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Analysing the integrity of the development and management process of technical regulations in the Netherlands

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Research summary

Safety is regarded as the number one priority in the construction industry. Technical regulations are the tool to ensure safe working conditions and structural safety of buildings and infrastructure. High-quality technical regulations are therefore vital for safety in the construction industry. In the Netherlands, the development and management of technical regulations are organised in a private way. Meaning that private institutions develop and manage technical regulations. The private way of developing technical regulations means that the institutions do not have the obligation to be transparent in their processes. Resulting in that that it is unknown how the development and management process is organised. Additionally, the decision-making on which technical regulation gets developed is unknown.

The private way of developing technical regulations also mean that external parties and suppliers are often the main funders and are involved in the development and management process. External parties and suppliers have commercial interests in developing new technical regulations as it creates a sales market for their products. This creates a tension field between the commercial interests of the external parties and the quality and safety of the technical regulations. The opaqueness of the process makes it that it is unknown how much influence external parties have in the process of developing and managing technical regulations. The involvement of external parties and dependence on external funding are indications that the integrity might be compromised. While there are no direct signals that the quality of the technical regulations is compromised in the Netherlands, the opaqueness of the development and management process raises questions on the integrity of the process. Integrity in the process positively benefits the quality of the end product likely resulting in high-quality technical regulations. The main problem is that it is unknown how the Dutch institutions ensure integrity in the development and management of technical regulations.

The objective of this research is to understand how integrity can be ensured in the development and management of technical regulations. This is achieved by diagnostically analysing the integrity of three development and management processes by pointing out mechanisms that negatively affect the integrity. Additionally, advice is given to overcome those mechanisms. The reviewed processes are from three institutions that publish the most commonly used technical regulations in the Netherlands.

The research starts with a literature study to define the term integrity and specify it to business processes. Using various definitions it is determined that the general definition of integrity is being true to the shared ethical and moral standards. The literature points out that integrity in business processes is achieved when five core fundamentals are embedded in the process. Those core fundamentals are consistency, diligence, incorruptibility, transparency, and accountability. A literature study on those core fundamentals resulted in a specification of those core fundaments. The core fundamentals and its specification formed the theoretical framework on integrity in business processes. This framework is applied for the development and management process of technical regulations. Resulting in a list of mechanisms that could occur during the development and management process of technical regulations. Those mechanisms are present by using information from interviews, reviewing business policy documents, and using the information on websites.

The results of this research are a description and visualisation of the processes and a diagnostic integrity analysis. The procedural steps and validation methods are described for each process based on the interviews and business policy documents. The second part of the results is the integrity analysis of the three processes. A diagnostic analysis is conducted on the presence of mechanisms in the process. The results show that the processes of the institutions have differences between them. The present mechanisms are not identical per institution. This is due to the differences between the processes in procedural steps and validation methods. Certain mechanisms are present along with the three institutions and certain mechanisms are present per institution.





The analyses show that the institutions have carefully set up their processes as the processes are standardised and qualified personnel is allocated to guide the process. Mechanisms are present along the institutions that relate to the core fundamental diligence as individual and organisation reflections on the process are often missing. Reflections can lead to professional growth and can help to improve the quality of results. Reflections are an underexposed aspect in the development and management processes as reflections are not always conducted. The incorruptibility also has mechanisms present as the institutions struggle to recognise conflict of interests or favouritism in the process. Each institution has room for improvement in managing stakeholder interests. It is essential that an independent chairman guides the process and a stakeholder selection procedure is conducted. This is to minimize the chance of a conflict of interests or favouritism in the process. Transparency and accountability only have mechanisms that are partly present which indicates that only small improvements are possible.

Integrity in the development and management of technical regulations can be ensured when consistency, diligence, incorruptibility, transparency and accountability are embedded in the process. The embedding of those core fundamentals can lead to high-quality technical regulations. It is therefore essential that the Dutch institutions have those core fundamentals embedded in their processes. While the institutions have carefully set up their processes it cannot be concluded that integrity is completely ensured in the development and management process of technical regulations. Several mechanisms are present that negatively affect the integrity of the development and management process. Mechanisms that are present along the thee institutions are related to diligence and incorruptibility of the process. The diligence of the process is negatively affected as the institutions only perform a limited number of reflections. The incorruptibility of the process is shaped by managing stakeholder interests and propagating organisational ethics. The results show that those aspects are not completely embedded in each process, which undermines the incorruptibility of the process.

One way to enhance the diligence of the processes is to add a process step after the publication of the technical regulation. This process step is a reflection on the process and the validation methods with the stakeholders and employees involved in the process. Questions can be asked about how the process went and if everyone is satisfied with the results. Those reflections can be combined by discussing them with other employees. Periodically a meeting can be scheduled in which employees talk about how they experienced the process and the reflections can be compared. This can result in adjustments in the process or validation methods based on combined reflections. In this way, the diligence of the process is further enhanced which in turn improves the integrity of the process.

Also, improvements can be made in the management of stakeholder interests. The analysis shows that the institutions struggle in recognising conflict of interest or favouritism in the process. The measures taken to resolve this are only partly resolving this mechanism. Conflict of stakeholder interests can be prevented in two ways. The first way is having a selection procedure for which stakeholders to involve in the process. The interest of the parties can be investigated and selected based on added value. This extra procedural step can be added after the set-up of a workgroup or norm committee. The second way is to have an independent chairman that is able to oversee the interests of the parties. An independent chairman should be guided and supported by the code of conduct of the organisation. An additional step in the process can be made in which the chairman is informed of his duties and the code of conduct of the organisation. This improves the incorruptibility of the process.





Onderzoek samenvatting

Veiligheid wordt beschouwd als prioriteit nummer één in de bouwsector. Technische regelgeving zijn het instrument om veilige arbeidsomstandigheden en structurele veiligheid van gebouwen en infrastructuur te waarborgen. Hoogwaardige technische regelgeving zijn dan ook van vitaal belang voor de veiligheid in de bouwsector. In Nederland zijn de ontwikkeling en het beheerprocessen van technische regelgeving op private wijze georganiseerd. Private instellingen ontwikkelen en beheren technische regelgeving. De private manier van ontwikkelen van technische regelgeving betekent dat de instellingen niet verplicht zijn om transparant te zijn over hun processen. Dit heeft tot gevolg dat onbekend is hoe het ontwikkelen en beheerproces is georganiseerd. Daarnaast is het onduidelijk hoe de besluitvorming over de ontwikkeling van technische regelgeving tot stand komt.

De private manier van ontwikkelen van technische regelgeving betekent ook dat externe partijen en leveranciers vaak de belangrijkste financiers zijn en betrokken zijn bij het ontwikkel- en beheerproces. Externe partijen en leveranciers hebben commerciële belangen bij het ontwikkelen van nieuwe technische regelgeving, omdat dit een afzetmarkt creëert voor hun producten. Hierdoor ontstaat een spanningsveld tussen de commerciële belangen van de externe partijen en de kwaliteit en veiligheid van de technische regelgeving. De ondoorzichtigheid van het proces maakt dat het onbekend is hoeveel invloed externe partijen hebben in het proces van het ontwikkelen en beheren van technische regelgeving. De betrokkenheid van externe partijen en de afhankelijkheid van externe financiering zijn aanwijzingen dat de integriteit in het geding kan zijn. Hoewel er geen directe signalen zijn dat de kwaliteit van de technische regelgeving in Nederland in het geding is, roept de ondoorzichtigheid van het ontwikkel- en beheerproces wel vragen op over de integriteit van het proces. Integriteit in het proces komt de kwaliteit van het eindproduct positief ten goede, hetgeen waarschijnlijk zal resulteren in technische regelgeving van hoge kwaliteit. Het probleem is dat onbekend is hoe de Nederlandse instellingen de integriteit bij de ontwikkeling en het beheerprocessen van technische regelgevingen waarborgen.

Het doel van dit onderzoek is te begrijpen hoe de integriteit in het ontwikkel- en het beheerproces van technische regelgeving kan worden gewaarborgd. Dit wordt bereikt door een diagnostische analyse van de integriteit van drie ontwikkelings- en beheersprocessen. Mechanismen worden geïdentificeerd die een negatieve invloed hebben op de integriteit van het proces. Daarnaast worden adviezen gegeven om deze mechanismen te verhelpen. De onderzochte processen zijn afkomstig van drie instellingen die de meest gebruikte technische regelgeving in Nederland publiceren.

Het onderzoek begint met een literatuurstudie om de term integriteit te definiëren en te specificeren naar bedrijfsprocessen. Aan de hand van verschillende definities wordt vastgesteld dat de algemene definitie van integriteit luidt dat integriteit het trouw zijn aan de gedeelde ethische en morele standaarden is. De literatuur wijst erop dat integriteit in bedrijfsprocessen wordt bereikt wanneer vijf kern aspecten in het proces zijn verankerd. Die kern aspecten zijn consistentie, zorgvuldigheid, onkreukbaarheid, transparantie en verantwoordelijkheid. Een literatuurstudie naar deze kern aspecten resulteerde in een specificatie van deze kern aspecten. De kern aspecten en de specificatie ervan vormden het theoretisch kader van integriteit in bedrijfsprocessen. Dit kader is toegepast voor het ontwikkelings- en beheersproces van technische regelgeving. Dit resulteerde in een lijst van mechanismen die zich kunnen voordoen tijdens het ontwikkelings- en beheersproces van technische regelgeving. Mechanismen zijn knelpunten die kunnen optreden die de integriteit negatief beïnvloedt. De analyse van de aanwezigheid van mechanismen wordt gedaan door de mechanismen te specificeren in vragen om informatie over dat onderwerp te verkrijgen. Een analyse van de aanwezigheid van mechanismen kan worden gemaakt door gebruik te maken van informatie uit interviews, het bestuderen van beleidsdocumenten van de instellingen en het gebruiken van de informatie op websites. De resultaten van dit onderzoek zijn een beschrijving en visualisering van de processen en een diagnostische integriteitsanalyse. De procedurele stappen en validatiemethoden worden voor elk proces beschreven op basis van de interviews en de documenten over het bedrijfsbeleid.





Het tweede deel van de resultaten is de analyse van de drie processen. Een diagnostische analyse is uitgevoerd op de aanwezigheid van mechanismen in het proces. Uit de resultaten blijkt dat de processen van de instellingen onderling verschillen. De aanwezige mechanismen zijn niet identiek per instelling. Dit komt door de verschillen tussen de processen in procedurele stappen en validatiemethoden. Bepaalde mechanismen zijn aanwezig bij de drie instellingen en bepaalde mechanismen zijn aanwezig per instelling.

Uit de analyse blijkt dat de instellingen hun processen zorgvuldig hebben opgezet omdat de processen gestandaardiseerd zijn en er gekwalificeerd personeel is toegewezen om het proces te begeleiden. In de processen zijn mechanismen aanwezig die betrekking hebben op het kern aspect zorgvuldigheid. Individuele en organisatorische reflecties ontbreken vaak. Reflecties kunnen leiden tot professionele groei en kunnen helpen de kwaliteit van de resultaten te verbeteren. Reflecties zijn een onderbelicht aspect in de ontwikkelings- en beheersprocessen, aangezien reflecties niet altijd worden uitgevoerd. Ook voor het kern aspect onkreukbaarheid zijn mechanismen aanwezig. De instellingen hebben moeite om belangenconflicten of vriendjespolitiek in het proces te herkennen. Elke instelling heeft de mogelijkheid om de belangen van de stakeholders beter te managen. Het is essentieel dat een onafhankelijke voorzitter het proces begeleidt en dat er een selectieprocedure van stakeholders wordt uitgevoerd. Dit om de kans op belangenverstrengeling of vriendjespolitiek in het proces zo klein mogelijk te maken. Bij transparantie en verantwoordelijkheid zijn de mechanismen slechts deels aanwezig, hetgeen erop wijst dat slechts kleine verbeteringen mogelijk zijn.

Integriteit in de ontwikkeling en het beheer van technische regelgeving kan worden gewaarborgd wanneer consistentie, zorgvuldigheid, onkreukbaarheid, transparantie en verantwoordingsplicht in het proces zijn verankerd. De verankering van die kern aspecten kan leiden tot technische regelgeving van hoge kwaliteit. Het is daarom van essentieel belang dat de Nederlandse instellingen deze kern aspecten in hun processen hebben verankerd. Hoewel de instellingen hun processen zorgvuldig hebben ingericht, kan niet worden geconcludeerd dat de integriteit in het ontwikkelings- en beheerproces van technische regelgeving volledig is gewaarborgd. Er zijn verschillende mechanismen aanwezig die de integriteit van het ontwikkel- en beheerproces negatief beïnvloeden. Mechanismen die aanwezig zijn bij de instellingen hebben te maken met zorgvuldigheid en onkreukbaarheid van het proces. De zorgvuldigheid van de processen wordt negatief beïnvloed doordat de instellingen slechts een beperkt aantal reflecties uitvoeren. De onkreukbaarheid van het proces wordt vormgegeven door het managen van de belangen van belanghebbenden en het uitdragen van de organisatorische ethiek. Uit de resultaten blijkt dat deze aspecten niet in elk proces volledig zijn ingebed, wat de integere procesgang ondermijnt.

Een manier om de zorgvuldigheid van de processen te vergroten is het toevoegen van een processtap na de bekendmaking van de technische regelgeving. Deze processtap is een reflectie over het proces en de valideringsmethoden met de stakeholders en werknemers die bij het proces betrokken zijn. Er kunnen vragen worden gesteld over hoe het proces is verlopen en of iedereen tevreden is met de resultaten. Deze reflecties kunnen worden gecombineerd door ze met andere medewerkers te bespreken. Periodiek kan een bijeenkomst worden gepland waarin medewerkers vertellen hoe zij het proces hebben ervaren en de reflecties kunnen worden vergeleken. Dit kan leiden tot aanpassingen in het proces of de validatiemethoden op basis van gecombineerde reflecties. Op deze manier wordt de zorgvuldigheid van het proces verder vergroot, wat leidt tot een verbetering van de integriteit in het proces.

Ook het beheren van de belangen van de belanghebbenden kan worden verbeterd. Uit de analyse blijkt dat de instellingen moeite hebben met het onderkennen van belangenconflicten of vriendjespolitiek in het proces. De maatregelen die zijn genomen om dit op te lossen, lossen dit mechanisme slechts ten dele op. Belangenconflicten van belanghebbenden kunnen op twee manieren worden voorkomen. De eerste manier is het hanteren van een selectieprocedure voor de belanghebbenden die bij het proces worden betrokken. De belangen van de partijen kunnen worden onderzocht en geselecteerd op basis van toegevoegde waarde. Deze extra procedurestap kan worden toegevoegd na de oprichting van een werkgroep of commissie. De tweede manier is om een onafhankelijke voorzitter te hebben die de belangen van de partijen kan overzien. Een onafhankelijke voorzitter dient zich te laten leiden en ondersteunen door de gedragscode van de organisatie. Een extra stap in het proces kan zijn dat de voorzitter wordt geïnformeerd over zijn taken en de gedragscode van de organisatie. Dit komt de onkreukbaarheid van het proces ten goede en verbetert de integriteit van het proces.





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1. Introduction

1.1 Introduction to technical regulations

In the construction industry, safety is the number one priority during construction and operation. Technical regulations are the tools to secure safe working conditions and structural safety of buildings and infrastructure. Technical regulations provide governments, contractors, and suppliers with vital technical information on building processes and calculating structural safety. In addition, technical regulations are used to review the calculations to permit the construction of infrastructure assets. This makes that technical regulations are important for the legislation and vital to the construction industry. However, technical regulations are not always complete or sufficient for preventing the failure of a structure.

The most exemplary instance in which the technical regulations were not sufficient to prevent a failure, is the construction of the Grenfell Tower in London. A large part of the tower caught on fire as a fire broke out in one of the apartments. The fire spread quickly and got into the insulation of the building. The applied insulation materials were not fire-resistant enough to stop the spreading of the fire. On the contrary, the fire spread via the insulation throughout the building and caused injuries for more than 70 people (Moore-Bick, 2019). The technical regulations that should prevent this type of accident were not sufficiently developed and managed. The issues lay within the development and management process of the technical regulations. The development of technical regulations for that type of insulation material was conducted in a private setting. Meaning that suppliers and commercial parties were involved in the process of developing those technical regulations. It turned out that the quality of the technical regulations was insufficient as the fire resistance of the insulation materials was insufficiently considered (Moore-Bick, 2019). This example of the Grenfell tower clearly illustrates the issue in a private setting of developing technical regulations. The integrity of the development and management process is of great importance to prevent likewise incidents or failure of an infrastructure asset in the future. Integrity is inherently connected to the quality of technical regulations (Erhard H et al., 2009). Integrity should be embedded in the process of publishing and managing technical regulations to minimize the chance of failure.

1.2 Issues of the Grenfell tower related to the Netherlands

In the Netherlands, the development and management of technical regulations are also organised in a commercially oriented way. Meaning that external parties and suppliers are the main funders and are involved in the process of developing and managing technical regulations. While there are no direct signals that the quality of the technical regulations in the Netherlands is compromised, the example of the Grenfell Tower raises questions on the integrity of the processes. It is unknown how the Dutch institutions ensure their integrity in the development and management of technical regulations. This can be a multi-dimensional issue as several aspects influence the integrity of those processes. The involvement of external parties and dependency on external funding are indications that the integrity might be compromised.

The involvement of external parties affects the process of developing and managing technical regulations. The regime is missing in the process of developing technical regulation as no central institution is present to oversee the process. It is unknown how much influence external parties have in the process of developing and managing technical regulations. Furthermore, governments are not always involved in the process while they are the most dependent on high-quality technical regulation. The role of the government in ensuring integrity is unknown, while the government is dependent on technical regulation to retain structural safety.

Additionally, suppliers and private organisations invest heavily to publish new technical regulations for their products. Suppliers benefit from technical regulations that prescribe their products as it creates a sales market for their products. If those regulations are used within contracts, the contractor is obligated to fulfil those requirements and buy the mentioned products. Thus, suppliers have a commercial interest in being involved in the process. The extent to which external parties are involved is unknown and can compromise the integrity of the processes of the institutions which are responsible for the technical regulations. In addition, technical regulations are managed and kept up to date when external funding is found. This may also compromise the quality of the technical regulation. The choice of which technical regulation gets updated is not transparent. This may also pose additional risks for contractors that use those technical regulations. Risks are especially present during the maintenance of assets. If it turns out that a technical regulation is insufficiently managed, large liability issues can occur (May, 2007).

1.3 Reading guide

This report is set up in eight different chapters to diagnostically analyse the integrity of the development and management process of technical regulations in the Netherlands. The second chapter describes what technical regulations are and which system is used in the Netherlands to develop technical regulations. The third chapter describes the methodology and the validation methods used in this research. Chapters 4 and 5 describe the term integrity and define a theoretical framework to analyse the integrity of business processes. The definition of integrity is determined and specified for analysing the development and management process of technical regulations. Chapter 6 specifies that framework into measurable factors to analyse the process of institutions in the Netherlands. The seventh chapter shows the presentation of the results of this research and the analysis of the integrity of the development and management process is illustrated and described. Chapter 8 describe the conclusions and describes the recommendations and limitations of this research. A glossary is provided in appendix C.





2. Dutch regulatory system

2.1 Regulatory system

Regulations are an important tool to ensure safe buildings and infrastructure. Especially, technical regulations provide clients, contractors, and suppliers with vital information on the usage of products or materials. Technical regulations contain information and requirements on vital technical aspects, such as fire resistance or load-bearing capacity. This supports calculations to ensure structural safety in construction projects. A regulatory system is a system in which legislation and regulations get developed and managed. The regulatory system is a web in which several parties/stakeholders are involved to come to new or updated legislation or regulations. There are two types of regulatory systems, namely governmental controlled systems, and privately controlled regulatory systems. A governmental controlled regulatory system is a system with only governmental organisations involved. The government is in control of the system and can oversee the development and management processes. The key in this system is that expertise is present within governmental organisations (Cafaggi & Renda, 2012). For instance, the government is in control of which technical regulations get developed and develops technical regulations within governmental organisations with limited influence from external parties.

A privately controlled regulatory system is more complex. A privately controlled system does not have a central body to control the development and management processes and the influence from the government is limited. Private institutions are in control of the development and management process of technical regulations and have a certain freedom in their organisations. The institutions have the freedom to set up their development and management processes. Expertise and validation are acquired from the construction market which leads to many stakeholders being involved in the process (Cafaggi & Renda, 2012). Variations are possible in which governments are still involved in a privately controlled system. This research analyses the regulatory system in the Netherlands, which is a privately controlled system with limited influence from the government (Branco Pedro et al., 2010). However, a variation in which governments are involved might lead to interesting perspectives.

2.2 The transition towards a privately controlled system in the Netherlands

Traditionally, the approach of the Dutch government was to develop technical regulations within governmental institutions by their experts. This is to promote the legitimacy of the regulation and obtain trust in the government. However, due to reforms in the 1990's the approach of the Dutch government changed. The Dutch government moved the regulatory system towards a more open and market-driven method of policy development (OECD, 2009). A transition took place in which the Dutch government started to rely more on the knowledge present within the construction market. Governmental organisations started to introduce new contract types in which responsibility and expertise were required from the construction market. This caused experts to abandon governmental organisations and start working for engineering firms and contractors. Consequently, this had a negative impact on the attractiveness of governmental organisations as expertise was less valued and desired. This spiral had a major effect on the organisation of governments and the development of new contracts.

Experts abandoning governmental organisations causes a change in the development process of technical regulations. Traditionally, the Netherlands had a governmentally controlled system in which governmental organisations were responsible for the development and management of technical regulations. However, due to the abandonment of expertise, this was no longer sustainable. The government decided to shift responsibilities to develop and manage technical regulations towards the construction market. Also, a choice was made to shorten the funding for the development of new technical regulations. The institutions that develop and manage technical regulations started to see that governmental funding was shortened over the years. This meant that the financial structure of the institutions that issue technical regulation had to change. The institutions started to rely on external funding and the development and managing of technical regulations gained a commercially oriented character. The influence of the government started to decline while the influence of external parties started to increase. External parties started to become involved in the development process both by expertise and funding. This meant that the government-controlled system has transitioned towards a privately controlled system in the Netherlands.





2.3 Technical regulations

Technical regulations are part of a larger regulatory system. Regulations reflect the wider vision of the government. The main vision of the Dutch government is ensuring structural safety in infrastructure. Meaning that every infrastructure object can be designed and assessed by regulations. Technical regulation is a specification of the general regulation as it concerns specific products, materials, or building methods. The quality of the regulation is important to ensure the structural safety of infrastructure objects.

Technical regulation in the Netherlands

Technical regulations in the Netherlands are formulated as performance-based. Technical regulations are expressed as performance requirements in quantitative terms and define methods to meet those requirements (Branco Pedro et al., 2010). This means that technical regulations are specified on the technical aspects of a product. For instance, a specific concrete mixture has to bear a certain load before collapsing. Other types of formulations of technical regulations are present, like functional and prescriptive formulation. Those types either describe functional aspects or prescribe specific designs or construction solutions. However, those are not present in the Netherlands. Compared to other countries in Europe, the Netherlands is not unique with the performance-based formulation of technical regulations. Countries like Germany and Finland have a similar type of formulation of technical regulations (Branco Pedro et al., 2010). Table I illustrates the type of formulation for different countries in Europe.

	Austria	Belgium	Bulgaria	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Lavia	Lithuania	Luxemborg	Malta	Netherland	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom
Functional																											
Performance																											
Prescriptive																											
No information																											

Table I Formulation of technical building regulations of countries in Europe (Branco Pedro et al., 2010)

This performance-based method of defining technical regulations has implications for the institutions that develop technical regulations. *"Performance-based regulation is complicated by the fact that the concept can be applied in a variety of ways and with different degrees of regulatory comprehensiveness"* (May, 2004, p. 382). Meaning that performance-based regulation is complicated because it has to be generally applicable and not specific for one structure. Furthermore, the described requirements must be tested and validated. The quality of performance-based regulations are determined by the development process and the methods to validate the requirements (May, 2004). The institutions in the Netherlands that publish technical regulations have the freedom to set up their processes to achieve high-quality technical regulations. The institutions are free to choose which procedural steps are taken and which validation methods to use. This will likely result in different processes for developing technical regulations. It is important to realise that the freedom in setting up the development and management process might lead to differences between the institutions that publish technical regulations that publish technical regulations.





