Image building in the information governance discourse: Steps to economies of meaning

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It is the framework, which changes with each new technology and not just the picture within the framework ~Marshall McLuhan.

‘Design is the order and sense that we impart on otherwise chaotic existence. Design is the structure that we as humans impose over what is . . . it’s the meaning we give to experience that in and of itself that might not have any meaning. Design is structure and purpose where maybe none exists naturally (Salem-Baskin, 2010).’
Introduction

I have argued that information governance is the appropriate concept for organizations in order to consider the phenomena of the semiotic order in their innovation processes, because traditional management models are no longer appropriate. It requires governing actors to develop skills for making responsible choices in order to cope with aspects of the semiotic order, such as the exponential growth of information, the computational rendition of reality, and sign-value.

It became clear that, in the information governance discourse, the concept of meaning is essential for governing actors in making responsible choices, because fostering innovation processes must consider aspects of the semiotic order. The preceding chapter on the critique of meaning elaborated on various concepts of meaning that culminated in a comprehensive notion of meaning, which considers aspects of the semiotic order.

The purpose of this chapter is to synthesize the preceding notion of comprehensive meaning and the notion of governance into one unifying meaning-making framework, a construct. I have pointed out in chapter 2, that the next logical step in the design-oriented research process is the design of the artifact. That is the key subject of this chapter.

The practice of robust design involves justifying design decisions; therefore, the design process starts with determining requirements. They are the first step in tracing design decisions. Requirements serve three purposes in developing solutions: 1) they confirm the nature and scope of the problem, 2) they create understanding of the problem-solving capabilities of a solution, and 3) they are the basis for criteria to evaluate a solution. Put differently, in the design-oriented research approach exhibited in this dissertation, the design requirements are the means to provide rigor in the research setting.

Before proceeding, I must note that this chapter has not the intention to deep-dive into the theory of design. The sole purpose of elaborating on design aspects is to constrain the research and move it into the right direction: the design of a meaning-making framework. While this chapter needs to maintain the practice of robust design, solving the overarching problem – marrying the comprehensive notion of meaning with the information governance context – is of primary concern and, therefore, the main focus in this chapter.

When designing artifacts, it is common to reiterate the problem at hand by studying problem-relevant theories, because it gains more insight in solving the problem (Offerman, Levina, Schönherr & Bub, 2009). Therefore, this chapter will reiterate some problem aspects; in fact, this reinforces how a design-oriented research approach creates knowledge, as discussed in chapter 2.

Figure 6 illustrates that the design process, which covers requirements elicitation and framework design, is a follow-on activity on the theorizing discussions on information governance in chapter 3 and the concepts of meaning in chapter 4.
Chapter 5 - Toward a Framework of Meaning

The chapter starts with a general introduction on design aspects regarding the relation between problem definition, solution definition, and the elicitation of design requirements as a necessary activity in order to create a rigorous design process. It then develops requirements that address the conceptualizations on governance and meaning, as well as objects present in the technological life-world, the key themes of chapter 3 and chapter 4. After eliciting requirements, the chapter continues with designing a meaning-making framework. The development of hypotheses is a key activity in this. I do that through philosophical foundations, applying theories as well as applying common sense. The chapter then synthesizes the notions and results developed earlier into the actual construction of the framework. Some guidance on how to operate the framework as well as a short assessment on appropriate design characteristic is part of this synthesis. The final part of the chapter introduces a mapping of all requirements and hypothesis as a precursor to the next chapter on evaluative case studies. The chapter closes with a summary and conclusion of the results of the design process.

Framework requirements

What is design? What is a design? A design of something means it has an order, a structure, that makes it purposeful. Except for some common approaches and definitions, such as Simon's (1996) *The Sciences of the Artificial*, scientific literature does not provide much guidance on systematically structuring the process of designing an artifact (Offerman et al., 2009; Gehlert, Schermann, Pohl & Krcmar, 2009). A possible reason is that designing an artifact is predominantly a heuristic and creative process. It involves imagination on how a solution will look like, and if present theories are insufficient to find a solution to a problem, the design process

Figure 6: Constituting concepts of the design process

The chapter starts with a general introduction on design aspects regarding the relation between problem definition, solution definition, and the elicitation of design requirements as a necessary activity in order to create a rigorous design process. It then develops requirements that address the conceptualizations on governance and meaning, as well as objects present in the technological life-world, the key themes of chapter 3 and chapter 4. After eliciting requirements, the chapter continues with designing a meaning-making framework. The development of hypotheses is a key activity in this. I do that through philosophical foundations, applying theories as well as applying common sense. The chapter then synthesizes the notions and results developed earlier into the actual construction of the framework. Some guidance on how to operate the framework as well as a short assessment on appropriate design characteristic is part of this synthesis. The final part of the chapter introduces a mapping of all requirements and hypothesis as a precursor to the next chapter on evaluative case studies. The chapter closes with a summary and conclusion of the results of the design process.
draws on practical experiences and common sense (Hevner et al., 2004). Doing design in a research setting introduces an extra complexity because design decisions must be justified through theory or experience.

Every design process starts with defining requirements. To define an accurate and complete set of requirements is one of the greatest problems designers face (Marakas & Elam, 1998). Literature is rich in approaches on structuring the requirements determination process, but tends to stay more on a macro level without discussing the detailed steps needed to assure completeness and accuracy of the requirements for the to-be-designed artifact. The vast majority of approaches in requirement determination use verbal communication techniques in applying semantic structures in order to gather the required information from stakeholders, such as users of the artifact and business sponsors (ibid.). Since theory and experience drive the design process in this research, it lacks verbal communication in requirements gathering. Two issues emerge here that ask for an alternative approach in determining requirements: using theory instead of stakeholders, and securing completeness of requirements.

First, I apply the approach suggested by Gehlert et al. (2009), because it provides methodological guidance to integrate the concluding concepts and theories discussed in this thesis systematically and justifiably into the design process. This approach unfolds the design activities as follows:

- **Problem definition** – reason with existing theories to decompose the overall design goal into requirements. The approach assigns one or more companion indicator-value pairs to a requirement in order to enable their verification. If no suitable theory is available, experience is the basis of reasoning to formulate requirements and indicators.
- **Solution definition** – link the characteristics of the designing artifact to existing theories (or experience).
- **Rational management** – map the requirements to suitable hypotheses that make up the artifact; the underlying theoretical constructs in requirement and hypothesis share similar indicators to make this possible. If the design process cannot find theoretical support, it documents the implicit hypothesis. Implicit hypotheses explicate experience-based assumptions and are a by-product of the design.

There is one caveat in this approach. Theory-based design research requires similar levels of granularity for the indicators used in requirement determination as well as defining the solution, in order to verify the solution against its requirements in empirical research. When there is a lack of suitable theories this is not always possible. It is, however, possible to explicate hypotheses and make them subject of empirical research. Table 16 summarizes the aforementioned approach.
Table 16: Theory integration into design following Gehlert et al. (2009)

<table>
<thead>
<tr>
<th>Problem definition</th>
<th>Rational management</th>
<th>Solution definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal definition</td>
<td>Mapping</td>
<td>Artifact construction</td>
</tr>
<tr>
<td>Requirements</td>
<td></td>
<td>Hypotheses</td>
</tr>
<tr>
<td>Constructs</td>
<td></td>
<td>Constructs</td>
</tr>
<tr>
<td>Indicators</td>
<td>Share</td>
<td>Indicators</td>
</tr>
</tbody>
</table>

Second, although many consider it indispensable to specify requirements completely and accurately, over three decades of literature on requirement determination provides little empirical evidence regarding the effectiveness of particular methods in requirement determination processes (Marakas & Elam, 1998). At best, one can semantically structure the information gathering process (ibid.), but as this is a subjective communication process, the completeness issue remains. A general misconception is that the more requirements one uses in defining solutions, the better solves a problem. The principle to follow here is to maintain essentiality: In defining a solution for solving a problem, what requirements are truly essential? Essential here means if one characteristic is absent, the whole ‘system’ collapses (Beijer & Klerk de, 2010, pp. 109-117). There is a plethora of definitions of what requirements are; they commonly divide into two categories, functional and non-functional requirements. Functional requirements define what the artifact must do in order to solve the problem; non-functional requirements define what characteristics the artifact must have in order to solve the problem such as quality, performance, and user friendliness.

The design goal in this research is constructing a meaning-making framework for governing actors. One can decompose the design goal of the meaning-making framework into three functional requirements and two non-functional requirements.\footnote{I have argued earlier, that there is no exact science to determine how many requirements one needs in order to define a solution accurately, and that design processes are largely heuristic in defining a solution. I have argued elsewhere that one must avoid an overload of requirements that overlap and possibly conflict each other (Beijer & Klerk de, 2010). Therefore, I focus on what the meaning-making framework needs essentially in order to solve the problem. At this point, it is already possible to note that an appropriate definition of the meaning-making framework needs functional requirements on 1) innovation, because that is a natural part of the governance discourse; 2) meaning, because that is the key concept in this research; 3) objects, because part of meaning has phenomenological orientation. Non-functional requirements must address 1) that users adopt the framework as a mental model, its usefulness, and 2) comprehension to make the framework easy to use. I will underpin in more details these three functional requirements and two non-functional requirements later in this chapter.} The three functional requirements address the conceptualizations on governance and meaning, as well as the objects that are present in a technological life-world; they were the key notions developed in chapter 3 and chapter 4. The two non-functional requirements concern the aspects for the user of the framework, the governing actor. They cover the mental model that is necessary
for image-building processes in information governance along with the overall comprehension of the framework. Table 17 summarizes these requirements; the next sub-sections further elaborate on them and underpin their necessity.

Table 17: Requirements addressing essential design concerns

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Issues to address and resolve</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Functional</strong></td>
<td></td>
</tr>
<tr>
<td>Comprehensive meaning</td>
<td>Information governance requires objective and connective meaning for image building</td>
</tr>
<tr>
<td>Innovation</td>
<td>The essence of governance: making responsible choices</td>
</tr>
<tr>
<td>Life-world objects</td>
<td>The one-world paradigm of the technological phenomenology</td>
</tr>
<tr>
<td><strong>Non-functional</strong></td>
<td></td>
</tr>
<tr>
<td>Mental model</td>
<td>Governing actors need a mediating device for image building</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Inexperienced users must understand the framework</td>
</tr>
</tbody>
</table>

**Comprehensive meaning**

Image building is one of the constituting concepts in governance (Kooiman, 2003). In information governance, meaning-making processes are required in order to make responsible choices in a semiotic order. In the critique of meaning, in chapter 4, it became clear that information governance in a semiotic order needs a comprehensive concept of meaning. A concept of meaning that addresses objective meaning as well as connective meaning because the latter adds aspects of human action, the symbols humans encounter in their life, and the direct experiences in the flow of everyday business.

An obvious requirement for the framework then follows; the comprehensive notion of meaning must be included in the framework. Evaluating this requirement is to measure whether users of the framework consider one or more categories of objective and connective meaning – communicative, symbolic, inherent, and contextual meaning. The following requirement statement summarizes this.

**Requirement 1:** The framework must address objective meaning as well as connective meaning.

**Indicator:** Users discuss one or more of the meaning categories communicative, symbolic, inherent, or contextual.

**Innovation**

The main tenet on the re-conceptualization of governance in chapter 3 was that present management disciplines are unable to address the issues that are typical for the contemporary information society. They focus on optimizing scarce resources
instead of addressing the fundamental changes in the economic value-system this society exhibits (e.g. Hamel, 2009; Williamson, 1981; Ciborra, 2000). Because the new management paradigm should include the capability of making responsible choices, I have proposed a new interpretation of governance to fill this gap. Making responsible choices in general is about change, fundamental change. In the contemporary information society, the semiotic order causes this by introducing sign-value in the economic value-system (Lash, 2002; Baudrillard, 1998). I have argued that making responsible choices is a holistic search that involves the enterprises’ environment and considers implications and alternatives.52

The interpretation of information governance in this inquiry is an inevitable consequence of innovation in the contemporary information society. Innovation is the sheer reason of the holistic search process because it helps enterprises to observe the world ‘out-there,’ find their competency gaps, and when necessary, restructure their practices (Ciborra, 2002). In fact, the holistic search process is innovation. Processes involved in innovation from a governance perspective, depend on how governing actors ascribe meaning to things, situations, or opportunities that involve sign-value (Lash, 2002; Kallinikos, 2005, 2006; Ciborra, 2000, 2002).

Innovation, therefore, is part and parcel of the information governance discourse.53 This leads to the requirement that the meaning-making framework must include perspectives of innovation in order to support making responsible choices. Innovation theory provides the underpinning for indicators to measure this whether the framework addresses innovation. According to Sundbo (1998), innovation sums up into four categories: new product or service, new production process, new structure in the organization or management, and a new type of market. When users of the framework discuss issues that involve these types of innovation, should indicate whether the framework addresses innovation perspectives. The following requirement statement summarizes the requirement and its indicator.

