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Semiotic efficiency of notational iconicity

Negotiating text conventions and text functions in interdisciplinary editorial teams

Abstract

Holste (2019) elaborates and modifies Roelcke's (2002a) quantitative approach to evaluate the efficiency of written communication, especially of written language, by broadening the definition of text genre and by developing a more explanatory measure for efficiency. First, he considers not only elements of writing (Roelcke 2002a) but also the notational iconicity (Krämer 2003) of multimodal texts (Bateman 2008), i. e., of written text "combined with and surrounded by visual characters" (Schmitz 2014: 295). Because of this image/text relations (Unsworth 2007), text design and typography gain importance. Second, Holste's means to measure efficiency are the conventionality and functionality of such multimodal texts as they are negotiated in an interdisciplinary editorial team. In the present paper, a genre frequently used in German tender processes for public transport – the so-called *Optimierungsvorschläge* – is used to explicate the efficiency of notational iconicity and to describe how an interdisciplinary team edits multimodal texts on the basis of reciprocal expectations of expectations (Gloy 2012), i. e., on the basis of their expectations on the contracting authorities' expectations.

1 Introduction

As, in the light of climate change and climate politics, individual transport is being increasingly substituted by public transport, this business field is currently expanding.¹ This renders the optimization of tender processes to be an issue of ever-growing importance. One central aim of research on specialized communication (Schubert 2009; Kalverkämper 2016: 289–290) is to optimize processes and products of such types of communication. Roelcke's (2002a)² model of the efficiency of communication is an important reference point for criticism and further model developments in this research area (see, for example, Dannerer 2008: 54–55; Schubert/Heidrich 2014: 87–89; Heidrich 2016: 199–207; Mushchinina 2017: 171–173; Holste 2019: 25–33; Pelikan 2019: 67–69). The model relates the capacity of communicants to the complexity of communicats

¹ This article outlines many central points of Holste (2019).

² Roelcke (2002a) outlines many central points of Roelcke's (2002b) comprehensive German monography in English.

(Roelcke 2002a: 31–32) and thus makes it possible to conceptualize processes and products of communication as well as cognitive processes informing communication. In contrast to a model focusing exclusively on genres (Brinker/Cölfen/Pappert 1985/2018) it also facilitates the conceptualization of the behavior of communicants so that it is possible to describe, for example, the actions of agents in (interdisciplinary) organizations and projects (Pelikan 2019) more comprehensively.

The model of semiotic efficiency (Holste 2019) broadens this approach by assuming texts to be multimodal and further modifies Roelcke in that it assumes efficiency to be determined by conventions and functions. In interdisciplinary teams, these conventions and functions are, on the one hand, shaped by the respective microcultures of the domains to which the experts belong.³ On the other hand, the way these conventions and functions are negotiated also depends on the experts' expectations (Gloy 2012) on what the contracting authorities are likely to expect.⁴

The paper focuses on the question in which ways the notational iconicity of multimodal texts can be negotiated in interdisciplinary teams so that these texts become semiotically more efficient. Object of the investigation are so-called *Optimierungsvorschläge* (OVs) – a text genre typically used in German tenders – that tenderers compose with the aim to modify the specifications for tenders or the requirements specifications in such a way that the service can be delivered at a lower price without notably lowering the quality of the offer. Against this backdrop and in contrast to previous publications (Holste 2019, 2020a, 2020b), this paper is taking heed of Bateman's (2008) concept of multimodal text genres,⁵ Klein's (1991/2014) concept of genre networks (*Textsortenvernetzung*), and Krämer's (2003) concept of notational iconicity.

In the following, the model of semiotic efficiency (section 2.4) as well as the domain of tenders for public transport services (section 2.5) will be outlined. An example drawing on interdisciplinary processes of text composition as they can be observed in these tender processes will provide insights into how the model can be applied in practice (sections 2.6 and 2.7).

2 Semiotic efficiency

Especially two aspects of the model of communicative efficiency (Roelcke 2002a) are strongly criticized: the exclusive focus on written language and the formalized, quantitative means modelling the relationship between the capacity of the communicants and the complexity of the communicat.

³ The text producing teams consist of rail vehicle engineers, plant engineers, members of marketing and controlling departments and technical editors.

⁴ Holste (2019) puts the concept to the test by applying it to a number of tenders for public transport services.

⁵ The author is aware of the fact that simple choices between possible translations of technical terms such as the choice between *genre* and *text type* for *Textsorte* (Brinker/Cölfen/Pappert 1985/2018) do not capture the related research traditions and hopes that this fact does not impede on the comprehensibility of this paper because the general discourses should have no bearing on the terms as they are used here.

The first criticism relates to the fact that the expressive aspect of utterances in the model of communicative efficiency is conceptualized monomodally so that it exclusively refers to written elements such as words, sentences, monomodal texts and language (Roelcke 2002a: 32–33). At a very basic level, many authors criticize that linguistic research has turned ‘a blind eye to pictures’ (*Blind für Bilder*, the title of Schmitz 2005). Consequently, concepts have been developed that include a larger variety of expressive aspects: the quality of written words etc. to form shapes, pictures, image/text relations (Unsworth 2007) and diagrammatic elements, especially reconfigurative diagrams (Bauer/Ernst 2010)⁶ all of which represent what Bateman (2008: 106) calls typography. Written elements in combination with pictures in a communicat are “mainly organized by visual design in order to be perceived as efficiently as possible” (Schmitz 2014: 301).

A second central criticism is that the relationship between the capacity of the communicant and the complexity of the communicat is defined quantitatively (Heidrich 2013: 255). Accordingly, this formalizing approach conceptualizes communicants rather as acting like a homo oeconomicus (Dannerer 2008: 49) and not as acting in social contexts such as company organizations where they “rely on established routines when taking recourse to patterns of action and genres” (tr. from Dannerer 2008: 50)⁷ because “from repeated instances of successful, efficient communication emerge conventions at all linguistic and communicative levels” (tr. from Mushchinina 2017: 172).⁸ Consequently, Mushchinina (2017: 185) conceptualizes the (lack of) acceptance of conventions of specialized communication with a focus on language. Likewise, Heidrich defines the attitudes and expectations of communicants as “cultural conventions, counting among them conventions of genre” (tr. from Heidrich 2016: 226).⁹ Roelcke (1999/2020: 39) himself takes a qualitative approach to conceptualize efficiency of specialized communication along Grice’s maxims and develops a general communicative and cognitive framework to elaborate his understanding of communicative efficiency (Roelcke 2002a). All in all, the model of semiotic efficiency thus takes up both points of criticism in that it can account for multimodal aspects of texts and replaces key figures as a measure for efficiency with the notions of conventionality and functionality.¹⁰

2.1 Notational iconicity in multimodal texts

Generally, Holste’s (2019: 114–118) model of semiotic efficiency comprises written language and photos and incorporates technical drawings as diagrammatic elements because they feature a combination of schematic drawings and written elements. In this

⁶ In reconfigurative diagrams different modalities of signs are combined. They facilitate intuitively accessible and deductive thinking as is, for example, the case with groundplans (Bauer/Ernst 2010: 46).