2.4 Dutch institutions

In the Netherlands, technical regulations are based on European standards. The CEN institution is a European organisation that provides the Netherlands with its technical regulations. The European regulations are relatively general and are sometimes not directly applicable to construction projects in the Netherlands. Some of the European regulations need specifications to be used to evaluate the structural safety of products or materials. Dutch institutions that develop and manage technical regulations perform the specification of certain products of materials. Figure 1 illustrates the process and the different institutions in the Netherlands. In the Netherlands, several institutions are present that are engaged in the development and management of technical regulations. Those institutions publish and manage the most commonly used technical regulations in the construction industry. Those institutions publish various types of technical regulations. The different types of technical regulation represent different technical aspects. Those regulations cover aspects from object/product level to material level. The externally involved parties are parties like engineering firms, industrial organisations, universities, governmental organisations and suppliers. Two main governmental organisations can be identified namely 'Rijkswaterstaat' and 'ProRail'. Those governmental organisations have expertise in their organisations and are therefore regularly involved in the development of technical regulations.



Figure 1 Process and institutions present in the Dutch environment

Developing and managing technical regulation is not the only activity of the Dutch institutions. Commercialisation has led to a new business structure. The institutions also perform other activities to obtain funding. Activities vary from offering workshops or training courses to performing audits. It is important to realise that those institutions have other processes in their business model. The institutions are not funded or supported by the government, which makes that those institutions do not have the obligation to be transparent about their business model. This causes a certain kind of opaqueness of their business organisation. Therefore, it is unknown with activities are the most prominent within the organisations. Organisations strive towards optimizing those processes and thus put a lot of effort into them to ensure optimisation (Koehn, 2005). The development process of technical regulations is likely the main activity of the institutions. This means that it is likely that those processes are carefully set up.





2.5 Development- and management process

This research covers two processes of the institutions, namely the development process and the management process. The development process is the process in which an entirely new technical regulation will be developed. This implies an initiation phase, development phase, and publication phase. The initiation phase is the start of developing a new technical regulation. External parties or institutions that publish technical regulations see a need to develop new technical regulations due to a desire from the market or an innovation. The initiation phase covers all the aspects before development can start. Thus the initiative for a new technical regulation, search for relevant stakeholders, obtainment of funding, and acquirement of expertise. This stage shifts towards the development phase in which the technical regulation gets developed. In this phase, consultations of the stakeholders take place and the draft of the documents that form the technical regulation is made. At last, the publication phase, in this phase the validation of the technical regulation takes place. This is to ensure that the regulation is complete, readable, specific, and validated. Finally, the technical regulation gets published to the public and the management and the usage process starts.

Comments or questions may arise during the usage of the technical regulation or it may turn out that some regulations are not complete or applicable anymore due to new developments in the construction market. This requires some technical regulation to get updated. This is considered the management process of the technical regulations. The management process is the process of updating technical regulations.

2.6 Research gap

2.6.1 Scientific research gap

From a scientific perspective, the research gap is firstly introduced by the assessment report on the regulatory system of the Netherlands by the OECD (2009). This report states that the privately-controlled regulatory system does not provide a strong framework for the development of new regulations. Concluding that the Dutch regulatory system might not deliver high-quality technical regulation. Additionally, from a practical perspective, the fire in the Grenfell tower raised questions on the quality of technical regulations. The severity of the fire was caused by a failure in technical regulations due to the privately-controlled system in the United Kingdom (Moore-Bick, 2019). Both aspects formed the initiative to investigate how high-quality regulations can be achieved.

Research points out that high-quality results can be achieved by having integrity embedded in the organisation (Khan et al., 2010; Koehn, 2005; Sánchez-Apellániz et al., 2013). While various researches are present on what integrity is (Huberts, 2018; Monga, 2016), it is limitedly related to an organisation. Kaptein (2008) has researched how to measure integrity in organisations but not specifically business processes. The private regulatory system is shaped by business processes that develop and manage technical regulations. Thus a connection is missing between the concept of integrity and the privately controlled regulatory system in the construction industry. This is due to the different domains of the two aspects. Regulatory systems are within the domain of civil engineering and integrity is related to the domain of ethics. This research is unique as it combines those two domains.

Various researches are present that investigate either individual integrity or organisational integrity (Monga, 2016; Ponomarenko, 2016). However, research is missing on both aspects in combination by reviewing the integrity of processes within an organisation. This research is in that way unique as it covers individual integrity, integrity within the organisation and combines it for business processes (development and management of technical regulations). Specifically by addressing the integrity of the development and management of Dutch technical regulations by pointing out possible bottlenecks. This research combines definitions of integrity into a general definition of integrity and additionally specifies it for business processes.





This framework illustrates the core fundamentals and the indicators that influence those core fundamentals. Additionally, research is conducted to investigate the relations between the core fundamentals. This research investigates the connection between the privately controlled regulatory system and integrity and analyses the gap in integrity in the development and management of technical regulation in the Netherlands. The analysis of the technical regulatory system is also linked back to the theoretical integrity framework. Advice to improve the Dutch technical regulatory system is also linked back to the theoretical integrity framework. This research is relevant as it concerns social importance as high-quality technical regulations are required to ensure structural safety. Furthermore, this research has added value to the scientific world as this framework provides the scientific world with a tool to analyse the integrity of business processes. This research could serve as the foundation of other integrity analysis frameworks.

2.6.2 Practical research gap

Besides a scientific research gap, this research also covers a practical research gap. A practical research gap can be identified from a practical perspective. The commercialisation of the institutions that develop and manage technical regulations has led to the opaqueness of the process. The institutions do not have the obligation to be transparent on their processes and validation methods. This creates a practical research gap on how the processes work and how they can be made transparent to others. To analyse the integrity of the institutions, the process and validation methods need to be understood. Meaning that the processes within those organisations need to be researched. This creates transparency on how the institutions have organised their processes.

Furthermore, the severity of the fire in the Grenfell tower was caused by the private development of technical regulations. Questions were raised if such cases can occur in the Netherlands. This research analysed the Dutch technical regulatory system to point out bottlenecks that can compromise the quality of technical regulations. By analysing the integrity of the process, clarity can be given to those aspects. This will not exclude that failure can occur but can indicate the likeliness that errors might be present in some technical regulations.





3. Methodology and validation

This research is about analysing the integrity of the development and management process of technical regulations in the Netherlands. In general, the qualitative research method is used to analyse the integrity of the development and management process. To be specific, this research is qualitative with a diagnostic character. This means that the integrity is diagnostically analysed by identifying and analysing the possible bottlenecks that could occur during the process. Those bottlenecks are identified based on qualitative data gathering methods, like interviews and reviewing business policy documents. The diagnostic character of this research is chosen to determine the presence of certain bottlenecks. It is not feasible to further analyse the bottlenecks given the timespan of six months for this research. The diagnostic character makes that bottlenecks can be identified and described and specific recommendations can be given (Verschuren & Doorewaard, 2010).

The term integrity can be applied in many different ways. For instance, it can be used to describe the characteristic of a politician or can be used to assess the conduct within an organisation. The nature of the term makes it is widely used and has various definitions. In this research, the integrity of the development and management of technical regulations in the Netherlands is considered. This starts by understanding what the term integrity means and how it can be applied to analyse the development and management process. The methodology can be divided into two aspects, namely the development of the theoretical framework and the analysis of the integrity. The theoretical part is the development of the framework where integrity is specified into measurable factors. The analysis of the integrity uses those specified measurable factors to analyse the integrity of the development and management processes of three institutions in the Netherlands.

3.1 Methodology to develop a theoretical framework

3.1.1 *Defining integrity*

As stated, the term integrity is widely used to describe the characteristics of an individual or an organisation. In this research, the term integrity is applied to analyse the integrity of a business process. This starts by defining the term integrity and understanding the importance of the term. This is conducted by consulting scientific articles on the topic of integrity. Scientific articles are peer-reviewed articles, which means that various experts have reviewed those articles before they got published. This implies that the information is reliable and valid. Various definitions and applications of the term integrity have been published. Those have been gathered and compared to define the most important aspects of integrity. Literature is obtained through acknowledged sources like Scopus and Taylor & Francis. The research strives towards using sources that are not older than 10 years or are fundamentally important for this topic.

Literature pointed out that individual and organisational integrity can be differentiated. Individual and organisational integrity is further specified by more scientific literature. From the literature, it is identified that individual and organisational integrity is present in business processes. Also, integrity can be differentiated into intrinsic and extrinsic integrity. This results in an integrity matrix in which characteristics of individual/organisational and intrinsic/extrinsic aspects were described, which is illustrated in Figure 4. This matrix introduced important characteristics of integrity in business processes and forms the foundation of the identified core fundamentals. Aspects that were present in all the definitions of integrity have been bundled to develop a combined general definition of integrity. This general definition is further specified into a definition of integrity on developing and managing technical regulations, which is described in paragraph 4.2.3. This definition also introduced the core fundamentals of integrity in business processes based on scientific articles.

3.1.2 Core fundamentals and indicators

The specified definition of integrity mentions several core fundamentals that should be embedded in the processes of organisations. Those core fundamentals are further defined by using scientific articles to comprehend what the core fundamental is and how it relates to integrity. It is also reviewed if the core fundamentals have a relation to each other. This is also done through scientific articles. Additionally, the core fundamentals are further specified in indicators. Indicators show how the core fundamental is formed, which allows for the identification of measurable factors. Each core fundamental has several indicators. Defining the indicators is also done with scientific articles.





The definition of the term integrity, the core fundamentals, and the indicators shape the theoretical framework. This framework is validated in three ways. The first way is the usage of scientific articles. Nearly all the used sources are scientific articles. Information from other sources is cross-checked before it is used in this research. The second way is the usage of the PDCA (Plan Do Check Act) cycle. This means that the development of the framework is done according to a plan and adjusted through feedback by the supervisors. The third way of validating the framework is by discussing it with an expert in the field of ethics. Those three ways validate the theoretical framework.

3.1.3 Mechanisms

The identified indicators are further defined into mechanisms that could occur during the process. The mechanisms are possible bottlenecks that might occur during the development and management process. Those possible bottlenecks are defined from scientific sources. Literature is gathered on the different indicators and mechanisms are developed based on theoretical possible bottlenecks. The validation of the measurable factors is done by reflecting on the defined core fundamentals. The impact of the factors has been linked back to the core fundamentals to ensure that the factors measure the appropriate core fundamentals. Meaning that every factor has either a positive or negative impact on the core fundamental if it occurs. For instance, standardisation of process has a positive impact on the core fundamental 'consistency'.

3.2 Methodology to diagnostically analyse the integrity

3.2.1 Analysis of the institutions

Data gathering method

The defined measurable factors have been used to analyse the integrity of three institutions that develop and manage technical regulations in the Netherlands. Data from those institutions is obtained through qualitative data gathering methods. The data used are interviews and business policy documents. Interviews have been conducted with employees that are involved in the development and management process. Those employees are directly involved in the process and have the know-how of the process. Additionally, business policy documents have been requested to analyse aspects that are not suited to be asked during the interviews. Also, the business policy documents help to substantiate the interviews. The interviews have a semi-structured format to discuss the topics of this research but also have the freedom to ask more in-depth questions. The interviews are focused on aspects that cannot be described in business policy. Meaning that the interviews cover aspects that require personal perspective or expert view. Other aspects are analysed based on the organisations business policies. Aspects like standardization are suited to analyse by document study.

Diagnostically analysing the processes of the institutions

The structure of the analysis for each organisation is similar. The presented results are set up in a fixed order to ensure that the analysis is done similarly and consistently. First, a general description is given of the organisation and which technical regulation they are publishing. Within this general description, a table is presented with all the information used to analyse the integrity of that institution. The information sources have a unique ID and within the explanation of the results are referred back to that ID. This has two benefits namely easy overview of where the information is found and it keeps the reference list true to scientific sources. Secondly, the development and management process is described based on the business policy documents and the interviews. In this section of the results, the processes are described and illustrated by a flowchart graph. Lastly, the information from the interviews, business policy documents are used to analyse the presence of mechanisms in the process. The different analyses of the organisations are compared to oversee the similarities and differences.

The analysis of the integrity is conducted by analysing the possible bottlenecks presented in paragraph 5.4. The document study and interviews point out if those bottlenecks are present in the process. Some bottlenecks are clear and a score of "Yes" or "No" can be given. However, some bottlenecks consist of several aspects. The organisation might have some aspects present in their processes and some not. Therefore, the result would be that the bottlenecks are partly present in the process. For instance, an institution might have standardised only the initialisation phase and not the development phase. The outcome would be that the standardization of the process is partly fulfilled and thus the bottleneck is partly present.





Weighting factors

Integrity is defined by the five different core fundamentals. Integrity is shaped by behaving according to those core fundamentals. The diagnostic character of this research makes it that weighting factors are not applied in this research. While one could argue that certain fundamentals are more important than others, it is not adopted in this research. The diagnostic character of this study makes that the identified mechanisms are analysed to be (partly) present or not. This means that the identified mechanisms can be present, not present, or partly present. The qualitative nature of this research makes it difficult to validate weighting factors for the mechanisms. It goes beyond the scope of this research to investigate the exact influence of each mechanism on the integrity of business processes as it is not feasible in the timespan of this research. mechanisms in the development and management process may undermine the quality of the technical regulations. Improvements in the process can be realised by pointing out mechanisms in the development and management process.

Method comparison with the integrity thermometer

Kaptein (2008) has developed the foundation of the integrity thermometer to measure the integrity within organisations. The data gathering is based on a questionnaire and results are obtained by statistical analysis. However, there are several reasons why this method cannot be directly applied in this study. The main reason is that the objective of the integrity thermometer is different from this research. The integrity thermometer measures the integrity within an organisation while this research focuses on business processes. Another reason is that the integrity thermometer uses data-gathering methods that are not feasible in this study. The integrity thermometer obtains data through questionnaires from 250+ respondents and performs a statistical analysis on the replies. This is not feasible in this study. Only limited employees from the institutions are available that are involved in the development and management of technical regulations. A questionnaire would cause difficulties in validating the findings.

3.2.2 Conclusions, recommendations, and discussion

The analysis of the development and management process of technical regulations forms the foundation to make scientific conclusions. The presented results can indicate whether integrity is embedded in the processes of the institutions that publish technical regulations. The presence of mechanisms in the processes means that the integrity is negatively affected. The conclusions try to answer the main question of this research, namely: To what extent is integrity embedded in the development and management process of technical regulations. The conclusions are linked back to the integrity framework to make validated conclusions based on the scientific foundation of this research. The conclusions also introduce possible recommendations that can be given to the institutions to improve their processes. The advice can be categorized into institution-wide improvements and tailored improvements. Institution-wide improvements are recommendations that concern mechanisms that are present for all three institutions. Tailored improvements are specific improvements for each institution.

Meaning that all three institutions have certain mechanisms present that negatively affect the integrity of the processes. Institution-wide recommendations can be given so that those mechanisms can be addressed. Tailored improvements are specific recommendations for each institution. The differences between the processes between institution-wide and tailored improvements mean that different mechanisms are present per institution. Thus, mechanisms that are only present for one institution can be addressed by defining tailored improvements.

During this research, certain topics came to the attention that was outside the scope of this research. Those topics form the discussion paragraph. The considered technical regulations play a part in the bigger picture. The different technical regulations all serve the purpose of ensuring structurally safe infrastructure. The Dutch regulatory system consists of various parties in which some possible tension fields can be identified. Tension fields can be described as bottlenecks beyond one institution. Meaning that a wider view is used to indicate bottlenecks in the Dutch regulatory system. It is important to realise that the presented framework does not apply to analyse the tension field. Thus no scientific conclusions can be made on the observed tensions field but it can help to initiate additional research onto that topic.





3.3 Overview of the research methodology

Figure 2 illustrates a graphical overview of the research methodology of the development of the theoretical framework and the diagnostic analysis of the integrity. This figure clearly illustrates the anatomy of scientific research. The introduced topic is funnelled from a broad definition into measurable factors. The analysis of integrity has the opposite shape. The funnelled measurable factors are used to analyse the integrity of the development and management processes. The conclusions, advice, and discussions become broader as aspects that relate to this research are described.



Figure 2 Overview of the research methodology





3.4 Validity of the results

The validity of the results is important to make scientifically supported conclusions and recommendations about the development and management process of technical regulations. Validation is about assuring that the contents of this research are scientifically sound. This is achieved by considering multiple validation methods. Lucko et al. (2010) have defined various types of validation of methodology and results. Those types are the following: internal validity, external validity, face validity, content validity, criterion validity and construct validity. Those types of validation are reflected and explained for this research.

3.4.1 Internal validity

Internal validity is related to causality and is about eliminating alternative explanations of the findings. Internal validity is often used in quantitative research by statistical resampling and regression models. It can also be used for qualitative research. In this research, internal validity is achieved in several ways. The first way is in developing the theoretical framework. This framework is validated in three ways, namely the use of scientific sources, usage of the Plan-Do-Check-Act cycle, and discussing it with an expert in the field of ethics. Additionally, the indicators are related to the core fundamentals. This is done to ensure that the impact of the indicators on the core fundamentals is understood. Internal validity is also created during conducting of the interviews. Interviews are an important source of information in this research and thus validation is important. The interviews are set up in a semi-structured way. This has the benefit that the interview has structure but also creates room for discussion. The interviewes are chosen that are relevant for this research. Those are employees of the institutions but also stakeholders that are often involved in the process. Those stakeholders can help to validate the information from the interviews, the researcher had a neutral stand. This means that no preliminary findings or information from other interviews are shared with others. This is done to prevent blinding or biasing from the interviewer.

3.4.2 External validity

External validity is about the generalizability of the results and is about how research can be used in other contexts. External validity is difficult to achieve because the results of this research are specifically about three institutions in the Netherlands. Other institutions in other counties may have different processes and different bottlenecks present in the processes. Therefore the conclusions and recommendations of this research are not directly applicable to other institutions. However, the developed framework and analysis matrix can be used to analyse the integrity of other development and management processes.

While the development and management process might vary between countries, it is important to realise that other counties have a similar regulatory system. The results of this research might be an impulse to research the integrity of those institutions. The results show that integrity is a complex subject and a lot of effort is required to achieve integrity. The presented results in this paper can be eye-opening for institutions in other countries to change their perspective on integrity, which might lead to changes in the processes. This creates the external validity of this research.

3.4.3 Face validity

Face validity is about presenting the contents of the research to others in a way that is understandable and logical. This is achieved in two ways. The first way is discussing the developed framework with an expert in the fields of ethics. This creates validation of the framework and indicates if the framework is understandable for experts that were not concerned in this research. The second way is by presenting the advice to the institutions that participate in this research. The summary, framework, findings, and advice are communicated via a memo and a meeting with employees of the institutions. This ensures that non-researchers achieve an understanding of the findings and advice. The meeting with the employees of the institutions is set up to discuss the findings and to clarify possible misinterpretations.





3.4.4 Content validity

Content validity is about the validation of the data used in the research. In this research, the used data came from two sources. The first source is business policy documents in which the process is explained. Those business policy documents are validated by obtaining those through employees that use them. The validation of the interviews is more complex. Content validation of the interviews is achieved through triangulation of the interviews. Triangulation of the information is important for the validation of the collected data. Especially the triangulation of the information obtained through the interviews. Several mechanisms are substantiated by information that was provided through interviews. Triangulation helps to ensure the validity of the interviews to ensure that the information is correct and discrepancies are resolved (Carter et al., 2014). In this research, the triangulation of the interviews is conducted in two ways. The first way is comparing the information given by the employees of the same institution. The responses to the interview questions were analysed and the discrepancies are clarified by the employees. For instance, an answer could be incomplete which causes differences in the responses. The quality of the information will be improved by clarifying those aspects. The second way is to reflect the information with external sources. The experience of the development and management process might be different than the employees describe. To an even extremer event, the employees could say that they are working according to the business policy but the experiences from the stakeholders could say otherwise. Reflecting on the information from the interviews is also a valuable triangulation method to improve the quality of the interviews.

3.4.5 Criterion validity

Criterion validity is about the correlation between related measurements. Meaning that the analysis method is compared and reflected with other frameworks. This is achieved in this research as various aspects are compared and reflected in other scientific research. Firstly, the research method is compared to other research to ensure that the methodology is sufficient and scientifically supported. Secondly, the identified core fundamentals are compared to other frameworks to ensure that the core fundamentals contain the important integrity aspects.

3.4.6 Construct validity

Construct validity is to ensure that a research measures what it is supposed to measure. Meaning that the results of this research fill the research gap. This is achieved by having a clear methodology to ensure that the analysis measures what it is supposed to measure. The developed theoretical framework is based on scientific information to ensure that it is supported scientifically. This framework is specified for the development and management process of technical regulations. This is done by reviewing scientific information and identifying mechanisms that could occur during the process. This is further specified in Appendix D by identifying questions to obtain information on those mechanisms and information sources to get it from. Each question gained a unique ID. Those ID's have been incorporated in the semi-structured interview format to ensure that each question is asked during the interviews. The obtained information from interviews and business documents is thoroughly analysed and compared before conclusions were drawn. Interviews have been triangulated to ensure that the information is valid. Lastly, the results for each institution have been reviewed by employees of the organisation to ensure that the presented information is correct.





4. Integrity

4.1 Importance of integrity

An assessment report of the regulatory system in the Netherlands conducted by the OECD (2009) already states that the shift towards a more open and market-driven method has implications on the assessment of new regulations. The new methods of developing regulation do not provide a sufficiently strong framework for robust, evidence-based development of new regulations. The report states that consultation is an essential part of effective regulatory management. It recommends that a rapid improvement is required to ensure consultation. Consultation is achieved when the transparency is boosted and effective and timely consultation of stakeholders is considered, as that is essential to the assessment process for new regulations (OECD, 2009). This correlates with the findings of Mabillard & Zumofen (2017) as they state that transparency and accountability are treated together as pillars of high-quality governance. High-quality governance and thus high-quality technical regulations are achieved when transparency and accountability are the pillars of the organisation.

While this report by the OECD (2009) is almost 15 years old, it is not clear if the recommendations of this report are implemented in the current regulatory system. As previously stated, the institutions do not have the obligation to be transparent. This creates an opaqueness in the development and management process and the technical regulatory system. The opaqueness of the technical regulatory system in the Netherlands indicates that the boost in transparency is not achieved. Additionally, it seems that public consultation is limitedly achieved as governments are not always involved in the development of technical regulations.

The development and management process are the most important processes in ensuring high-quality technical regulations. Integrity in the development and management process is therefore important to achieve high-quality technical regulations. Erhard H et al. (2009) describe the importance of integrity in relation to the performance of organisations. Integrity is a necessary and essential condition for achieving high performance within an organisation. Individual and organisational integrity is essential to ensure the high performance of the organisation. Meaning that if integrity is embedded in the organisation, the opportunity can present itself to deliver high-quality technical regulation. This creates the importance of integrity for the regulatory system. Embedding integrity within the organisations and processes likely leads to high-quality technical regulations. Which will lead to satisfaction of the desires of the government to ensure structurally safe infrastructure.

4.2 Defining integrity

The term integrity is often used in various settings. Integrity is inherently correlated by ethics and moral standards and can even be described as a philosophical term. Literature defines various definitions of integrity but all vary based on the situation. Integrity can be used to describe the behaviour of an individual but can also be used to define ethics within organisations or group behaviour. The nature of the term causes variation in the definition of the term integrity.

One way to define integrity is to consider the opposite of integrity: corruption. Huberts (2018) states that integrity is obtained when corruption within an organisation is removed. Corruption is defined as acting in a particularistic interest because of advantages promised or given. Different forms of corruption can be distinguished such as favouritism, conflict of interests, extortion and embezzlement (Huberts, 2018). This definition of corruption can be present at different levels within the organisation. Individuals acting on behave of an organisation can encounter corruption but it can also be present within the business organisation. Integrity is achieved when the entire organisation is incorruptible both at an individual- and organisational level. This connects to the definition of integrity by Sánchez-Apellániz et al. (2013). *"Firm adherence to a code of morals and artistic values to obtain incorruptibility"*. Sánchez-Apellániz et al. (2013) state that integrity is a trait associated with humans being unimpaired and undivided in their behaviour. Individuals and organisations behave and act coherently to their values and beliefs. Erhard H et al., (2009) state a different definition of integrity. Integrity is a state or condition of being whole and complete. Objects, systems, persons, groups, organisations strive towards behaving with integrity.





Those different definitions all have one thing in common. A firm belief in being true to moral and ethical values will lead to integrity, both individually and organisationally. It is important to consider individual and organisational integrity. While there are differences between individual integrity and organisational integrity, ethics, morality, and honesty are the core aspects that shape the general term integrity. The following paragraphs cover more in-depth aspects of integrity for individuals and organisations.