**Requirement 2:** The framework must include an innovation perspective.

**Indicator:** Users discuss innovation issues from one or more of the categories product or service, production process, organization or management structure, or market type.

### Life-world objects

Contextual meaning, a constituting element of the notion of meaning developed in chapter 4, follows the technological phenomenology as called for by Lash (2002).

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52 See also the discussion on making responsible choices in chapter 3 on page 42.

53 See also the discussion on innovation in chapter 3 on page 46.
It is a phenomenology that is radical empirical – not transcendental – in a sense that it rejects the reflection, epistemology, and ontology of the objective observer.\textsuperscript{54} These positivist doctrines concern \textit{why} things and events are what they are; inquirers use them in explaining things and events from a two-world paradigm. The phenomenologist doctrine concerns about \textit{what} things and events are and \textit{how} to obtain knowledge from things and events.

According to Lash (2002, pp. 167-173), following Garfinkel’s ethnomethodology, the implication from an empiricist phenomenological approach is that the ‘what’ and the ‘how’ are inseparable.\textsuperscript{55} \textsuperscript{56} Put differently, the content and the method are inseparable. This is a direct consequence of the ruled-out objective observer and, as I will show in a moment, affects the design of the framework.\textsuperscript{57} In a one-world paradigm, object and subject become one; rather than through observations, one gains knowledge through operations. Where the positivist creates knowledge through reduction of objects, concepts, and theories into the smallest explainable lower level entities, the phenomenologist creates knowledge by reduction and bracketing through various operations.

Following Lash’s notion that the ‘what’ and the ‘how’ are inseparable, there are two pivotal concepts here to consider. First, the ‘what’ concerns the content, the phenomenological descriptions; the explications of what things and events are. The phenomenologist does this through bracketing in a given attitude, in a given relationship toward objects (Lash, 2002). For example, a mobile field worker in a technological life-world who gains knowledge by using his beloved technology to access and analyze information that is relevant for his day-to-day job, will assign a different meaning to it than a board member at a distance because their attitude toward the object is different. More specifically, the same technology creates different information for them.

Second, the ‘how’ concerns the method, the way users achieve knowledge in organized settings.\textsuperscript{58} The phenomenologist does this by analyzing the operational

\textsuperscript{54} In fact, with his technological phenomenology Lash (2002) rejected positivism, because these are two-world positivist doctrines.

\textsuperscript{55} Ethnomethodology concerns the study of ‘the methods in and through which members concordedly produce and assemble the features of everyday life in any actual, concrete, and not hypothetical or theoretically depicted setting. Ethnomethodology’s proposal – one that is incommensurate with respect to other sociological theory (Garfinkel, 1988) – is that there is a self-generating order in concrete activities, an order whose scientific appreciation depends upon neither prior description, nor empirical generalization, nor formal specification of variable elements and their analytic relations (Maynard & Kardash, 2010, p. 1483).’

\textsuperscript{56} See also footnote 28.

\textsuperscript{57} This also affects the approach on evaluating the framework. I will come back to that in chapter 6, which covers the evaluative case study.

\textsuperscript{58} The ‘how’ was of particular interest to Garfinkel. The ‘ethnomethod’ in his ethnomethodology concerns methods about gaining knowledge on how operational structures work in organized settings. For example, what makes people to continue practicing in a certain structure – what maintains the
structures of the organized settings, the forms of life. ‘It is not consciousness, but organized settings that have an “attitude,” an attitude whose operation yields practical knowledge (Lash, 2002, p. 168).’ Referring to the aforementioned example of the mobile field worker, the operational structure results in, what Lash (ibid.) called, *empirical reduction*.

In summary, a life-world incarnated by users that take the technology for granted – the technological life-world – provides the bracketing, while the organized setting provides the empirical reduction. Table 18 highlights where the positivist and the phenomenologist doctrines distinctively differ in this context.

### Table 18: Positivist versus phenomenologist doctrines

<table>
<thead>
<tr>
<th>Positivist</th>
<th>Phenomenologist (empiricist)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epistemology of the objective observer</td>
<td>Knowledge through operation with an attitude toward an object</td>
</tr>
<tr>
<td>Concerns the ‘why’ – erklären</td>
<td>Concerns the inseparable ‘what’ and ‘how’ – auslegen</td>
</tr>
<tr>
<td>Why, concerns why things and events are what they are.</td>
<td>What, concerns explication, the phenomenological description of things and events derived from bracketing in a specific attitude.</td>
</tr>
<tr>
<td>Knowledge through reduction by smaller lower level entities</td>
<td>How concerns the operation, the way knowledge is achieved.</td>
</tr>
</tbody>
</table>

The inseparability of content and method, argued by Lash (2002), raises an important issue for the framework. Since the framework’s purpose is to support governing actors in speaking, writing, and thinking about informational experiences for the discourse of information governance, its interest is the content, the ‘what,’ the phenomenological descriptions. To operate the framework, use the framework, it needs an organized setting with an attitude. This puts constraints on the usage of the framework and therefore requires the design to include one or more characteristics that make that possible; after all, content and method are inseparable. In order to make an attitude possible, and because the phenomenological approach is not just a ‘simple’ constructivist approach that allows the user of the framework to construct meanings using reflection-based interpretations, an object must be present in the organized setting. Instead of a two-world paradigm, in which the user in a scientific attitude is an observer (atomized and isolated), the user must experience the object; put differently incarnate the life-world.\(^{59}\)

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\(^{59}\) This affects the approach on evaluating the framework. I will come back to that in chapter 6, which covers the evaluative case study.
The above emphasis, that one cannot simply design a framework without considering its usage – its operationalization; it is one side of the rigor-relevance equation in research. This leads to the requirement that the framework must support an object perspective in order to make an attitude possible that operationalizes the framework for its users.

The use of object in natural language is diverse. Among many explanations of the term in philosophy, it ranges from ‘something that may be perceived by the senses, especially by sight or touch [to] anything that may be presented to the mind: objects of thought (Laycock 2011, para 1).’ The object in the context of the technological life-world can range from tangible, physical objects, but also anything, that these physical objects represent, such as information and constructs. According to bundle theory, it is best to describe objects by means of their properties when including the notion of an object in the framework. For bundle theory, an object is nothing but a collection of universals – properties – that can be instantiated (Laycock, 2011). The evaluation of the requirement that the framework must support objects can be, measurement whether users can use the framework to describe the properties of life-world objects. The aforementioned requirement and its indicator for evaluation summarize then as follows:

**Requirement 3:** The framework must support one or more objects.

**Indicator:** Users list properties of objects in the framework.

### Mental model

The central notion that underpins the purpose of enabling governing actors to write, speak, or think about informational experiences for the discourse of information governance, is the formation of governing images; governing images is an unavoidable concept in governance (Kooiman, 2003). Therefore, the first and foremost objective of the framework is to support governing actors in their image-building processes present in information governance. Questions that rise then are what exactly are images? How do people build images?

According to Byrne (2005), there are many concepts involved when people build images. Images can be the result of counterfactual thoughts, such as in reasoning what would have happened if a certain event happened or not happened. Images can also be the result of fantasy such as in child play when talking to imaginary friends. Very different from these imaginative thoughts are creative thoughts, the

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60 Bundle theory goes back to David Hume, a Scottish philosopher. The common wisdom on bundle theory is that one can describe concrete objects as a bundle – collection – of properties (Laycock, 2011).

61 ‘Although different versions of the bundle theory diverge on the issue of how particular objects are constituted out of properties, all versions of theory would seem to agree that the fundamental ingredients of concrete objects are indeed properties (Laycock, 2011, para 2.6).’

62 See also the discussion on governing images in chapter 3 on page 47.
case when people create a work of art such as poetry, music, and drama. Imaginative thoughts, as well as creative thoughts, can create images in peoples’ minds (Byrne, 2005). Byrne (ibid.) has claimed that imaginative thoughts rely on the same principles that guide rational thought. This seems to confirm the importance of image-building processes in governance concepts in order to make responsible choices.

People cannot directly link phenomena in the real world to mental processes. They need mediating cognitive devices to represent relevant structures of the real world in their minds (van Dijk, 2009). Mental models can serve as such a device. Johnson-Laird and Byrne (2000) commented on mental models as follows:

‘Mental models can be constructed from perception, imagination, or the comprehension of discourse. They underlie visual images, but they can also be abstract, representing situations that cannot be visualized. [...] Mental models are akin to architects’ models or to physicists’ diagrams in that their structure is analogous to the structure of the situation that they represent, unlike, say, the structure of logical forms used in formal rule theories (Johnson-Laird & Byrne, 2000).’

This leads to another requirement of the framework: it should be able to serve as a mental model for governing actors in order to imagine the relevant aspects of the semiotic order in their image-building governing processes.

Literature related to the measurements of mental models mostly concern shared understanding of teams. These measurements take the notion of eliciting individual mental models and find a level of sharedness by applying techniques such as concept maps and consensus analysis (e.g. Kruger & Wenel, 1997; Johnson & O’Connor, 2008; Stone-Jovicich, Lynam, Leitch & Jones, 2011). These measurement approaches are not usable for this inquiry, since they assess peoples’ conceptualizations; they look for what the mental models are that people have ‘inside their head.’ A leading question in this inquiry, however, is whether users adopt the framework as a mental model instead; a reversed question. Put differently, do subjects adopt the presented mental model in looking at world phenomena they encounter in image formation?

To measure whether users adopt the framework as a mental model, I attach an indicator concerning applicability to the requirement. When users apply the majority of the framework in describing governance innovation issues during image building it would satisfy this requirement. It is my assumption that a minimum of 75% should provide enough good evidence. The following requirement statement summarizes this.

63 In discussions on cognitive processes and thinking, one often uses the term imagination. To denote the phenomena that people create pictures in their mind in response to visual perceptions, the term imagery is frequently used (Byrne, 2005).

64 See also the discussion on making responsible choices in chapter 3 on page 42 that argues that responsible choices are careful weighted choices that consider the environment.
Comprehension

The concept of governance is omnipresent at the senior management level and board level of enterprises (van Grembergen & de Haes, 2007; Weill & Ross, 2004). It includes an increasing awareness for information governance because it enables the innovation dialogue for enterprises in the contemporary information society (Beijer & Kooper, 2010).

It is conventional knowledge that board members and directors in enterprises have multidisciplinary backgrounds. Senior managers in the information domain, such as Chief Information Officers, are increasingly having non-IT backgrounds (Maes & de Vries, 2008). Developing (yet again) a lingua franca among all stakeholders in the information governance discourse would make it unattractive for senior management and directors to adopt the framework in making responsible choices in the semiotic order.

First, enterprises fail to address the informational developments from the contemporary information society because they see themselves caught in the formalism of detailed operational frameworks such as COBIT and ITIL (Simonsson & Johnson, 2006; Kooper et al., 2009). This happens against the background of the romantic search for strategic business-IT alignment where two distinctively different worlds try to unify by developing a common language (Maes & de Vries, 2008). Technocratic concepts such as IT architecture and Service Oriented Architecture dominate this search and demand formal notations such as UML,\textsuperscript{65} BPMN,\textsuperscript{66} and ArchiMate.\textsuperscript{67} The technocratic and formal paradigm of IT leads to informational illiteracy. Facilitating a meaningful dialogue that includes informational and organizational aspects, as well as non-system issues, requires more than formal box-arrow-based languages and diagrams (Maes, 2007).

Second, developing a difficult framework raises concerns on the necessary skills and capacity on logical reasoning, in order to operate the framework. If the constituting elements of the framework show no easy to understand logical coherence, it will be difficult to use for inexperienced users.

\textsuperscript{65} UML (Unified Modeling Language) originates from the object-oriented software engineering discipline and is a standardized modeling language to model software intensive systems. Its general purpose leads to an adoption in the enterprise architecture domain for UML-based modeling of enterprises.

\textsuperscript{66} BPMN (Business Process Model and Notation) is used for graphical representations in specifying business processes using flowchart techniques.

\textsuperscript{67} ArchiMate is an open enterprise architecture modeling language that has a broader scope than UML and BPMN. It is used to analyze, describe, and visualize pan-enterprise architecture concepts.
Easiness in understanding the framework captures the idea of refraining from formal languages and an ‘easy-going’ logical structure such that inexperienced users can easily work with it. Whether users can discuss their issues in natural language together with the proportion of constituting framework elements recalled correctly, should give an indication to what extent the framework meets this requirement. It is my assumption that a lower limit of 75% should give proper evidence for both indicators. The following requirement statement summarizes this.