⁷ “im Rückgriff auf Handlungsmuster und Textsorten auf bewährte Routinen [verlassen]” (Dannerer 2008: 50) – The original wordings of translated direct quotations are given in footnotes. The author would like to thank Jessica Holste M. A. for her professional proofreading.

⁸ “Aus den wiederholten Fällen der erfolgreichen, effizienten Kommunikation kristallisieren sich Konventionen auf allen sprachlichen und kommunikativen Ebenen heraus” (Mushchinina 2017: 172).

⁹ “kulturell unterschiedlichen Konventionen, u. a. auch Textsortenkonventionen” (Heidrich 2016: 226).

¹⁰ This paragraph summarizes Holste (2019: 33–37).

context, it is of particular relevance that writing is not merely a linguistic code but also has a visual appearance. Whereas Krämer (2003)¹¹ refers to this as “notational iconicity”, Bateman (2008: 106) calls it text-typography.¹²

Krämer (2003: 523) elaborates this concept by differentiating between the structural, the referential and the performative aspects of signs and concludes that written language can be investigated as a medium (corresponding to its structure), a system of symbols (corresponding to its referential nature) and a cultural technique (corresponding to its performative quality). As medium, written language is characterized as follows: “Writing’s ‘notational iconicity’ (‘Schriftbildlichkeit’), with its traits of being disjunctive and differentiated, is thus a medium that embodies the principle of differentiation and that can implement this process visually” (Krämer 2003: 525). Written language, using gaps and spacings, produces a kind of “inter-spatiality” (Krämer 2003: 524) that creates “‘syntax-visibility’ as a kind of structural visualization” (Krämer 2003: 524).

As system of symbols, written language is defined as follows: “On the one hand, phonetic writing erases the mimetic, gestural, and tonal traces of the human body from language use; on the other hand, it gives language pure discursive materiality and corporeality.” (Krämer 2003: 528) From this results its scriptural existence and its status as thing and/or object (Krämer 2003: 528). As a cultural technology, “different types of writing correspond to different modes of language-use that cause the referential aspect to be neutralized” (Krämer 2003: 523).¹³

The following examples she provides are taken from mathematics and logic and describe an operative handling of writing in the shape of numbers and letters leading her to conclude that “operative writing is not only a tool for describing, but also a tool for cognizing, a technique for thinking that enhances intelligence” (Krämer 2003: 534).¹⁴

The discussion about writtleness also results in different definitions of text with some authors arguing that the term should only be used to refer to written elements of a multimodal communicat (Adamzik 2004/2016: 69). However, in accordance with Stöckl (2016), I use the term *text*¹⁵ to refer to multimodal texts that may incorporate the following

¹¹ The paper is a translation of the German original (Krämer 2002/2009).

¹² In Bateman (2008: 106), text-typographic resources feature as one distinct semiotic mode next to pictorial representational resources and diagrammatic representational resources.

¹³ Investigations of cultural implications of varying types of typographies also yield interesting results. Thus Spitzmüller’s (2013) concept of graphic variation shows in which ways the meaning of usages of (typo-)graphic means of expression vary depending on the social group they are used by.

¹⁴ Schmitz (2006: 100) conceptualizes this type of operative writing or notational iconicity as ‘tertiary writtleness’ which he distinguishes from primary and secondary writtleness. Tertiary writtleness refers to “Schrift als nicht autonomes Element in multimodalen Kontexten, vor allem in Text-Bild-Gefügen” ‘written language that makes language appear to be a non-autonomous element in multimodal contexts, especially in text-picture-combinations’ (Schmitz 2006: 90; cf. Holste 2019: 82).

¹⁵ Rothkegel uses the term *document* “generell für elektronisch gespeicherte Daten” ‘generally for electronically stored data’ (Rothkegel 2010: 122). “Die Verbindung ergibt sich einerseits durch die Parameter der Textorganisation (Sequenzstruktur), andererseits durch Merkmale des Textdesigns (Gestalt)” ‘In contrast, text represents a concept that combines features of text organization (sequence structure), on the one hand, and features of text design (shape) on the other’ (Rothkegel 2010: 121). For Schubert

elements as part of a distinguished communicative unit (analogous to genre): written elements in their visual appearance (typography), pictorial and diagrammatic elements as well as their structural combination (text design) and semantic combinations (language-picture-relations). As all texts, including those that only contain written elements, have a visual appearance, all texts are considered multimodal: “All texts are multimodal.” (Kress/van Leeuwen 1995: 25) The definition shows that typography can approximate notational iconicity. To acknowledge notational iconicity as one multimodal expressive aspect of communication means to react to the criticism of Roelcke’s model of communicative efficiency. Correspondingly, the model of semiotic efficiency also aims to relate communicative efficiency to the parameters of conventionality and functionality of communicative actions.

2.2 Conventionality and functionality

Roelcke constructs his model of communicative efficiency in contrast to the minimax principle popular in business science where it describes the quantitative relationship between input and output. Roelcke uses it to model the relationship between the complexity of the communication and the capacity of the communicant. He thus does not account for the linguistic concepts of conventionality and functionality, but includes Saussure’s neighbouring concepts of *langue* – referring to the language system – and *parole* – referring to the realized text (Roelcke 2002a: 32). The idea to complement the dichotomy of *langue* and *parole* by introducing the plane of norms as mediating between the language system of a particular language (*langue*) and its specific linguistic realizations (*parole*) is derived from Coseriu (1979: 57).

The model of semiotic efficiency (Holste 2019: 114–118) introduces the plane of conventionality¹⁶ and functionality of genres as located between *langue* and *parole*.¹⁷ As outlined above, the discussion on the optimization of communication, on the one hand, resulted in the proposition that processes of communication and their products can be measured against their degree of conventionality and functionality. On the other, conventionality and functionality are oriented at genres comprising language and pictures – as expressed in written language, pictures and notational iconicity.