4.2.1 Individual integrity

"Individual integrity is defined as a person that has an honest morality, strong character, and being above reproach. It is doing the right thing for the right reasons, no matter the costs. It is acting for the right reasons and motives" (Sánchez-Apellániz et al., 2013, p. 2). Meaning that an individual is considered to have integrity if it acts consistently and diligently based on its values and beliefs. This definition correlates with the definition of Monga (2016). Monga (2016) states that individual integrity is achieved by committing to sound moral principles and ethical values. Meaning that individual integrity is acting according to ethical and moral principles, which confirm that integrity goes together with ethics, morality, and honesty. Five different principles of individual integrity are defined by Monga (2016), presented in Table II. The five principles concern the moral standards of individuals. An individual is considered to have integrity if their behaviour is consistent and true to its moral and ethical convictions.

Integrity principle	Explanation
Wholeness	Person's overall consistency of behaviour across time and situations
Consistency of words and actions	Behaving and acting according and consequently based on your promises and believes
Consistency in adversity	Having moral steadfastness to not be persuaded by temptations
Authenticity	Being true to oneself through consistency between espoused values and enacted values
Moral or ethical behaviour	Showing honesty, justice and respect, empathy and compassion, fairness, and being trustworthy

Table II Integrity principles (Monga, 2016)





4.2.2 Organisational integrity

Organisational integrity is important for businesses and organisations as business models with embedded integrity are essential to function long-term (Koehn, 2005). One important aspect of organisation integrity is the term transparency. Transparent organisations share information with stakeholders to make informed decisions regarding the relationship with the organisations. Furthermore, an organisation with a clear mission, vision, strategic priority, and shared business values along the firm can reach the goal of gaining the trust of its customers. This is achieved through transparency and aligning their actions with the organisation's values and ethics (Ponomarenko, 2016). Management of an organisation. Organisations and firms with high trust have transparency and integrity included in their business organisation. (Sánchez-Apellániz et al., 2013).

Figure 3 illustrates how organisational integrity is shaped. Shared values and a clear direction create organisational transparency and in turn create integrity. Transparency to stakeholders is important as stakeholders are essential to the existence of the organisation. Stakeholders can be classified as primary stakeholders and secondary stakeholders. Primary stakeholders are groups or individuals that are essential to the organisation. Those stakeholders have contractual relations with the organisation and are often parties like suppliers of clients. Secondary stakeholders are groups, individuals, or governments that play a part in the credibility of the organisation (Sánchez-Apellániz et al., 2013). Transparency between the different stakeholders is essential for obtaining trust and establishing relationships with the stakeholders.



Figure 3 Organisational integrity (Ponomarenko, 2016)





Overview of integrity

Monga (2016) defines features of integrity and states that integrity can be intrinsic and extrinsic. *"Intrinsic integrity is the commitment to sound moral principles and being true to oneself"* (Monga, 2016, p. 5). Meaning that intrinsic integrity is connected to an individual. Only the individual can truly know its principles and values and the true intentions behind its actions. An individual also has extrinsic integrity. Extrinsic integrity is about propagating your values and beliefs to others. This is realised through the actions and communication of the individual. The propagating of individual integrity is done by being consistent. This means that an individual stays true to their values and believes in words and actions and sticks to the beliefs in adversity. An individual does not suddenly change their values and beliefs if it fits the situation. For instance, an individual convinced that everyone needs to be tolerant towards others should not change its perspective if people with different cultural backgrounds start to live in its neighbourhood.

Intrinsic and extrinsic integrity can also be identified for organisations. Intrinsic integrity within an organisation is that an organisation knows where it stands for and what the organisation wants to achieve. This can be embedded in the organisation by having a clear internal vision. An internal vision should be developed based on the shared values within the organisation. Organisational wide integrity is obtained when employees can identify themselves with the values and beliefs of the organisation. This internal vision can be made specific to an organisational mission. This shapes the intrinsic integrity of organisations. Extrinsic integrity is propagating the values and beliefs of the organisation towards others. Ponomarenko (2016) states that extrinsic integrity is achieved when organisations are transparent and align their actions with the organisation's values and ethics. Based on the description of intrinsic and extrinsic integrity, a matrix is developed. The matrix provides a clear overview of the intrinsic/extrinsic aspects of individual/organisational integrity. The matrix is presented below in Figure 4.

Wholeness Moral and/or ethical behaviour Commitment to sound moral principles	Consistency of words and actions Consistency in adversity					
Intrinsic Supporting consistent behaviour Shared values with in the organization	Extrinsic Propagating organizational ethics Organizational transparency Diligence in adopting information					
Organizational						

Individual

Figure 4 Integrity matrix

The integrity of business processes is shaped by individual and organisational integrity. Business processes of organisations combine individual and organisational integrity. Organisational integrity is present as the development process is set up by the organisation. This means that the organisation has thought about the different steps in the process and validation methods. Additionally, organisational ethics can be propagated in those processes. Individual integrity is present as individuals (employees) are involved in the process. An individual is involved in the process and has a certain freedom in their actions. The individuals act according to their values and beliefs but can be supported by organisational integrity. For instance, an individual has the belief that transparency is utterly important. An organisation that also values transparency can support that belief by having policy documents or facilities to achieve transparency. This illustrates that both individual and organisational integrity are present in business processes and both contribute to integrity.





4.2.3 Definition of integrity in a regulatory context

Integrity within the regulatory system is important to obtain high-quality regulation. Institutions that publish technical regulations have the ethical obligation to have integrity embedded in the organisation, as it concerns structural safety, which is important for society. Integrity in the institutions that publish technical regulations should be embedded in the main processes. The main processes of those institutions likely are to develop and manage technical regulations. Organisational and individual integrity should be embedded in the process of developing and managing technical regulation. Meaning that the ethical values of the organisations should be present in the process and employees act accordingly. Furthermore, high-quality governance and thus high-quality regulation is achieved when transparency and accountability are present in the process and organisation of the institutions. This is achieved by a consistent and diligent method of developing and managing technical regulation (Mabillard & Zumofen, 2017).

The commercialisation of the institutions has led to the involvement of various stakeholders in the process. Several stakeholders are introduced in the process of developing technical regulations. Those stakeholders invest in the publishing of new technical regulations. Meaning that integrity in the process has become more and more important as the institutions are more dependent on external stakeholders. It is of great importance that diligence and incorruptibility are embedded in the processes. Diligence should be present to critically analyse external documents and expertise. This is achieved by having a critical review of documents and having diligence in adopting information. Furthermore, information should be validated before using it in new technical regulations. Incorruptibility is also of great importance to achieve integrity. The dependence on external stakeholders makes it important to not be persuaded into forms of favouritism or influence peddling. The organisation and the employees should be resistant to such influences and should act fierce towards parties that propose forms of corruption.

The previous paragraphs defined important aspects of integrity. While there is no consensus on the definition of the term, it can be specified for business processes. The considered Dutch regulatory system consists of three large institutions that publish technical regulations. Integrity should be the main focus of those institutions and should be embedded in the processes. Meaning that the development and management of technical regulation should be done with integrity and close to the ethical values of the organisations. To be specific, individual and organisational behaviour should be in line with the ethical and moral standards what is expected of those institutions. Meaning that the organisation and the processes are incorruptible, diligent, consistent, and transparent. In addition, the organisations and individuals are accountable for the final results. Based on the findings of Monga (2016) and Erhard H et al. (2009) it is determined in this research that the general definition of integrity is:

"Integrity is being true to the shared ethical and moral standards"

Dutch translation: "Integriteit is trouw zijn aan de gedeelde ethische en morele standaarden"

This definition can be specified for business processes. The institutions that develop and manage technical regulations have to act according to shared values and ethics. Those values and ethics should be embedded in the main processes. Based on the literature, it can be determined that integrity has five core fundamentals. Integrity is achieved when those five fundamentals are present in the processes and the behaviour of the employees. The five core fundamentals are consistency, diligence, incorruptibility, transparency, and accountability. The determined definition in this research of integrity specified for business processes is the following:

"Integrity is acting according to the shared values and ethics within the organisation in which consistency, diligence, incorruptibility, transparency, and accountability are the core fundamentals of the organisation and is embedded in the main processes of the organisation"

Dutch translation:

"Integriteit is handelen volgens de gedeelde waardes en ethische standaarden binnen de organisatie, waarbij consistentie, zorgvuldigheid, onkreukbaarheid, transparantie en verantwoordelijkheid de fundamentele speerpunten van de organisatie zijn en worden verankerd in de belangrijkste processen van de organisatie"





5. Integrity framework on business processes

This chapter translates the definition of integrity into a theoretical integrity framework on business processes. In this framework, the core fundamentals of integrity are identified and described. Furthermore, the relations between the core fundamentals are investigated. After the core fundamentals are specified, indicators have been researched that shape the core fundamentals to complete the theoretical integrity framework

5.1 General description of the framework

The theoretical integrity framework is a translation of the definition of integrity into a usable framework to analyse the integrity of a business process. The goal of the framework is to provide information on how the core fundamentals shape integrity and which indicators influence the core fundamentals. The indicators that influence the core fundamentals can be translated into specific cases. In this case, the core fundamentals are specified for the Dutch regulatory system (Chapter 6). Figure 5 illustrates the breakdown of integrity into the five core fundamentals.



Figure 5 Integrity broken down into five core fundamentals

5.2 Core fundamentals of integrity

5.2.1 Consistent

According to the Cambridge Dictionary (2021), consistency can be defined as *''the quality of always behaving or performing in a similar way, or/of always happening in a similar way''*. Meaning that consistency is acting and behaving according to structured work methods and making decisions rationally. Consistency can be divided into individual consistency and organisational consistency. Individual consistency is shaped by the behaviour and decision-making of the individual. The behaviour of an individual should be according to its (shared) moral and ethical beliefs. An individual achieves consistency by staying true to those beliefs. In practice, it means working and behaving consistently and making rational decisions to create a predictive pattern. Consistent behaviour is shaped by staying true to the (shared) values and beliefs (Sherman et al., 2010). Consistent behaviour is the interaction between the characteristics of a person and the situation it is in. To be specific, it is how an individual reacts to other individuals and handles unexpected events.

Organisational consistency is defined by standardisation and creating trust within the organisation. Argandoña (2011) states the importance of consistency in organisations. This research shows that consistency is an important condition for long-term organisational well-being. Consistency plays a key role as a driver of trust in organisations. Furthermore, consistency is the method to introduce ethics into practice as ethical matters can be introduced by consistent working methods or in decision-making. Organisational consistency is achieved when employees identify themselves with the organisation and trust is created between employees, managers, and stakeholders (Argandoña, 2011). Standardised business- and decision-making processes help to facilitate the creation of trust between employees and external parties. Consistency in organisations is shaped by staying true to the mission and vision of the organisation. This is carried out by consistency in behaviour, decision-making and working according to the standardised business processes (Flieger, 2020).





5.2.2 Diligence

Diligence is shaped by working carefully and reflecting on the process and results. Reflecting on the process is shaped by critical analysis of individual behaviour and the processes. Working carefully is shaped by having a critical view on adopting information. Furthermore, diligence is shaped by creating trustworthiness by external parties. Trust is important for organisations to ensure long-term existence. Businesses are reliant on external parties to create revenue. Establishing trust along external parties helps to create revenue as parties tend to return to trustworthy partners (Mouzas et al., 2007). Diligence is about creating trustworthiness by external parties. Consistency in the organisation helps to create a predictive pattern and diligence further helps to create high-quality results. A critical view and reflections help to improve the organisation and improve the end products. Diligence goes together with stakeholder management. The selection of which stakeholder to involve in which process has to be conducted diligently. A selection needs to be made which stakeholder to involve based on the added value of the stakeholder.

Furthermore, reflections are an important aspect of diligence as reflection is an exploration and explanation of events. The exploration and explanation of why certain things happen during a process help to improve the organisation. Reflections can help to improve the business process and can also improve the end product. Individuals and organisations can perform reflections on various aspects. Individuals can critically reflect upon existing structures and practise within the organisation. Furthermore, individuals can critically review the collective learning methods and innovation within the organisation. This implies questioning the organisational structure, work processes, and validation methods. In addition, organisations can implement organisational reflections. Organisational reflections combine different reflections from different employees into an organisational reflection. This is achieved through discussions with employees. Organisational reflections have the positive benefit that the results are widely supported in the organisation. Meaning that discussion on reflections results in organisational improvement that is supported by the employees, which in turn creates employee satisfaction (Vince & Reynolds, 2010).

5.2.3 Incorruptibility

Incorruptibility is inherently correlated to the ethical codes of an organisation. Ethics codes can be defined as *"written, distinct, and formal documents which consist of moral standards used to guide employee or corporate behaviour"* (Valentine & Johnson, 2005, p. 45). Meaning that organisations develop ethics codes to help employees on how to behave and act accordingly. For instance, ethical codes can contain that bribery is heavily sanctioned. This makes that ethical codes are inherently correlated to incorruptibility. Incorruptibility is obtained when employees work according to the ethical codes of their organisation. The ethical codes are the tool to establish incorruptibility in organisations (Valentine & Johnson, 2005).

In practice, this means that the involvement of stakeholder interest needs to be managed. The involvement of external parties in the process can lead to the occurrence of corrupt behaviour. For instance, corrupt behaviour can be a form of favouritism for certain parties. Management of the stakeholder interests is therefore important. Furthermore, the organisation should strive to remove (possible) corruption. This is achieved when managers discuss with the employees on code of conduct and periodically update the ethical codes of its organisation. In addition, the organisation should act fierce towards corrupt behaviour. Employees must be aware of the sanctions when caught showing corrupt behaviour and should be sanctioned accordingly if it occurs. Incorruptibility is achieved with clarity in the code of conduct and sanctionability when infringement of the code of conduct is embedded within the organisation.





5.2.4 Transparent

Transparent is a term without unified consensus. According to the Cambridge Dictionary (2021), the definition of transparency is: *"Transparent business and financial activities are done in an open way without secrets so that people can trust that they are fair and honest"*. This means that documents and processes need to be shared openly and that the decision-making is conducted openly. This relates to diligence as transparency is also a positive influence towards establishing trust.

Transparency of documentation consists of three dimensions, namely disclosure, clarity, and accuracy. Disclosure is the open sharing of information with the relevant stakeholder on time. Meaning that every party has timely access to the relevant information for the business activity. Clarity means that the information is understandable for everyone and is free of room for interpretation. Every stakeholder should understand the information without any clarification. Accuracy is that the information is correct and thus free of mistakes (Schnackenberg & Tomlinson, 2016). Besides transparency of documentation, organisations need to be transparent about business processes. This is achieved by timely informing stakeholders on the course of events and which parties are involved. Stakeholders should be aware of the process steps and validation methods to prevent surprises in the process. Transparency in communication is also important. Communication needs to be conducted openly to prevent private collaboration and hidden agendas. Communication should be conducted in an open way. Meaning that stakeholders know what is discussed and with whom.

5.2.5 Accountability

Accountability is being responsible for one's behaviour and actions. In addition, accountability is looking beyond self-interest. It is about serving the clients' needs in a way that the organisation stands behind the end product (Arunachalam, 2015). In practice, this means that individuals and organisations take responsibility for their actions and the results. An incentive to have integrity is created by being accountable for the results. Employees can be guided with conversations on responsibilities during the process. Later, a reflection can take place to see if the employee handles the responsibilities adequately. Being accountable for certain results helps to stick to ethical values. To a further extent, accountability does also imply being liable for delivered products. Organisations or individuals can be held accountable (and liable) when a failure occurs. Integrity on accountability is obtained when responsibility and liability are embedded individually and in the organisation (Arunachalam, 2015).

5.3 Comparison to other frameworks

As stated, the definition of integrity is not unified, and depending on the situation the definition is different. This is also the case by identifying the core fundamentals of integrity. Different thermology is used to describe different aspects of integrity. The defined definition of integrity in chapter 3 already covers five core fundamentals based on aspects of intrinsic/extrinsic and individual/organisational integrity matrix (Figure 4), which are described in the paragraphs above. Those five core fundamentals are compared to other integrity frameworks to assess if those core fundamentals contain all the important aspects of integrity.

Barnard et al. (2008) have researched the integrity of business leaders and developed a conceptual framework of integrity. This framework is mainly focused on individual integrity and what shapes business leaders that are considered to have integrity. While the framework does not cover core fundamentals, it identifies the competencies of individuals that shape integrity. The competencies all have one thing in common and that is living according to a core set of values and principles. Integrity reflects those values and principles. The competencies of integrity are self-motivation, hard-working, moral courage, assertiveness, self-discipline, honesty, responsibility, consistency, trustworthiness, commitment, and fairness (Barnard et al., 2008). Table III illustrates the competencies related to the core fundamentals of this research. Most noticeable are the competencies self-motivation, self-disciple related to consistency. Self-motivation and self-discipline are related to consistency as it concerns a consistent working method. A consistent working method is achieved through self-discipline and being motivated to keep doing it.





Core fundamental Competencies Relation Consistency Self-motivation, Consistency in working method • self-discipline, • Discipline to follow standardised working methods consistency Diligence Hard-working, Ability to speak out when something is not correct moral courage and Diligence in adopting information assertiveness, Creating trust among stakeholders trustworthiness Incorruptibility Commitment Commitment to sound moral principles • Not being tempted into corrupt behaviour • Transparent Honesty, fairness Open communication • Not withholding information • Accountable Responsibility Responsible and liable for individual behaviour •

A different study regarding measuring integrity in an organisation is the study of Kaptein (2008). In this study, the ethical climate in organisations is measured. Kaptein (2008) identified seven dimensions to measure the ethical climate in organisations. Those dimensions are clarity, congruency, feasibility, supportability, transparency, discussability, and sanctionability. Appendix A defines those dimensions. KPMG (n.d.) has used those dimensions to create the integrity thermometer. The integrity thermometer is a tool to measure the integrity within an organisation. The way it measures integrity is covered in Appendix A. Those dimensions of integrity can also be related to the identified core fundamentals. Table IV illustrates the dimensions related to the core fundamentals.

Core fundamental	Dimensions	Relation
Consistency	Congruency	 Consistency within the organisation and in the processes
	Feasibility	 Consistent working methods to work ethically
Diligence	Discussability	Reflections to support discussions on ethical matters
	Supportability	 Ethical values supported by its employees
Incorruptibility	Clarity	Clarity in expectations of what is expected regarding
	Sanctionability	preventing corruption
		 Sanctioning employees when corrupt behaviour occurs
Transparent	Transparency	Transparent on decision-making
		• Transparent in communication, both toward colleagues and
		external parties
Accountable	Sanctionability	Accountable for individual behaviour

Table IV Dimensions by Kaptein (2008) related to core fundamentals

Table III Competencies by Barnard et al. (2008) related to core fundamentals

Based on the comparison of the integrity framework of Barnard et al. (2008) and the research of Kaptein (2008) it can be concluded that the five core fundamentals contain important aspects of integrity. The different frameworks cover individual integrity and organisational integrity. Individual and organisational integrity come together in business processes. From the comparison with the other frameworks, it can be concluded that the identified core fundamentals cover the important individual and organisational aspects. This makes the five core fundamentals cover the integrity in business processes.

5.4 Relations between core fundamentals

5.4.1 *Relation between transparency and accountability*

An important relationship is a relationship between transparency and accountability. Chapter 3 already described that high-quality governance is achieved when transparency and accountability are considered. Transparency and accountability have a relation as one supports the other. Mabillard & Zumofen (2017) define perspectives in which transparency can help to create accountability. It states that transparency of the process and the decision-making can facilitate accountability, both at an individual and organisational level. Transparency in the process and decision-making helps to verify the course of events and provides a body for accountability. Being





transparent on the course of events during the process and in communication helps to create traceability and predictability. Both traceability and predictability are important aspects of accountability. Accountability is shaped by being responsible for your actions. Traceability and predictability in your actions help to create responsibility. Transparency creates the opportunity to examine the course of events and the decision-making. This helps to achieve accountability as the process can be analysed. Additionally, transparency reduces the need for accountability because the involved parties can be held accountable through transparency. This also opens up the opportunity to penalise or blame certain parties when a failure occurs. In the development and management process of technical regulations, it implies that the employees and the involved stakeholders are accountable for the results. Therefore, transparency helps to create accountability both at an individual level and organisational level.

5.4.2 Relation between transparency and incorruptibility

The relation between transparency and accountability also extends to incorruptibility. Transparency and incorruptibility are correlated as transparency can help to remove corruption. An example is removing corruption from governments of countries by committing to transparency. Transparency in policy decisions helps to remove corruption in government to a certain extent (Koessler & Lambert-Mogiliansky, 2013). While little research is present on the relations between transparency and incorruptibility within business processes, it is likely to assume that transparency helps to remove corrupt behaviour within the process. Especially, when individuals are held accountable and sanctioned when it occurs. Transparency in the decision-making and the process likely removes the opportunity of favouritism and conflict of interests.

5.5 Indicators for the core fundamentals

Paragraph 5.2 described the core fundamentals and already introduced some indicators for those core fundamentals. This paragraph elaborates further on those indicators for each core fundamental. Every indicator that affects the core fundamental is further explained in this paragraph.

5.5.1 Consistency

The organisations' way of working determines if there is consistency within the organisation. The way of working is defined by three indicators, namely: consistent behaviour, standardised business processes and the decision-making process.

Consistent behaviour is shaped by the extent to which an individual stays true to its (shared) values and beliefs. An individual can create a predictive pattern in their behaviour towards others and can become predictable in his/her actions and communication. This has the advantage that external stakeholders know how an individual reacts and what he/she stands for. Predictability creates trustworthiness among stakeholders (Ponomarenko, 2016). Achieving and measuring consistent behaviour can be difficult and can vary per individual. An individual should behave consistently across situations. Meaning that individuals act based on their values and beliefs during unexpected events, towards other stakeholders and other business processes (Sherman et al., 2010). Measuring the consistency in the behaviour in various situations is difficult to achieve. It goes beyond the scope of this research to investigate the true extent of behavioural consistency of employees that are involved in the development and management process of technical regulations.

One could argue that consistent behaviour is under lightened in this research. That argument is valid and acknowledged. It goes beyond the scope of this research to investigate the full extent of the consistent behaviour of the employees. Sherman et al. (2010) identified types of behavioural consistency and states that the measurement is very complicated. Especially the philological aspects and the personality characteristics make it too complex to consider in this research. However, consistent behaviour can be supported by organisational integrity. Paragraph 4.2.3 explains that individual integrity (consistent behaviour) can be supported by organisational integrity. The mission and vision of the organisation can help to create consistent behaviour as the employee can act according to the values and beliefs of the organisation. The mission and vision of the organisation can be made based on the mission and vision of the organisation can be made based on the mission and vision of the organisation.





The mission and vision shape the ethical climate within an organisation and provide consistency for employees and towards external parties. The vision is meant to inspire employees and the organisation to look into the future. It describes the direction in which the organisation is going, and plans can be developed based on the vision. Furthermore, the vision is the tool to introduce ethics into organisations. The vision of an organisation can contain important information on ethical matters. The vision describes globally how to achieve the mission of the organisation. (Madu, 2013). The mission of an organisation provides the direction of the organisation. It is specified for the organisation, which makes objectives specific. The mission contains important information on what needs to be achieved

Consistency is also shaped by standardised business processes. Consistency in results is created by standardised business processes. Münstermann et al. (2010) state that business process standardization significantly impacts process performance. This enhances process time, costs and notably on quality. It is important to realise that not every business process can be standardised due to the nature of the process. Three different types of business processes can be identified, standards, routine and non-routine (Kaniški & Vincek, 2018). Standard processes are suited for standardisation as there is a repetition of the activity. Routine processes have similar repetition but have different subjects, for instance, the same process but different topics. Standardisation is possible but only for aspects that occur during every process. For instance, the construction of a concrete beam. While the shape might vary, the method of construction can be standardised. Lastly, non-routine processes are not suited for standardisation. Non-routine processes are highly creative and unique. An organisation that strives towards consistency should avoid non-routine processes in their business model. Consistency in business processes is achieved initially by having standard- or routine processes. Additionally, the organisation should have a policy in place on how the process is organised. The policy should at least contain information on which steps are taken in the process.