**Requirement 5:** The framework must be easy to comprehend.

**Indicators:**
1. Proportion of informal language used > 75%
2. Proportion of framework elements recalled correctly > 75%

**Summary**

This section has argued that it is possible to decompose the overall design goal of constructing a meaning-making framework for governing actors into five essential requirements. The requirements typically emphasize the conceptualizations on governance and meaning, the objects that are present in a technological life-world, as well as the usability of the framework for governing actors. Table 19 summarizes the design requirements along with their justifications. The next section covers the actual design of the framework.
Table 19: Meaning-making framework design requirements

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Justification</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Functional requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Address objective meaning as well as connective meaning</td>
<td>Image building in a semiotic order includes more than mere semiotic related meaning</td>
<td>Users discuss one or more of the meaning categories communicative, symbolic, inherent, or contextual</td>
</tr>
<tr>
<td>2</td>
<td>Includes an innovation perspective</td>
<td>Innovation is part of governance and involves making responsible choices</td>
<td>Users discuss innovation issues from one or more of the categories product or service, production process, organization or management structure, or market type</td>
</tr>
<tr>
<td>3</td>
<td>Support one or more objects</td>
<td>The user needs an object to have an attitude toward it, otherwise it cannot incarnate a life-world</td>
<td>Users list properties of objects in the framework</td>
</tr>
<tr>
<td></td>
<td><strong>Non-functional requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Serve as a mental model for its users</td>
<td>A mediating cognitive device is needed to link real world phenomena to mental processes</td>
<td>Proportion of framework elements applied in describing governance innovation issues during image building &gt; 75%</td>
</tr>
<tr>
<td>5</td>
<td>Easy to comprehend</td>
<td>No exclusion of usage by non-technical people, senior management, and directors</td>
<td>Proportion of informal language used &gt; 75%</td>
</tr>
</tbody>
</table>

**Framework design**

In the sections that follow, I will develop the properties of the framework and discuss how they lead to hypotheses necessary to evaluate the framework against the requirements from the previous section on framework requirements. Following the earlier segmentation in functional requirements, the first part of hypotheses development divides into three main parts concerning: 1) innovation, 2) meaning, and 3) the unavoidable object. Next, I will develop hypotheses that concern the non-functional requirements. The framework design closes by synthesizing requirements and hypotheses into the actual construction of the meaning-making framework.
Framework design: Meaning

The marriage of objective meaning and connective meaning in the discourse of information governance, postulated in chapter 4, raises the pivotal issue of how to synthesize or reconcile these notions of meaning into a single unifying concept that enables governing actors to write, speak, or think about informational experiences. The following discussions seek to common grounds in meaning and meaning-related concepts and develop arguments that communication-based concepts and sense-making-based concepts of meaning cannot synthesize the four orientations of meaning; it proposes a pragmatist approach of meaning instead.

Beyond communication: action, affection, incarnation

When synthesizing or reconciling the four notions of meaning into a single unifying concept, it is tempting to use a communication perspective, but there are some concerns related to the concepts involved in the orientations of connective meaning that make it difficult, if not impossible. 68

First, the premise of the notion of an inherent orientation of meaning was that the concepts proposed by Wittgenstein (1958), Habermas (1984), and Giddens (1984) used the broad understanding of human action such as prior experiences and the complete human life-world. From a communication perspective, the inherent orientation of meaning includes much more than communicative intent, the transfer of a message from sender to receiver.

Second, symbolic meaning, in contrast to semiotic related meaning – objective meaning – deals with symbols. Symbols differ from communicative signs in a sense that they are loaded with affect. Although they represent a world that is ‘not there,’ they are constituents of (technological) forms of life. Communicative signs, on the other hand, refer to things and are separate from forms of life. Symbolic practices involve symbolic meaning, and distinctively differ from communicative actions (Lash, 2002, p. 32).

Third, the one-world paradigm subscribes to contextual meaning. Using a communication perspective – transferring messages from sender to receiver – would push the interpretation of the contextual meaning into a two-world paradigm and thus back into a semantic discussion. A two-world framing of this orientation of meaning would conflict its one-world premises. Table 20 summarizes the issues of a communicative interpretation of meaning with the various orientations of meaning.

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68 See also the argumentation against deconstructing connective meaning into a communication perspective on page 82.
With his structuration theory, Giddens (1984), has proposed to consider communication ‘as a general element of interaction, [...] a more inclusive concept than communicative intent (i.e. what an actor ‘means’ to say or do) (ibid., p. 29).’ Structuration theory regards non-intent interaction with structure as of equal importance as communicative intent from actors (ibid., p. 30). To some degree, Giddens’ concept of communication would solve the issue of communicative intent in the orientations of connective meaning, but it limits itself to the communication paradigm, that is, transferring messages from the sender to the receiver, without due thought of any intent. Put differently, Giddens’ structuration theory does not include concepts such as affection and incarnation. Structuration theory concerns non-intentional communication and always refers to an object – the structure – that ‘communicates’ to the agent.

The foregoing illuminated that the concept of communication does not help weaving the whole fabric of meanings – objective meaning and connective meaning – into a single comprehensive concept. Its constituting concepts are simply too fundamentally different and too subjective to do so. For the communicative orientation of meaning, reference is the philosophical foundation because semiological reference is the basis for communication. For the inherent orientation of meaning, action is the philosophical basis because prior experiences and life-worlds bias the way people act. The symbolic orientation of meaning has affection as its philosophical foundation because affection toward objects varies with people’s likes or dislikes. For contextual meaning, incarnation is the philosophical basis because people become one with the objects, events, life-worlds. Table 21 lists the key differences of the four orientations of meaning in terms of their philosophical foundations, reference, action, affection, and incarnation respectively.

<table>
<thead>
<tr>
<th>Orientation</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>--</td>
</tr>
<tr>
<td>Inherent</td>
<td>Its communicative aspects do not address the inclusion of prior experiences and life-worlds in communication and how that affects actors</td>
</tr>
<tr>
<td>Symbolic</td>
<td>Assumes a world that is ‘not there;’ a world subjectively constructed by humans vastly differs from communicative action</td>
</tr>
<tr>
<td>Contextual</td>
<td>One cannot frame a one-world paradigm into a two-world paradigm because it would ‘fallback’ into a semantic deconstruction</td>
</tr>
</tbody>
</table>
Table 21: Philosophical foundations for the orientations of meaning

<table>
<thead>
<tr>
<th>Meaning</th>
<th>Orientation</th>
<th>Philosophical foundation</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective</td>
<td>Communicative</td>
<td>Reference</td>
<td>Refers to objects semiologically.</td>
</tr>
<tr>
<td>Connective</td>
<td>Inherent</td>
<td>Action</td>
<td>Includes prior experiences and life-world.</td>
</tr>
<tr>
<td>Connective</td>
<td>Symbolic</td>
<td>Affection</td>
<td>Affection when confronted with objects.</td>
</tr>
<tr>
<td>Connective</td>
<td>Contextual</td>
<td>Incarnation</td>
<td>Provides a life-world; object and subject become one.</td>
</tr>
</tbody>
</table>

The communication paradigm concerns the transfer of messages from the sender to the receiver without due thought of any intent and is the philosophical point of departure for adding other philosophies with regard to the concept of meaning. The previous discussion further explored the communication paradigm in order to find a common base that can unify the four orientations of meaning—communicative, symbolic, inherent, and contextual. Adding action, affection, or incarnation to the communicative orientation of meaning provides inherent, symbolic, and contextual orientations of meaning respectively. Figure 7 illustrates this.

![Figure 7: Philosophical foundations for the orientations of meaning](image)

Because these various concepts of meaning reveal such fundamental differences, it will be highly unlikely, that there are any commonalities among them that can be used to conceptualize a framework that addresses a comprehensive concept of meaning in an absolute manner. It makes sense to conclude that an

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69 See the discussion on communication starting at page 61 as part of the critique of meaning in chapter 4.
understanding of what meaning is does not provide the ingredients to design the meaning-making framework. Therefore, in what follows, I am going to seek beyond what meaning is: how does meaning emerge.

**Sense making**

Instead of looking at commonalities among the various concepts of meaning, a view at the meaning-making process – how meaning emerges – might offer aspects that can help to reconcile the notions of meaning into a single concept. It is tempting to consider sense making here, because it is a comprehensive concept that involves meaning in various ways. Moreover, organizational sense making concerns how organizations make decisions, seemingly similar to the central problem in this thesis: making responsible choices (e.g. Weick 1995; Choo, 1996; Weick, Sutcliffe & Obstfield, 2005). However, there are a number of conceptual issues with sense making that prevent to use it as an appropriate concept to reconcile the various orientations of meanings.

First, sense making is a cognitive process that contrasts the affection and incarnation present in connective meaning. According to Weick (1995), ‘sensemaking is about such things as placement of items into frameworks, comprehending, redressing surprise, constructing meaning, interacting in pursuit of mutual understanding, and patterning (ibid., p. 6).’ Sense making happens when one confronts an unknown ambiguous situation and wants to find out what is happening. As Weick et al. (2005) have put it, ‘[t]o focus on sensemaking is to portray organizing as the experience of being thrown into an ongoing, unknowable, unpredictable streaming of experience in search of answers to the question, “what’s the story?” (ibid., p. 410).’ To find out the story one uses existing frames of references to direct interpretations and ‘talk’ the event, experience, situation, into existence (ibid., p. 409). Weick et al. (ibid.) explained ‘talk’ into existence as one reasons, using language, in order to understand and comprehend the situation at hand. Therefore, the sense-making process is dominantly a cognitive process in which one creates understanding by interpreting events and comparing them to existing frames of reference.

Second, sense making is predominantly retrospective. Weick (1995) and Weick et al. (2005) portray a number of cases in which the protagonist is making sense out of a series of events that have taken place over a longer or shorter period of time. Out of these events, the protagonist builds up a chain of connecting facts that serve as rationales when the ‘sense has been made’ and follow-on action is possible. Therefore, sense making creates a meta-view that overarches unconnected past events. This contrasts the radical empiricist phenomenological perspective that this

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70 Various disciplines have studied the concept of sense making, such as research on human-computer interaction, information sciences, and organizational studies, each with their own slant. The sense making I refer to is the organizational sense making, unless noted otherwise.
thesis developed in the contextual orientation of meaning, which puts reflexivity at the spur of the moment at the center of its line of thought.

Third, sense making is inherently two-world thinking because it involves labeling and presumptions. Weick et al. (2005) explained that sense making is about imposing labels on interdependent events in order to connect categories of events systematically to types of actors; it is part of the whole reasoning in order to find out what is going on. Conceptually, action is a part of sense making. ‘If the first question of sensemaking is “what’s going on here?” the second, equally important question is “what do I do next?”’ (Weick et al., 2005, p. 412)’ In the step toward action, the protagonist presumes a lot, based on a hunch, as if things where true or there already. Sense making, therefore, is a continuous verification of the differences in notification, compared to existing references and can involve immediate action to verify this notion. Both labeling and presumption inherently follow a two-world paradigm. Labeling is from a communicative orientation of meaning because it is an objective act of reference; it is a semiological action referring to something. Presumptions rise through inferences of facts in the past; also acts of reference.

Weick (1995) separated sense making distinctively from interpretation. Sense making is about how one creates a plausible understanding of what one interprets (ibid., pp. 13-15). Interpretation cannot go without something being there, such as a text that one will read. Sense making, on the other hand, fills in the gaps; it is about constructing, framing, rendering the observations into a plausible, coherent whole – an invention. Therefore, by nature the act of sense making differs from the act of interpretation. A form of meaning making does happen during the act of sense making, but its dominant nature is from an objective act of reference, which resembles my communicative orientation of meaning. Indeed, sense making does include biases from the past, one’s life-world, but manifests itself in a different way: labeling the past.

The foregoing discussion on sense making in this section tries to pursue useable concepts in order to design the meaning-making framework. Seemingly, sense making distinctively differs from my interpretation on meaning making. ‘[Sense making] is about the continued redrafting of an emerging story so it becomes more comprehensive, incorporates more of the observed data, and is more resilient in the face of criticism (Weick et al., 2005, p. 415).’ This contrasts my interpretation on meaning making because meaning making in the context of sense making is about how organizations reduce uncertainty and ambiguity in interpretation processes. As Weick (1995) has put it, ‘in the case of ambiguity, people [...] are confused by too many interpretations, whereas in the case of uncertainty [...] they are ignorant of any interpretations (Weick, 1995, p. 91).’ My interpretation of meaning making in the image-building processes of the information governance discourse is a concept that unifies the various orientations of meanings that organization and their users find in contemporary information society.
According to Weick (1995), interpretation is the precursor to sense making. It is attractive to position sense making as the precursor to my interpretation of meaning making. However, even though there are some signs of commonalities on the emergence of meaning making, such as the communicative orientation of meaning, sense making lacks the integration of the four orientations of meaning and aspects of the symbolic and contextual orientations of meaning in particular. As said earlier, sense making dominantly resembles the communicative orientation of meaning.