Bateman defines multimodal text genres as follows:

In short: A genre in a linguistic sense is a socially recognized class of texts (either spoken or written) that is used for a specific social purpose and which has a regularly occurring structural organisation recognisable by virtue of distinctive patterns of linguistic phenomena.
(Bateman 2014: 69)

(2007: 1) *text* refers exclusively to written language that, combined with pictures, layout etc., makes a *document*.

¹⁶ Engberg and Janich (2007: 220ff) and also Rothkegel (2008: 76–77) describe the ability to deviate from conventions of communication as competence.

¹⁷ I discuss the differences between and similarities of norm and convention elsewhere (Holste 2019: 27, 55–60).

To describe the process of perception of a document page, the genre and multimodal model (GeM model) draws on (socially recognized) genre conventions that guide the process of perception in accordance with the above mentioned specific social purposes.

This conception of the agents involved in the constitution, perpetuation and modification of conventions can be described in more depth with reference to Gloy's notion of the reciprocal expectations of expectations (Gloy 2012: 32) that conceive of communicants as expecting their opposite to expect from them certain communicative actions. This reciprocal relationship is institutionalized when my expectations on the others' expectations on myself are backed up "by the assumptions that other people have on what I am supposed to do as well as on the assumptions I have on these assumptions and on the assumption that this also applies vice versa to the others" (tr. from Gloy 2012: 31–32; cf. Holste 2019: 57–58).¹⁸

When Gloy speaks of "institutionalized" expectations, the wording is reminiscent of conventions because the involved individuals more or less base their actions on a shared set of expectations. The social dimension of expectations in institutionalized context can thus be called conventions (Holste 2019: 58). Gloy's account complements Bateman's notion of generic expectations that he defines with reference to Kostelnick and Hassett:

Nevertheless, Kostelnick and Hassett's research clearly demonstrates how a good account of genre, however we finally come to achieve this, is necessary to understand users' interpretations of the documents they encounter. The importance of such *generic expectations* brought about by convention when dealing with multimodal artefacts cannot be overestimated. (Bateman 2008: 205–206, italics in the original)

Although Bateman follows the inverse logic by assuming that conventions cause individuals to expect something whereas Gloy argues that shared expectations achieve an institutionalized quality which seems to resemble conventions, both emphasize that conventions and expectations are inseparably intertwined. At bottom line, Bateman's concept of genre conventionality can be used to complement Roelcke's model of communicative efficiency, i. e., its planes of langue and parole. When integrating a plane of conventions, communicants' processes of writing can be described.

To sum up, whereas only the broadened definition of text genre to include pictures, notational iconicity and the combination of graphic and written elements, i. e., diagrammatic elements as a means of expression makes Roelcke's central idea to measure the efficiency of communication applicable to public tender processes, the substitution of a quantitative measure for efficiency by the notions of conventionality and functionality of genres is necessary to conceptualize such processes as carried out by interdisciplinary teams.

¹⁸ "Letztere ist *institutionalisiert*, wenn sich eigenes Erwarten (darüber, was ich zu tun habe) auf die Ansichten anderer Personen darüber, was ich zu tun habe, ferner auf meine Annahme über diese fremden Ansichten sowie auf die Annahme stützt, dass all dieses vice versa auch für die Anderen gilt." (Gloy 2012: 32, italics in original)

2.3 Genre networks (*Textsortenvernetzung*)

The relation between individual texts and the text genres to which they belong is one particular way to describe how specialist texts interrelate (Kalverkämper 2020: 35–36) in accordance with conventional concepts of text genres (e. g. Brinker/Cölfen/Pappert 1985/2018). Another way is to consider how text genres are juxtaposed in a network (Kalverkämper 2020: 35–36) where individual texts represent a text genre, are part of a communicative process in the context of a sequence of actions “im fachlichen ‘Leben’” ‘in specialized <life>’ (Kalverkämper 2020: 37), and also belong to a specialized culture. A comparable categorization – without reference to specialized cultures – can also be found in Adamzik (2011: 372ff) who defines the juxtapositions of text genres as paradigmatic relations and the pragmatic-functional interconnectedness of text genres and their individual representatives as syntagmatic relations.

Regulations rigidly determine the sequence and choice of text genres involved in the communication of tendering processes discussed here¹⁹ that therewith corresponds to the second concept capturing how specialist texts interrelate. Accordingly, Klein’s (1991/2014) model of functional text-text-relations, developed for the description of static processes, can also be put to use for the description of specialist text genres used in tendering communication. This is so because Klein (1991/2014) describes the frame of interaction involved in law-making as a sequence of actions regulated by a prescribed process and the resulting text-text-relations, i. e., as a sequence of text samples representing different text genres that result from the aforementioned actions.²⁰ This model was devised as an alternative to typologies of specialist text genres (Heinemann/Heinemann 2002: 143) that fail to deliver enough unambiguous criteria either necessary to set a specific text sample apart from competing genres or sufficient to allocate it to a particular genre. Klein’s (1991/2014) model of text-text-relations attempts to solve this problem by describing “functional intertextual connections before and independently of scientific analysis” (tr. from Klein 1991/2014: 339)²¹ and that thus dispenses with the scientific aggregation of typologies. The following arguments support the approach to investigate individual texts in their relation to the network of texts they belong to:

Welchen Nutzen hat nun diese Betrachtung von Textsortennetzen? Zunächst ist natürlich an einen theoretischen Wert zu denken, insofern man Konsens darüber erzielen kann, dass solche Beziehungen zwischen Textsorten zu einer angemessenen Sicht auf das Universum der Texte verhelfen und dabei insbesondere **Beteiligtenperspektive** und dem Textsortenwissen besser gerecht werden, als taxonomische Ansätze das leisten können.

(Adamzik 2011: 380, boldface AH)

¹⁹ This section outlines many central points of Holste (2019: 176–177).

²⁰ This concept taken from German linguistics is similar to Swales’ (1990) *spider’s web* concept of text genre relations. However, in contrast to Klein (1991/2014) Swales’ (1990: 177) metaphor or concept implies a particular text genre as the center of investigation. Simonnæs (2020: 423–424) employs Swales’ model to describe the text genre “court decision”.