Furthermore, the decision-making process shapes the core fundamental consistency. Individual and organisational decision-making shape the consistency of the process. Individual decision-making is about staying true to its ethical standards and making rational decisions. Staying true to ethical standards creates consistency in the decision-making. The decision-making process within organisations has the purpose to achieve the company's objectives. The goals of the company are defined in the mission and vision of the organisation. There are three different variables in the organisational decision-making process, namely effectiveness, efficiency, and consistency. Effectiveness covers the gain of the decision. Meaning an assessment of what the added value is of the decision. For instance, organisations can decide to invest in personal development with the added value of employees satisfaction. Efficiency is about making the decisions to provide clarity or to reduce workload for the employees. Consistency is making decisions based on the ethical values of the organisation. While the outcome of the decision might be different, the process leading to it should be based on ethical values (Argandoña, 2011).

5.5.2 Diligence

The core fundamental diligence is about creating trust within the organisation and with external parties. Diligence is about creating quality of the results and the process by having a critical view and by performing reflections. The creation of trust within the organisation is about working close to ethical standards. This is mainly achieved by showing reliable behaviour. Meaning that the behaviour is close to ethical values with clear communication towards others. The employee becomes predictable, which leads to establishing trust. The creation of trust is also important for external parties. Trust between the organisation and the external parties creates a well-working relationship. Meaning that trust is essential in ensuring cooperation and achieving highquality results. Trust is created by working true to ethical values and having reliable behaviour. There are several other factors that influence the trustworthiness of an organisation. For instance, honesty, competence, and goal congruence. Meaning that employees are honest in their behaviour and communication. Also, being competent to perform the tasks and by keeping the goal in mind during the process (Karlsen et al., 2008). External stakeholders are often essential for organisations. The selection of stakeholders to be involved in the process is often a difficult part. Stakeholder management is important to know which party to invite based on the added value. Only relevant parties need to be invited to join a business process. A balance needs to be achieved between the number of stakeholders involved and the validation of the results. Too few involved stakeholders will lead to insufficient validation of the results thereby compromising the quality of the end product. Too many reduce the workability.





A critical view is also an important aspect of diligence, especially when adopting information from sources. A crucial view is required to assess the content and the relevance of information. Employees of an organisation should be careful in adopting information. The quality of the end product can be compromised when the end product is developed based on incomplete or insufficient information. A critical view can be expressed by validating results and asking critical questions on the contents (Karlsen et al., 2008).

Furthermore, reflections are also very important to improve business processes and results. Reflections can take place at an individual level but also organisationally. Individual reflections are partly about personal aspects and partly about the process and results. Individual reflections are about assessing individual behaviour by questioning own behaviour and interaction with others. This will lead to professional growth. Furthermore, questioning business processes and the results will help to improve the quality. Critically reflecting on the processes and the results might lead to changes in the existing structures to make them more efficient or more focussed on improving the quality of the end product. The organisation should use those individual reflections to achieve organisational learning. Organisational learning is achieved within an organisation by combining different individual reflections into organisational reflection. Firstly, employees that perform similar tasks should reflect together on the process and result. Different perspectives from different employees lead to critical analysis of the processes. Support from the employees is also created when it is concluded that changes are needed to improve the process or the results. Employees should have the freedom to express their opinion and every employee should be valued for their input. The higher management of the organisation should adopt those conclusions and integrate them into the business structure. Meaning that collective reflections lead to changes within the organisation. Only then is organisational reflection achieved. The key is that the organisation should provide the employees with the tool to perform reflections (Hilden & Tikkamäki, 2013). Figure 6 illustrates how individual reflections shape organisational reflections.



Figure 6 Reflective practise enabling learning process (Hilden & Tikkamäki, 2013)





5.5.3 Incorruptibility

Incorruptibility is defined by the code of conduct and compliance to the code of conduct. The code of conduct is a translation of the ethical values of the organisation. The code of conduct describes what is important for the organisation and envisions their way of working. To be specific, the code of conduct often describes how to handle money and financial matters, how to deal with conflict of interest, and which side-line activities are allowed. Additionally, the code of conduct can contain information on how ethical values can be achieved. For instance, it could describe that information is shared in a fixed manner to achieve transparency. The description of how to handle financial matters could be that several employees have to agree before accepting a job. Furthermore, this is also related to managing conflict of interests. Conflict of interests can occur within an organisation prevents such forms of corruption and how to act when it occurs. Lastly, side-line activities are activities that are directly related to business processes (Valentine & Johnson, 2005). For instance, an employee has shares of that provider.

Clarity on how to react to forms of corruption is also important. Employees of the organisation must be aware of the code of conduct and should work by it. This means that employees must be made aware of the code of conduct within the organisation. Also, employees must be made aware of the sanctions that can happen when corruption occurs. The organisation also must have the courage to sanction according to the severity of the corruption (Valentine & Johnson, 2005). For instance, an employee might be offered bribery by a party but does not mention this to this supervisor. The employee could get an official warning from his supervisor when it is discovered.

5.5.4 Transparent

The core fundamental transparency is defined by three indicators, namely transparent documentation, clarity on business processes, and open communication. Transparency in documentation is achieved when all relevant stakeholders have complete, clear, and timely access to information. Transparency in documentation can extend towards providing financial transparency by showing the financial situation. For instance, it might be valuable for an organisation to share financial information with stakeholders in a process. This is to provide clarity on how much each party is financially committed to the project.

Furthermore, transparency is achieved by clarity on business processes. The stakeholders must be made aware of which steps are taken in the process and what is expected from them. This must be clear before the process starts to ensure that the stakeholders are correctly involved in the process. Stakeholders must be made aware of the following: steps in the processes, expected involvement, financial commitment, indication on the amount of work and validation methods (Schnackenberg & Tomlinson, 2016). Clarity on business processes is achieved when they are timely communicated to stakeholders.

Lastly, open communication is important to ensure transparency. Communication plays an important role in the development of trust within an organisation and with stakeholders. Open communication is achieved as an actor is empowered to share their thoughts without any repercussions. Meaning that during a business process every actor can say whatever he/she wants to say. Open communication extends towards the registration of communication. During meetings, minutes need to be drafted to register the communication. Furthermore, when communication occurs outside meetings it should also be registered. The involved stakeholders must have timely access to this information. This is to prevent hidden collaboration to steer the end product The information should contain aspects like, who were communication? About which topic? What is the goal of communication? (Schnackenberg & Tomlinson, 2016). Open communication is achieved when everyone has freedom of speech and communication is registered and available for everyone involved.





5.5.5 Accountable

Accountability is shaped by individual behaviour and organisational accountability. Individual behaviour is being responsible for one's behaviour. Meaning that an individual stands behind his actions. To an extent, being proud of what it has achieved. Individual actions are personal decision-making, delivering work, and communication to others. The ethical values of the organisation where their working should be reflected in those actions. Individuals work for organisations which shifts liability issues towards the organisation. Individuals are in that way protected from large liability issues (Heine & Grabovets, 2016). Organisational accountability is shaped by trusting in the quality of the delivered products. For instance, a car manufacturer might believe that their cars are very robust and therefore give a long-term guarantee to the customer. Such behaviour indicates organisation is liable. This can be very complex. Taking the example of the guarantee of the car, when a part breaks, liability can be easy. The organisation is liable for the replacement of the part based on the guarantee. However, if the driver caused a collision due to the broken part it gets much more complex. Was the collision preventable? Is the broken part directly related to the cause of the collision? Organisational accountability is knowing to which extent it is liable and if possible, knowing to which extent it is not liable (Heine & Grabovets, 2016).

The indicators presented in this paragraph are orderly illustrated in table V. The core fundamentals and their related indicators are illustrated in this table.

CORE FUNDAMENTAL	INDICATOR					
	Consistent behaviour					
Consistency	Standardised business processes					
	Decision-making process					
	Reflections on process and results					
Diligence	Critical view					
	Creation of trustworthiness					
	Managing interests					
Incorruptibility	Clarity on how to conduct					
	Sanctionability					
	Transparent documentation					
Transparent	Clarity on business processes					
	Open communication					
Accountable	Responsible for one's behaviour					
Accountable	Liable for end product					

Table V Overview of the core fundamentals and the related indicators





5.6 Impact of the indicators on the integrity of business processes

The defined indicators impact the integrity of business processes. The indicators affect the core fundamentals that shape integrity in business processes. It is important to understand the impact of the indicators on the core fundamentals of integrity in business processes. This is to ensure that the framework can be used appropriately and to prevent wrongful conclusions. Table VI illustrates the impact of the indicators on the core fundamentals. As illustrated, the indicators all have a positive impact on the core fundamental. This in turn means that the indicators positively benefits integrity in business processes. For instance, consistent behaviour positively benefits the core fundamental consistency. This means that the indicator 'consistent behaviour' positively impacts the integrity of business processes. On the contrary, when no 'consistent behaviour' is shown, The indicator and thus the integrity is negatively impacted.

		<u>INDICATOR</u>	<u>IMPACT</u>	EXPLANATION
	S	Consistent behaviour	Positive	Consistent behaviour has a positive impact on consistency. Consistent behaviour by employees help to create predictability and helps to stay true to the (shared) values and believes
	onsisten	Standardised business processes	Positive	The standardisation of business processes helps in being consistent. The organisation and employees know how the process is organised and can follow those procedures.
Integrity of business processes	cy	Decision-making process	Positive	Decision-making based on rational thinking and ethical values help in being consistent. The methodology in making decisions helps to make consistent and deliberate decisions.
		Reflections on process and results	Positive	Reflections on the processes and results support the core fundamental diligence. Critical analysis of the steps in the process, behaviour and validation methods helps to keep employees sharp and improve the processes
	Diligence	Critical view	Positive	Critical view in adopting information helps to prevent failures in the end products. The process should be carried out with relevant and enough information to support the contents of the end product. This supports the diligence of the business process.
		Creation of trustworthiness	Positive	Trustworthiness is about stakeholder management. Diligence in selecting stakeholders to get involved in the process positively benefits integrity. A careful consideration of stakeholders based on added value indicates a predictive pattern, which in turn creates trustworthiness
	n	Managing interests	Positive	The managing of interests positively affects the incorruptibility of the business process. Knowing the interests of stakeholders helps to analyse the intents of the parties. The managing of interests positively benefits incorruptibility as corruption can be signalled more easily.
	corruptibili	Clarity on how to conduct	Positive	Employees can be guided by information on how to conduct during the process. Corrupt behaviour of individuals and organisations can be prevented by clarity on how to conduct. This has a positive impact on incorruptibility.
	ťγ	Sanctionability	Positive	Sanctionability is the tool to punish unethical conduct of individuals and organisations. Awareness of the sanctions of corrupt behaviour helps to remove (possible) corruption in an organisation and thus positively benefits incorruptibility.
		Transparent documentation	Positive	Transparency in documentation has a positive effect on the core fundamental transparency. Transparency is achieved stakeholders have timely access to relevant information.
_	Transparent	Clarity on business processes	Positive	Clarity on the steps of the business processes helps to prevent expectations. Stakeholders are aware of the set-up of the process, which limited expectations. This in turn creates trustworthiness by the stakeholders. Clarity in the business process positively benefits transparency.
		Open communication	Positive	Open communication has a positive benefit on transparency. Stakeholders that are aware of what is said with whom helps to prevent faults in the communication and the end product
	Account	Responsible for one's behaviour	Positive	Awareness of the responsibilities positively benefits accountability. Involved parties that are aware of their responsibilities know what is expected of them and will strive to reach that. Which in turn positively benefits integrity.
	table	Liable for end product	Positive	Awareness of the extent of the end product helps organisations to act with integrity. Organisations knowing to which extent they are liable for the end product helps to create accountability.

Table VI Impact of the indicators on the core fundamentals





5.7 Theoretical integrity framework

Based on the previous paragraphs, the theoretical integrity framework is developed. Figure 7 provides a visual representation of the fanned-out definition of integrity and the relations between the core fundamentals. The definition of integrity is split into the five core fundamentals. The core fundamentals are further split into indicators that shape those core fundamentals. Lastly, the arrows between incorruptible, transparent, and accountable indicate a relation between those core fundamentals.



Figure 7 Theoretical integrity framework on business processes




5.7.1 Validation of the framework

The validation of the framework is conducted in three ways. The information used to develop this framework is obtained through validated sources. Nearly all the sources mentioned are peer-reviewed articles. An article that is not peer-reviewed is crossed-checked by other sources to validate the findings. Additionally, the researcher used the PDCA (Plan Do Check Act) cycle to develop the framework. This means that firstly it was carefully planned how to develop this framework. Secondly, developing it and checking it by using validated sources and lastly by acting on feedback or mistakes.

The second way of validation is done by comparing the core fundamentals to other integrity frameworks. The analysis showed that the described competencies or dimensions correlate with the core fundamentals of this research. The identified competencies by Barnard et al. (2008) and the dimensions of Kaptein (2008) have been considered for the validation of the framework. Both frameworks are representative as those frameworks are used by companies to perform audits. Furthermore, both frameworks have been published in journals, implying that those frameworks are peer-reviewed. Therefore, it is safe to assume that those frameworks are representative and valid. The analysis showed that those dimensions and competencies are present in this theoretical integrity framework.

The third way is validation by reviewing the framework by an expert in the field of ethics, integrity and compliance. The researcher has discussed the framework with Prof. Dr. M. (Muel) Kaptein during an online interview. Mr. Kaptein wrote eight books and has published over 50 peer-reviewed papers in various journals. The books and the papers all cover aspects related to ethics, integrity and compliance. Therefore, it is assumed that Mr. Kaptein is an expert in the field of ethics and integrity. During the interview, the researcher and the Professor discussed the method to develop the framework and the contents of the framework. The expert indicated that the framework is comprehensive and covers all the important aspects of the integrity of business processes. The development method of the framework is appropriate, and the framework is developed logically. The core fundamentals and indicators are defined based on valid sources and fit in the framework logically (M. Kaptein, personal communication, 13 October 2021). The three described methods of validation validate the integrity framework of the researcher. The framework is validated by using information from peer-reviewed articles, comparing it to other frameworks and discussing it with an expert in the field.

5.7.2 Integrity framework in perspective of the scientific field

As stated, integrity is a term that can be used in various settings. In this research, the term integrity is specified for analysing the integrity of business processes. In the scientific field, other research is present that use the term integrity in a different way. A recently published article by Hoekstra & Kaptein (2020) is about a framework for setting up integrity programs. Integrity programs are measures that organisations can take to promote integrity in their organisation. The method used to develop the framework is by firstly defining integrity and core fundamentals that shape the integrity in the context of integrity programs. Secondly, the core fundamentals are further specified into indicators that can be measured. This is similar to the integrity framework to measure integrity violations in organisations by Lasthuizen et al. (2011). This framework is developed by firstly defining the opposite of integrity, namely corruption. Corruption is further specified into perspective to other frameworks it can be concluded that the development method is similar. Other research (Hoekstra & Kaptein, 2020; Lasthuizen et al., 2011) also have used the same steps to develop a framework. Firstly, the definition of integrity is defined for the context of the research and secondly, that definition is further specified into measurable factors.





6. Framework specified to Dutch regulatory system

The framework presented in Figure 7 is in this chapter specified to the Dutch regulatory system. The core fundamentals are assessed for three development and management processes of technical regulations. Furthermore, relevant indicators are specified into possible mechanisms that could occur. Mechanisms can be defined as bottlenecks that negatively affect integrity. Interviews with employees of the three institutions that publish technical regulations point out if those possible bottlenecks are present. In addition, a document study is conducted to assess aspects that cannot or are not needed to be covered in the interviews.

6.1 Translation of core fundamentals

The integrity framework can be translated for the Dutch regulatory system. The institutions that develop and manage technical regulations can be assessed by this framework. This is to point out possible bottlenecks in the development and management process. Table VII illustrates the indicators and the relevance towards the core fundamentals for the development and management process of technical regulations. The table indicates that every core fundamental applies to the development and management process. Therefore, all five core fundamentals are considered in the integrity analysis.

	INDICATOR	RELEVANCE FOR THE PROCESS OF DEVELOPING AND MANAGING			
	INDICATOR				
Consistency Diligence Incor	Consistent behaviour	Consistent behaviour in the process helps to improve the consistency of the development and management processes and create predictable behaviour. Mission and vision can guide employees to create consistent behaviour.			
	Standardised business processes	Standardisation of the process facilitates consistency and ensures different processes have the same process steps and validation methods.			
	Decision-making process	Rational decision-making on which technical regulation to update and which stakeholders to invite has a positive impact on the consistency of the process			
	Reflections on process and results	Reflections and organisational learning help to critically analyse the existing process. This can help to improve the process and make sure that every involved party is heard and satisfied with the way of working.			
	Critical view	Critical view is especially important in adopting information for external parties. Information that is not analysed can contain mistakes or wrongful assumptions during the process.			
	Creation of trustworthiness	Stakeholders are important for the existence of the institutions and thus healthy relationship with stakeholders is important.			
		Managing interests is important as initiations to develop technic regulations often come from external parties. The process should not about serving commercial interests.			
Incorr	Managing interests	Managing interests is important as initiations to develop technical regulations often come from external parties. The process should not be about serving commercial interests.			
Incorruptibi	Managing interests Clarity on how to conduct	Managing interests is important as initiations to develop technical regulations often come from external parties. The process should not be about serving commercial interests. Clarity on how to behave during the process is important to be considered incorruptible. Code of conduct helps to guide employee behaviour.			
Incorruptibility	Managing interests Clarity on how to conduct Sanctionability	 Managing interests is important as initiations to develop technical regulations often come from external parties. The process should not be about serving commercial interests. Clarity on how to behave during the process is important to be considered incorruptible. Code of conduct helps to guide employee behaviour. Employees and stakeholders must be aware of the possible sanctions when infringement of the code of conduct occurs to prevent corrupt behaviour. 			
Incorruptibility Tra	Managing interests Clarity on how to conduct Sanctionability Transparent documentation	 Managing interests is important as initiations to develop technical regulations often come from external parties. The process should not be about serving commercial interests. Clarity on how to behave during the process is important to be considered incorruptible. Code of conduct helps to guide employee behaviour. Employees and stakeholders must be aware of the possible sanctions when infringement of the code of conduct occurs to prevent corrupt behaviour. A lot of information is gathered during the process and that information should be available in time for all stakeholders during and after the process 			
Incorruptibility Transpar	Managing interests Clarity on how to conduct Sanctionability Transparent documentation Clarity on business processes	 Managing interests is important as initiations to develop technical regulations often come from external parties. The process should not be about serving commercial interests. Clarity on how to behave during the process is important to be considered incorruptible. Code of conduct helps to guide employee behaviour. Employees and stakeholders must be aware of the possible sanctions when infringement of the code of conduct occurs to prevent corrupt behaviour. A lot of information is gathered during the process and that information should be available in time for all stakeholders during and after the process Stakeholders should not be surprised by the steps in the process to prevent wrongful assumptions and to prepare the stakeholders. 			
Incorruptibility Transparent	Managing interests Clarity on how to conduct Sanctionability Transparent documentation Clarity on business processes Open communication	 Managing interests is important as initiations to develop technical regulations often come from external parties. The process should not be about serving commercial interests. Clarity on how to behave during the process is important to be considered incorruptible. Code of conduct helps to guide employee behaviour. Employees and stakeholders must be aware of the possible sanctions when infringement of the code of conduct occurs to prevent corrupt behaviour. A lot of information is gathered during the process and that information should be available in time for all stakeholders during and after the process Stakeholders should not be surprised by the steps in the process to prevent wrongful assumptions and to prepare the stakeholders. Communication between the stakeholders needs to be registered openly to know what was said to whom. This is to prevent miscommunications. 			
Incorruptibility Transparent Accou	Managing interests Clarity on how to conduct Sanctionability Transparent documentation Clarity on business processes Open communication Responsible for one's behaviour	 Managing interests is important as initiations to develop technical regulations often come from external parties. The process should not be about serving commercial interests. Clarity on how to behave during the process is important to be considered incorruptible. Code of conduct helps to guide employee behaviour. Employees and stakeholders must be aware of the possible sanctions when infringement of the code of conduct occurs to prevent corrupt behaviour. A lot of information is gathered during the process and that information should be available in time for all stakeholders during and after the process Stakeholders should not be surprised by the steps in the process to prevent wrongful assumptions and to prepare the stakeholders. Communication between the stakeholders needs to be registered openly to know what was said to whom. This is to prevent miscommunications. Employees and stakeholders should be aware of their responsibilities during and after the process. This is to create individual accountability and clarity on the division of responsibilities during the process. 			

Table VII Core fundamentals translated to the development and management process



6.2 Mechanisms to analyse the integrity in the development and management process

The method to improve the Dutch regulatory system is by identifying and overcoming bottlenecks in the system. This is realised by analysing the integrity of the development and the management process of technical regulations. Bottlenecks in a process reduce the productivity and quality of the end product (Urban & Rogowska, 2018). The identified indicators are specified into mechanisms to analyse the integrity of the process. The mechanisms are aspects that could occur that negatively affect the indicator of the core fundamental. For instance, the core fundamental 'consistency' consists of the indicator 'standardised-business processes'. This indicator is for example negatively affected when an institution has not standardised the development process. The mechanisms for all the indicators are illustrated in Table VIII.

As stated in paragraph 5.5.1, the exact effect of consistent behaviour is difficult to measure due to the philological aspects and the personality characteristics of individuals. Therefore, the indicator 'consistent behaviour' is limitedly considered in this research. The mission and vision of the organisation can help to create consistent behaviour. The mission and vision should contain aspects that help employees to create consistent behaviour. For instance, the mission and vision can be about valuing transparency and clarity to stakeholders. This indicates that the behaviour and actions of employees can be guided by the mission and vision. Therefore, the mission and vision of the institutions are analysed whether they support consistent behaviour to indicate if consistent behaviour will be achieved.

	<u>INDICATOR</u>	<u>MECHANISMS</u>	<u>SOURCE</u>
	Standardised business processes	Unqualified employees for the development and management process	(Münstermann et al., 2010)
Consisten		No standardisation of the development processes	(Kaniški & Vincek, 2018)
		No standardisation for managing technical regulations	(Lodge & Wegrich, 2012)
୍ ୧		Lacking traceability in the decision-making	(Argandoña, 2011)
	Decision-making process	Choices by employees cannot be reduced rationally	(Argandoña, 2011)
		Incorrect manner in carrying out the decision	(Argandoña, 2011)
		Reflections on the process are missing	(Hilden & Tikkamäki, 2013)
	Reflections on process and results	Reflections on the validation methods are missing	(Hilden & Tikkamäki, 2013)
		Organisational reflections are missing	(Hilden & Tikkamäki, 2013)
Dilige	Critical view	Adopting information (from external parties) to quickly as reliable and correct	(Karlsen et al., 2008)
nce		Insufficient consideration on the validation methods	(Karlsen, 2002)
	Creation of trustworthiness	Missing policy on inviting stakeholders in the process	(Karlsen et al., 2008)
		Incorrect manner of validation by stakeholders	(Karlsen et al., 2008)
		Missing policy on managing and updating the developed products	(Lodge & Wegrich, 2012)
	Managing interests	Not recognising the conflict of interests of favouritism in the process	(Valentine & Johnson, 2005)
Inco		Organisational code of conduct not present in the process	(Valentine & Johnson, 2005)
rrupti	Clarity on how to conduct	Not actively promoting the code of conduct in the process	(Singh & Prasad, 2017)
bility		Incorrect conduct when forms of corruptions are signalled	(Singh & Prasad, 2017)
	Sanctionability	Lacking sanctioning rules within the organisation that could be applied in the process	(Valentine & Johnson, 2005)

Table VIII Mechanisms that could occur during the development and management process





	INDICATOR	MECHANISMS	<u>SOURCE</u>	
	Transparent documentation	on Not all the stakeholders have timely access to the relevant information		
Transparen		Stakeholders are surprised by the steps in the process	(Schnackenberg & Tomlinson, 2016)	
	Clarity on business processes	Limited information available on the development and management process	(Karlsen, 2002)	
	Open communication	Not all stakeholders are aware of what, when and with whom was said	(Schnackenberg & Tomlinson, 2016)	
		Incorrect registration of communication	(Thomas et al., 2009)	
		Information on the organisation, processes and validation methods are not publicly available	(Kundeliene & Leitoniene, 2015)	
_		Lack of clarity on the division of individual responsibility in the process	(Hassan, 2013)	
Accou	Responsible for one's behaviour	Employees are not aware of their individual responsibility	(Heine & Grabovets, 2016)	
Intable		No conversations take place within the organisation about responsibility	(Hilden & Tikkamäki, 2013)	
	Liable for end product	Institutions do not know to which extent their liable for the end product	(Heine & Grabovets, 2016)	

The presented mechanisms in Table VIII for each indicator are based on peer-reviewed literature. Various mechanisms have been identified by different sources. Those mechanisms are analysed in the development and management process of technical regulations for the three institutions. The analysis is conducted based on information obtained through interviews and analysing business policy documents.