From the foregoing, I conclude that the concept of sense making does not provide the appropriate basis to conceptualize the meaning-making framework. The concept of sense making fundamentally differs from my interpretation of the concept of meaning. Table 22 summarizes the fundamental differences between sense making and comprehensive meaning making.

Table 22: Sense making versus comprehensive meaning making

<table>
<thead>
<tr>
<th>Sense making</th>
<th>Comprehensive meaning making</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create understanding about what is going on – ‘What is the story here?’</td>
<td>Creates interest through integrative objective and connective meaning</td>
</tr>
<tr>
<td>Retrospective – labeling the past to existing frameworks of reference for resilience of criticism</td>
<td>Prospective – exploring the present to consider future use</td>
</tr>
<tr>
<td>Limited to two-world thinking</td>
<td>Includes one-world thinking</td>
</tr>
</tbody>
</table>

**Changing habits of action**

Considering the aforementioned concepts of communication and sense making, I submit that looking at the effects of these concepts might provide a better solution to address a comprehensive notion of meaning in designing the framework. Put differently, refrain from using absolute definitions of various concepts of meaning, and instead, illuminate the phenomena that affect the governance discourse. What follows is a proposition on how to clarify phenomena.

The premise for a comprehensive notion of meaning is that a meaningful event, process, or object has a notable effect on actors – organizations and their users. This will be one of the dimensions of the framework, the effect of phenomena, practice, experiences in the information society. It heavily leans on classical pragmatism (e.g. Peirce, James, Dewey) as a maxim or principle that centers on the rule of clarifying ideas by tracing their practical consequences. In what follows, I will present in bold strokes the classical pragmatist thought that underpins this dimension of the framework.\(^71\)

\(^71\) In the development of pragmatism as a philosophical tradition, the endeavor of pragmatists was to return from abstract philosophical reasoning to common sense and factual experiences. The overall objective was to form intelligent practices by extracting theory from practice and linking it to each
Chapter 5 - Toward a Framework of Meaning

Literature shows consensus that the inauguration of the pragmatist approach is from Charles Sanders Peirce (e.g. Dewey, 1916; Hookway, 2008; Emirbayer & Maynard, 2010; Gava, 2011). Peirce (1877, 1878), has laid the groundwork for his pragmatic maxim in the first two articles, The Fixation of Belief and How to Make Our Ideas Clear, of the series Illustrations of the Logic of Science, both published in The Popular Science Monthly (1877-1878). Peirce asserted the primacy that the conception of an object’s effect provides the whole conception of the object. Put differently, in order to understand an object, one must understand its practical consequences. Pierce was preoccupied with the meaning of a thought and the meaning of a concept. Allegedly, his ideas were not easy to comprehend, considering his various attempts to clarify the original pragmatic maxim by showing different versions. The original version reads as follows. ‘Consider what effects, that might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of those effects is the whole of our conception of the object (Peirce, 1878, para. 2).’ In order to emphasize the idea of practical consequences as the spirit of his maxim, Pierce later explained in easier terms: ‘we must look to the upshot of our concepts in order rightly to apprehend them (Baldwin, 1972, p. 301).’

James, later, reaffirmed this pragmatic maxim, making it a pivotal concept in meaning making and truth in human thinking and doing. ‘In his view, practice – experience – supplies the impetus for all inquiry; it also reveals the meaning of ideas and provides the ultimate test of their truth (Emirbayer & Maynard, 2010, pp. 225).’ Later, James supplemented his insights with radical empiricism.

Following the idea of practices, Dewey emphasized on the inseparable subject and object, in a sense that thing and thought are a product of reflection – two-world thinking – on pure experiences. In Dewey’s view, object and subject, stimulus and response, are two sides of the same coin in a lived experience; one cannot see them as entities in themselves, but they are always a joined part of the same whole. With this, Dewey addressed a central theme in the pragmatist thought: the habitual and take-for-granted nature of human practices (Emirbayer & Maynard, 2010). In what follows, I will show that this theme in particular is the central thought in the philosophical underpinning of the meaning-making framework.

Clearly, the shared philosophical belief of the classical pragmatists is the primacy of action interrelated with thought and the significance of their practical consequences; they are the cornerstones of the pragmatist thought. The subtlety other. Considering the differences among classical as well as contemporary pragmatist thinkers such as Mead, Addams, Putnam, Bernstein, Rorty, and Brandom, this development did not result in a unifying interpretation of the pragmatist view. For the purpose of this section, it is less important to examine the differences of the various thinkers, because with the design of the framework I will revert to the foundational ideas from the first classical pragmatists (Peirce, James, and Dewey).

72 This resembles the technological phenomenology as called for by Lash (2002), which is radically empirical – not transcendental – in a sense that it rejects the reflection, epistemology, and ontology of the objective observer.
and deeper meaning of this are present in a more detailed formulation by Peirce on thought and concept.

‘[T]he whole function of thought is to produce habits of action; and that whatever there is connected with a thought, but irrelevant to its purpose, is an accretion to it, but no part of it. If there be a unity among our sensations which has no reference to how we shall act on a given occasion, as when we listen to a piece of music, why we do not call that thinking. To develop its meaning, we have, therefore, simply to determine what habits it produces, for what a thing means is simply what habits it involves. Now, the identity of a habit depends on how it might lead us to act, not merely under such circumstances as are likely to arise, but under such as might possibly occur, no matter how improbable they may be. What the habit is depends on when and how it causes us to act. As for the when, every stimulus to action is derived from perception; as for the how, every purpose of action is to produce some sensible result. Thus, we come down to what is tangible and conceivably practical, as the root of every real distinction of thought, no matter how subtle it may be; and there is no distinction of meaning so fine as to consist in anything but a possible difference of practice (Peirce, 1878, pp. 292-293).’

What Peirce has asserted was a habitual foundation of meaning. To determine what something means, simply find what habits it involves. Reverting to Dewey, the habitual and take-for-granted nature of practices gives evidence of deep-rooted meaning. ‘When practices proceed uninterruptedly and without resistance, their meaningfulness resides deep within them as part of an unbroken coordinated system of activity, and the validity of objects forming part of those systems goes unquestioned as well (Emirbayer & Maynard, 2010, pp. 226).’ There are deep-rooted day-to-day practices constituting lived experiences that one only becomes fully aware of after changing them. Therefore, objects, events, or processes are meaningful if they result in changing existing habits or producing new habits.

Until this point, the exposition of the pragmatist view mainly concerned the notion of a habitual foundation of meaning. The recent debate in sociological sciences, regarding the features of pragmatism and its lack of empirical developments, positions ethnomethodology as a possible solution that can further develop the pragmatist view (e.g. Emirbayer & Maynard, 2010; Quéré & Terzi, 2010; Rawls, 2010). This is a fortunate development and seems like a natural fit from an operational perspective, because the line of thought toward a comprehensive concept of meaning embraced the phenomenological mindset, one-world thinking, and the radical empirical technological phenomenology as called for by Lash (2002). Clearly, these philosophical foundations, the pragmatist view, and ethnomethodology are in the same realm of thought and plea for using pragmatism for one part of the framework.

In contrast to the concepts of communication and sense making, as discussed in the previous section, the pragmatist approach, equating meaning with habits of

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73 With operational I mean here, putting the framework to practice, using the framework in the field to support the information discourse.
action, seems an adequate concept to address the four orientations of meaning: communicative, inherent, symbolic, and contextual meaning. My argumentation on the pragmatist line of thought leads to the first hypothesis that is typical for the meaning-making framework. Later, a synthesis of all hypotheses will lead to the construction of the framework.

Hypothesis 1: Comprehensive meaning manifests as habits of action.
Indicator: Users explicate any of the four orientations of meaning (communicative, symbolic, inherent, contextual), or any combination thereof, as habits of action.

Framework design: Innovation

There is an overabundance of literature on innovation and several definitions of its concepts including the various sub-disciplines such as innovation management and innovation dissemination. Briefly, innovation is a forward-looking activity looking for game-changing opportunities. Because it is predominantly anticipating future needs, innovation processes are difficult to control effectively. Therefore, most innovation theories concentrate on how organizations systematically look for innovation opportunities, conceptualize new value propositions, and solve the problems based on the needs identified for the environment in which the organization operates.

From an organizational perspective, innovation is the result of organizational interaction processes that are systemic and insist a variety of actors from different types of organizations (Coriat & Weinstein, 2002). As such, theories on innovation systems typically address the institutionalized processes involved in problem analysis, solution creation, value proposition development, and commercialization.

Innovation taps into ideas and inventions in order to realize successful products, services, and solutions. It is, therefore, necessary to separate innovation from the creative activities that precede it. Creativity and innovation are not the same thing. Creativity concerns the process of producing novel and useful ideas, while innovation concerns the formalized process of successful realization of those ideas (Amabile et al., 1999).

From an information governance perspective, innovation-related processes rely on the meaning making of governing actors – ascribing meaning to things, situations, or opportunities that involve sign-value. Therefore, with the design of the meaning-making framework, I opt to concentrate on the creativity phase, and dismiss the complexity and dynamics in the follow-on phase concerning innovation processes.

Prior research in meaning making in the creative phase of innovation focused on the social-environmental aspects that influence creative behavior in organizations (e.g. Amabile et al., 1999; Woodman, Sawyer & Griffin, 1993). It concerned the
meaning that actors assign to the environment and circumstances that influence creativity, such as management stimulation, autonomy in work, organizational pressure, intra-organizational aspects, and intra-individual aspects. In short, all the aspects that relate to the fostering of meaning making. In contrast to the fostering aspects, the meaning-making framework designed in this research, pursues to enable governing actors in assigning meaning to the aspects of the semiotic orders, such that they can build up their governing images.

The creativity phase is pivotal in innovation, because it is the phase where organizations need to answer the question of what to innovate, or what can lead to innovation. It is the moment, when ideas emerge before they ‘materialize’ in the follow-on innovation processes. The essence of the creativity phase is twofold. First, to generate ideas; an activity influenced by the environment and circumstances (e.g. Amabile et al., 1999; Woodman et al., 1993). Second, to judge, whether these ideas are meaningful. The point I want to make here is, that, apart from fostering a creative climate that results in the generation of novel and useful ideas, a distinguishable process concerns how one assigns meaning to an idea. Put differently, how can governing actors assign meaning to ideas that use concepts, experiences, or artifacts that relate to the semiotic order?

Three issues seem relevant in assigning meaning to ideas in the creative phases of innovation. First, the cognitive style involved in solving problems determines how one assigns meaning to an idea. According to Kirton’s (1976) adaptive-innovation theory, each person is creative and solves problems. The theory differentiates individuals that want to do things better, the adaptors, and individuals that want to do things differently, the innovators. Therefore, the ideas, events, and experiences in the information society are ‘seen’ differently by organizations and their individuals with different cognitive styles – their meaning making is different.

Second, the habits in innovation processes focus on problem solving. Various methods and processes used in innovation such as TRIZ, lateral thinking, and CPS, combine creativity with problem solving. Problem solving seems the point of departure to start the creative process (c.f. Simon, 1996). However, what if, there is no problem? What, if one does not see the problem? What if the concepts, experiences, and artifacts that are typical for the semiotic order do not solve problems in the first place, but introduce new opportunities, induce paradigm

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74 In contrast to innovation as the formal process in enterprises, in this context, ‘innovation’ means doing things differently. Kirton (1976) has stated, ‘The contention [. . .] is that everyone can be located on a continuum ranging from an ability to “do things better” to an ability to “do things differently,” and the ends of this continuum are labeled adaptive and innovative, respectively (ibid., p. 622).’

75 TRIZ is the Russian acronym for a theory of inventive problem solving that is developed by Altshuller (Shuljak, 1977).

76 Lateral thinking is a technique that combines creative problem solving with creative thinking developed by de Bono (1999).

77 CPS is a creative problem solving technique developed by Osborn (1953).
shifts? Of course, in retrospect, one can always link-back a novel idea to a problem that it solves, but creativity can certainly introduce newness of a kind that one could never have imagined. For example, it was not obvious that the introduction of social media would shift the consumer-buying paradigm, urging marketing organizations to adjust their strategies accordingly. Because old skills do not scale into today’s networked world, it is indispensable for organizations to look around continuously and see if there are new skills to augment in order to look beyond existing paradigms (Brown, 2012).