²¹ “funktionale intertextuelle Zusammenhänge vor und unabhängig von wissenschaftlicher Analyse” (Klein 1991/2014: 339).

‘So what is the use of this particular way of looking at the way text genres interrelate? First, there is of course the theoretical value, provided it can be agreed upon that the consideration of relations between text genres facilitates an appropriate look at the universe of texts and is able to better account for **the perspective of the participants** and the knowledge of text genres than taxonomic approaches do.’

To consider tendering processes as a network of text genres therewith has the advantage that knowledge about texts can be described as belonging to the capacity of communicants. The concept of the network of text genres is illustrated by the following example of tendering processes (see Figure 1).

2.4 The model of semiotic efficiency

Central to the model of semiotic efficiency is the observation that communicants belonging to certain fields of expertise such as engineering, plant engineering, jurisprudence etc. choose written language and/or pictures such as technical drawings, imaging diagrams, photos and computer-aided design (CAD) as their preferred means of communication. In this context, also notational iconicity plays an important role. As has already been outlined elsewhere, this relationship between multimodal means of expression and microcultural conventionality²² is particularly relevant for technical editors (Holste 2020a) and for lawyers’ communicative tasks (Holste 2020b).

The model of semiotic efficiency (Holste 2019: 114–118) recognizes this relationship (see Table 1). Based on this, I define “semiotic efficiency” as follows:

Semiotische Effizienz liegt auf der Ebene von Textsorten vor, wenn Kommunikanten über die Kompetenz verfügen, die Konventionalität und Funktionalität von Textsortenexemplaren erstens zu erkennen und zu verstehen. Zweitens befähigt sie diese Kompetenz dazu, Textdesign, -grammatik, -semantik und -funktionen derart zu wählen, dass sie entsprechend ihrem kommunikativen Zweck in den situativen Kontext eingebunden sind. Dies schließt in Form einer kreativen Kompetenz auch Abweichungen von Konventionen ein, die gefragt sind, wenn Standardlösungen diesen Zweck nicht erfüllen.

Textsortenkonventionen sind dabei an den fachlichen Hintergrund der Rezipienten gebunden; die Kommunikanten handeln diese Konventionen im interfachlichen Kontext mithilfe ihrer transsubjektiven Kompetenz aus. Um derart kommunikativ zu handeln, arrangieren die Kommunikanten folgende Ausdrucksmittel durch Textdesign und Grammatik: (schriftbildliche) Wörter, Sätze, Teiltexthe, ikonisch-materielle Bilder und Diagramme.

(Holste 2019: 117)

‘At the planes of genre, semiotic efficiency is given when communicants have the competence to, first, recognize and understand the conventionality and functionality of samples of a genre. Second, this competence must enable them to determine the textual design, grammar, semantics and functions in such a way that the text fulfills its communicative purpose in a given situational context. This can afford them to deviate from conventions, thus illustrating a creative competence that compensates insufficient standard solutions.

Genre conventions depend on particular fields of expertise and the experts representing them. In interdisciplinary contexts, communicants negotiate conventions they have acquired

²² The various microcultures (Horn-Helf 2010: 94) experts belong to indeed account for the particular mix of conventions developed by interdisciplinary teams.

in their particular field of expertise by employing their trans-subjective competence. In order to communicate in such a way, the communicants use the following means of expression to develop a specific text design and grammar: (notationally iconic) words, sentences, parts of texts, iconic-material pictures and diagrams.’

The elements of this definition are systematized in the following model of semiotic efficiency (see Table 1;²³ following, most importantly, Roelcke 2002a: 32; Engberg/Janich 2007; Bateman 2008; Gloy 2012). When all levels of the model are related to the situational context, the particular character of conventionality and functionality of the communicat emerges.

	Complexity (of a)		Capacity (of a)
	Communicat		Communicant
	Intension (effect)	Extension (effort)	Competence (ability)
general realiza- tion	Information and instruction	Elements and their relations	Knowledge of communicats’ conventionality and functionality
as regards genre	Conventionality and functionality of text design and textual grammar of a genre	(Notationally iconic) words, sentences, parts of texts, iconic-material pictures as well as imaging and reconfigurative diagrams arranged by text design and textual grammar	1. Knowledge of genre conventions and functions (reciprocal expectations of expectations) 2. Relationship between deviation from conventions (using creative competence) and fulfilment of conventions 3. Transsubjective competence
Interaction in context: Interaction of elements of the context model²⁴ applied to communication as part of B2G-tender processes (Business-to-Government-Communication)			

Table 1: Model of semiotic efficiency taking account of genre (Holste 2019: 118)

The situational context is captured by the context model of communication in B2G tendering (Business-to-Government-Communication). It is determined by interdisciplinary communication, form communication, institutional asymmetries as well as by the following planes of communicative actions: domain, organization and project. These aspects or planes are referred to in the example below. The following description of the domain of tenders for public transport services applies the model to one of many possible situational contexts.

After a short introduction to the domain of tenders for public transport (see section 2.5), the exemplary description of the complexity of the communicat (the OVs, see section 2.6) as constituted by its notational iconicity should enable non-expert readers to follow the editing moves of the interdisciplinary team so that eventually the “capacity of the communicant” can be approximated (see section 2.7).

²³ This synopsis does not include the plane of *langue* because it is not subject of the empirical investigation. The table illustrates the conceptual contrasts and fusions by complementary or mixed colors.

²⁴ An elaborated explanation of the context model can be found in Holste (2019: 113).

2.5 The domain of tenders for public transport

A first, rough overview on the tendering process allows insights into, first, the organizational structures and organizational processes of a major enterprise engaged in tendering processes for public transport and, second, into the expectations of expectations that editors have on recipients, i. e., their processes of perception. These tendering procedures resemble those in other economic sectors as, for example, tendering procedures in the software sector (Holste 2019: 22) because public procurements must comply with the *Procurement and contract procedures for Supplies and Services – Part A* (Verdingungsordnung für Leistungen – Teil A; VOL/A):

Die VOL/A ist nach dem Wortlaut des § 1 für alle Lieferungen und Leistungen anzuwenden, die nicht Bauleistungen oder freiberufliche Leistungen sind. (VOL/A: 122)

‘According to the wording of § 1, the VOL/A regulates all supplies and services that are not construction or freelance services.’

The VOL/A realizes the EU Directive 2004/18/EC of the European Parliament and of the Council on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts.