6.3 Integrity assessment framework overview

The previous paragraphs describe various mechanisms regarding integrity. Those mechanisms might be present in the institutions that publish technical regulations. Questions to analyse those mechanisms are developed to analyse if those mechanisms are present. Additionally, the information source is defined as some of the possible mechanisms that need to be analysed during interviews and others through document study. Unique ID's are allocated to each question. Those unique ID's are used in the semi-structured interview format to ensure that every question is asked during the interviews. The specification of the framework is illustrated in Table IX.





CORE FUNDAMENTAL	INDICATOR	NR	MECHANISMS	QUESTIONS TO ASSESS MECHANISMS	INFORMATION SOURCE
<u>Consistency</u>	Consistent behaviour	1.1	Mission and vision do not contain a clear course of action for employees and does not get collectively established	What is in the organisation's mission and vision, and how is it developed?	Website
		1.2	Unqualified employees for the development and management process	To what extent does a selection take place as to which employee is suitable for which subject?	Interview
	Standardised business processes	1.3	No standardisation of the development processes	To what extent is the development process of technical regulations standardised?	Policy document
		1.4	No standardisation for managing technical regulations	To what extent is the management process of technical regulations standardised?	Policy document
		1.5	Lacking traceability in the decision-making	How is it determined which standards are developed/updated? And how is this registered?	Policy document
	Decision-making process	1.6	Choices by employees cannot be reduced rationally	Can you take me through all the choices that have to be made during the process?	Interview
		1.7	Incorrect manner in carrying out the decision	How is it determined (majority, voting ratio, unanimity) when technical regulations can be published?	Policy document
<u>Diligence</u>		2.1	Reflections on the process are missing	Do you ever discuss the process with colleagues? And is this also registered?	Interview / Policy document
	Reflections on process and results	2.2	Reflections on the validation methods are missing	To what extent are methods critically examined to validate the result?	Interview
		2.3	Organisational reflections are missing	How do improvements in the process come to fruition? And is that based on multiple individual reflections?	Interview
	Critical view	2.4	Adopting information (from external parties) to quickly as reliable and correct	How do you judge information provided by third parties? And when is it considered complete and reliable?	Interview
	Critical view	2.5	Insufficient consideration on the validation methods	Which validation methods are included in the process?	Policy document
		2.6	Missing policy on inviting stakeholders in the process	How is it determined which stakeholders are invited? Is it based on policy documents?	Policy document
	Creation of trustworthiness	2.7	Incorrect manner of validation by stakeholders	How is the validation set up and what is the influence of external parties?	Interview
		2.8	Missing policy on managing and updating the developed products	Is there a policy within the organisation on how and when technical regulations are managed and updated?	Policy document
Incorruptibility	Managing interests	3.1	Not recognising the conflict of interests of favouritism in the process	How are commercial interests weighed up against social interests?	Interview
	Clarity on how to conduct	3.2	Organisational code of conduct not present in the process	Are there codes of conduct present within the organisation? And how are these reflected in the process?	Policy document
		3.3	Not actively promoting the code of conduct in the process	To what extent are the codes of conduct discussed with the stakeholders in the process?	Interview
		3.4	Incorrect conduct when forms of corruption are signalled	To what extent is attention paid to recognising forms of corruption in the process?	Interview
	Sanctionability	3.5	Lacking sanctioning rules within the organisation that could be applied in the process	Which rules are there within the organisation if a conflict of interest arises?	Policy document
Transparent	Transparent documentation	4.1	Not all the stakeholders have timely access to the relevant information	How is information shared with stakeholders?	Interview
	Clarity on business	4.2	Stakeholders are surprised by the steps in the process	How is the process communicated to stakeholders?	Policy document
	processes	4.3	Limited information available on the development and management process	Where can information be obtained about the processes of the organisation?	Policy document
		4.4	Not all stakeholders are aware of what, when and with whom was said	To what extent is attention paid to open communication between all stakeholders involved?	Interview
	Open communication	4.5	Incorrect registration of communication	In which way is communication (minutes etc.) recorded?	Interview
		4.6	Information on the organisation, processes and validation methods are not publicly available	Where can information be found on the organisation, process and validation methods?	Website
Accountable		5.1	Lack of clarity on the division of individual responsibility in the process	Are you aware of your responsibilities during the development of standards and guidelines?	Interview
	Responsible for one's behaviour	5.2	Employees are not aware of their individual responsibility	To what extent are you responsible for the end result if there is a mistake?	Interview
		5.3	No conversations take place within the organisation about responsibility	Are there internal discussions about responsibilities?	Interview
	Liable for end product	5.4	Institutions do not know to which extent their liable for the end product	To what extent is the organisation liable when there are errors in the technical regulations?	Interview

Table IX Integrity analysis matrix

7. Analysis of the development and management processes of technical regulations

7.1 Analysis of the processes of the institutions

In the Netherland, the development of technical regulation is a complex system. The complexity of the system comes from the different institutions that develop and manage technical regulations and the interaction with stakeholders that are involved. In the Dutch regulatory system, three institutions can be distinguished namely Institute A, Institute B and Institute C. Those institutions are the largest in the Netherlands and publish the most and most commonly used technical regulation about civil infrastructure. Those institutions publish technical regulations that governments and other clients can use to specify specific technical civil aspects. technical regulations are a tool to ensure the structural safety of infrastructure objects. As stated, those institutions are selected to analyse the integrity in the development and management process. Institute A, Institute B, and Institute C play a key role in the Dutch regulatory system as those institutions issue the most used technical regulations and serve the needs of the governments to ensure structural safety. This chapter analyses the integrity of the processes of development and management of those institutions. The developed framework, presented in Chapter 5, and the specification in Chapter 6 is used to analyse the processes of institutions.

7.1.1 Considered technical regulations

The three institutions publish different technical regulations with different levels of specification. Institute A publishes technical regulation A on a variety of topics. The considered technical regulations in this research are the ones that are related to civil engineering. Technical regulation A is in comparison with the other technical regulations rather general. technical regulation A often provide the user with margins of operation. Meaning that the user has a certain kind of freedom on how it gets adopted in the design and contracts.

Institute B publishes technical regulation B and those are more specific than technical regulation A. technical regulation B are mainly about specific concrete solutions or products. Innovations that concern concrete can be standardised through a technical regulation B. Lastly, Institute C publishes certifications schemes. Those schemes can be used to verify that a product of material meets the set of requirements and that a certification can be given. The certification scheme is very specific as all the requirements are defined and measured before certification can be granted.

7.1.2 Analysis boundaries

The institutions are large organisations that publish technical regulations on various subjects. It is not feasible to consider the development and management processes for all the technical regulations. Therefore, a selection is made to analyse technical regulations that apply to civil structures and roads. Those are selected as those are very often present in contracts for civil infrastructure. In addition, a selection is made to only review Dutch technical regulations and exclude European standards. technical regulations about electricity and mechanical components are also not considered in this research.

It is important to realise that the analysis of the integrity in business processes does not reflect the integrity of the organisation. Integrity within an organisation is different from integrity in business processes as other aspects of integrity apply. This makes this research only representative of the business processes considered and that the results are not representative of the entire organisation.

As stated, the indicator 'consistent behaviour' is difficult to measure due to the philological aspects and the personality characteristics. The mission and vision can help to guide employees to be consistent in their behaviour. This research excluded the analysis of consistent behaviour due to its complexity. This research only indicates if the mission and vision support consistent behaviour. While no scientific conclusions can be drawn, an indication can be given if consistent behaviour is supported and guided by the organisation.

7.2 Diagnostic integrity analysis: Institute A

Institute A is a normalisation and standardisation Institute. Institute A is a non-profit organisation with the purpose of serving social interests. Thus the organisation strives to achieve safety in products and values privacy. The purpose of the activities of Institute A is to connect parties and interest holders into developing standardised agreements. Meaning that Institute A connects various parties from the market into collectively accepted agreements. Those agreements are written down in standardisation documents, called technical regulation A.

Activities

The main activities of Institute A are developing and managing technical regulation A. This means that the organisation develops norms in collaboration with market parties. Managing technical regulation is the activity of selling technical regulation. Institute A develops technical regulation on various disciplines, like chemicals, electrotechnics, construction, and ICT. This research only considers the norms for construction. Additionally, Institute A provides the service to provide suppliers with certificates and quality marks. Those certificates and quality marks indicate that a product, system, person or process fulfils certain requirements. It is an additional step beyond the development of technical regulation to provide suppliers or manufacturers with certification or quality marks. The certificates and quality marks are also not considered in this research.

The available information to analyse the integrity of the development and management of technical regulation A is illustrated in Table X. The available information contains business policy documents and interviews with two employees. The available information has unique IDs from 1.1 till 1.5.

	Available information	
ID	Title	Summary of information
1.1	A starter guide to standardization for experts	Policy document explaining the different steps in developing technical regulations. It explains the purpose of technical regulations and how its developed
1.2	How to write standards	Brochure that explains writing techniques in technical regulations. To ensure the unified written language in standards.
1.3	Standardization and related activities	Detailed policy document on standardization and related activities for standards in the Netherlands. It defines all the procedural steps before publishing national standards.
1.4	Institute A website	General information on Institute A
1.5	Interviews with employees of Institute A	Information on the processes in the organisation and on how integrity is embedded within the organisation.
	Interviews: F + H	Information available in Appendix E

Table X Information used to analyse Institute A





7.2.1 Development process

The development process of technical regulation A can be divided into three phases, namely: the initiation phase, the development phase, and the publishing phase. The initiation phase is about setting up a committee with relevant stakeholders on the subject. The committee is responsible for the development of technical regulation A. The development phase is about the development process of technical regulation A. In this stage, the committee carries out the process of developing technical regulation A. Collaboration and research are required to develop technical regulation A. The last phase is the publishing phase. This phase is about validating the results and publishing technical regulation A to the public.

Initiation phase

The initiation phase starts with initiation from the market, existing committees, or a Dutch ministry. Those parties might have a subject that needs standardisation. Parties in the construction market may have a new product for which no technical regulations are present. Existing committees may have seen that certain technical regulation A are aged or have become irrelevant or Dutch ministries see an opportunity to standardise governmental needs.

The development of a technical regulation A starts with an evaluation of the initiation. The initiation is analysed on relevance or market-wide needs. The decision if a technical regulation A is developed is based on larger market needs and not on one supplier. After it is decided to develop a technical regulation A, a committee is set up. Institute A searches for relevant stakeholders and financing for the development. The goal of Institute A is to have a widely supported committee. This means that stakeholders from various organisations are present in the committee. Stakeholders like suppliers, governments, universities, engineering firms and industry organisations are invited to join the committee. Financing is obtained by asking those stakeholders to invest in the development of technical regulation A. Once the stakeholders and the financing are organised, a stakeholder analysis is conducted. Institute A has a special tool to analyse if the committee is a reflection of the market. If not, adjustments can be made by selecting additional stakeholders or removing stakeholders. Once accepted, the committee develops a project plan. A project plan contains information on which norms to develop, the need, activities, financing and link with international committees. The development of the norm can start when all the participants of the committee agree on the project plan.

Development phase

The development phase starts with a first meeting with the stakeholders on the subject. In this meeting it is discussed which research will be conducted, who will be chairman and a reporter will be assigned. A chairman is an important person in the process. The chairman needs to be independent and must have the ability to oversee the interests of the stakeholders. One of the stakeholders can apply as a candidate to be chairman. That person is appointed when all the other stakeholders agree. The role of Institute A is to be the secretary in the process and facilitate the development. This means arranging meetings, sharing information, distributing meeting notes and discussing concept reports with other committees. A reporter is appointed to write technical regulation A based on the research and input from the committee. The reporter uses the information from the research to draft a concept technical regulation A. This concept is discussed with the workgroup and if needed with other committees. Those parties may have remarks on the contents and the reporter writes a new concept report. Those steps iterate several times until all parties can agree on the content. The publishing phase can start once there is consensus on the content.





Publishing phase

The publishing phase is the process of letting the public know a new technical regulation A is developed. The committee has a consensus on the contents of the report and publishes technical regulation A online for a period of critical reflection. Everyone interested can provide comments on the subject. An employee collects those comments and presents them to the committee. The committee has to adopt or refute those comments. An updated technical regulation A is developed in which the comments are processed. This new version is can be published. technical regulation A are published online and can be purchased. Figure 8 illustrates the different steps in the development process in a flowchart.



Figure 8 Development process of technical regulation A

7.2.2 Management process

The management process of technical regulation A is the collection of comments during the usage of technical regulation A. Institute A follows the usage of technical regulation A and collects comments made by the users. Those comments can be categorized into small comments and large comments. Small comments are usually about small redactional mistakes and can easily be resolved, for instance, typos in technical regulation A. Those types of mistakes are fixed and users are made aware via a notification. Larger comments are on the subject of technical regulation A. It might occur that certain parts of a technical regulation A are not correct. Those larger comments are brought up to the committee. The committee discusses the comments and can decide to resolve those comments. This might imply that additional research is required to resolve the problems. If that is the case, technical regulation A can be redeveloped based on the information from the research and can discuss within the committee or with other committees. The way those comments are resolved is through the usage of a correction sheet. technical regulation A is supported by a correction sheet in which the comments are resolved. Additionally, the text within the norm is changed to remove the mistakes. Also, committees analyse technical regulation A every 3-5 years. From this analysis, it can become clear that a norm is outdated or starting to become irrelevant. This might induce a new initiation to develop an updated technical regulation A.





7.2.3 Diagnostic analysis of the integrity of Institute A

The analysis of the integrity of Institute A is done by analysing if the identified mechanisms are present in the business processes. A described, a bottleneck can be present (Yes), not present (No), or partly present (Partly). Table XI illustrates the integrity analysis of Institute A and explains the score. The column 'ID' refers to the sources presented in Table XI in which the information is obtained.

	<u>MECHANISMS</u>	PRESENT?	EXPLANATIONS	<u>ID</u>
	Unqualified employees for the	No	Employees of Institute A are facilitators of the	1.1
	development and management process		process. By training on the job, policy documents and	1.3
			expertise the employees are interchangeable and	1.5
			qualified for the job	
	No standardisation of the development	No	Business policies are in place in which the process	1.3
	processes		steps are described. Also, the validation methods are	
			achieved	
С	No standardisation for managing technical	No	The monitoring and collection of comments are	1.1
on	regulations		conducted in a standardised way. Redevelopment is	1.3
sist	(Cgulations		standardised based on the steps in the development	1.5
en			process.	
Y	Lacking traceability in the decision-making	Partly	Choice to develop technical regulation A based on	1.3
			market needs. However, it seems insufficient	1.5
			consideration of urgency or safety.	1.0
	Choices by employees cannot be reduced	No	Choices are made rationally and close to business	1.3
	rationally		market-wide supported committee	1.5
	Incorrect manner in carrying out the	No	Consensus building in the decision-making before	1.3
	decision		publishing. Everyone has the ability to speak and be	1.5
			heard in the committee	
	Reflections on the process are missing	Partly	Employees periodically reflect on the process but it is	1.5
			missing within the committee. Employees reflect	
			seldom with stakeholders of the committee	
	Reflections on the validation methods are	Partly	Institute A has diligently considered the validation	1.3
	missing		methods. Interviews indicate that the process is much	1.5
			this could be improved	
	Organisational reflections are missing	Yes	Organisational learning is missing in the organisation	1.5
		105	due to the lack of reflections. Combining individual	
			reflections into organisational learning is therefore	
			not possible.	
	Adopting information (from external	No	Institute A conducts a gap analysis to analyse	1.3
D	parties) to quickly as reliable and correct		information from external sources. Information is	
ilig	Insufficient consideration on the validation	No	Institute A has thought of proper validation methods	12
enc	mothods	INO	Consensus building, analysing with other committees	1.5
e	methous		and period of critical reflection indicate valuable	2.0
			validation methods	
	Missing policy on inviting stakeholders in	No	Business policy is clear on inviting stakeholders. On	1.3
	the process		average 10 people and market-wide supported	
			committee	
	Incorrect manner of validation by	No	Validation is done by consensus building, period of	1.1
	stakeholders		critical reflection and discussing it with other institute	1.3
			influence in the validation methods is limited	1.5
	Missing policy on managing and undating	No	Clear policy on how to manage technical regulation A	1.3
	the developed products		by following the usage of the norms. Policy on the	-
			handling of comments and periodically reflecting the	
			relevance of technical regulation A	

Table XI Integrity analysis Institute A





	MECHANISMS	PRESENT?	EXPLANATION	ID
In	Not recognising conflict of interests of favouritism in the process	Partly	Chairman has a key function in recognising the conflict of interests. Chairman is appointed by the stakeholders from one of the stakeholders. While being informed of the duties as chairman, conflict of interest might still occur as it is one of the involved stakeholders. An Independent chairman would be more incorruptible. Favouritism might still occur. Parties that fund many developments might be inclined to be invited more.	1.5
orrupt	Organisational code of conduct not present in the process	Yes	No central document in the organisation that describes the code of conduct of the organisation	1.1 1.3
ibility	Not actively promoting the code of conduct in the process	Yes	No central document implies that actively promoting the code of conduct is not possible	1.3 1.5
	Incorrect conduct when forms of corruption are signalled	Yes	No central document means that there is no standardised way to handle if forms of corruption are signalled. The likeliness of incorrect conduct when corruption is signalled is therefore considered high.	1.3 1.5
	Lacking sanctioning rules within the organisation that could be applied in the process	Yes	Policy document does not describe sanctioning rules, it is based on rational punishment (E.G. fraud = fired). Missing code of conduct also implies lacking sanctioning rules	1.5
	Not all the stakeholders have timely access to the relevant information	No	Stakeholders have timely access to relevant information. Information is available 1-2 weeks for a new meeting	1.2 1.5
	Stakeholders are surprised by the steps in the process	No	During the first meeting, the stakeholders are made aware of the process steps and validation methods. The project plan provides additional information	1.3
Trans	Limited information available on the development and management process	No	Business policy document explains how the development and management process is organised. This indicates that sufficient information is present.	1.3
oarent	Not all stakeholders are aware of what, when and with whom was said	No	Information is sent via email and is uploaded to a cloud environment. Information is always available for all the stakeholders	1.2 1.5
	Incorrect registration of communication	No	Communication and documentation are stored in an online cloud and is available at all times for all stakeholders	1.2 1.5
	Information on the organisation, processes and validation methods are not publicly available	Partly	Stakeholders are made aware of the process steps and validation methods. However, it is not publicly available on the website	1.4
	Lack of clarity on the division of individual responsibility in the process	No	Employees are aware of their responsibilities during the process. The division of responsibilities is clear.	1.5
Accour	Employees are not aware of their individual responsibility	No	Employees know the responsibility of technical regulation A. They are responsible for the development and management based on business policy	1.5
ıtable	No conversations take place within the organisation about responsibility	Partly	Interviews indicate that communication between employees take place but it is not a standard topic of conversation.	1.5
	Institutions do not know to which extent their liable for the end product	No	Institute A known the extent of their liability and state that they are never liable for faults in the technical regulations	1.5

7.2.4 Consistent behaviour

The mission and vision of Institute A contain aspects about serving public interests. Serving public interests is valued within the organisation as the mission and vision and interviews indicate. Employees are aware of the greater vision of the organisation. However, the mission and vision do not contain aspects that can be related to integrity. This indicates that consistent behaviour by employees is limitedly supported. Employees can be guided by knowing that public interests are served but are not guided from an integrity perspective.



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7.3 Diagnostic integrity analysis: Institute B

Institute B is a knowledge platform in the Netherlands that gathers information on various aspects of infrastructure and civil engineering. Information is available on contracting, mobility and public space. This information is available for the civil engineering market in de form of Institute B publications. Governments and other clients can use those publications to draft contracts or have an idea on how to design public space. Institute B is a non-profit organisation, which implies having no profit motive. The goal of the organisation is to achieve safe infrastructure. Which is achieved by developing manuals and technical regulations.

Activities

Institute B performs many activities related to developing knowledge in the construction industry. Institute B develops and manages technical regulations and manuals on various topics. Also, Institute B offers training to learn people how to get acquainted with certain topics in the civil engineering industry. This research focuses on the development and management of technical regulation B. Those recommendations are largely about aspects related to concrete. Thus the innovative use of material or new techniques of application of concrete.

The technical regulation that is considered in this research is the development and management of the technical regulation B. A technical regulation B is a publication in which agreements with parties from the construction industry is defined. The goal of technical regulation B is to prevent misunderstanding and mistakes in the construction process. Furthermore, the goal is to reduce the risks of costs- and time overrun in construction projects. technical regulation B contain technical information on new products/materials or new applications of products. technical regulation B provide clients with agreed rules of application of the product and serve as a pre-norm. Institute A can use this technical regulation B to develop a more general technical regulation A on this topic. technical regulation B serve the purpose to stimulate innovation and preventing unclarities of incorrect application during construction, in this case for concrete solutions.

The available information to analyse the integrity of the technical regulation B process is illustrated in Table XII. The available information is business policy documents and interviews with two employees. The available information has unique IDs from 2.1 till 2.6.

	Available information	
ID	Title	Summary of information
2.1	Institute B Procesaanpak beoordelen geschiktheid alternatieve grondstoffen voor beton	Policy document of the organisation describing the process steps leading to publishing technical regulation B. Starting from the initiation phase till the publishing phase
2.2	What is technical regulation B?	Policy document explaining what the technical regulation B is, the practical usage and the development procedure.
2.3	Mogen we kennis met u maken?	Leaflet that describes which activities of Institute B executes and explains the way of working of Institute B.
2.4	Projectplannen PAR Beton 2020-2021 + financieel overzicht	Document describing project propositions on which technical regulations are on the agenda for 2020/2021 including financial information.
2.5	Institute B Website	General information on Institute B
2.6	Interviews with employees of Institute B	Information on the processes in the organisation and on how integrity is embedded within the organisation.
	Interviews: B and D	Information available in Appendix E

Table XII Information used to analyse Institute B





7.3.1 Development process

The development of a technical regulation B can be divided into three phases, namely: initiation phase, development phase and publishing phase. The initiation phase is setting up a workgroup to develop a new technical regulation B and draft a project plan. The development phase is the phase in which the technical specification is made by conducting research and discussing it with experts from the workgroup. Lastly, the publishing phase is about which steps are taken before a new technical regulation B can be published.

PAR

Institute B has a unique committee that can help Institute B with advice on trends in the market or help in the development of technical regulation B. This committee is called the "ProgrammaAdviesRaad Beton" (PAR) and consists of 14 parties. Those parties are industrial organisations, contractors, governments, universities, and engineering firms. The parties that are present in the PAR are selected by Institute B. Institute B strives to have a variety of stakeholders in the PAR to prevent too much influence by commercial interests.

Initiation phase

The initiation phase starts with initiation from the market, government or result from research findings. Those parties want to develop new technical regulations for new materials, products or applications. This initiation comes because the new product cannot be classified under existing technical regulation and thus a new technical regulation B is needed to create a sales market for the product or material. For some technical regulation B, it is required to perform preliminary research to assure that the material or product is suitable for usage in concrete. For instance, if a supplier wants additional aggregates in concrete the supplier must do preliminary research. This can be approved by performing a quick scan. A quick scan is an analysis conducted by Institute C or in the assignment of the PAR and it must show that materials are suitable for use. If so the process can start.

The first step in the initiation phase is an analysis of whether it is worth developing the new technical regulation B. The PAR gives Institute B advice if it is worth developing the initiation. The PAR assesses if the application is desirable for the market and if there is a need from the construction industry. If that is the case, the initiation process can continue. Otherwise, the application gets rejected. The second step in the initiation phase is setting up a workgroup. Institute B contacts a variety of stakeholders in the construction industry and the PAR if they are willing to participate in a workgroup and share their expertise. The workgroup is responsible for the development of the technical regulation B. The goal of Institute B is to have a broadly-supported workgroup. This means a workgroup with an employee of Institute B, suppliers, contractors, government, universities, engineering firms and industry organisations. Usually, the maximum size of the workgroup is 12 persons to retain workability. Institute B searches for those stakeholders and for funding to develop the recommendation. Usually, the initiator/supplier or the government is a large funder of the development. When the workgroup is formed, a project plan is developed. A project plan contains information on the steps of the process, required time, which research to conduct, the financing and how it gets published. In collaboration with the PAR, the plan can be accepted and the development phase can start. A Go/No Go is given to developing the new technical regulation B.