Third, the notion that, in the contemporary information society, with the abundance of information and technologies, organizations increasingly show signs of being caught in their pursuit for control of ICT, asks more for an innovation climate based on hospitality (Ciborra, 1999), and less a climate based on problem solving. ‘Hospitality describes the phenomenon of dealing with new technology as an ambiguous stranger. Hospitality is a human institution, which is about being receptive, adopting, managing boundaries between what or whom is known, and what or whom is unknown (Ciborra, 1999, p. 8).’ Ciborra (1999) argued for hospitality in the context of project development and thereby turning the classical design paradigm upside down into a ‘we have to live with it’ perspective – what can the organization do to ‘serve’ new information-related developments without jeopardizing the current state of the firm. From an economical perspective, hospitality concerns about the ‘equivalents in transactions and fairness in exchange (ibid., p. 12).’ In the context of information governance, what is the decision basis for governing actors to ‘open the house’ for a stranger – what does it mean to them? In the semiotic order, the notion of semiotic means and material replaces the traditional perspective on product-related innovation; it elevates the role of meaning to the outcome of a process of interaction with the environment.

These issues: the cognitive styles, the problem-solving bias, and the notion of a hospitality-based innovation climate, urge for a different mindset on creativity in innovation. While playing with technology and communications, the information society ‘out-there’ confronts organizations with new meanings and the direct experiences of the technological life-world (Lash, 2002). Creativity then becomes more a journey of imagination, a journey in which governing actors need to imagine how the products of the contemporary information society are useful for their organization. Useful, not only in the sense of how it can solve current problems or resolve deficiencies, but even more how organizations can take advantage of the opportunities that the contemporary information society provides. The latter may

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78 Social media, such as online communities, influence consumer purchase behavior and replace the traditional funnel metaphor on purchase decision making. It becomes an online-driven purchase journey, in which the consumer enters into an open-ended relation with the brand, sharing experiences after purchase (e.g. Pentina, Prybutok & Zhang, 2008).

79 See also the discussion on the pursuit for control in the section, discourse in governance on page 4.
sound opportunistic, but it reflects exactly the point that I want to make in chapter 3: governing actors need to make responsible choices.

The foregoing leads to differentiation between problem-driven innovation, which are the improvements or radical changes needed to solve deficiencies in the firm, and opportunity-driven innovation, which concerns how firms can take advantage of the products of the contemporary information society. Figure 8 illustrates this distinction; it emphasizes a different take on creativity.

![Diagram of Problem-driven versus opportunity-driven innovation](image)

**Figure 8: Problem-driven versus opportunity-driven innovation**

Biran (2011) dismissed the banal opportunities that happen by coincidence, those available only to the happy few in contrast to creative opportunities that require human genius or brilliance. Following this philosophy of opportunity, the creative phase in innovation then essentially concerns the ability to assign meaning to the set of products available to organizations from the contemporary information society – what products, or combinations thereof, can introduce beneficial change without jeopardizing the firm. Put differently, what do governing actors need to know in order to make responsible choices regarding the innovation potential of the technological life-world and its ‘intrusive’ technologies?

Against the background of the aforementioned cognitive styles and hospitality-based innovation (Kirton, 1976; Ciborra 1999), governing actors need to know what is **fundamental** in the products of the contemporary information society providing a

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80 In general, opportunism has a bad connotation, because it refers to making advantage of fortuitous situations, without considering the effects to others. For example, the opportunistic behavior of management and other stakeholders in firms, that results in concessions in the interest of shareholders (Werder, 2011). Biran (2011) in his manifest for positive opportunism, however, has positioned opportunism as the raw material for change. ‘The purpose of opportunism is to present the exploitation of opportunities as a positive and novel idea [as] opposed to the amoral concept of dishonest, egocentric, and exploitative opportunism (ibid., p 55).’

81 See also the discussion on making responsible choices starting at page 42.
technological life-world that can lead to innovation potential – what are their underlying principles that allow to do things differently.

The work of Lemke (2002, 2010) is noteworthy because it covers a long and broad search to fundamental issues concerning meaning making in the relation of discursive technologies and contemporary societal change. Although Lemke’s (ibid.) work is in the linguistic realm, it revealed three fundamental concepts that apply to the innovation perspective of my research. These concepts concern 1) the convergence of time, 2) the disruption of existing constructions, and 3) the connection of radical distinguished concepts. They provide the basis to the design of the innovation perspective of the meaning-making framework. Before elaborating on these three concepts, I will briefly introduce the work of Lemke and put it in the context of the technological life to which Lash (2011) has referred.

According to Lemke (2002), post-modern technologies, such as hypertext, emphasize the notion that discursive technologies ‘afford us the possibility of creating new kinds of syntagmatic meanings by linking across the re-contextualized elements of traditional genres and forms (Lemke, 2002, p. 80).’ Text in this context is more than written language or visual representations. Lemke (2002, 2010) considered all the things people make, such as tools, buildings, changes to the natural environment, and even the human-body itself, as material-semiotic artifacts. Meaning-making habits in crossing boundaries of genres and forms all use these artifacts; they are foundational in Lemke’s conceptualization of a new class of theoretical object called traversals:

‘Traversals are temporal-experiential linkings, sequences, and catenations of meaningful elements that deliberately or accidentally, but radically, cross genre boundaries. A traversal is a traversal across standardized genres, themes, types, practices, or activities that nevertheless creates at least an ephemeral or idiotypical meaning for its human participants, and represents at least a temporarily functional connection or relationship among all its constituent processes and their (human or nonhuman) participants (i.e. actants) [emphasis in original] (Lemke, 2002, pp. 86-87).’

What Lemke (2002) pointed to with the theory on traversals, is that people build meaning by combining the things they encounter, products they use, or events they ran into, while ‘surfing’ and ‘cruising’ their life-world, which is especially the case in the contemporary information society. By including phenomena such as web surfing, channel surfing, and mall cruising, into the theory of traversals, Lemke (ibid.) emphasized that people create coherent meaning through unpredictable – incoherent – sequences of short-lived encounters in different spheres. This phenomenon is analogue to the way people tell their life stories: ‘we tell our lives as narratives, but we experience them as hypertexts (Lemke, 2002, p. 91).’

Meaning making against the background of the technological life-world that Lash (2011) referred to, is about creating contexts from the contents of the short-
lived encounters in that life-world. What Lemke’s theory of traversals contributes to
the understanding of meaning making in the innovation context, is that governing
actors need to augment context creation onto the daily practices of organizations
and their users, in order to put themselves in the position to initiate innovation
processes. Put differently, governing actors need to create a shared imagination of
how context creation provides the opportunity to innovate, and how that enhances
the firm without jeopardizing its continuity. Looking with a meaning perspective at
to embed into the framework in order to address the innovation context in meaning
making. In what follows I will elaborate on the earlier mentioned perspectives of the
framework, based on the principles 1) time convergence, 2) disruptive construction,
and 3) radical connections.

Time convergence

The main tenet in Lemke’s theory on traversals is the notion that time is a key
principle in organizing complex dynamical systems, such as living systems in general,
ecosystems, and human systems. Natural systems show a strong linear relation
among the many scales available, such as weight, time, size, and energy that
characterize them. However, ‘in more complex systems, especially those in which
signs and meaning play a role in behavior and system dynamics, these simple
correlations break down [emphasis in original] (Lemke, 2000, p. 273).’ Complex
dynamical systems exhibit a hierarchical structure of processes with different time
scales. The (faster) processes in lower levels integrate into a higher-level process
that executes on a different (longer) time scale (Lemke, 2000, 2002, 2010). To
emphasize the radical differences in timescales, Lemke provides examples such as
the meaning in a conversation versus the change of the system of language, and the
building of cathedrals that spanned many lifetimes. In the context of information
governance, an example is the dynamics involved by board members deciding about
information technology concepts is far less than the dynamics of those involved in
detailing these concepts during realization projects.

The insulation of timescales is something that Lemke (ibid.) denoted as adiabatic
separation: processes that occur at radically different rates do not exchange energy
and thus no information. This results in the phenomenon, that intermediate levels
in the hierarchy reorganize information between higher and lower levels –
informational alternation in both directions; a well-recognized effect in today’s
organizations.

There are exceptions to the principle of adiabatic separation, when short
timescale events have long-term consequences. For example events that
dramatically affect people’s life. The opposite is also an exception; long timescale
processes affect short timescale activities. For example, the way traditions that color
cultures inscribe daily activities and behavior of people. Lemke refers to the latter
exception as a form of heterochrony, a concept used in developmental biology.
The notion of adiabatic separation and its exceptions, such as heterochrony, reveals that the process-centered view in inquiry to complex dynamical systems only maintains a static notion of things and institutions; not about what they do, but what they are (Lemke, 2000). In order for institutions and things to affect dynamical systems, they require a medium – a person that interacts with it. Put differently, in complex dynamical systems, artifacts – semiotic artifacts – maintain the relation among processes with radical different timescales. Lemke (ibid.), claimed that time seems a more reliable concept to understand the differences in the processes that are involved in adiabatic separation.

According to the foregoing, the notion of time seems appropriate to meaningfully addressing time-insulated processes in the creative realm of innovation. Apart from the discussion regarding time as the fundamental unit of inquiry in adiabatic separation and heterochrony, time seems a general accepted concept in many discussions to address new values that relate to the contemporary information society (e.g. Davis, 1987; Stalk Jr. & Hout, 1990; Lash, 2002).

I submit that when a semiotic artifact in one timescale affects the processes of another timescale it is a meaningful artifact. Put differently, meaningful semiotic artifacts enable governing actors to converge timescales. For example, a mobile application on a smartphone operated by fieldworkers who enter orders in situ, replacing a traditional manually operated order-management process in the back-office is an innovation that converges the two timescales – the slow back-office process that was there for years versus the fast mobile process. Implementing such a technology can deeply affect the existing processes, culture and organization. The convergence of timescales as a unit of inquiry allows governing actors to consider responsible choices.

**Disruptive construction**

Simply by its definition, standardization is a necessary condition for Lemke’s (2010) concept of traversals; when absent, traversals are not possible. Allegedly, standards are meaningful because they make or break the ‘chain’ of traversals. However, standards also provide a perspective to address meaning making in the creative realm of innovation.

According to Lemke (2010), standardization is everywhere, and although people probably dislike the idea of standardization in their lives, the progress of the modern world was by virtue of standardization. Moreover, standards are a prerequisite for large ecosystems to develop, because they depend of the identical character of its members (Lemke, 2010). Likewise, it is also a founding principle that characterizes the concept of infrastructures and contributes to the notion that standardization is an expression of meaningfulness. Infrastructures are ‘open’ in a sense that they...

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83 See the definition of traversals on page 115.

84 The term infrastructure in this context refers to the generic concept of infrastructure, which can have many appearances such as human infrastructure, knowledge infrastructure, technical computer
consist of interdependent parts that eventually always connect to external structures. As such, ecologies of infrastructures can emerge (Hanseth & Monteiro, 1997). If new standards develop, they can, when meaningful, develop across infrastructures and introduce large-scale changes.

According to Lemke (2002) it are not the small changes that operate within the normal limits of existing standards that will cause large-scale changes or new phenomena. One could speak of the resilience, or absorption capacity of ecosystems handling external events. However, some events can be surprisingly meaningful and introduce change. Lemke (ibid.) has put this in the light of complex system theory, where strong couplings can be unpredictable because of the ‘multiple feedback loops and nonlinear reinforcement of small effects toward the larger scale by the collective and cooperative phenomena of whole systems (Lemke ibid., p. 86).’

In the information governance context, the foregoing reveals the notion that semiotic artifacts and semiological events affect the behavior of organizations and their users. It is similar to how standardization of the meaning of semiotic artifacts deeply affects activities in today’s society. ‘[I]t is the material embodiment of meaning in physical texts, documents, tools, artifacts, architecture, designed land- and cityscapes, and in our own human bodies that enables us to coordinate activities over long periods of time and so over global societies and virtual communities of millions of people and billions of artifacts (Lemke 2010, p.84).’ Standardization happens in communicative meaning at all three semiotic levels – syntactic, semantic, and pragmatic level – otherwise communication is simply not possible. However, standardization also happens in situations that concern connective meaning – symbolic, inherent, and contextual meaning. Table 23 lists some examples.

### Table 23: Standardization examples in the realm of connective meaning

<table>
<thead>
<tr>
<th>Connective meaning</th>
<th>Standardization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbolic</td>
<td>Iconic devices such as the iPhone have become such a symbolic meaning to many that one can consider it a standard.</td>
</tr>
<tr>
<td>Inherent</td>
<td>Languages implicitly contain the entire background knowledge of its evolution. One can consider language a standard.</td>
</tr>
<tr>
<td>Contextual</td>
<td>Connectedness with the Internet makes people adapt their behavior. One can consider writing on Twitter a standard behavior for people to express their opinion.</td>
</tr>
</tbody>
</table>

The point I want to make with the notion of standardization, is that, on the one hand, the extent of standardization is a measure of meaningfulness, because it takes time and meaning to let structures and ecosystems emerge by virtue of standards.

network infrastructure, and road infrastructure. In the IS research discipline, infrastructures are social-technical networks.
On the other hand, meaningful events, products, and activities can degrade existing standards and eventually replace them with new standards.