Since 1993, the hitherto state-owned local rail passenger traffic has been liberalized in order to provide this governmental service in more economic ways, to comply with EU regulations and to therefore join the EU wide market. Tendering procedures of local public transport require interdisciplinary project communication on behalf of the participating organizations (Holste 2019: 228–240), i. e., not only the tenderer but also the tendering authority are represented by an interdisciplinary team because the arrangement of contents and functions of the OVs is a complex issue. For example, lawyers are required to assess in how far particular statements are binding; automotive and plant engineers assess in how far a suggestion can be technically realized; controllers evaluate if a technical and/or juridical solution can be financed.

On the side of the contracting authority, the project team develops requirements specifications (*Lastenhefte*), specifications for tenders, a transportation contract and defines bidding conditions (see Figure 1 – Text genres of the tenderer are red, text genres of the contracting authority are green). On the side of the tenderer, the project team develops functional specification documents (*Pflichtenhefte*) answering or else corresponding with the requirements specifications (VDI 2519–1: 2002). It composes OVs, railway schedules and so forth.

Functional specification documents lend themselves to an analysis of semiotic efficiency because they are a combination of technical drawings, photos, diagrams and written language (Holste 2019: 291–375). Likewise, the analysis of the corresponding editing process allows insights into how experts negotiate conventions in order to develop efficient texts (Holste 2019: 386–395).

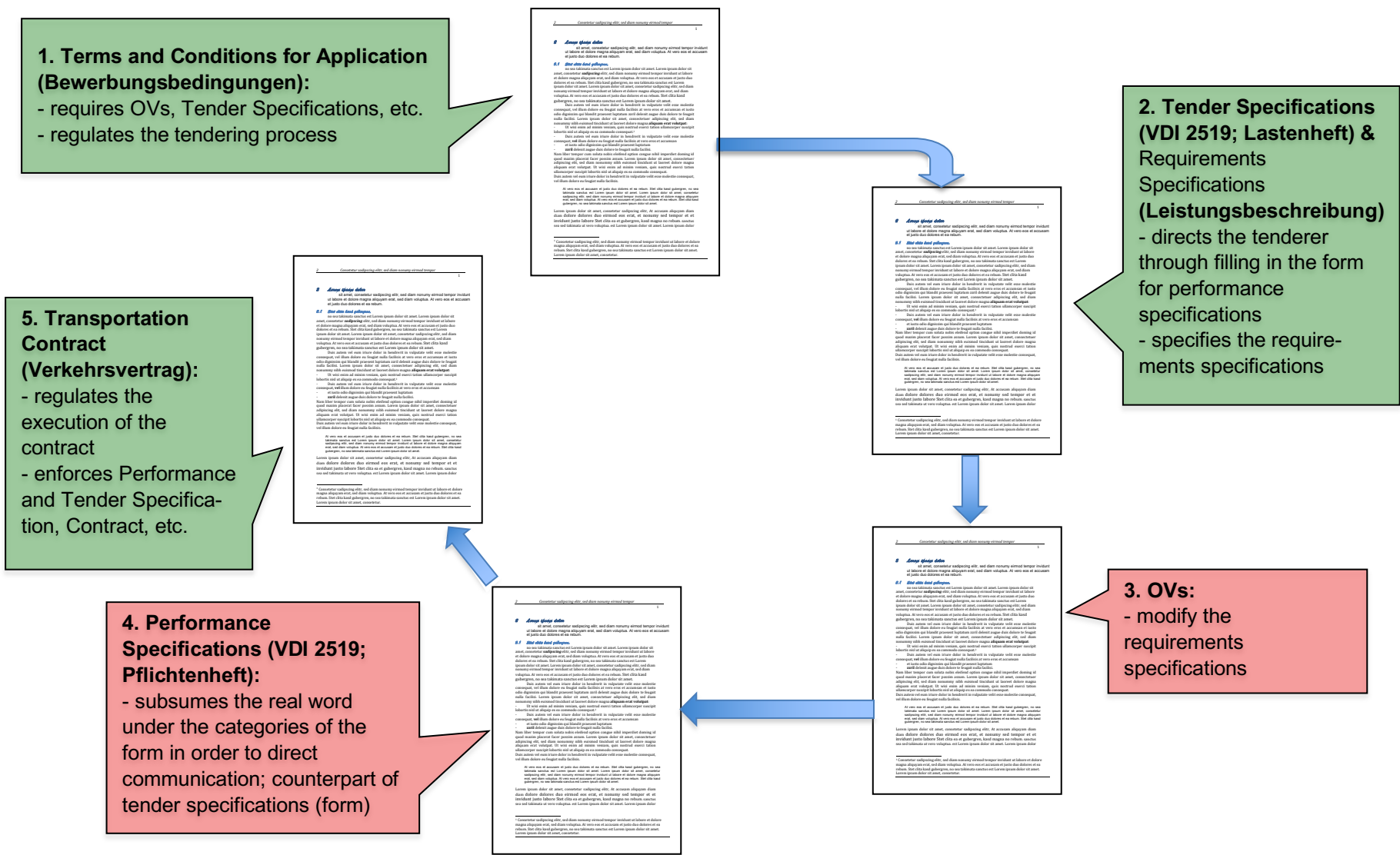


Figure 1: Genre networks (*Textsortenvernetzung*) of tendering processes (based on Holste 2019: 206–211). Green: contracting authority; red: tenderer

Generally, the investigation of the semiotic efficiency of OVs in Holste (2019) focuses also on notational iconicity. It thus does not include iconic-material pictures but rather bulks of text, pictorial diagrams or tables (the latter two only rarely and not in the analysed example; Holste 2019: 258–262). In the following, first, the design of the OVs is described and then editing processes are interpreted.

2.6 Complexity of the communicat: notational iconicity

The text corpus in Holste (2019: 220–222) consists of 23 OVs that were chosen from three tendering procedures with two different contracting authorities. The prototypical example referred to and described below (see section 2.7, Figure 2) is an anonymized version of a specific OV (a finished version that was handed in to the contracting authorities). The modifications should help to make the dimensions of semiotic efficiency visible without demanding many elaborations on the authentic OV that would not contribute to the understanding of the model.

First, the OV is described in terms of its complexity as communicat (see Table 1). This comprises an approximation of its extension (effort) as well as of its intension (effect). Inasmuch as the OV represents a text genre, its text design and textual grammar take on specific features either in terms of their notational iconicity (one aspect of extension; Holste 2019: 252–254) or in terms of their functionality (one aspect of intension; Holste 2019: 288–291).

