across all five studied major events that create uncertainty, the dominant responses reflect an intention to retain control over the railway system and to signal control externally. The overarching goals were to restore operational stability, reduce passenger disruption, improve system functioning, and avoid unfulfilled political commitments. Across cases, uncertainty was primarily addressed through damage control and predict-and-control approaches. Information gathering and organisational adaptation were used to inform future outcomes. Table 6 summarises the types of uncertainty encountered, the dominant responses, and the structuring of interactions among NS, ProRail, and the Ministry.

In organising responses to uncertainty, the Ministry consistently adopted a coordinating role, occasionally stepping back when parliament assumed leadership, as in the Fyra inquiry. NS and ProRail alternated between collaboration and cooperation, depending on the nature of the uncertainty and the institutional context. In periods of cooperation, the organisations showed organisation-focused behaviour. After incidents that directly affected train services, such as wintery weather disruptions and the Westerpark collision, NS and ProRail intensified collaboration, often at the behest of the Ministry.

A “successful” railway system was consistently described by the interviewees as one that operates on time, without accidents or major disturbances, but also as an inherently complex system, both technologically and in its governance. The emphasis on punctuality aligns with a broader societal and political demand. It is therefore no surprise that the disruptions caused by the wintery weather led to public disappointment and intensified political pressure on the Ministry. In the event of an accident, the Ministry must be able to demonstrate that all reasonable measures are being taken to prevent recurrence. This underpins the idea that information gathering, system analysis, and organisational adaptation serve not only operational purposes, but also political ones related to accountability and legitimacy. Power and political accountability run through these responses. The Ministry holds structural power through its concession contracts with both NS and ProRail: it sets objectives, budgets, KPIs and sanctions, and can assign joint tasks. This creates an asymmetry of rationalities. NS and ProRail work from a professional logic of predictable delivery, while the Ministry answers to a political logic of accountability to Parliament, and the

Table 6

Overview of the sort of uncertainty, the dominant responses and the arrangement of mutual interactions.

Sort of uncertainty	Responses	Interactions NS and ProRail	Interactions Ministry
Operational problems <i>Wintery weather-related train disturbances</i>	Dominantly, damage control and predict and control approaches were used, information was gathered, and the organisation adapted with the intention to increase control	Collaboration	Coordination
Two incidents 1) <i>Westerpark train collision</i> 2) <i>Fyra parliamentary inquiry</i>	Dominantly a damage control approach, information was gathered to inform a predict and control approach for the future	Collaboration, after the train collision Cooperation, for the Fyra parliamentary inquiry	Coordination, after the train collision Cooperation, because Parliament had a coordinating role
Large projects and programmes <i>Increasing service frequency on the A2 corridor (Better and More programme)</i>	Predict and control approach, whereby information was gathered to inform a predict and control approach for the future	Collaboration	Coordination
Governance issues <i>Proposed Transition of ProRail to a ZBO</i>	There were no joint actions	Cooperation	Coordination

two can clash, as in the delayed A2 decision. When Parliament itself takes control, as in the Fyra inquiry, the Ministry steps back and the actors retreat to their formal positions. The Ministry acts as the sector's *metagovernor* (Sørensen et al. 2023). It designs and periodically re-articulates the conditions under which NS and ProRail cooperate, sometimes participating and in other situations setting the stage. The Ministry can rewrite concessions and targets, thereby influencing the slow-moving, control-oriented culture likely to be present in these arrangements (Veeneman 2021). Beyond these structural power dynamics, the three organisations and the individuals acting within them also exercise agency. Each actor has agency to trigger institutional change over time by engaging with the properties of existing institutional frameworks that permit or invite specific kinds of change strategies (Hirschhorn et al. 2020).

Large uncertainties have either brought actors together or driven them apart. Shared operational challenges have led to collaboration when supported by the Ministry, whereas governance reforms and external judgment can lead to fragmentation and organisation-focused behaviour. The Fyra parliamentary inquiry and the proposed transition of ProRail to a ZBO illustrate this dynamic. The parliamentary inquiry was primarily oriented towards damage control and preventing future incidents, following what was widely labelled a “debacle” in the media. Parliamentary inquiries also involve attribution of responsibility, leading actors to adopt more defensive and strategic behaviour. Similarly, the proposed ZBO transition redirected attention away from joint system performance towards internal organisational interests. Across the five uncertainty-generating events, shared goals and ambitions functioned as a unifying force, while organisational restructuring and external scrutiny tended to incentivise organisational self-orientation.

5. Discussion and conclusion

This single-case study shows that responses to unexpected events that create uncertainty in the Dutch railway sector are not ad hoc but are systematically shaped by an interorganisational culture centred on control and predictability. Uncertainty is approached as something that can be reduced through the shared production and alignment of facts, coordinated planning, and the clarification of roles and responsibilities. This cultural logic (which is not necessarily factual) is deeply rooted in the sector's shared history, institutional arrangements, and broader Dutch consensus-oriented governance tradition (Hofstede et al. 2010).

Collaboration, trust, and leadership influence governance culture. Collaboration, in itself, functions as a cultural practice shaped by actors' behaviour (Weick and Sutcliffe 2001; Schein and Schein [1985] 2017; Paulsson et al. 2018; Stamsnijder et al. 2026). In the relationship between NS and ProRail, trust is built through the exchange and joint interpretation of professional knowledge. Joint fact-finding not only supports decision-making but also serves as a mechanism for aligning perspectives and sustaining collaboration. At the same time, the Ministry operates within a political logic that can clash with the professional rationality of railway organisations, particularly under conditions of heightened public scrutiny. Public opinion and media attention trigger and amplify control-oriented responses. In these instances, national culture and expectations about how railways should operate meet the interorganisational culture of the railway sector.

While this control-oriented culture enables stability in a highly interdependent system, it can also become constraining. A strong focus on predictability, rules, and accountability will shift the focus to the separate rather than the shared performance, see also De Bruijn (2003), which can limit flexibility and shift attention away from adaptation and innovation. Understanding when responses enhance performance or when they become maladaptive, for example, by constraining innovations, efficiency and resilience, is an important direction for future research. Further research can also examine how shared ambitions and professional knowledge contribute to sustained collaboration, and how these interact with political rationalities. Examining whether the cultural pattern we describe is similar across complex sociotechnical systems with comparable interdependence, and how this relates to the amount of organisational integration, can also be a promising avenue for future research.

Methodologically, this study demonstrates the value of using responses to events that create uncertainty as an entry point for analysing the cultural layer of governance in complex sociotechnical systems. This approach makes otherwise implicit cultural patterns visible in situations where no predefined course of action exists. At the same time, it is less suited to capturing cultural dynamics in stable conditions and in systems with lower levels of organisational and technological interdependence. Comparative research across countries with different legal frameworks, governance arrangements, and cultural contexts could further enhance understanding of how the cultural layer of railway system governance affects the delivery of public transport services. Such insights can support the design of governance arrangements that not only ensure performance but also remain adaptable in the face of uncertainty. This understanding can provide policymakers and practitioners with insights that extend beyond this single-case study.

CRedit authorship contribution statement

Marjolein Stamsnijder: Writing – review & editing, Writing – original draft, Investigation, Conceptualization. **Didier van de Velde:** Writing – review & editing, Writing – original draft, Investigation, Conceptualization. **Wijnand Veeneman:** Writing – review & editing, Supervision, Methodology, Conceptualization.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Marjolein Stamsnijder reports financial support and administrative support were provided by Nederlandse Spoorwegen (NS). Marjolein Stamsnijder reports a relationship with Nederlandse Spoorwegen (NS) that includes: employment. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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