I submit that meaningful events are both disruptive and constructive in a sense that they make existing structures disappear while new ones arise; they diminish existing standards while introducing new ones (Lemke 2002; Schumpeter 2010). The extent, by which new standards can disruptively displace existing standards, is a measure that allows governing actors to make responsible choices because new standards can deeply affect the organization and its users.

**Radical connections**

One of the key characteristics of Lemke’s interpretation of traversals is that a traversal crosses genre boundaries in a radical manner (Lemke 2002, 2010). Considering that people ‘surf’ their world, their information experience in the contemporary information society is ad-hoc and unpredictable. They cross boundaries of information, of radical different information contexts, and make use of unlimited potentials (Lemke, ibid.).

Putting the foregoing against the background of the semiotic order, where the contemporary information society violates the means-end distinction and consumerism juxtaposes productionism, it becomes clear that the theory of traversals can weave producers and consumers into a single larger network making ad-hoc connections possible (Lemke, ibid.; cf. Lash 2002). While surfing their world – living their technological life-world – people are consuming and producing almost simultaneously when crossing radical boundaries of information contexts. As Lemke has put it,

‘[traversals] can create local and ephemeral possibilities of meaningful connection or catenation among otherwise radically distinguished and separated genres and domains of activity. And not just one to another, but whole sets of genres, domains, topics, themes, categories of person, categories of experience, of action/activity that are united by the thread of even a single traversal that passes through all of them [emphasis in original] (Lemke, 2002, p. 93).’

What Lemke (ibid.) pointed at is a post-modernistic hybridization of separated elements from their usual context. For example, a running shoe that connects to a smartphone with the capability to provide all sorts of information and instructions to the runner opens up a whole range of new possibilities; it creates a new life-world. The contribution to the notion of meaning making in the innovation context is that connecting objects, events, or processes that are radical different and from normally isolated domains can be meaningful opportunities for the firm. Moreover, even if, the possibilities are ephemeral of nature, it can be meaningful.

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85 See also the definition of traversal on page 115.
86 Surfing is a concept and behavior that goes back to ‘channel surfing’ on radio or television but nowadays associated to the Worldwide Web.
87 See also the discussion on the rise of new values on page 32-36 and Table 5 on page 36 in particular.
I submit that the extent to which it is possible to connect objects, events, or processes that are radical different is a measure of meaning that allows governing actors to make responsible choices because it increases the possibilities for the firm.

**Synthesis**

The argumentation on the aspects of innovation leads to the second hypothesis that characterizes the meaning-making framework. This hypothesis combines all three aspects in order to measure the extent of innovation potential. Later, a synthesis of all hypotheses will lead to the construction of the framework.

<table>
<thead>
<tr>
<th>Hypothesis 2:</th>
<th>Time convergence, disruptive construction, or radical connections are meaning-making perspectives to consider innovation potential.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator:</td>
<td>Users explicate innovation potential of product or service, production process, organizational or market structure as time convergence, disruptive construction, or radical connections.</td>
</tr>
</tbody>
</table>

**Framework design: Objects**

Earlier I argued that the concept of object must be part of the meaning-making framework in order to make an attitude possible with the framework for its users.\(^{88}\) Conceptualizing an object for this notion raises two key aspects. First, there is the phenomenological context introducing the problem how to handle the two-world concept of object in the one-world paradigm of the phenomenological context. Second, there is the definition of the term object, which introduces the discussion whether we mean, for example, object, thing, or device. The first issue relates to how one engages with objects. The foundation for that, however, lies in the notion how we look at objects in general, so I will start with a philosophical underpinning of the concept of object.

**Object terminology and description**

Various disciplines, such as linguistics, philosophy, mathematics, and computer science, use the term object with a great variety in meanings; sometimes within a discipline itself, the term object has different meanings. I limit myself to the philosophical discipline, because it is the one closest to the phenomenological perspective elaborated in developing the meaning-making framework.

The philosophical discipline uses object in many occasions to point to something that is not a subject – the classical Descartian object-subject separation or dualism. With ‘being objective’ one often means that one must stick to facts. That is, avoid any subjectivity and describe the issue at hand according to its properties, its real

\(^{88}\) See the requirement discussion on life-world objects starting at page 95.
existence. This is where the philosophical problem starts: 1) Is it an existing object or an abstract object? 2) To what extent can one describe an object according to its properties? 3) Can one, following the fifth framework requirement on comprehension, be precise in describing object properties without formalistic languages? 4) Can one describe objects isolated from their environment? The latter also concerns the ambiguous use of the term object blurring it with related terms such as thing, tool, device, and artifact. In what follows, I will elaborate on these questions.

First, there is the general notion in philosophy that one can distinguish between abstract and concrete objects – abstracta and concreta. Abstract objects do not physically exist in time and space. For philosophers, it is essential to separate abstract objects from concrete objects, because, in contrast to concrete objects, which are sensible because they are tangible and factual, abstract objects involve abstract thinking, a mental process. It involves the object-subject paradigm. It is necessary to consider abstract objects in the meaning-making framework because the semiotic order, as well as the innovation dimension of the framework, implies that governing actors frequently encounter ideas, abstractions.

Second, in describing an object, it requires more than just its properties to make it fully comprehensible. According to modern philosophy, the properties of an object are its attributes, the form of the object in its own right. For example, the way an object presents itself to the world such as the redness of an apple. The properties of an object, however, do not tell anything about the parts that make up an object, or what material makes up an object, or what functionality an object has, such as what it can do by itself, what one can do with it, and what is necessary to operate it.

Part of these blanks can be filled-in with the white-box and black-box approach. These conceptual models provide insight in describing objects from a constructional and functional perspective respectively (Dietz, 2006). According to the white-box model, one can abstract the construction and operation of an object. Complementary to this is the black-box model, which can describe the function and external behavior of an object in relation to its input parameters. Dietz (ibid., pp. 65-69) provides the example of an automobile to distinguish the two models. From a mechanics perspective, one can decompose an automobile into interacting components such as chassis, wheels, motor, and lamps – white-box model. From a driver perspective, one can decompose an automobile into functional systems that collectively provide the transfer between input and output variables such as lightning system, power system, steering system, and brake system – black-box model. However, this conceptual model approach does not give room for the material aspects of the object.

Third, in order to describe objects precisely and accurately one can use object description languages. These are formal and standardized data representations of objects. Their purpose is to share commonly exchanged object information among various systems such as libraries, public registers, and software systems. Their
schemas are standardized and formal. For example, NASA uses ODL for the planetary data system, the Dublin Core metadata terms can describe web resources (e.g. video, images, and web pages) and physical resources (e.g. books and works of art), and the US Library of Congress uses MODS for describing bibliographic element sets. Table 24 provides a typical schema for an object description language.

Table 24: Typical schema for an object description language

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Object</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parts</td>
<td>What are the parts that constitute the object?</td>
</tr>
<tr>
<td>Material</td>
<td>What material makes up the object?</td>
</tr>
<tr>
<td>Properties</td>
<td>What are the important attributes of the object? (e.g. its external presentation: interface attributes)</td>
</tr>
<tr>
<td>Functions</td>
<td>What can the object do by itself?</td>
</tr>
<tr>
<td></td>
<td>What can one do with the object?</td>
</tr>
<tr>
<td></td>
<td>What does the object need for its functions?</td>
</tr>
</tbody>
</table>

Fourth, from a technological philosophical perspective, it is common wisdom one cannot consider objects apart from their context. According to Verbeek (2005) one cannot consider technology simply as means to an end, because it always reshapes the ends as well as the context of its application. For example, with the introduction of the automobile humankind was able to span greater distances in a shorter time. It changed the ends, because it made people living further away from their work and thereby separating labor from leisure. It also changed the context, because automobile drivers have a different relation to their environment than, for example, bicyclists do, socially as well as spatially (ibid.).

With respect to context and isolation, colloquial usages of the term object, such as the terms thing or artifact and device, emphasize the issues involved. They are fundamentally different concepts; a thing is a generic term, identifying an object made by human beings such as a work of art or a fireplace. According to Verbeek (2005), isolating a thing from its context loses its meaning, because it requires engagement and an environment in order to have meaning. Verbeek (2005) illustrates this with the example of the fireplace from the philosopher of technology Albert Borgmann. A fireplace limits itself to a single room and requires people to chop wood and supply it slowly but continuously to the fire in order to make it warm. However, a central heating system, which is a device, makes warmth instantaneous available when turning on a radiator, ubiquitous in all rooms of a building. Devices deliver availability of commodities, resources; they are pure means and do not lose

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89 Borgmann (1984) argued in his book *Technology and character of contemporary life* that technology is taking away important aspects of our lives, because it increasingly replaces human activities making them losing social contexts. The fireplace is a well-known example from Borgmann to illustrate this.
their meaning separated from their goal, because they do not require engagement to maintain their meaning (ibid.).

The foregoing on the general concept of objects regarding its terminology and description possibilities – abstraction, properties, formalism, and isolation – concludes the following. 1) It concerns notions of objects that are concrete as well as abstract. 2) It is certainly possible to describe an object, but it needs more than just properties in so doing. 3) It is possible to describe objects precisely and accurately, but it requires extensive formalism. 4) Context and engagement are two critical aspects to consider. Except for the last one, these conclusions dominantly reflect the two-world paradigm and are of little use for the phenomenological perspective. Phenomenologically speaking there is always an intending subject related to an object, and therefore must be included in describing an object. The question remains how to handle objects in a one-world context.

**Engagement: the device paradigm**

Verbeek (2005) developed a post-phenomenological vocabulary in which involvement of artifacts and how they co-shape human existence is a central theme. I briefly touched Verbeek’s interpretation of the device paradigm in the foregoing. Verbeek’s interpretation is of particular interest because it corresponds to the technological phenomenology from Lash (2002). It can help to explicate objects from a phenomenological stance. In what follows, I will further investigate the device paradigm.

Verbeek’s point of departure is Borgmann, who introduced the term *device paradigm* in order to study how technological artifacts shape the patterns of human life. Verbeek (2005) explained that this pattern of human life is a technological pattern, were devices continuously replace things to deliver a commodity. The machinery in devices breaks the inseparable bond between things and their context, such that one can consume commodities without being involved in their production.90 Hence, Borgmann’s device paradigm is about breaking up things into a commodity and machinery, without considering engagement. Moreover, according to Verbeek, Borgmann saw the emergence of technological devices as an impoverishment because people stopped engaging when using devices (ibid., pp. 174-199).

Verbeek (ibid.) argued against the Borgmannian disengaging device view of mere commodity-delivering entities because devices can *promote* engagement too. For example, in Borgmann’s view a television discourages people to go to theaters. Verbeek (ibid.) has contrasted this with the example of people watching a life reporting of a disaster on television; it can engage them.91

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90 See also the fireplace example in the section starting at page 120.
91 Verbeek (2000) has listed many counter examples for a new interpretation of the device paradigm.
Verbeek’s (ibid.) post-phenomenological stance that devices can engage people resembles the technological phenomenology from Lash (2002). I have explained earlier that the technological phenomenology from Lash is about the new ways of connectivity through the flood of devices that place users at the center of the networks of communications, they adapt to their life-world and renew their practices that are so typical for the information society – they incarnate.\(^{92}\) Verbeek’s (2005) post-phenomenological vocabulary puts more emphasis on the involvement that people can have with devices and distinguished three variants of involvement. First, there is involvement regarding the artifact itself such as the effort in playing the piano. Second, the context or environment of the artifact invites involvement such as chopping wood in the fireplace example from Borgmann. Third, involvement with the product that becomes available through the device such as enjoying music from a CD player (Verbeek, 2005, pp. 192-193).

The overall argument that Verbeek (2005) developed was, that although technical devices in general diminish the involvement with the environment, they can introduce new forms of involvement that are engaging. The distinction is not always easy to make, but involvement can include effort-based (meaning-making) engagement. For example, for many riding a bike serves as a form of exercise as well as a mode of transportation.

Common in all three variants of involvement is the notion that devices give something to the user of the device; they invite engagement. I explained earlier that the phenomenological stance finds its roots in the one-world thinking model that assumes engagement.\(^{93}\) Because the device paradigm concerns engagement, it is appropriate to use Verbeek’s modified device paradigm in the phenomenological context for objects. The point I am trying to make here is that with this device paradigm users can describe what the object – device – gives them without going into formal details about object properties and the like.