2.6.1 Extensional complexity

As regards their notational iconicity, all OVs have consistently formatted headers and footers that frame a running text (see Figure 2). Running text is justified (flush left and right) and evenly positioned between header and footer. The typeface, font size and colour (grey scale) of the running text under the headings is also consistent. Due to the contrast between grey scale and the white background not only the headings stand out but also the elements of running text comprising several lines thus become text bodies. These are set off against the headings as only the headings are bolded. Apart from the headings, the written elements *x.x Mio. €* and *x.x €/price per train kilometre* are marked in bold type. As will be further elaborated below (see section 2.7), this is an important result of the interdisciplinary team's negotiation of notational iconicity.

Next to being bolded, headings have a larger font size than the rest of the text with the heading of the whole text having the largest. Contrariwise, the grey scale does not contrast headings and surfaces of running text but rather unifies them. The red colour of the logo²⁵ renders it visually salient because the OV's writing otherwise is exclusively grey scale against the white page background (see Figure 2). The logo represents the so-called "substance of meaning" (Bedeutungssubstanz) of the enterprise (Kastens/Lux

²⁵ The logo, identifying colours and trademarked design elements belong to the plane of expression of an enterprise (Kastens/Lux 2014: 64).

2014: 58) and is part of its functional structure. Besides bold print, some words in a mid-page position of running text are italicized.

All in all, a notationally iconic hierarchy of written elements is created by design choices that either contrast or unify: Headings, being bolded and set in a larger font size, make up one specific group of written elements that is clearly distinguishable from the design of the areas of running text. As the headings are bolded, have a larger font size and are positioned above the areas of running text, a hierarchy is established.

2.6.2 Intensional complexity

Intensional complexity comprises the conventionality and functionality of text genres. In the text analysis these are specified as a functional structure represented by the text design and textual grammar of OVs (see Table 1). In this paper, the focus is on the editors' notions of functionality, i. e., on the capacity of the communicants (see section 2.7) in terms of notational iconicity.

Generally, directives as text functions (*appellative Textfunktion*, Brinker/Cölfen/Pappert 1985/2018; *direktive Textfunktion*, Rolf 1993: 224)²⁶ are central to OVs because their aim is to cause the contracting authority to modify the requirements specifications or the specification for tenders as suggested by the latter.²⁷ It is realized by the functional structure of the OV comprising modules that fulfil various sub- and minor functions (see green frames in Figure 3): In the first sentence, the assertive functional module *exposition* informs the recipient on a requirement mentioned in the specifications for tenders and provides the source reference. *Optimization* can be classified as a directive functional module because it indirectly asks the addressee to modify the respective requirement in the contract awards documents. *Documents to be adopted* is a directive functional module aimed at convincing the recipient that it is beneficial to adopt the wording of the OV into the specifications for tenderers so that the bid price can be lowered. The concluding module *price effect* is an assertive functional module because it informs on the effects of the pricing. As the OV aims to persuade the addressee to modify the CADO, it has a directive function (Brinker/Cölfen/Pappert 1985/2018: 113), if only indirectly.²⁸

In the following, the capacities of the communicants are addressed (see Table 1) when the observed processes of negotiation concerning notational iconicity are described and interpreted. The process of negotiating makes the interdisciplinary nature of the domain particularly obvious although it can, of course, also be deduced from a description of the modules: For example, the modules *exposition* and *optimization* (see Figure 2) combine the technical languages of rail vehicle engineering, plant engineering and marketing.

²⁶ Based on illocutionary acts (Searle 1979/1981: 12–27).

²⁷ Besides this textual/communicative function, from a procedural vantage point, the OVs must be designed in such a way that a) the minimum requirements are met, b) the price is lowered, c) they do not discriminate other tenderers and d) they warrant to sustain the quality of the offer to a sufficient extent.

²⁸ As the OV becomes part of the transportation contract when the bid is won, the tenderer commits himself to perform the service at the suggested price. Accordingly, next to the already mentioned functions, this is a primarily implied commissive functional module.