Development phase

The development phase starts with a first meeting with the stakeholders in the workgroup. The workgroup discusses how to execute the research and appoints a chairman and reporter. The chairman fulfils a key role in the process. The chairman must be aware of the (general) interests of the stakeholders and be independent of all stakeholders. Sometimes an employee of Institute B is the chairman but also an external person can be chosen. A reporter is also allocated to write the new technical regulation B. This person is writing and drafts the reports that can be assessed by the workgroup. In the first meeting, it is discussed on whom and in which manner research is conducted to form the technical foundation of the recommendation. When those three aspects are sorted out a concept technical regulation B can be written. The reporter uses the research to write a concept report. This report is discussed with the workgroup to be able to get the correct outcome. Remarks on the concept report. Several iterations take place before everyone from the workgroup agrees on the substance of the report. If consensus is reached on the report, the publishing phase can start.





Publishing phase

The publishing phase is about validating the results. The concept technical regulation B is discussed with relevant Institute A committees and sometimes with the PAR. The PAR and Institute A committee may have some remarks on the substance of the concept report. Those remarks go back to the workgroup and get discussed. The comments are either refuted or adopted in a new concept report. If the PAR and Institute A committee agrees on the substance of the final concept report, it can be published. The technical regulation B can be published on Institute B website and in several online environments. The different phases are illustrated in a flowchart in Figure 9.



Figure 9 Development process of technical regulation B

7.3.2 Management process

The management process of institute B is to keep the technical regulation B relevant and up-to-date. The PAR can advise institute B on which technical regulation B to revise. The PAR follows the trends in the market and can indicate if recommendations are starting to become irrelevant and need updating. The process of keeping the technical regulation B up-to-date is done by obtaining comments from users. The users of the technical regulation B can provide institute B with comments on the substance of the recommendation or redactional comments. Small comments are often redactional comments on typos or small mistakes in formulas. For instance, a square root symbol might be incorrectly taken over in the publishing phase. Those small issues can be easily resolved by changing the text of the recommendation. The recommendation is online available and thus users will see the resolved issues right after they got resolved. Larger comments require a correction sheet. Large comments on the substance of the recommendation. The workgroup will be gathered to revise those comments and will discuss if the comments are relevant and how the recommendation changes. Once resolved, a correction sheet is published to let the users know that the large comments have been processed.

Additionally, institute B and the PAR analyse all the technical regulation B once in 3-5 years. The recommendations are analysed if the contents are still up-to-date and relevant/applicable for the market. This might induce a new initiation to develop an updated technical regulation B.





7.3.3 Analysis of the integrity of Institute B

The analysis of the integrity of institute B is done by analysing if the identified mechanisms are present in the organisation and business processes. A described, a bottleneck can be present (Yes), not present (No), or partly present (Partly). Table XIII illustrates the integrity analysis of institute B and explains the score. The column ID refers to the sources presented in Table XIII in which the information is obtained.

		<u>ISSUE</u>		
	<u>MECHANISMS</u>	<u>PRESENT?</u>	<u>EXPLANATIONS</u>	<u>ID</u>
	Unqualified employees for the	No	Employees are facilitators of the process. Training on	2.6
	development and management process		the job, experience and policy documents indicate	
			that employees are qualified to facilitate the process.	
	No standardisation of the development	No	Policy document available in which the process steps	2.1
Con	processes		are standardised. While the subject of the process	2.2
			varies, the process is standardised	
	No standardisation for managing technical	No	Process of managing technical regulations is	2.2
	regulations		standardised in which the steps are described. The	2.6
			redevelopment of technical regulations is based on	
sist			the process of development.	
:en	Lacking traceability in the decision-making	Partly	Development is based on market needs. While it is	2.4
c\			considered based on collaboration with the PAR there	2.6
			is no justification based on urgency or safety.	
	Choices by employees cannot be reduced	No	The facilitation of the process is based on business	2.4
	rationally		policy and employees following the policy. The main	2.6
			choice is the selection of stakeholders and the target	
	In a second s	NLa	Is to have a widely supported workgroup	2.0
	incorrect manner in carrying out the	NO	is a consensus in the workgroup. Everyone is heard	2.6
	decision		and has the ability to speak	
-				2.6
	Reflections on the process are missing	Partly	Interviews indicate that reflection is only done	2.6
			sporadically between employees. Reflections with the	
_	Deflections on the velidetics methods are	Deuthu	workgroup on the process are missing	26
	Reflections on the validation methods are	Partiy	merviews indicate that employees communicate	2.0
	missing		from the workgroup or DAP is missing	
	Organisational reflections are missing	Voc	Reflections are limited performed and thus	2.6
	Organisational reflections are missing	Tes	organisational learning based on collective reflection	2.0
			is missing.	
	Adopting information (from external	Partly	Preliminary research is required to start the	2.6
	narties) to quickly as reliable and correct	i ar ciy	development of a new technical regulation B in form	
	parties to quickly as reliable and correct		of a quick scan. However, the interviews do not	
			indicate if this information is cross-checked with other	
			experts or other research.	
lig	Insufficient consideration on the validation	Partly	Institute B has thought of proper validation methods.	2.1
en	methods	,	Consensus building and reviewing it with relevant	2.2
ĉe			Institute A committees is acceptable but could be	
			improved by comments from the public	
	Missing policy on inviting stakeholders in	No	Policy is clear. The goal is to have a broadly supported	2.1
	the process		workgroup with stakeholders from various parties,	2.2
			which is achieved	
	Incorrect manner of validation by	No	Stakeholders are involved in the validation method	2.2
	stakeholders		'consensus building' but have limited influence as	2.6
			everyone needs to agree. Discussing it with relevant	
			committees indicate even less influence by	
			stakeholders.	
	Missing policy on managing and updating	Partly	Policy is in place on the managing of technical	
	the developed products		regulations. However, the policy could be improved	
			by having a more clear explanation on how to collect	
			comments	

Table XIII Integrity analysis Institute B





	MECHANISMS	<u>ISSUE</u>		
	Not recognising conflict of interests of	Partly	The chairman has a key role in the process. Employees	2.6
	favouritism in the process		interests of the stakeholders. Favouritism might still	
			occur. Parties that fund many developments might be	
	Organisational code of conduct not present	Vec	Inclined to be invited more. The leaflet and website do not clearly illustrate where	23
In	in the process	163	the organisation stands for and what the code of	2.5
corr			conduct is. This is therefore not present in the process	
uptibi	Not actively promoting the code of conduct in the process	Yes	Employees are not aware of the code of conduct in the organisation thus promoting it is not possible.	2.6
lity	Incorrect conduct when forms of corruption are signalled	Yes	The missing code of conduct indicates that the signalling of a form of corruption is not guided and the conduct by employees is not supported organisational-wide	2.6
	Lacking sanctioning rules within the	Yes	Policy is missing on sanctioning rules, it is based on	2.2
	organisation that could be applied in the process		rational punishment (E.G. fraud = fired). This should be described in a code of conduct.	2.6
	Not all the stakeholders have timely access	No	Information and meeting records are timely shared	2.6
	to the relevant information		for the experts to analyse the contents. Usually 1-2 weeks before a new meeting	
	Stakeholders are surprised by the steps in	No	Project plan provides initial information on the	2.1
	the process		first meeting. In addition, the business policy is shared	2.2
	Limited information available on the	No	Business policy explains the what, why, how, and with	2.1
=	development and management process		whom in the process. This provides enough	2.2
ans.			management process	
par	Not all stakeholders are aware of what,	Partly	Information is sent by email. Emails can get lost or	2.6
ent	when and with whom was said		incorrectly registered. This indicates that	
			was said	
	Incorrect registration of communication	Partly	Information is spread through the mail. It could be	2.6
			improved by having a cloud environment. Also to improve traceability	
	Information on the organisation, processes	Partly	The involved stakeholders in the process get policy	2.2
	and validation methods are not publicly		documents but those are not online available on the website	2.5
	available	Nie		2.0
	Lack of clarity on the division of individual	INO	the process. The division of responsibilities is clear.	2.0
7	Employees are not aware of their individual	No	Employees know the responsibility of the technical	2.6
Acco	responsibility		regulation B. They are responsible for the	
ount	No conversations take place within the	Partly	development of it based on the business policy	2.6
able	organisation about responsibility	Turtiy	discussed but is not a standard topic during meetings	2.0
(D	Institutions do not know to which extent	No	Institute B knows the extent of their liability and state	2.2
	their liable for the end product		that they are never liable for faults in the technical	2.6
			regulations.	

7.3.4 Consistent behaviour

The mission and vision of institute B are outdated (d.d. 2019) and is very general. The mission and vision are too abstract to guide employee behaviour. The mission and vision contain an abstract explanation on serving public needs. Aspects that relate to integrity are entirely missing. This indicates that it is likely that consistent behaviour is not or limitedly supported within the organisation.





7.4 Diagnostic integrity analysis: Institute C

Institute C is a certification Institute specialising in product certification for the building sector. Institute C certifies parties with developed technical regulation C in which requirements are specified. Institute C develops and manage certificates schemes. Meaning that it develops certificates schemes in which requirements on products or materials are specified. The management of those schemes is conducting inspections and issuing certificates. Institute C profiles itself as an independent organisation. Institute C is accredited for many certificates schemes and the building sector by Dutch Accreditation Body. Which checks the suitability of the certificates schemes and the independence from Institute C in the process of developing certificates are documents in which the product and the development process of the product are analysed and tested based on predetermined requirements. When a supplier fulfils those requirements and certificates can be issues that the product is structurally safe. Institute C is a commercially oriented organisation, which means that does have a profit motive. This is different from Institute A and Institute B.

Activities

The main activity of Institute C is to develop and manage technical regulation C, conduct inspections and issue certificates. A technical regulation C is an agreement made with the sector in which the requirements of a product are described. Those technical regulation C are used to analyse the manufacturing process and the material characteristics. Those technical regulation C can be very specific and are often for materials or products. Those certificates are issued for a variety of sectors like automotive, retail and construction. This research focuses upon the certificates for the construction industry. The development of those certificates is even more important aspect of the business model of Institute C. However, the issuing of the certificates is even more important. Certifications can only be issues when inspections and laboratory tests are conducted. This creates an important revenue stream for the organisation as employees of the organisation conduct those activities. Additionally, Institute C provides services like offering consultancy or training. Those services are not considered in this research.

The available information to analyse the integrity of Institute C technical regulation C is illustrated in Table XIV. The available information is business policy documents and interviews with three employees. The available information has unique IDs from 3.1 to 3.5.

	Available information		
ID	Title	Summary of information	
3.1	Gedrag- en nalevingscode van Institute C	Leaflet with information on the code of conduct of the	
		organisation.	
3.2	We create trust	Brochure in which the development process and the	
		inspections are explained.	
3.3	Certification Document in which the process steps and valid		
		methods of developing technical regulation C are	
		explained.	
3.4	Institute C website	General information on Institute C	
3.5	Interviews with employees of Institute C	Information on the processes in the organisation and on	
		how integrity is embedded within the organisation.	
	Interviews: C + K + L	Information available in Appendix E	

Table XIV Information used to analyse Institute C





7.4.1 Development and management process

The development phase of a certification scheme can also be divided into three phases. The first phase is the initiation phase and it is about setting up a workgroup to develop the certificate scheme. The second phase is the development phase and in this phase, the certificate scheme is developed by the workgroup. The third phase is the publishing phase, in which the validation of the certificate scheme takes place and the final product gets published.

Initiation phase

The initiation phase starts with an initiation from a market party to develop a certification scheme to guarantee the quality of their product of materials. Those certification schemes are used to analyse the production process and the technical specification of their products. This is especially interesting for suppliers. Those parties often initiate the process to develop a certification scheme. Institute C collaborates with the initiator and starts to set up a workgroup and a board of experts. The workgroup consists of technical experts with the know-how and the board of experts consists of directors and managers. Institute C strives to achieve a market-wide supported workgroup and board of experts. The workgroup and the board of experts mostly consist of the same parties. For instance, a technical expert of a supplier is present in the workgroup and another person of that company is present on the board of experts. The development phase can start after the workgroup and board of experts have been formed and agreed on the subject of the certification scheme.

Development phase

The development phase starts with a first meeting with the stakeholders in the workgroup. In this first meeting, the process is explained by an employee of Institute C. The workgroup and the board of experts discuss which research to conduct and appoint a chairman. The chairman must be aware of the general interests of the parties of the workgroup. The chairman is selected from one of the parties or an employee is appointed from Institute C. After the first meeting, the workgroup starts with developing a certification scheme. The experts discuss the results of the research and develop a technical design. In this technical design, aspects are explained like what to measure, how to measure, acceptable variations. This concept report is passed over to the board of experts. The board of experts discuss the technical design and make remarks on the substance. Additionally, the inspection frequency is discussed with an employee of Institute C. An assessment is made on the frequency of inspections. The remarks go back to the workgroup and the workgroup starts to process those remarks and make an updated technical design.

The updated technical design is discussed with the board of experts. This might take a few iterations before a consensus is formed. The board of experts must have a consensus on the technical design before the publishing phase can start.

Publishing phase

The publishing phase is the validation of the certification scheme. The final technical design is published online for a period of critical reflection. In this period, everyone can make their remarks on the content of the certification scheme. Those comments are collected and delivered to the workgroup. The workgroup assesses those remarks and makes an updated technical design. If accreditation for a certification scheme is required, Institute C sends a request to the Dutch Accreditation body (Raad van Accreditatie). The accreditation body analyses the contents if it fulfils the requirements for accreditation. Which may lead to some remarks on the contents. Those remarks are also sent back to the workgroup to be processed. The certification scheme can get published after the remarks from the period of critical reflection and the board of accreditation are processed. The different phases are illustrated in a flowchart in Figure 10.







Figure 10 Development process of technical regulation C

7.4.2 Management process

As stated, the management process of the certificates schemes is important for the organisation. Within the certification schemes, the frequency of inspection and the methods are described. An employee of Institute C performs inspections based on those described methods. The management process of the certification schemes can be divided into two aspects. Firstly, the management of the contents of the technical regulation C. The usage of the technical regulation C may turn out that the frequency of the inspection methods is not appropriate for the product or material. In that case, the workgroup can come together and discuss how this can be resolved. The inspection frequency can change or small adjustments can be made in the methodology. Each change in the certification scheme must be approved by the work group and the board of experts. Secondly, the process of inspections and issuing certificates is conducted. Institute C has developed a process to guide employees to perform inspections and conduct an assessment on the materials. This is registered in a checklist that can be used to ensure that every step is taken during the inspection.





7.4.3 Analysis of the integrity of Institute C

The analysis of the integrity of Institute C is done by analysing if the identified mechanisms are present in the organisation and business processes. As described, a bottleneck can be present (Yes), not present (No), or partly present (Partly). Table XV illustrates the integrity analysis of Institute C and explains the score. The column ID refers to the sources presented in Table XV in which the information is obtained

	<u>MECHANISMS</u>	<u>ISSUE</u> <u>PRESENT?</u>	EXPLANATIONS	ID
	Unqualified employees for the development and management process	No	Employees are selected based on their expertise. The employees may have critical inputs to improve the end product. Extensive learning programs within the organisation indicate that employees are qualified.	3.5
	No standardisation of the development processes	No	Institute C has standardised the process of developing certificate schemes. This is embedded in a policy document of Institute C. In which the procedural steps and validation method are explained.	3.2 3.3 3.5
Consis	No standardisation for managing technical regulations	No	Managing technical regulations is the core business of the organisation. The process is standardised in the organisation and employees are guided to follow the business policy.	3.3 3.5
stency	Lacking traceability in the decision-making	Yes	Development is based on supplier needs. Every supplier can initiate the development of a certificate scheme. To a limited extent, the market needs are considered.	3.3 3.5
	Choices by employees cannot be reduced rationally	Partly	The facilitation of the process is based on business policy. However, the selection of stakeholders for the workgroup and board of experts is not always a balanced market-wide representation.	3.3 3.5
	Incorrect manner in carrying out the decision	No	Certificate scheme is only published after the consensus of the workgroup and board of experts. Furthermore, an accreditation board and a period of critique validate the result.	3.5
	Reflections on the process are missing	No	Employees discuss the process in clusters, every two weeks. This means that the process and selection of stakeholders are discussed.	3.5
	Reflections on the validation methods are missing	Partly	Reflections on the validation methods are conducted in the cluster meetings. However, it is not always discussed during those meetings	3.5
	Organisational reflections are missing	Partly	Organisational reflections are to a certain extent present in the organisation. Clusters communicate with each other. However, organisational learning could be more facilitated in the organisation.	3.5
D	Adopting information (from external parties) to quickly as reliable and correct	Partly	New certificates schemes are often based on new research. However, suppliers can deliver information at the start of the process.	3.3 3.5
ligence	Insufficient consideration on the validation methods	No	Consensus building, analysis by the board of accreditation and a period of critiques indicate a proper consideration of validation methods	3.3 3.5
	Missing policy on inviting stakeholders in the process	Partly	Policy is to have a balanced market-wide representation of the topic. However, interviews indicate that this is regularly not achieved.	3.3 3.5
	Incorrect manner of validation by stakeholders	No	The influence of stakeholders is limited based on consensus-building. Everyone needs to agree before it gets published. Additionally, a period of critical reflection and accreditation indicates that the influence is even more limited.	3.5
	Missing policy on managing and updating the developed products	No	Managing technical regulations is important to Institute C. This process is standardised within the organisation in business policy documents. The employees are also trained to execute the policy	3.2 3.3 3.5

Table XV Integrity analysis Institute C



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		ISSUE		
	<u>MECHANISMS</u>	PRSENT?	<u>EXPLANATIONS</u>	<u>ID</u>
Incorruptibility	Not recognising conflict of interests of favouritism in the process	Partly	An independent chairman helps to identify the interests of every stakeholder. However, every party can come to Institute C to develop a certificate scheme. A selection procedure would help to eliminate favouritism	3.5
	Organisational code of conduct not present in the process	No	Institute C has a business policy document on the code of conduct and is publicly available on the website. The code of conduct contains important integrity aspects, like anti-bribery and confidentiality	3.1
	Not actively promoting the code of conduct in the process	No	Code of conduct is promoted among the employees. Employees are aware of what is expected of them in regards to ethical behaviour.	3.1 3.5
	Incorrect conduct when forms of corruption are signalled	No	Institute C has a clear code of conduct to prevent corruption in the organisation. Institute C also has an internal compliance committee to analyse the incorruptibility of the organisation.	3.1 3.5
	Lacking sanctioning rules within the organisation that could be applied in the process	No	Independent audit on the code of conduct is performed every year. Sanctioning is performed when the audit indicates that the code of conduct is not respected.	3.1 3.5
	Not all the stakeholders have timely access to the relevant information	No	Information and meeting records are timely shared with the experts to analyse the contents	3.5
Transparent	Stakeholders are surprised by the steps in the process	Partly	During the first meeting, an employee of Institute C explains the process steps and the validation methods. It could be improved by having a project plan before the development phase starts	3.5
	Limited information available on the development and management process	No	Business policy document explains how the development and management process is organised.	3.3
	Not all stakeholders are aware of what, when and with whom was said	Partly	Information is spread through the mail. Information can get lost or incorrectly registered, thus bottleneck might occur	3.5
	Incorrect registration of communication	Partly	Information is spread through the mail. It could be improved by having a cloud environment. Also to improve traceability	3.5
	Information on the organisation, processes and validation methods are not publicly available	Partly	The involved stakeholders in the process get policy documents but those are not online available on the website	3.5
Accountable	Lack of clarity on the division of individual responsibility in the process	No	Institute C provides clarity for its employees on the division of responsibility during the process	3.5
	Employees are not aware of their individual responsibility	No	Involved employees know the responsibilities they are having during the process. They are responsible for facilitating the process and sharpening the substance	3.5
	No conversations take place within the organisation about responsibility	Partly	Employees regularly meet within the division. Interviews indicate that responsibilities are discussed. However, it is unclear if responsibilities are a regular topic of conversation.	3.5
	Institutions do not know to which extent their liable for the end product	Partly	Institute C indicated that the users are liable for the usage of the certificate scheme. However, liability is unknown if there was a mistake in the certificate scheme	3.4 3.5

7.4.4 Consistent behaviour

Institute C values integrity as an organisation as it propagate itself as an independent organisation. Institute C sees integrity as a tool to achieve that independent status. Therefore, the mission and vision contain various aspects that can be related to integrity. Furthermore, the employees are guided and tested to analyse if they understand the values of the organisation and can identify with them. This indicates that the consistent behaviour of individuals is supported by the organisation. However, the mission and vision only limitedly mention societal needs. This could be added to improve help to guide employees even more.





7.5 Overview of the integrity analyses: Institute A,B, and C

The analyses of the different institutions can be compared to oversee the differences in mechanisms in the organisations. Table XVI illustrates an overview of the integrity analysis of Institute A, Institute B, and Institute C.

Table XVI Overview of	f the integrity analy	/ses: Institute A, Ii	nstitute B, Institute C

		MECHANISMS PRESENT?		
	MECHANISMS	Institute A	Institute B	Institute C
Consistency	Unqualified employees for the development and	No	No	No
	management process			
	No standardisation of the development processes	No	No	No
	No standardisation for managing technical regulations	No	No	No
	Lacking traceability in the decision-making	Partly	Partly	Yes
	Choices by employees cannot be reduced rationally	No	No	Partly
	Incorrect manner in carrying out the decision	No	No	No
	Reflections on the process are missing	Partly	Partly	No
	Reflections on the validation methods are missing	Partly	Partly	Partly
	Organisational reflections are missing	Yes	Yes	Partly
Diligenc	Adopting information (from external parties) to quickly as reliable and correct	No	Partly	Partly
	Insufficient consideration on the validation methods	No	Partly	No
e	Missing policy on inviting stakeholders in the process	No	No	Partly
	Incorrect manner of validation by stakeholders	No	No	No
	Missing policy on managing and updating the developed products	No	Partly	No
Inc	Not recognising conflict of interests of favouritism in the process	Partly	Partly	Partly
orr	Organisational code of conduct not present in the process	Yes	Yes	No
d n'	Not actively promoting the code of conduct in the process	Yes	Yes	No
tibi	Incorrect conduct when forms of corruption are signalled	Yes	Yes	No
lity	Lacking sanctioning rules within the organisation that could be applied in the process	Yes	Yes	No
Incorruptibility Transparent	Not all the stakeholders have timely access to the relevant information	No	No	No
	Stakeholders are surprised by the steps in the process	No	No	Partly
	Limited information available on the development and management process	No	No	No
	Not all stakeholders are aware of what, when and with whom was said	No	Partly	Partly
	Incorrect registration of communication	No	Partly	Partly
	Information on the organisation, processes and validation methods are not publicly available	Partly	Partly	Partly
Accountable	Lack of clarity on the division of individual responsibility in the process	No	No	No
	Employees are not aware of their individual responsibility	No	No	No
	No conversations take place within the organisation about responsibility	Partly	Partly	Partly
	Institutions do not know to which extent their liable for the end product	No	No	Partly





7.6 Analysis of the results

Table XVI illustrates the overview of the integrity analyses of the processes of the three institutions. The interpretation of the results is important to understand what the table represents and which conclusions can be drawn from those results. Every core fundamental is analysed to understand if the mechanisms relate to each other and how the results should be interpreted. For instance, several mechanisms are identified regarding reflections. If those mechanisms are present the core fundamental 'diligence' might look compromised but in reality, the aspect reflection might need improvements.

7.6.1 Consistency

Overall, the mechanisms that could compromise the core fundamental consistency are limitedly present within the three processes. The institutions have standardised the development and management process and qualified employees are selected to guide the processes. There is one noticeable aspect present and that is that the mechanism related to the traceability in the decision-making is partly present for Institute A and Institute B and present for Institute C. The results show that Institute A and Institute B make a decision to develop a technical regulation based on market needs. This implies a decision based on added value for multiple parties in the construction industry.Institute C do not always consider the market needs and sometimes serves just the needs of the initiator of the technical regulations.

Aspects that all institutions are missing is the consideration of safety and urgency. It could be the case that there are pressing matters that need technical regulations to prevent failure or improve safety. For instance, the hairline cracks in several large bridges that were discovered in 2016 needed direct attention. The development of technical regulations can support those sudden discoveries by quickly starting to develop technical regulations that standardise maintenance works or prevent hairline cracks in new bridges. This instance shows that the development of technical regulations should not always be about market needs but that safety of buildings and infrastructure should have the priority. The three institutions could improve the decision-making process by also considering safety and urgency by having some decision-making procedure in place.