**Conclusion**

I have searched in this section how to make the concept of object a part of the meaning-making framework. The phenomenological stance for the framework prevents the use of two-world – positivist – ideas to describe objects. Although there are several concepts available, such as formal languages and schemas, to describe objects, they are not suitable for the one-world notion. Verbeek’s (2005) interpretation of the device paradigm seems appropriate for governing actors to describe objects. First, this device paradigm considers engagement, which is a fundamental character of the one-world notion. Second, it allows governing actors informally describing objects simply by explicating what objects – devices – give them. The foregoing argumentation on objects leads to the third hypothesis to

\(^{92}\) See the discussion on the phenomenological orientation of meaning starting at page 75.

\(^{93}\) See the discussion on the phenomenological orientation of meaning starting at page 75.
characterize the meaning-making framework. Later, a synthesis of all hypotheses will lead to the construction of the framework.

Hypothesis 3: The device paradigm allows for a phenomenological explication of objects. 
Indicator: Users explicate what an object makes available to them such as, for example, information, insights, and knowledge.

Framework design: Non–functional aspects

The preceding sections on the framework design regarding meaning, innovation, and objects focused on the functional requirements of the meaning-making framework. They concern what the framework must do, in order to facilitate governance image building, enabling governing actors to make responsible choices. The non-functional requirements concern which characteristics the framework must have in order for governing actors to adopt the framework in their image-building processes. What follows is a development of hypotheses for the non-functional requirements regarding mental model and comprehension.

Mental model

The central question on the requirement for a mental model is: will users adopt the framework in looking at world phenomena they encounter in image formation? Practitioners in the field of human computer interfacing face a similar problem. In order to design effective user interfaces, they must tap into the user’s belief – mental model – on how the system supposes to work. They use the concept of mental models to see to what extent users adopt a user interface in expressing their issues (Davidson, Dove & Weltz, 1999). In an exploratory study, Davidson et al. (1999) approached the concept of mental models from a usability perspective. They determined whether subjects used components of one mental model of a user interface to describe the functionality of another. Their perspective on usability of a product focused on learn-ability and retain-ability after Costantine and Lockwood (1999). For the meaning-making framework, this comes down to whether the framework plays a significant role in the user’s reasoning and explaining things – its learning process – and whether the user retains the elements of the framework along with their interrelationship in doing that. The ultimate in the former is when the user adopts the framework to express functionality or outcome of other models and notions used in image formation. This leads to the fourth hypothesis in characterizing the meaning-making framework.
Hypothesis 4: The framework provides opportunity for expressing the functionality and/or outcome of other models or notions during image formation activities.

Indicator: Users retain framework elements and their interrelations in expressing issues in image formation.

**Comprehension**

The requirement on comprehension addresses how easy users can work with the framework in terms of language and structure. Put differently, can the user of the framework explicate governance issues using informal language, in a structure that does not require extensive analysis to understand? Research on verbal language learning has resulted in information-processing theory. It shows that when there is a structure in the thing to remember, the learning performance increases; structures make things easier to understand. For example, various quantitative learning experiments have shown decreased performance with the learning of nonsense syllables (Simon & Feigenbaum, 1964). Another, more every day, example is the chessboard experiment that shows how chess players remember the position of chess pieces on the board easier than non-chess players (Simon, 1996). Allegedly, the framework’s structure and the relationships among the framework’s constituting elements influence how users work with it and adapt it as a mental model. This leads to the fifth hypothesis on the meaning-making framework.

Hypothesis 5: The framework structure has an orderly, logical, and aesthetically consistent relation of elements, which can contain informal language.

Indicator: Users can reproduce the framework and populate it using informal language.

**Synthesis: Framework construction**

At this point, I will synthesize the requirements and hypotheses, which I developed in the preceding sections, into the actual meaning-making framework. I will first construct the actual framework, after which I will elaborate on the details necessary to use the framework. I will close this synthesis by assessing the design quality of the framework and the completeness of hypotheses.

**Constructing the framework**

For the actual construction of the meaning-making framework, the point of departure is the requirements and accompanying hypotheses that I have developed in the foregoing sections of this chapter. I have explained earlier that this is a process
that is predominantly heuristic and creative, meaning, that there is no formal way of
doing this and draws on imagination and practical insight.94

The foregoing sections on requirements and design hypotheses clearly show
that the framework structure distinguishes three main elements that relate to one
and other. They concern objects, habits of action, and innovation. The latter,
innovation, subdivides into time-converged, disruptive construction, and radical
connections.

The object and habits of action elements are interrelated. First, there is a clear
notion that the subject is central in habits of action. Following the one-world
paradigm, the object and the subject become one; they have an implicit relation.
Second, following the device paradigm, there is always interaction between the
device and the subject. The latter interacts with the device in order to operate it. For
example, people tune a television to watch a certain channel; people program a
smartphone to read things such as emails, agenda, and action items; people
command a web browser to visit the World Wide Web on the Internet. The devices
on their turn make people do things – habits of action. The interrelation between
objects and habits of action follows the technological phenomenology from Lash
(2002) and the post-phenomenological stance from Verbeek (2005). Because of its
interrelationship, object and habits of action become a unity in relation to the
innovation perspectives.

The relation of the unity object and habits of action with the innovation
perspective, in fact, concerns the main thesis of this research, how to verify whether
products and artifacts of the contemporary information society are of any innovative
value to organizations and their users. I consider the interplay between object and
habits of action as the meaning-making precondition toward the innovation
perspective. It is the first step; the first thing governing actors need to know in order
to make responsible choices by evaluating its innovation potential. Put differently,
the knowledge to make a choice for the technological life-world and its intrusive
technologies.

According to the foregoing, Figure 9 illustrates the first approximation of a
possible structure for the meaning-making framework.

94 See also the discussion on how design science research differs from routine design on page 23.
Figure 9: The meaning-making framework (first approximation)

Figure 9 clearly covers all the functional requirements. One of the non-functional requirements considers the aspect of comprehension, therefore, it makes sense reducing the number of connections among the various framework perspectives; the less people have to remember the better they will comprehend the framework. Because of the intrinsic relation between object and habits of action, I choose to bond these two perspectives – objects and habits of action – together, albeit though that they remain separate framework perspectives. The consequences of the aim for comprehension are twofold. First, using the framework requires a clear explanation of the objects and habits of action perspectives because they become less self-explanatory. Second, appropriate usage of the framework requires methodological guidance because the interrelationship between objects and habits of action is not obvious. Figure 10 illustrates the second approximation of the meaning-making framework.

Figure 10: The meaning-making framework (second approximation)

Following the notion on comprehension, more simplification of the framework is possible. First, there is no strict need for a border around the objects and habits of action perspectives because the previous step in simplifying the framework bonded the two perspectives together. Second, although the three innovation perspectives – time convergence, disruptive construction, and radical connections
are labeled Innovation, it is fair to assume that the methodological guidance revealed by the previous step in simplifying the framework goes along with an explanation of all perspectives; therefore making it not strictly needed to include this innovation label.

In general, we can conclude that steps toward simplification of the framework in order to fulfill the non-functional requirement on comprehension puts some constraints on using the framework; it requires clear explanation and guidance when using the meaning-making framework for the first time. Figure 11 shows the final structure of the meaning-making framework. It also includes a ninety-degree turn in order to make it more practical for users to populate it with notes and remarks.

**Operating the framework**

In designing the structure of the framework, while considering the aim for comprehension, I raised the issue that the framework requires an explanation of the various perspectives and some methodological guidance in order for governing actors to operate it. Although the setup and discussion of evaluative case studies in chapter 6 will elaborate on the methodological approach required to operate the framework, it is possible at this point to give a brief overview of the steps needed for its operation. The method operating the framework divides into three bold steps that are naturally following the philosophical groundwork of the framework.

First, one needs to describe the properties of the object in terms of what it makes available to its user. This typically concerns what the products from the contemporary information society provide such as insight, support, knowledge, and utility. The second step involves examining how the meanings that users ascribe to the object affects their current habits, or introduce new ones. The third step involves an assessment of the object-habits-of-action pair against the three innovation dimensions in order to find the innovation potential. A workshop setting is a typical

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95 See the discussion on the consequences of the aim for comprehension on page 128.
way to introduce the framework to governing actors, after which they should adapt
the framework as a mental model in their information governance discourse. Table
25 summarizes some of the possible guiding questions of the various framework
perspectives.

Table 25: The meaning-making framework: guiding questions

<table>
<thead>
<tr>
<th>Properties of the object</th>
<th>Habits of action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object</td>
<td>Changes in behavior and activities</td>
</tr>
<tr>
<td>Habits of action</td>
<td></td>
</tr>
<tr>
<td>• What does the product or concept from the modern information society provide their users such as insight, support, utility, and knowledge?</td>
<td>• What new habits, or activities, do the meanings (communicative, inherent, symbolic, or contextual) of the object properties develop with the user?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time-converged activities</th>
<th>Disruptive construction</th>
<th>Radical connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Converges, coordinates, motivates, or attracts activities across insulated timescales</td>
<td>Diminishes standards and introduces new ones</td>
<td>Connects radically distinguished genres and domains of activities</td>
</tr>
<tr>
<td>• To what degree do object and habits of action converge, or coordinate, operationally insulated activities or structures such as information, processes, and hierarchies?</td>
<td>• Do the object and habits of action replace well-accepted standards with new standards ones such as ways of working, norms, and processes?</td>
<td>• Do the object and habits of action create new meanings for products or activities outside their usual context, enabling connections for isolated objects and activities?</td>
</tr>
</tbody>
</table>

**Design verification**

There are two aspects to consider on verifying the design of the meaning-making framework. This verification concentrates on the design itself and does not include aspects on using the framework such as utility and usefulness. There are two basic verifications. Does the framework meet all requirements? What is the quality of the design?

First, verifying whether the framework meets all requirements simply needs an assessment of these requirements, defined in this chapter, against the properties that characterize the framework. Table 26 enumerates the requirements with the properties of the framework. It clearly shows that the framework meets all requirements, except for the fourth requirement regarding mental model. This is a requirement that involves field verification because it needs user interaction. This similarly applies to the fifth requirement on comprehension. Although the construction of the framework shows reasonable steps that simplified its structure it is fair to include a property that indicates this, however comprehension is subject to the user and requires field verification as well for a final verdict. The evaluative case study will include steps to assess both non-functional requirements.
Table 26: Verification of design requirements

<table>
<thead>
<tr>
<th>No.</th>
<th>Requirement</th>
<th>Framework Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Address objective meaning and connective meaning</td>
<td>The framework has a perspective that addresses habits of action.</td>
</tr>
<tr>
<td>2</td>
<td>Includes an innovation perspective</td>
<td>The framework has an innovation perspective that subdivides into time-converged, disruptive construction, and radical connections.</td>
</tr>
<tr>
<td>3</td>
<td>Support one or more objects</td>
<td>The framework has an object perspective.</td>
</tr>
<tr>
<td>4</td>
<td>Serve as a mental model to its users</td>
<td>N.A.</td>
</tr>
<tr>
<td>5</td>
<td>Easy to comprehend</td>
<td>The framework has a simplified structure, with all unnecessary items removed.</td>
</tr>
</tbody>
</table>

Second, in order to create proper abstract models of organizational activities, Dietz (2006) suggests five quality criteria: coherency, comprehensiveness, consistency, conciseness, and essentiality. They can be equally applied for assessing the design of the meaning-making framework.

- **Coherency** – is the framework a logical integrated whole? There are no loose elements in the framework. Each element has a relationship to one or more other elements in the framework. The three separate elements on time-convergence, disruptive construction, and radical connections are a subdivision of the innovation perspective.

- **Comprehensive** – does the framework cover all relevant issues? The purpose of the framework is to include connective meaning into the information governance discourse against the background of a technological phenomenology (Lash, 2002). The relevant issues unfold for that threefold. 1) The perspective on habits of action covers the issue of meaning. 2) The perspective on innovation covers the governance issue. 3) The object perspective covers the phenomenological notion.

- **Consistent** – is the framework free from any inconsistencies? All the elements of the framework use the same level of abstraction and refrain from using formal languages. Table 25 lists some guiding questions to use the framework; it is an exemplar of the consistency used throughout the framework.

- **Concise** – are there no superfluous matters contained in the framework? The notions on meaning and governance that I developed against the background of a broad philosophical understanding of the contemporary information society come together into a lean unifying meaning-making framework.