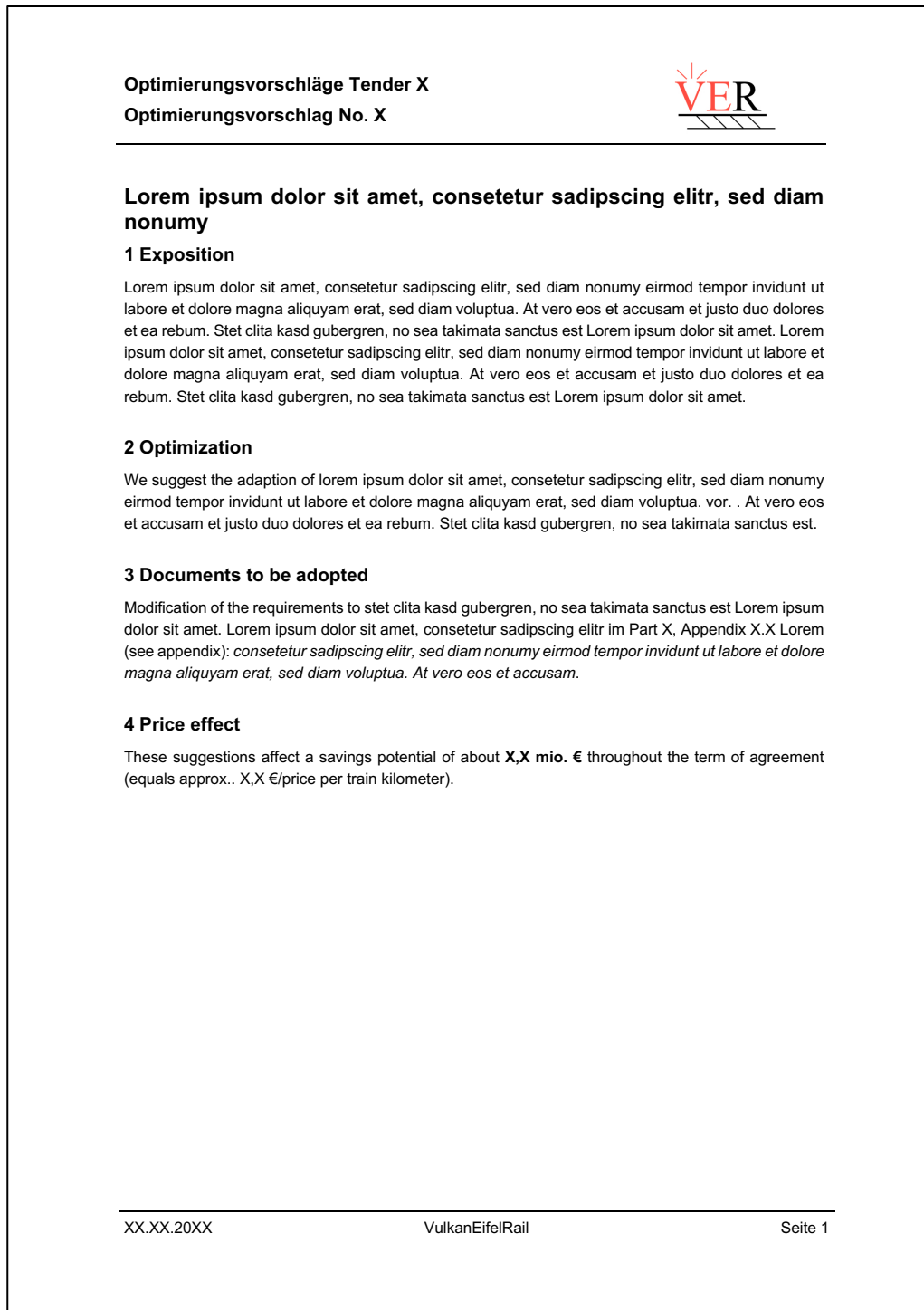


Figure 2: Exemplary prototypical OV (Holste 2019: 255)²⁹

²⁹ The examples are anonymized. The logo and company name are used as an example.

2.7 Capacity of the communicants

The example below gives a first insight as to how the expectations of the tenderer's project teams on the assumed expectations of the contracting authorities as readers of the OVs shape the negotiation of the text design of the OV as regards its notational iconicity. The functional structure of the OVs is represented by the bolded headings and their position. As already indicated above, the highlighting and positioning of price declarations (*x.x Mio. €* and *x.x €/price per train kilometre*) are an important outcome of the interdisciplinary negotiation of the OVs' designs as regards their notational iconicity (see Figure 1).

Prior to the discussion of the OVs in the interdisciplinary team, the documented suggestions of the various departments – vehicle engineering, controlling, plant engineering etc. – on various issues – seat capacity of a vehicle, timing, distribution of gains – are not consistently designed. The following example illustrates how the editors discuss how to unify the functional structure. Prior to the technical editor's (Ed 1) suggestion below, a technician (Tec 1) had argued that the price should be decisive for the design of the OV:

Rdk 1: Hält Aussage von Tec 1 entgegen, dass nicht nur der Preis entscheidend sei, sondern auch die Anpassung an die VDU. Erläutert die grundsätzliche Dreiteilung aller OV dieser Ausschreibung entsprechend der Vorlage der Redaktion für die Fachautoren zu:

1. Verweis auf die VDU
2. Inhaltliche Ausführung der Optimierung
3. Angabe des Preises.

Leit: Zustimmung. (Holste 2019: 383)

'Ed 1: Argues that not only the price is decisive but also the OVs adoption to the contract awards documents (CADO). Explains the basic tripartite structure of all OVs in this tender in accordance with the editorial team's template for the experts of the various domains:

1. Reference to the CADO
2. Explication of the contents of the suggested optimization
3. Declaration of price

Head: Agrees [...]

This sequence is immediately followed by a statement uttered by a member of the marketing team (Mkt 2) and related to the presentation of the price (see Fig. 3).

Head: Calls for a pithy heading.

Mkt 2: Suggests that the sum that can be saved should be suggested in the heading at the beginning and that it should be followed by the sub heading *1 Explanation*.

The statements influence the eventual design of the OVs' notational iconicity in two ways:

- (1) The position and highlighting of the price
- (2) The consistent formatting of the chapter headings in accordance with the structure of the CADOs so that these are easily recognizable because they are bolded and assigned a marked position.