7.6.2 Diligence

The core fundamental diligence is shaped by the indicators: reflections on the process and results, critical view and creation of trustworthiness. It is noticeable that the reflections on the process and validation methods are partly missing along with the three institutions. The lack of reflections in turn result in limited organisational learning. The individual reflections on the process and validation methods need to be combined into a collective reflection and organisational learning as stated in paragraph 5.5.2. This makes that the mechanisms on reflections on the process and validation methods affect organisational learning. The results show that reflections are partly missing, which result in that organisational learning is not fully achieved. A different noticeable aspect is that Institute B has more room for improvement on critical view and creation of trustworthiness. In comparison with the other institutions, Institute B has more mechanisms (partly) present about adopting information and the consideration of validation methods.





7.6.3 Incorruptibility

Incorruptibility is shaped by three indicators, namely: managing stakeholder interests, clarity of conduct and sanctionability. Most noticeable are the mechanisms about the clarity of conduct and sanctionability. Those indicators are mainly shaped by the content and the propagation of the code of conduct. The results show that a code of conduct is missing for Institute A and Institute B. The results show that four mechanisms present for Institute A and Institute B, negatively affect the incorruptibility of the process. However, some nuance has to be given as those mechanisms are related to each other. The four mechanisms are all related to the code of conduct of the organisation. The four mechanisms would not be present if the institutions had a code of conduct in which ethical behaviour is described and propagated toward their employees. The results show that Institute A and Institute B do not have a code of conduct in their organisations which in turn results in the presence of those four present mechanisms. Those mechanisms would be resolved when Institute A and Institute B develop a code of conduct and propagate this towards their employees. Furthermore, recognising the conflict of interest or favouritism in the process can be improved along with the three institutions. All three institutions could pay more attention to this aspect by either implementing a selection procedure for stakeholders or appointing an independent chairman to oversee the interests.

7.6.4 Transparent

The mechanisms that negatively affect the transparency of the processes are only partly present along with the three institutions. This implies that limited improvements are possible to achieve transparency of the processes. The improvement that can be made is the registration of documentation and communication and making information publicly available. The registration of documentation and communication can be improved by setting up an online environment in which the research documents, draft versions and minutes are stored and at all times available for the stakeholders. Additionally, information on the process and validation method can be published on the institutions' websites to improve publicly available information.

7.6.5 Accountable

The mechanisms that negatively affect the accountability of the processes are limitedly present. The main improvement that can be made is having conversations about responsibilities. Employees can be guided more in understanding which responsibilities they have and how to handle those responsibilities. This can be resolved by making responsibilities are a standard topic of conversation.

7.7 Relations between core fundamentals

The framework presents relations between the core fundamentals of transparency, incorruptibility and accountability. Transparency can facilitate incorruptibility and transparency. This is related to the development and management of technical regulations. In this case, incorruptibility and accountability can be improved by transparency. One could argue that the relations between the core fundamentals are not displayed in the indicators and results. This is supported as it was beyond the scope of this research to investigate the true extent of the relations between the core fundamentals and the indicators.

Transparency to improve incorruptibility

The incorruptibility in the development and management process can be improved by transparency in the code of conduct of the organisation. Incorruptibility can be improved when the code of conduct is communicated and shared at the start of the development process. The involved parties can be made aware of how the organisation and individuals (employees) want to achieve incorruptibility in the process. The code of conduct can contain important information on how stakeholder interests are managed, which possible forms of corruption can be present, and how they can be detected. This can facilitate that not only the employees but also other stakeholders can recognize forms of corruption and can report them to the employee. Additionally, the likeliness that stakeholders try to introduce corrupt behaviour into the process is reduced. When persons are made aware that corrupt behaviour is unacceptable, the likeliness of such behaviour is reduced (Singh & Prasad, 2017).





Transparency to improve accountability

As described, transparency can improve accountability. This may also be the case in the development and management of technical regulations. Transparency on the expected responsibilities of the stakeholders during the process can help to improve accountability. Stakeholders are made aware of their responsibilities and know what is expected of them. The legal liability of the considered technical regulations does not lie by the institutions (Gujadhur & Schwohnke, 2009). This means that the institutions cannot be held accountable for mistakes in the technical regulations but the users of the technical regulation. The extent of transparency to improve accountability is therefore reduced. Transparency on the legal status of technical regulations can be communicated to clients to make them aware of the legal status of technical regulations.

7.8 Validation of the results

7.8.1 Accountability of the organisational documents

The business policy documents that were reviewed in this research were obtained from the employees of the institutions. In the interviews, the researcher has requested a business policy document in which the process steps and validation methods were described. Additionally, the code of conduct was also requested if it was available. Institute A and Institute B indicated that no central document about the code of conduct was available within the organisation.

7.8.2 Validation of the interview process

Semi-structured format

The validation of the interviews is done by using a semi-structured interview format. Appendix D provides an overview of the questions that were asked during the interview. However, by just asking the questions one by one the interviewee might feel uncomfortable or threatened. Therefore, an agenda is drafted with a logical structure. The agenda had three sections, namely: introduction, content and conclusion. The used agenda can be found in Appendix E. The introduction is about making the interviewee at ease. This is achieved by asking a personal question about their function and the organisation. This transitioned into the second section to obtain specific information on the organisation and the processes. The conclusion section is about ending the interview by mentioning how the information will be used, thanking the interviewee for their time.

Open questions were used to prevent steering from the interviewer and to prevent unsubstantiated answers (easy Yes or No answers). Lastly, to prevent exhaustion of the interviewer and interviewee the interviews lasted on average one hour. An hour is enough time to obtain the relevant information but not be too long-winded.

Logical course of events

It is important that the interviewee is at ease during the interview and does not experience a spitfire of questions during the interview. It is also important to have a logical course of events to ensure a smooth interview. This is achieved by having a unique numbering system. Appendix D presents the questions that are asked during the interview to obtain the relevant information. Those questions have been given an ID. The researcher has categorized the questions into three interview topics. Those interview topics are development process, validation and integrity aspects. The developed questions in Appendix D have been categorized into those three topics by their unique ID's. This ensures the questions have a logical course of events. Also, the ID's ensures every question is asked during the interview.





7.8.3 Comparing information from employees of the same institution

Information on the development and management process of technical regulations is obtained through interviews with several employees that are involved in those processes. The steps in the process and the validation methods are standardised in the business policy documents but do require individual actions. Especially, the individual actions by employees can cause differences in the information. For instance, one employee can invite stakeholders through his/her network while another employee can invite stakeholders in a more general way via publication in a trade magazine. Instances like this may cause discrepancies in the information provided by the employees from the interviews. Appendix E illustrates the comparisons made from the information provided by the employees from the three institutions. Certain questions had differences in the answers. Most differences can be considered as a misunderstanding of the question or incomplete answers. Clarification is asked on those topics. The comparison of the information is illustrated in Appendix E.

7.8.4 *Reflecting with information from external sources*

The development and management process of technical regulations is also discussed with other parties. An industry organisation and the two main governmental organisations have been interviewed. Those organisations are regularly involved in the development process of technical regulations as those parties are often stakeholders in committees and workgroups. The interviewees are aware of how the process is organised and the influence of the employees of the institutions on the results. The reflections provided important information on the process and validated the sayings by the employees. Furthermore, reflecting the information with external sources is valuable in ensuring that the processes are conducted in the same way as the employees of the institution's state.

7.8.5 *Reflecting the results with employees of the institution*

The results, conclusions and recommendations of this research are discussed with employees of the institutions. This is done to ensure that the described process is correct and that the integrity analysis contains the correct information. The conclusions and recommendations were discussed to provide the institutions with additional information on what the results mean and which improvements are possible in the process. The researcher provided the employees with a research summary in which the methodology and framework is presented. This is to increase the traceability of the results. The discussion with the employees showed that small improvements in the description were possible. The descriptions have been adjusted to ensure that the presented information is correct.





8. Conclusions and recommendations

8.1 Conclusions

The concept of integrity is complex and does not have a unified definition. Integrity is inherently connected to ethics as moral standards and values are always related to the concept of integrity. This makes the concept of integrity versatile and can be related to various situations. It is possible to relate the concept of integrity to diagnostically analyse the integrity of business processes. This is achieved by combining aspects of individual and organisational integrity into a theoretical framework. A combination of individual and organisational integrity is present in business processes as organisations set up the process and individuals execute them. The development and management of technical regulations in the Netherlands are performed by privately controlled institutions. The three considered institutions develop and manage technical regulations based on business processes. It is shown that the theoretical framework can be applied to diagnostically analyse the integrity of the three development and management processes of technical regulations. This means that the concept of integrity can be related to the construction industry. Therefore, it can be stated that the domain of ethics and civil engineering can be connected.

The changes in the approach of the Dutch government to reform the regulatory system towards a more open and market-driven method of policy development has impacted the Dutch regulatory system. The responsibilities of developing and managing technical regulations shifted towards privately controlled institutions. This resulted in freedom for the institutions to set up the development and management processes of technical regulations (OECD, 2009). This is visible for the three considered development and management processes. The analysed processes have differences between them in the procedural steps and the validation methods. Therefore, it can be stated that the reforms toward a privately controlled system have resulted in different processes by the institutions.

Integrity can positively benefit the quality of the results. Meaning that high-quality technical regulations can be achieved when integrity is embedded in the development and management process of technical regulations. Integrity in the development and management process of technical regulations is achieved when the core fundamentals of consistency, diligence, incorruptibility, transparency and accountability are embedded in the processes. The institutions have standardised the development and management processes and allocated qualified personnel to guide the process. This indicates that the institutions have carefully thought about the procedural steps and validation methods. However, when considering the integrity of the process, several mechanisms are present that might negatively affect the integrity of the process. The three considered development and management processes have differences between them, resulting in the presence of different mechanisms for each process.

The results show that several mechanisms are present along the three institutions and mechanisms are present per institution. The core fundamentals of diligence and incorruptibility are the most negatively affected as several mechanisms are present. The diligence of the process is negatively affected as the institutions only perform a limited number of reflections. Individual and organisational reflections can lead to professional growth and can help to improve the quality of results. Reflections are an underexposed aspect in the development and management processes as reflections are not always conducted. Individual reflections on the process and validation methods are only limitedly conducted. Resulting in missing organisational reflections or being conducted with only a limited number of individual reflections.

The incorruptibility of the process is shaped by managing stakeholder interests and propagating organisational ethics, in the form of a code of conduct. The results show that those aspects are not completely embedded in each process, which undermines the incorruptibility of the process. Each institution has room for improvement in managing stakeholder interests. It is essential that an independent chairman guides the process and a stakeholder selection procedure is conducted. This is to minimize the chance of a conflict of interests or favouritism in the process. Also, two of the three institutions do not have a code of conduct. This means that organisational ethics are not registered within the organisation and that employees do not have the tools to propagate ethics into the process and recognise corrupt behaviour. Those two aspects mean that the incorruptibility of the development and management processes is negatively affected.





Lastly, the results show that the core fundamentals of consistency, transparency and accountability only have mechanisms that are partly present. This implies that the consistency, transparency and accountability of the process are nearly embedded in the process. The party present mechanisms imply that only relatively small improvements need to be made to overcome those mechanisms. This indicates that the institutions have carefully set up their development and management processes. The processes are standardised, information is timely available and employees are aware of their responsibilities within the process.

As stated integrity in a process is achieved when consistency, diligence, incorruptibility, transparency and accountability are embedded in the process. Integrity is ensured when there are no mechanisms present that negatively affect the integrity. While the institutions have carefully set up their processes it cannot be concluded that integrity is completely ensured in the development and management process of technical regulations. The three considered development and management processes all have several mechanisms present that negatively affect integrity. Each core fundamental has room for improvements as at least a partly present mechanism is present for each fundamental. Improvements in the process can be categorized into institutional-wide improvement and tailored improvement per institution, as certain mechanisms are present along with the three institutions and certain mechanisms are only present per institution.

8.2 Recommendations

Improvements in the development and management of technical regulations are possible as mechanisms are present that negatively affect the integrity of the processes. Improvements in the processes can be categorised as institution-wide improvements and tailored improvement. Institutions-wide improvements are the removal of mechanisms that negatively affect integrity for the three institutions. Meaning that certain mechanisms are present that compromise the integrity of all three processes. These are improvements in the core fundamentals of diligence and incorruptibility. Additionally, tailored improvements for each institution are possible. The results show that each core fundamental has some room for improvement for all the institutions.

Institution-wide improvements

Improvements that can be made institution-wide are improvements in the reflections, management of stakeholders and online transparency. The results show that reflections about the process and validation methods are an underexposed aspect of the processes. Reflections are not performed periodically and are not always on the correct topics. Therefore, organisational learning is not always possible as reflections cannot be combined into organisational learning. The first step to improve this is to add a process step after the publication of the technical regulation. This process step is a reflection on the process and the validation methods with the stakeholders and employees involved in the process. Questions can be asked about how the process went and if everyone is heard and satisfied with the results. The institutions can develop a format in which certain base questions are formulated that can be asked. The next step is combining those reflections by discussing them with other employees. Periodically a meeting can be scheduled in which employees talk about how they experience the process and the reflections can be compared. This can result in the process or validation methods being adjusted based on combined reflections. In this way, the diligence of the process is further enhanced which in turn improves the integrity of the process.

Additionally, improvements can be made in the management of stakeholder interests. The analysis shows that the institutions struggle in recognising conflict of interest or favouritism in the process. The measures taken to resolve this are only partly resolving this mechanism. Conflict of stakeholder interests can be prevented in two ways. The first way is having a selection procedure for each stakeholder to be involved in the process. The interest of the parties can be investigated and selected based on added value. This selection procedure also creates traceability of the decision on which parties to involve. This extra procedural step can be added after the set-up of a workgroup or committee. The second way is to have an independent chairman that is able to oversee the interests of the parties. An independent chairman should be guided and supported by the code of conduct of the organisation. An additional step in the process can be made to inform the chairman of his duties and the code of conduct of the organisation. This can be done in the process step in which the chairman is appointed. This improves the incorruptibility of the process and improves the integrity of the process.





The transparency of the process can be improved by publishing information on the process on their websites. Information on the procedural steps and validation methods can be published to inform people that are unknown to the process and show how carefully the institution have thought about setting up the process. This would further enhance the transparency of the development and management process.

Tailored improvements: Institute A

Two tailored improvements are possible in the development and management process of Institute A. Those improvements are improving the traceability in the decision-making and developing a code of conduct. The traceability in the decision-making can be improved as more careful consideration can be done on which technical regulation to develop. Institute A already selects the development based on market needs but the aspects of safety and urgency can also be considered. The transition towards a more sustainable and circular economy may cause a large increase in the demand for technical regulations. It is important that the most pressing topics are developed first. An adjustment can be made in the evaluation of the initiation request to assess the safety or urgency of the topic.

Also, it is recommended to develop a code of conduct for the organisation to improve the incorruptibility of the process. Several mechanisms have been identified that can be related to the lack of having a code of conduct in the organisation. The code of conduct should be developed in collaboration with its employees to ensure that everyone stands behind the values of the organisation. The code of conduct should contain information on which values are important for the organisation, how to handle if infringement occurs and which sanctioning rules could be applied. This may sound severe but the point of the code of conduct is that the organisation has thought about which values are important and how those values are achieved. Employees can propagate this code of conduct during the first meeting with the stakeholders.

Tailored improvements: Institute B

Tailored improvements are also possible for Institute B. Four tailored pieces of advice could be given to improve the integrity of the development and management process of the technical regulation B. Those are improving the diligence in adopting information, adding a period of critical reflection, developing a code of conduct and setting up an online environment.

The diligence in adopting information can be improved by adding a procedural step in the process. The results indicate that a check on the provided information by the initiator could be done more diligently. A procedural step could be added that information by the initiator is always checked before it will be used in the development. Experts can review those documents or additional research can be conducted to evaluate if the information is valid. This extra step could be done during the development of the project plan. This is to assess if the information is vital for the project plan and how the information will be used during the process. Also, an additional validation method could be added in which the public can read the concept report and provide the workgroup with comments. A period of critical reflection can be introduced after the workgroup reaches consensus on the concept report. This report can be published online and other experts can provide the workgroup with additional comments on the matter. The workgroup can discuss and evaluate those comments to further improve the quality of the technical regulation. Those two recommendations would improve the diligence in the process.

The incorruptibility of Institute B can also be improved by developing a code of conduct for the organisation. The described recommendation for Institute A is also applicable for Institute B. The development of a code of conduct indicates that the organisation has thought about which values are important and how those values are achieved. The last tailored recommendation for Institute B is setting up an online work environment. Information, research and minutes get sent via e-mail, which may get lost or incorrectly registered. An online environment would help in creating structure in information storage. Stakeholders of the process can get permission to access this online environment to be up to date on the latest research and the communication between each other. The possibility that stakeholders are misinformed or use old information can be limited by setting up an online environment. This would improve the transparency of the process.





Tailored improvements: Institute C

Three tailored recommendations can be given for the development and management process of Institute C. Those are improving the policy on inviting stakeholders, developing a project plan, and setting up an online environment. The traceability in the decision-making process can be improved by Institute C. The analysis shows that traceability is missing which undermines the consistency of the process. This can be improved by selecting the development based on market needs and if possible on urgency and safety. Every manufacturer or supplier can initiate the development of a new certification scheme. To improve the consistency of the process, a selection procedure can be added to evaluate the development initiation. A decision-making matrix can be developed to guide employees in selecting which technical regulation C contributes to market needs, safety and urgency. This extra procedural step can be added before the stakeholders are selected.

A noticeable difference between the processes is that the development and management process of Institute C does not have the development of a project plan. The transparency of the process could be improved when a project plan is developed. A project plan can contain valuable information on how the process is organised, which validation method will be used, what is expected from each stakeholder and what the goal of the development is. This makes that stakeholders are not surprised by the procedural steps during the process. Lastly, transparency can be improved when an online environment is set up. Similar to the recommendation for Institute B, Institute C can also set up an online environment to store research, minutes and other information.

8.3 Discussion

The analysis of the integrity of business processes is done diagnostically. This means that a diagnostic analysis is done based on mechanisms that could be present in the process which negatively affect the integrity. A different method to analyse the integrity is done through a qualitative method. Kaptein (2008) has developed a program to measure the integrity within organisations. This analysis is based on data obtained through questionnaires that were held under employees. This method of analysing the integrity might be interesting in this case as an evaluation can be made. The developed framework in this research can likely be used in qualitative research. The specification of the mechanisms needs to be adjusted as questions need to be drafted that can be answered in questionnaires to analyse statistically. Additional research is required to investigate if the development and management process can be analysed and evaluated qualitatively.

The involved stakeholders in the development and management process of technical regulations are often very similar. The government has an interest in developing technical regulations and is regularly involved in the different processes. Furthermore, there are only limited experts available on the specific subjects of those technical regulations. This results in the same experts often playing a part in the development and management process. It is important to consider the integrity of the stakeholders that are involved in the process. Integrity in the development and management process is easier to achieve when stakeholders value the same moral and ethical values. It might be interesting for the institutions to investigate how stakeholders can be made aware of the moral standards and values of the institution and how stakeholders can be supported in the process. Additional research is required to investigate how stakeholders can be made aware of moral and ethical standards and which effect it has on the integrity of the process.

Institute A and Institute B are non-profit organisations, which means that those institutions do not make a profit from their services. However, funding is required to continue the operation of the institutions. Employees, offices and other expenses need to be paid. The interviews indicate that the development of technical regulations is an important revenue stream for those organisations. This implies that the development process is important for those organisations to continue existing. In this research, the technical regulations on those topics which creates a certain tension field in obtaining funding. Both organisations are searching for developing technical regulation within the same technical field. Both organisations are non-profit but do have a commercial interest in development to continue to exist. The analysis of the integrity of the development and management process of Institute A and Institute C already has a commercial character and obtains funding mainly through inspection and granting certificates.





The development of new technical regulations is the tool to perform more inspections. The necessity to develop new technical regulations are not as high as Institute A and Institute B as funding is largely obtained in the management and usage phase. Additional research is required to understand the exact revenue income from the development of technical regulations and the necessity of the institutions to develop technical regulations to obtain funding.

The reforms in the 1990s to shift the responsibilities from the government towards the construction market affected the development and management of technical regulations. Institutions became responsible for those processes and had the freedom to set up those processes (OECD, 2009). The freedom of setting up those processes has led to differences between them. This is substantiated by the fact that the presented processes have noticeable differences. This implies that the institutions have set up those processes within their organisation with limited communication with the other institutions. While not necessarily an issue, a possible tension field that can be observed is that system thinking is missing in the Dutch regulatory system. It is noticeable that the different technical regulations together serve a larger public need but the institutions are limitedly connected. The purpose of technical regulations is to serve public interests as structural safety needs to be ensured of buildings and infrastructure objects. The institutions serve a greater need, beyond their organisations. Therefore, it is noticeable that the institutions have limited communication and collaboration between them.

The observed possible tension field is that system thinking is missing in the Dutch regulatory system. System thinking would start by understanding the position of the institutions in the Dutch regulatory system and the interactions with other parties (Arnold & Wade, 2015). This can help to collaborate more in the development and management processes or to have the same procedural steps in the development of technical regulations. Which might result in even higher-quality technical regulations. Additional research is required to explore what the exact positive benefits are of system thinking and how it can be achieved.

The Dutch regulatory system is a privately controlled system with limited influence by the government. Research shows that different regulatory systems are present. While a transition back to a governmental controlled system is unlikely, the Dutch government can start to think to obtain more influence in the system. The results show that improvements are possible in the development and management process. Additionally, the regime is missing in the process which leads to possible tension fields in the system. The Dutch government should consider getting more involved in the privately controlled system. The government can take the role of supervisor and gain regime over the process. This in turn might lead the observed possible tension field of system thinking to be further investigated and resolved. The regulatory systems (Branco Pedro et al., 2010). A transition might lead to interesting perspectives, uniformity in the technical regulations can be achieved if the institutions have the same process steps and validation methods. If the government gets involved, it might demand that certain processes steps and validation methods are followed. Which in turn may lead to more uniformity in the technical regulations. Additional research is required to investigate how a variance between privately and governmentally controlled systems can be achieved and governmental regulations. Additional research is required to investigate how a variance between privately and governmentally controlled systems can be achieved and what the main benefits and drawbacks are.

Lastly, this research investigates the integrity of the development and management process of the Netherlands. The Netherlands play a part in the larger European system. The European system provides all the countries in Europe with technical regulations which are often used as a foundation for new Dutch technical regulations. Several interviewees raise their concerns about the integrity of those processes. Concerns were mostly raised about the incorruptibility of European regulations as many stories are present that large companies have a large influence in the outcome of the European regulations. Limited information is available on how those processes are organised and how integrity is embedded in those processes. Additional research is required to investigate if integrity is embedded in the development of European technical regulations.





8.4 Limitations of the research

Several limitations have been made to ensure that this research could be conducted within the given period. Four main limitations can be identified in this research. The first limitation is that the relations between the core fundamentals are limitedly considered in this research. Research points out that the core fundamental of transparency can be related to incorruptibility and accountability. While this is indicated in the theoretical framework, it is limitedly adopted in the analysis of the three processes of the institutions. Only a small explanation is given on how transparency can help to improve incorruptibility and accountability. The identified mechanisms to analyse the processes are not related to each other. Additional research is required to investigate the exact relation between the core fundamentals and how it affects the mechanisms.

The second limitation of this research is that the mechanisms do not have a weighting factor. This research has a diagnostic character which implies that the presence of the mechanisms is merely investigated. Certain mechanisms can be related to each other which implies that one could argue that certain mechanisms are more important than others. Additional research is required to investigate if weighting factors positively affect the analysis of business processes. Thirdly, the research is limited by not investigating the consistency of individual behaviour of the employees in the processes. The literature points out that individual behaviour is difficult to measure due to the philological aspects and the personality characteristics of individuals. It was not feasible within the given timespan to fully analyse how consistent behaviour in the process can be achieved. Additional research is required to investigate the consistency of the behaviour of the employees in the processes.

The fourth limitation of this research comes from a practical perspective. The obtained data for this research came from interviews and business policy documents. The researcher did not participate in the development processes to verify the information from the interviews and policy documents. This implies that there is a possibility that the reality is different from what was said and described. However, this research has taken measures to minimize the chance of that being the case. Employees from the institutions were asked to describe the processes to verify the business policy documents. Also, more in-depth questions were asked on how improvements in the process take place and how the validation methods are organised. Additionally, interviews are conducted with people that participate regularly in the development process and verify the course of action during those processes. This makes it unlikely that the processes are different in reality than what is presented in this research but the possibility still exists.