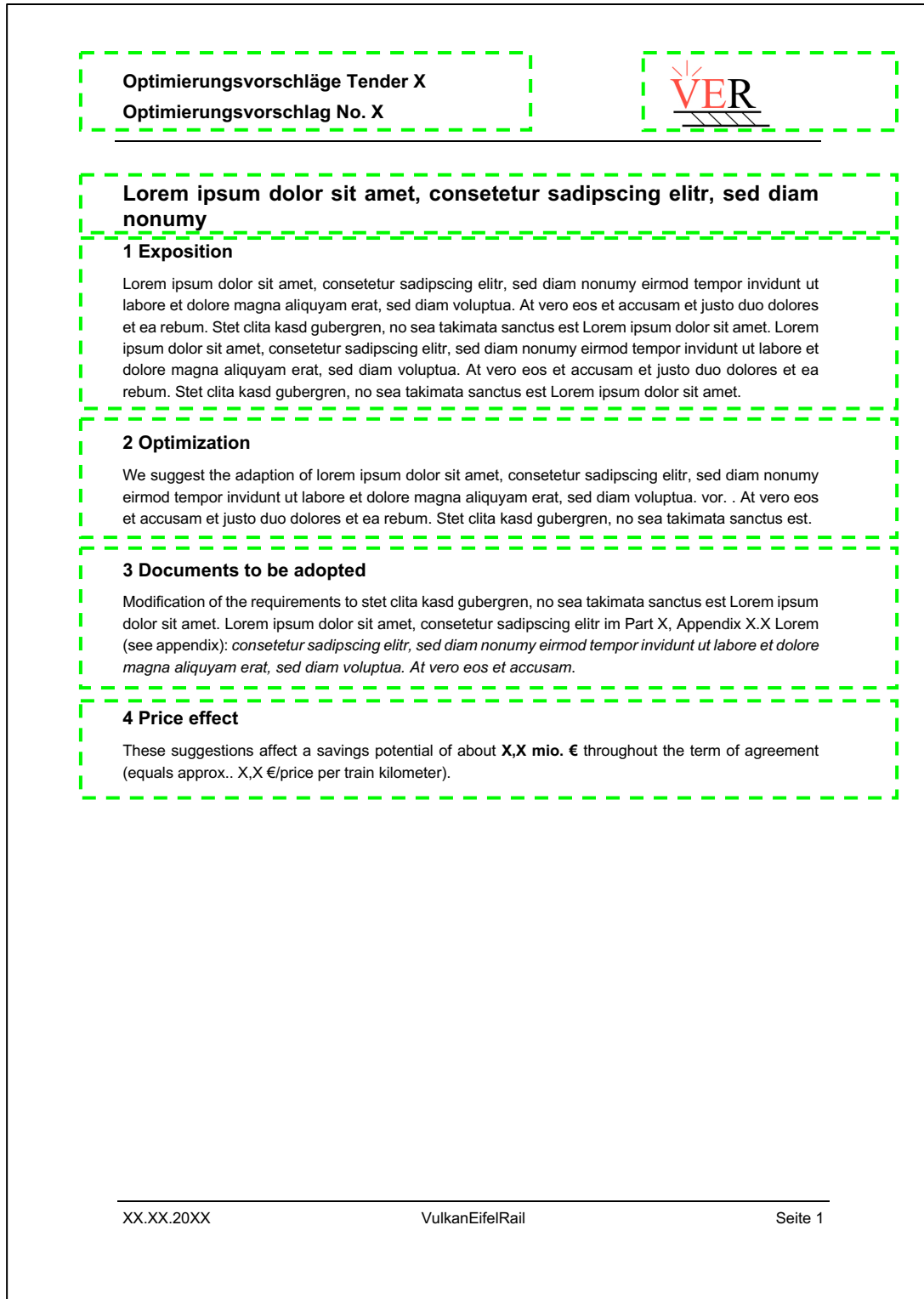


Figure 3: Structure of functional modules (green frames; Holste 2019: 266)

(1) The function of OV_s is to convince the contracting authorities to adopt the CADOs (see sections 2.6 and 2.6.2) when a modification is suggested that lowers the bid price. This is why Tec 1 and Ed 1 discuss just how relevant the price is. In the finished version of the OV, the head of the team has bolded the price so that its declaration is visually salient in comparison to the rest of the running text.

There are several interpretations that can explain why the price is eventually not part of the heading as suggested by the member of marketing but mentioned at the bottom of the page. One is the plausible path of perception: Visually salient elements guide perception in such a way that they attract the perceiving person's attention more than do less salient elements (van Leeuwen 2005: 82). It is also the case that information presented at the bottom of the page can be more readily remembered because they present what is read last (van Leeuwen 2005: 81–85). If related to the example above, the relevance of the price is indicated by it being bolded (salient) and positioned in a concluding (prominent) section of the text, thus emphasizing the importance of the price for a modification of the CADO because the overall function of the OV is to convince the addressee to modify the CADO. This interpretation could also explain why the head of the team further modified the OV after the team editing so that only the finished version presents a bolded price (see Figure 2).

The visual design also indicates the creative competence (see Table 1) of the interdisciplinary team because neither the requirements specification nor the specifications for tenderers require a specific structure of the text.

It is of special interest that the eventual solution of positioning the bolded price at the bottom of the page – as decided upon by the head of the team – seems to represent a compromise between the suggestions offered by Mkt 2 and Ed 1: While the former suggests bold type (but in the heading), the latter opposes this idea by pointing out that the template requires the declaration of price to be mentioned at the end of the text. The head of the team eventually takes up both notions. In the context of this paper, the idea that the remarks of Mkt 2 and Ed 1 are representative of their microcultures in the interdisciplinary team – with Mkt 2 opting for an option that would be typical in advertising contexts whereas Ed 1 suggests that the requirements of the text structure have to be met – can be only of a speculative nature. Nonetheless, it makes sense to assume that their microcultures at least to some degree determine their vantage points on the issue.

(2) The suggestion of Ed 1 to unify the functional structure in accordance with the CADO indicates the expectation that the contracting authority will expect such a unified structure for all OV_s (reciprocal expectation of expectation; see Table 1). Regardless of the fact that both interviewed contracting authorities involved in the three investigated tendering processes indeed expected this (Holste 2019: 384–385), it makes sense that a consistent functional structure is represented by consistent notational iconicity so that coherence and cohesion can be established among the various OV_s. The design visualizes structural and functional features so that it can be quickly recognized as soon as the first OV has been read in detail.

This unification of notational iconicity also indicates a creative competence (see Table 1) on behalf of the interdisciplinary team because the structure of the OVs is not stipulated in the requirements specifications or the specifications for tenders whereas this is the case for the genres functional specifications documents and railway schedules (Holste 2019: 252).

3 Conclusion

The central aim of this paper has been to answer the question in which ways the notational iconicity of multimodal texts can be negotiated by interdisciplinary teams to achieve semiotic efficiency. In this context, the conceptualization of text genres according to Bateman's (2008) and Krämer's (2003) concept of notational iconicity featured as the basis for the conceptualization of negotiation processes which could then be elaborated to include the conceptualization of communicative actions of the involved team members in the model of semiotic efficiency.

In conclusion, the involved communicants from various fields of expertise agreed on a consistent functional structure represented by the consistent notational iconicity of all samples of the text genre in question. The communicants thus act according to, first, microcultural conventions of text genres as regards notational iconicity and, second, functional structures that were negotiated in interdisciplinary teams.

The bolded declaration of price and its position at the bottom of the page reflect the assumption of the editors to convince the addressee to modify the specifications for tenders. However, the design of the OVs does obviously not necessarily result in the contracting authority adapting the specifications for tenders. To assume this would mean to confuse illocution and perlocution (Brinker/Cölfen/Pappert 1985/2018: 98). Just why a contracting authority eventually adopts suggested modifications can have many reasons apart from being a result of the communication between a tenderer and the contracting authority via the OVs. For example, reasons relating to the general economic situation, such as a change in shares of monopolistic market shares, can also be decisive – as can the communication with other bidders via the OVs.

The investigation of this type of communication is not only relevant for the agents of the domain. For example, I implement some of the deduced recommendations (Holste 2019: 413–424) on behalf of the contracting authority *Nahverkehr Westfalen Lippe*. These recommendations can moreover be put to use in other domains in which public tendering is common as, for example, in the domain of software acquisition (Holste 2019: 220). Further, these insights can be communicated in courses on academic and professional writing for engineers to introduce novices to interdisciplinary writing projects (Holste/Gebhardt 2020; Holste et al. 2020). The early instruction to foster interdisciplinary, multimodal writing literacy can support students of the engineering science (Holste 2021) in meeting future professional demands.

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