9. References

- Argandoña, A. (2011). Consistency in Decision Making in Companies. SSRN Electronic Journal, 1(1), 2–17. https://doi.org/10.2139/ssrn.1295317
- Arnold, R. D., & Wade, J. P. (2015). A definition of systems thinking: A systems approach. *Procedia Computer Science*, 44(C), 669–678. https://doi.org/10.1016/j.procs.2015.03.050
- Arunachalam, M. (2015). Accountability for Business Ethics in the Context of Financial Markets Authority's Corporate Governance Principles. *Journal of Applied Business Research*, 13(1), 19–34. https://www.researchgate.net/publication/284723160
- Barnard, A., Schurink, W., & de Beer, M. (2008). A Conceptual Framework of Integrity. SA Journal of Industrial Psychology, 34(2), 40–49. http://www.sajip.co.za
- Branco Pedro, J., Meijer, F., & Visscher, H. (2010). *Technical building regulations in EU countries: a comparison of their organization and formulation*. https://www.researchgate.net/publication/260980505
- Cafaggi, Fabrizio., & Renda, Andrea. (2012). *Public and private regulation: Mapping the labyrinth* (No. 370; Vol. 1). CEPS. http://www.ceps.eu
- Carter, N., Bryant-Lukosius, D., Dicenso, A., Blythe, J., & Neville, A. J. (2014). The use of triangulation in qualitative research. *Oncology Nursing Forum*, *41*(5), 545–547. https://doi.org/10.1188/14.ONF.545-547
- Erhard H, W., Jensen, M. C., Zaffron, S., & Erhard, W. (2009). Integrity: A Positive Model That Incorporates the Normative Phenomena of Morality, Ethics, and Legality. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.920625
- Flieger, M. (2020). Consistency concept in different organizational structures: functional, process and hybrid. *Scientific Journal of the Military University of Land Forces*, 197(3), 677–687. https://doi.org/10.5604/01.3001.0014.3961
- Gujadhur, S., & Schwohnke, D. (2009). *Technical Regulations: Recommendations for their elaboration and enforcement* (1st ed., Vol. 1). International Trade Centre. www.sxc.hu
- Hassan, S. (2013). The importance of role clarification in workgroups: Effects on perceived role clarity, work satisfaction, and turnover rates. *Public Administration Review*, 73(5), 716–725. https://doi.org/10.1111/puar.12100
- Heine, K., & Grabovets, K. (2016). From Individuals to Organizations: The Puzzle of Organizational Liability in Tort Law. *The Dovenschmidt Quarterly*, 3(2), 44–53. https://doi.org/10.5553/doqu/221199812015003002002
- Hilden, S., & Tikkamäki, K. (2013). Reflective Practice as a Fuel for Organizational Learning. Administrative Sciences, 3(3), 76–95. https://doi.org/10.3390/admsci3030076
- Hoekstra, A., & Kaptein, M. (2020). The Integrity of Integrity Programs: Toward a Normative Framework. *Public Integrity*, 0, 1–13. https://doi.org/10.1080/10999922.2020.1776077
- Huberts, L. W. J. C. (2018). Integrity: What it is and Why it is Important. *Public Integrity*, 0, 1–15. https://doi.org/10.1080/10999922.2018.1477404
- Kaniški, I., & Vincek, I. (2018). Business processes as business systems. *Technical Journal*, 12(1), 55–61. https://doi.org/10.31803/tg-20170808183458
- Kaptein, M. (2008). Developing and testing a measure for the ethical culture of organizations: The corporate ethical virtues model. *Journal of Organizational Behavior*, 29(7), 923–947. https://doi.org/10.1002/job.520
- Karlsen, J. T. (2002). Project stakeholder management. *Engineering Management Journal, 14*(4), 19–24. https://doi.org/10.1080/10429247.2002.11415180
- Karlsen, J. T., Græe, K., & Massaoud, M. J. (2008). Building trust in project-stakeholder relationships. *Baltic Journal of Management*, *3*(1), 7–22. https://doi.org/10.1108/17465260810844239
- Khan, M. A., Afzal, H., Phil, M., Fahad, M., & Khan, A. (2010). Determine the Relationship between Consistency of Work and Organizations Performance. *SDMIMD Journal of Management*, 1(1), 25–35.





- Koehn, D. (2005). Integrity as a business asset. *Journal of Business Ethics*, *58*(1), 125–136. https://doi.org/10.1007/s10551-005-1391-x
- Koessler, F., & Lambert-Mogiliansky, A. (2013). Committing to transparency to resist corruption. *Journal of Development Economics*, 100(1), 117–126. https://doi.org/10.1016/j.jdeveco.2012.08.006
- KPMG. (2016). Measuring Ethical Climate with the Integrity Thermometer.
- Kundeliene, K., & Leitoniene, S. (2015). Business Information Transparency: Causes and Evaluation Possibilities. Procedia - Social and Behavioral Sciences, 213(2015), 340–344. https://doi.org/10.1016/j.sbspro.2015.11.548
- Lasthuizen, K., Huberts, L., & Heres, L. (2011). How to measure integrity violations: Towards a validated typology of unethical behavior. *Public Management Review*, *13*(3), 383–408. https://doi.org/10.1080/14719037.2011.553267

Lodge, M., & Wegrich, K. (2012). Managing regulation: Regulatory Analysis, Politics and Policy (Vol. 2).

- Lucko, G., Asce, A. M., & Rojas, E. M. (2010). Research Validation: Challenges and Opportunities in the Construction Domain. *Journal of Construction Engineering and Management*, 136(1), 127–135. https://doi.org/10.1061/ASCECO.1943-7862.0000025
- Mabillard, V., & Zumofen, R. (2017). The complex relationship between transparency and accountability: A synthesis and contribution to existing frameworks. *Public Policy and Administration*, 32(2), 110–129. https://doi.org/10.1177/0952076716653651
- Madu, B. C. (2013). Vision: The relationship between a firm's strategy and business model. *Journal of Behavioral Studies in Business*, 6(1), 1–9. http://www.aabri.com/copyright.html.
- May, P. J. (2004). Performance-Based Regulation and Regulatory Regimes: The Saga of Leaky Buildings. *Law & Policy*, 25(4), 382–401. https://doi.org/10.1111/j.0265-8240.2003.00155.x
- May, P. J. (2007). Regulatory regimes and accountability. *Regulation & Governance*, 1(1), 8–26. https://doi.org/10.1111/j.1748-5991.2007.00002.x
- Monga, M. (2016). Integrity and its antecedent: A unified conceptual framework of integrity. *Journal of Developing Areas*, *50*(5), 415–421. https://doi.org/10.2307/26415605

Moore-Bick, M. (2019). Report of the Public Inquiry into the fire at Grenfell Tower.

- Mouzas, S., Henneberg, S., & Naudé, P. (2007). Trust and reliance in business relationships. *European Journal of Marketing*, 41(9–10), 1016–1032. https://doi.org/10.1108/03090560710773327
- Münstermann, B., Eckhardt, A., & Weitzel, T. (2010). The performance impact of business process standardization: An empirical evaluation of the recruitment process. *Business Process Management Journal*, 16(1), 29–56. https://doi.org/10.1108/14637151011017930
- OECD. (2009). Better regulation in Europe: An assessment of regulatory capacity in 15 member states of the European Union: Better Regulation in the Netherlands. www.copyright.com.
- Ponomarenko, A. (2016). Organizational Integrity: A Strategic Model for Leadership. https://doi.org/10.13140/RG.2.2.20315.57120/1
- Sánchez-Apellániz, M., Charlo, J., & Núñez, M. (2013). Integrity as a core value in organizations: the development and implementation of a strong ethical culture. https://doi.org/10.1057/9781137280350.0023
- Schnackenberg, A. K., & Tomlinson, E. C. (2016). Organizational Transparency: A New Perspective on Managing Trust in Organization-Stakeholder Relationships. *Journal of Management*, 42(7), 1784–1810. https://doi.org/10.1177/0149206314525202
- Sherman, R. A., Nave, C. S., & Funder, D. C. (2010). Situational similarity and personality predict behavioral consistency. *Journal of Personality and Social Psychology*, 99(2), 330–343. https://doi.org/10.1037/a0019796
- Singh, C., & Prasad, M. (2017). Code of Ethics in an Organisation. Journal of Application or Innovation in Engineering & Management, 6(5), 138–142. https://www.researchgate.net/publication/321938144





- Thomas, G. F., Zolin, R., & Hartman, J. L. (2009). The central role of communication in developing trust and its effect on employee involvement. *Journal of Business Communication*, *46*(3), 287–310. https://doi.org/10.1177/0021943609333522
- Urban, W., & Rogowska, P. (2018). The Case Study of Bottlenecks Identification for Practical Implementation to the Theory of Constraints. *Multidisciplinary Aspects of Production Engineering*, 1(1), 399–405. https://doi.org/10.2478/mape-2018-0051
- Valentine, S., & Johnson, A. (2005). Codes of ethics, orientation programs, and the perceived importance of employee incorruptibility. *Journal of Business Ethics*, 61(1), 45–53. https://doi.org/10.1007/s10551-005-7057-x
- Verschuren, P., & Doorewaard, H. (2010). *Designing a Research Project* (Second). Eleven International Publishing.

Vince, R., & Reynolds, M. (2010). Organizing Reflective Practice. https://www.researchgate.net/publication/229053242





Appendix A – Integrity thermometer

Kaptein (2008) has developed a tool to analyse the integrity within organisations. This research showed that seven virtues can be differentiated to analyse the integrity within an organisation. Those virtues are clarity, congruency, feasibility, supportability, transparency, discuss ability and sancitonability. Those virtues are further elaborated on below.

Clarity is being clear and open on what is expected behaviour and conduct of employees. Clarity is achieved when the expected conduct is concrete, comprehensive and understandable. This covers a wide variety of subjects on which an organisation can be clear. Employees can be made aware of how to handle money or other financial assets. Also, clarity can be given on how to behave towards external persons and organisations. Clarity is achieved when the organisation is clear on the ethical standards that employees should uphold.

Congruency is about the consistency of the organisation. Congruency is about preventing unethical conduct and promoting ethical conduct among employees. Managers and leaders should stimulate working ethically and promote this towards their employees. Feasibility is about to which extent the organisation creates conditions that enable employees to comply with ethical expectations. Meaning that unethical behaviour occurs when employees lack time, budget, equipment, information and authority to fulfil their responsibilities. Feasibility ensures that the responsibilities of employees can be achieved by the given facilities.

Supportability is the creation of trust and respect in the work environment. This is about to which extent employees identify and endorse values, norms and rules of the organisation and the extent to which the organisation stimulates this. Transparency is about to which extent the actions are visible to themselves and colleagues. This is about if the employee is aware of their ethical conduct and if their actions are in line with what they want to transmit. Discuss ability is about to what extent employees can discuss ethical matters with managers and other colleagues. This creates the opportunity to learn from each other and raise awareness on ethical manners. The workplace becomes more secure as moral issues can be raised. Santionability is about the punishment of unethical conduct. Organisations should have thought about which unethical behaviour can occur and what the punishment is when it occurs. Employees should be made aware on

An example of an analysis of an organisation is illustrated in Appendix Figure 1. The virtues are adjusted by the company that performs this analysis. This is done specifically in which areas improvements are possible. A survey is conducted to obtain information about the organisation. This information is statistically analysed to evaluate the integrity within an organisation.



Case Study: The Integrity Thermometer as a key to insight

Appendix Figure 1 Results from the integrity thermometer


Appendix B – Integrity framework on business processes – Dutch translation







Appendix C – Glossary

Definition	Explanation
Accountability	Being responsible for one's behaviour and actions. Looking beyond self-interest
	and serving clients' needs in a way that the individual and organisational stands
	behind the end product
Commercialisation	Institutions becoming more reliant on external funding due to the involvement
	of commercial stakeholders in the development process
Consistency	The quality of always behaving or performing in a similar way, or/of happening
	in a similar way
Construction industry	The industry in which buildings and infrastructure objects are designed, constructed, and maintained.
Contract types	Types of contracts in which the size and division of responsibility can be divided
	between contractor and government
Core fundamentals	Several terms that define aspects that shape the integrity in business processes
Diligence	Working carefully and reflecting on the process and results to critically evaluate the existing structures and processes
European standards	Standards that are developed in collaboration with European countries and are
	applicable in all European countries
External funding	Funding that is obtained through commercial parties
Governmentally	A regulatory system with a central body as the government is in control over the
controlled regulatory	development and management of technical regulations
system	
Incorruptibility	The quality to not be persuaded in forms of corruption. Organisational
	incorruptibility is ethical and moral standards to guide employee behaviour
Indicators	Aspects that specific the core fundamentals of business processes
Individual integrity	A person that has an honest morality, strong character, and is above reproach
Institution	Organisation that handles the development and management of technical regulations
Integrity	Being true to shared ethical and moral standards
Mechanisms	Possible bottlenecks that could occur during a process, which negatively affects
	the integrity of the process
Mission and vision	A policy of the organisation in which the goals of the organisation are described
	and which ethical and moral values are important
Organisational integrity	The embedment of integrity within the organisation to ensure long-term
	functioning
Privately controlled	A regulatory system without a central body in which private institutions are in
regulatory system	control of the development and management of technical regulations
Procedural steps	The process steps that are taken in the development and management process of technical regulations
Regulatory system	An overarching term that incorporates the parties involved in the publishing and managing of technical regulations
Structural safety	Term to express that the technical aspects of a building or infrastructure object
	are safe to use
Technical regulations	Agreements within the construction industry. Which specifically is explain how
0	certain technical aspects need to be constructed to ensure structural safety
Transparent	Openly sharing information of documentation and communication
Validation methods	Methods to ensure that the contents of the technical regulations are correct





Appendix D – Integrity analysis overview – Dutch translation

KERN ASPECT	INDICATOR	NR	TYPISCHE PROBLEMEN	VRAGEN OM HET TE BEOORDELEN
<u>Consistentie</u>	Consistent gedrag	1.1	Missie en visie bevat geen duidelijke handelingsrichting voor medewerkers en wordt niet eendrachtig opgesteld.	Wat staat er in de missie en visie van de organisatie en hoe wordt het opg
		1.2	Onjuist gekwalificeerde medewerker in het proces	In hoeverre vindt er een selectie plaatse welke medewerker geschikt is vo
	Gestandaardiseerde bedrijfsprocessen	1.3	Geen standaardisatie van het ontwikkelproces van technische regelgeving	In hoeverre wordt het ontwikkelingsproces van technische regelgeving ge
		1.4	Geen standaardisatie van het managen van technische regelgeving	In hoeverre wordt het managementproces van technische regelgeving ges
	Besluitvormingsproces	1.5	Missende herleidbaarheid in keuzes welke technische regelgeving ontwikkeld wordt	Hoe wordt bepaald welke standaarden gemaakt/geüpdatet worden? En h
		1.6	Keuzes van medewerkers kunnen niet rationeel herleid worden	Kunt u mij meenemen over welke keuzes er allemaal gemaakt moeten wo
		1.7	Incorrecte manier in het komen tot besluitvorming	Op welke manier (meerderheid, stemverhouding, unanimiteit) word gepubliceerd kan worden?
Zorgvuldigheid	Reflecties op het proces en resultaat	2.1	Missende reflecties op procesgang	Gaat u wel eens met collega's in discussie over de procesgang? En wordt o
		2.2	Missende reflecties over validatie methoden	In hoeverre wordt er kritisch naar de methodes gekeken om het resultaat
		2.3	Organisatorisch leren is niet aanwezig in de organisatie	Hoe komen verbeteringen in het proces tot stand? En is dat op basis van r
	Kritische blik	2.4	Informatie (vanuit derden) te snel beschouwen als betrouwbaar en correct	Hoe beoordeelt u informatie dat verstrekt wordt vanuit derden? En v betrouwbaar?
		2.5	Onvoldoende afweging gemaakt over de toegepaste validatiemethoden	Welke validatie methoden zitten er in het proces opgenomen?
	Scheppen van vertrouwen	2.6	Missend beleid op het uitnodigen stakeholders	Hoe wordt bepaald welke stakeholders uitgenodigd worden? Is dat gebas
		2.7	Incorrecte manier van validatie door stakeholders	Hoe is de validatie opgezet en wat is daarin de invloed van externe partije
		2.8	Missend beleid over het managen en updaten van ontwikkelde producten	Is er binnen de organisatie beleid gemaakt over hoe en wanneer technisch
<u>Onkreukbaarheid</u>	Managen van belangen	3.1	Niet herkennen van belangenverstrengeling of vriendjespolitiek in het proces	Hoe worden de commerciëlenbelangen afgewogen tegen de maatschapp
	Duidelijkheid over manier van handelen	3.2	Gedragscode van de organisatie komt niet terug in het proces	Zijn er gedragscodes binnen de organisatie? En hoe komen die terug in he
		3.3	Het niet actief promoten van de gedragsregels in het proces	In hoeverre worden de gedragsregels besproken met de stakeholders in h
		3.4	Onjuist handelen wanneer vormen van corruptie worden gesignaleerd	In hoeverre wordt er actief aandacht besteed aan het herkennen van vorr
	Sanctioneerbaarheid	3.5	Missende regels binnen de organisatie over sancties m.b.t vormen van corruptie	Wat voor regels zijn er binnen de organisatie als belangenverstrengeling o
<u>Transparant</u>	Transparantie in	4.1	Niet alle stakeholders hebben toegang tot alle relevante informatie	Hoe wordt informatie gedeeld met stakeholders?
	Helderheid over bedrijfsprocessen	4.2	Stakeholders zijn verrast door de procesgang	Hoe wordt de procesgang gecommuniceerd met stakeholders?
		4.3	Geen informatie beschikbaar over hoe de processen in de organisatie verlopen	Waar kan informatie verkregen worden over de processen binnen de orga
	Open communicatie	4.4	Niet alle stakeholders zijn op de hoogte wat, wanneer en met wie gezegd is	In hoeverre wordt er aandacht besteed aan open communicatie tussen al
		4.5	Incorrecte registratie van communicatie	Op welke manier wordt communicatie (notulen ect.) geregistreerd?
		4.6	Informatie over de organisatie, processen en validatiemethoden zijn niet publiekelijk beschikbaar	Waar kan informatie gevonden worden over de organisatie, proces en val
<u>Verantwoordelijkheid</u>	Verantwoordelijk voor individueel gedrag	5.1	Onduidelijkheid in de verdeling van verantwoordelijkheid tijdens het proces	Weet u welke verantwoordelijkheden u heeft tijdens het opstellen van no
		5.2	Medewerkers zijn niet op de hoogte van hun verantwoordelijkheid	In hoeverre bent u verantwoordelijk voor het eindresultaat als er een fou
		5.3	Geen gesprekken binnen de organisatie over verantwoordelijkheid	Vinden er intern gesprekken plaats over verantwoordelijkheden?
	Aansprakelijk voor eindproduct	5.4	Organisatie weet niet in hoeverre ze verantwoordelijk en aansprakelijk zijn voor het eindproduct	In hoeverre is de organisatie aansprakelijk wanneer er fouten in de techni

Appendix Table 1 Integrity analysis overview for institutions that publish technical regulations



INFORMATIE BRON Website gesteld? Interview oor welk onderwerp? Beleidsdocument estandaardiseerd? standaardiseerd? Beleidsdocument noe wordt dit geregistreerd? Beleidsdocument orden tijdens het proces? En hoe pakt u dat aan? Interview It er bepaald wanneer technische regelgeving Beleidsdocument Interview / dat ook geregistreerd? Beleidsdocument t te valideren? Interview meerdere individuele reflecties? Interview wanneer wordt het beschouwd als compleet en Interview Beleidsdocument seerd op intern beleid? Beleidsdocument en? Interview he regelgeving gemanaged en geüpdatet wordt? Beleidsdocument Interview elijke belangen? Beleidsdocument et proces? net proces? Interview men van corruptie in het proces? Interview optreedt? Beleidsdocument Interview Beleidsdocument anisatie? Beleidsdocument Interview lle betrokken stakeholders? Interview lidatiemethoden? Website ormen en richtlijnen? Interview t in zit? Interview Interview ische regelgeving zitten? Interview

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Appendix E – Reporting of the interviews

A summary of the conducted interviews is presented in this Appendix. Appendix Table 2 illustrates an overview of the interviews conducted by the researcher. Interview A is not related to the analysis of the organisations but forms the evidence of the validation of the framework. The other interviews are related to the analysis of the organisations that publish technical regulations. The semi-structured interview agenda is presented in this appendix. Also, the triangulation of the interview reporting's can also be found in this appendix.

Interview reporting removed due to privacy reasons

Interview agenda

De ID's achter de vragen refereren naar Appendix D om zo ervoor te zorgen dat alle vragen behandeld worden tijdens de interviews

Algemene informatie

Titel:	Borgen van integriteit in het opstellen van technische regelgeving
Interviewer:	M. B. Dekker
Interviewde:	
Organisatie:	
Functie:	
Datum:	
Tijd:	
Locatie:	Online

Opening (+- 5 min)

- Kunt u vertellen wat voor werk u doet?
 - Hoe lang zit u al bij de organisatie?
 - Wat zijn uw dag dagelijkse bezigheden?
- Kunt u kort wat vertellen wat uw organisatie allemaal doet en waar het voor staat?

Introductie (+- 2 a 3 min)

- Uitleg over de inhoud van het onderzoek
- Heeft u er bezwaar tegen als ik het interview opneem om het uitwerken van de resultaten makkelijker te maken?
- Melden dat informatie uitsluitend voor onderzoek is en vertrouwelijk wordt behandeld. Alleen gedeeld met docenten/directe begeleiders. Uiteindelijke openbare thesis is een paper waarin geen bedrijfsinformatie vermeld wordt

Ontwikkelingsproces (+- 15 min)

- Kunt u mij kort uitleggen hoe het proces werkt van het opstellen van standaarden en richtlijnen?
 En wat is uw rol daarin?
- Kunt u mij meenemen welke keuzes er allemaal gemaakt moeten worden tijden het proces? (1.5/1.6)
- In hoeverre worden die processen gestandaardiseerd? (1.3/1.4)
 - Zijn die documenten openbaar of zou ik de beleidsdocumenten mogen ontvangen om te analyseren?
- In hoeverre vindt er een selectie plaats welke medewerker geschikt is voor welk onderwerp? (1.2)
- Hoe wordt informatie gedeeld met de betrokkenen? (4.1-4.3)
 - o En wordt daarbij de procesgang ook gecommuniceerd? Zou ik dat mogen inzien?
 - Hoe beoordeeld u informatie die verstrekt wordt door externen? (2.4)
- Hoe gaat de communicatie tussen de partijen? (4.4)
 - En hoe wordt dat geregistreerd en is het toegankelijk voor alle partijen? (4.5)



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Validatie (+- 15 min)

- Hoe vind de validatie plaats van nieuw ontwikkelede technische regelgeving? (1.7/2.7)
- In hoeverre wordt er kritisch gekeken naar de methodes om het resultaat te valideren? (2.5)
- Stel er zit een fout in norm, weet u in hoeverre u dan verantwoordelijk bent? (5.4)
- Vinden er intern wel eens gesprekken plaats over verantwoordelijkheden? (5.1/5.2/5.3)

Integriteit (+- 15 min)

- Gaat u wel een met collega's in discussie over de procesgang en validatiemethoden? (2.1/2.2)
 - Doet u zelf wel eens aan reflecties over het resultaat en procesgang? (2.1/2.2)
- Hoe komen verbeteringen in het proces tot stand?
 - En is dat op basis van reflecties en organisatorisch leren? (2.3)
- Zijn er gedrag/werkcodes binnen de organisatie en hoe worden die gecommuniceerd? (3.2/3.3/3.4/3.5)
 - En zou ik die mogen ontvangen?
- Wat voor actie ondernemen jullie om belangenverstrengeling of vriendjespolitiek te herkennen en tegen te gaan? (3.1)
- Wat is uw visie over het huidige systeem en ziet u zelf knelpunten in het systeem?

Sluiting (+- 5 min)

- Resultaten van onderzoek
- Indien er onduidelijkheid is, of als ik nog vragen heb, zou ik u dan mogen bereiken om weer wat vragen te stellen?
- <u>Optioneel</u>: Weet u een collega die ik ook deze vragen mag stellen om de bevindingen te kunnen valideren?