- **Essential** – is the framework limited to the bare essence, independent of its operation? The essential parts of the framework, the perspectives on objects, habits of action, and innovation do not require other constructs. When populated, it stands on its own and is ready for evaluation.
The assessment against the five quality criteria for abstract models contributes to the understanding, that, based on the premises on meaning and governance developed in the preceding chapters, the framework has a proper design and construction. Its degree of utility and usefulness requires assessment in evaluative case studies.

**Framework solution mapping**

The next chapter in this dissertation will cover the evaluative case studies. Proper evaluation requires an appropriate measurement model. The preamble to such a model is a unifying model that shows the complete mapping between requirements and hypotheses to test. Table 27 summarizes how the earlier-developed design requirements map against the proposed hypotheses that are foundational to the framework characteristics.
### Table 27: Solution hypotheses mapped to framework requirements

<table>
<thead>
<tr>
<th>No.</th>
<th>Requirement</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Functional</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Requirement</td>
<td>Solution hypotheses mapped to framework requirements</td>
</tr>
<tr>
<td></td>
<td>Address objective meaning as well as connective meaning</td>
<td>Comprehensive meaning manifests as habits of action.</td>
</tr>
<tr>
<td></td>
<td>Indicator</td>
<td>Users explicate any of the four orientations of meaning (communicative, symbolic, inherent, contextual), or any combination thereof, as habits of action.</td>
</tr>
<tr>
<td></td>
<td>Users discuss one or more of the meaning categories communicative, symbolic, inherent, or contextual</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Requirement</td>
<td>Hypothesis</td>
</tr>
<tr>
<td></td>
<td>Includes an innovation perspective</td>
<td>Time convergence, disruptive construction, or radical connections are meaning-making perspectives to consider innovation potential.</td>
</tr>
<tr>
<td></td>
<td>Indicator</td>
<td>Users explicate innovation potential of product or service, production process, organizational or market structure as time convergence, disruptive construction, or radical connections.</td>
</tr>
<tr>
<td></td>
<td>Users discuss innovation issues from one or more of the categories product or service, production process, organization or management structure, or market type.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Requirement</td>
<td>Hypothesis</td>
</tr>
<tr>
<td></td>
<td>Support one or more objects</td>
<td>The device paradigm allows for a phenomenological explication of objects.</td>
</tr>
<tr>
<td></td>
<td>Indicator</td>
<td>Users explicate what an object makes available to them such as, for example, information, insights, and knowledge.</td>
</tr>
<tr>
<td></td>
<td>Users list properties of objects in the framework.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Non-functional</strong></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Requirement</td>
<td>Hypothesis</td>
</tr>
<tr>
<td></td>
<td>Serve as a mental model to its users</td>
<td>The framework provides opportunity for expressing the functionality and/or outcome of other models or notions during image formation activities.</td>
</tr>
<tr>
<td></td>
<td>Indicator</td>
<td>Users retain framework elements and their interrelations in expressing issues in image formation.</td>
</tr>
<tr>
<td></td>
<td>Proportion of framework elements applied in describing governance innovation issues during image building &gt; 75%</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Requirement</td>
<td>Hypothesis</td>
</tr>
<tr>
<td></td>
<td>Easy to comprehend</td>
<td>The framework structure has an orderly, logical, and aesthetically consistent relation of elements, which can contain informal language.</td>
</tr>
<tr>
<td></td>
<td>Indicators</td>
<td>Users can reproduce the framework and populate it using informal language.</td>
</tr>
<tr>
<td></td>
<td>Proportion of informal language used &gt; 75%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Proportion of framework elements recalled correctly &gt; 75%</td>
<td></td>
</tr>
</tbody>
</table>
Summary and conclusions

This chapter started with an overall introduction on the design process. It became clear that design is a creative and heuristic process that lacks proper theories on how to structure such a process. This challenges design in a research setting because design decisions must be justified through theory or experience rather than through the commonly used requirement elicitation from stakeholders. Therefore, I have used the mechanism of requirements in an alternative approach that integrates the concepts and theories, discussed previously in this dissertation, systematically and justifiably into theory-derived requirements and design hypotheses. As part of this design process, I developed hypotheses that map against requirements. Because, requirements, as well as their matching hypotheses, have indicators assigned in order to assess their compliance, their indicators required a similar level of granularity.

After the general introduction to the design process, the chapter continued by developing design requirements. It decomposed the overall design goal, constructing a meaning-making framework for governing actors, into three functional requirements and two non-functional requirements. The requirements concerned comprehensive meaning, innovation, life-world objects, mental model, and comprehension respectively.

Requirements

Comprehensive meaning is a requirement to ensure that the framework can operate with objective meaning as well as connective meaning. In fact, the synthesis of meanings that developed in the critique of meaning in chapter 4.

Innovation is a requirement to address my interpretation of information governance. Innovation from a governance perspective relies on the meaning that governing actors ascribe to things, situations, or opportunities that involve sign-value. It is an essential part of the information governance discourse and, therefore, a meaning-making framework cannot do without it.

The requirement life-world object is a direct implication from the inseparability of content and method, the ‘what’ and the ‘how,’ in the phenomenological orientation of meaning – contextual meaning. It follows the technological phenomenology where object and subject become one. A one-world paradigm forces to obtain knowledge rather through operation than through observation. Therefore, the framework must enable organized settings in which the user can incarnate a technological life-world – experience an object. This contributes to the notion that one cannot design this meaning-making framework without considering its usage and that an object must be part of the framework. An object in this context can range from tangible objects but also anything that represents these objects such as information and constructs.
Mental model is a non-functional requirement that reflects the notion that governing images are an inevitable concept in governance. The image-building processes involved in governing images relate directly to how people create images in their minds through various thought processes. In order to create images, people need mental models to link phenomena in the real world to mental processes; mental models support thought processes. This contributes to the notion that the usefulness of the framework depends, among others, on whether governing actors adopt it as a mental model when looking at real-world phenomena in image-building processes.

The non-functional requirement on comprehension developed from the understanding that one cannot assume a strong technical literacy among framework users. The targeted users of the framework such as board members, directors, and senior managers shy away from formal and detailed operational frameworks. Therefore, the framework must be easy to understand, refrain from formal languages, and must have an ‘easy-going’ logical structure such that inexperienced users can easily work with it.

The overall conclusion regarding the requirements for the framework is that they emphasize on addressing the conceptualizations on governance and meaning done in chapter 3 and chapter 4, include objects as a necessity because of the phenomenological character, as well as the usability of the framework for governing actors.

**Design**

The next step in the design process was the actual development of hypotheses that map to the earlier developed requirements. This step naturally divided into three sections, the development of hypotheses on meaning, innovation, and objects respectively. Developing hypotheses addressing the non-functional requirements concluded the former.

The central theme in developing a hypothesis on meaning was to weave the whole fabric of objective meaning and connective meaning into one unifying comprehensive concept. It was tempting to use a communication perspective and sense-making perspective for that, because they both contain extensive meaning and meaning-related concepts. However, the four constituting orientations of meaning in objective meaning and connective meaning do not mutually use any part of these concepts. First, the communicative interpretation of meaning does not provide a common philosophical ground between objective and connective meaning. 1) Communication does not address the key aspects of the inherent orientation of meaning: the inclusion of how prior experiences and life-worlds affect actors. 2) Communicative action vastly differs from the world subjectively constructed by humans in the symbolic orientation of meaning. 3) The communication perspective cannot frame a one-world paradigm such as contextual meaning because it would ‘fall-back’ into a two-world semantic deconstruction – a two-world paradigm. This contributes to the philosophical understanding of the four.
orientations of meaning that communication is a too limited concept to synthesize these orientations into one unifying concept.

Second, sense making is about how meaning emerges through past events. It misses, however, a number of conceptual issues that prohibit using it to reconcile the various orientations of meanings. 1) It is a cognitive process that contrasts the affection and incarnation that exists in connective meaning. Sense making creates understanding of unknown and ambiguous situations by rationally comparing events with existing frames of reference. 2) Sense-making is predominantly retrospective, creating a meta-view of unconnected past events. This contrasts the radical empiricism that is typical for contextual meaning – the phenomenological orientation of meaning. 3) Sense making is inherently two-world thinking because it involves labeling and presumptions. It limits itself to a communicative orientation of meaning because it is an objective act of reference. This contributes to the understanding of meaning making that sense making distinctively differs from my interpretation of meaning making, because it is a concept that concerns reducing uncertainty and ambiguity in interpretation processes instead of the concepts involved in connective meaning such as biased action, affection and incarnation.

The communicative perspective of meaning as well as the perspective how meanings emerge – sense making – do not cover my interpretation of meaning making. Therefore, I developed a pragmatist interpretation. The motivation for this lies in the premise that looking at the effects of, for example, objects, events, situations, and processes, avoids the difficulty of finding common concepts in the four orientations of meaning and better illuminates the phenomena that affect the governance discourse. For this, I heavily leaned on the Peircian pragmatist thoughts that concern the notion of a habitual foundation of meaning. If objects, events, situations, or processes lead to change in deep-rooted day-to-day practices, if they result in changing existing habits or producing new habits, they are meaningful. I conclude that comprehensive meaning – the four orientations of meaning – manifest as habits of action, which is the first hypothesis.

The development of a hypothesis on innovation concentrated on the creativity phase of innovation because, from an information governance perspective, it is the phase where governing actors ascribing meaning to things, situations, or opportunities that involve sign-value. In contrast to the follow-on innovation processes that concentrate on rational verification and realization of innovative ideas in the enterprise context, the creativity phase is where meaning making prevails. Three issues seem relevant in assigning meaning to innovative ideas. 1) The cognitive style involved determines whether people want to do things better or do things differently; these styles exhibit different meaning making. 2) The dominant focus on problem solving as a point of departure does not include the imaginative processes that can look beyond existing paradigms. There has to be a problem; what if there is no problem but an excellent opportunity? 3) The notion that, in the semiotic order semiotic means and material replace the traditional notion on product-related innovation elevates the role of meaning to the outcome of a process
of interaction with the environment. Hospitality becomes the decision basis for
governing actors to consider new semiotic means and material – what does it mean
to them.

These issues urge for a different mindset on creativity in innovation. Aside from
problem-driven innovation, organization must also look for opportunity-driven
innovation – imaginations on how organizations can benefit from products of the
contemporary information society. The theory of traversals contributed to the
understanding of innovation that looking beyond problem-driven innovation
requires governing actors to augment context creation of the technological life-
worlds onto the daily practices of organizations. The theory of traversals reveals
three essential perspectives on innovation that support this: 1) time convergence,
2) disruptive construction, and 3) radical connections. I embedded these
perspectives in the meaning-making framework.

The perspective on time convergence learns that the dynamics in complex
systems, where signs and meaning play a key role, break with the strong correlation
of time-related scales that natural systems exhibit, such as time, weight, size, and
energy. Complex dynamical systems are hierarchical with processes of different time
scales – adiabatic separation. In complex dynamical systems, (semiotic) artifacts
maintain the relation among processes with timescales that are radically different. I
submit that when a semiotic artifact in one timescale affects processes in another
timescale it is a meaningful artifact. Semiotic artifacts can deeply affect the existing
processes in terms of time. It requires governing actors to make responsible choices;
time convergence seems an appropriate measure for that.

The perspective on disruptive construction finds its roots in standardization.
Standardization is everywhere; it is a necessary condition, for example, in
infrastructures and ecosystems; the progress of the modern world was by virtue of
standardization. The thesis with disruptive construction is that meaningful events
replace old standards. Ecosystems, infrastructures, and even humans show some resilence, but when the external events are too strong to resist they will disrupt
existing standards and introduce new ones. Semiotic artifacts and semiological
events similarly affect the behavior of organizations and their users. The
standardization of the meaning of semiotic artifacts deeply affects activities in
today’s society. I submit that meaningful events are both disruptive and
constructive in a sense that they make existing structures disappear while new ones
arise.

The perspective of radical connections concerns the unlimited innovation
potentials when combining radically different (information) contexts. The concept
of traversals contributes to the understanding of innovation that even ad-hoc or
ephemeral connections can be meaningful. While living their technological life-
world, people are consuming and producing almost simultaneously when crossing
radical boundaries of information contexts. A post-modernistic hybridization of
separated elements from their usual context creates whole ranges of new
possibilities; it creates new life-worlds such as when connecting a running shoe to a smartphone. The extent to which it is possible to connect objects, events, or processes that are radically different is a measure of meaning in the innovation context.

The innovation perspectives on time convergence, disruptive constructions, and radical connections weave together as a measure for innovation. They are meaning-making perspectives that help governing actors making responsible choices. It is the second hypothesis.

The development of the hypothesis on objects started with an exploration of some philosophical underpinnings of the concept of objects, in order to build the notion how to consider a two-world concept – object – in a one-world paradigm such as the technological phenomenology, the key context for the framework. Conceptually this concluded that 1) it involves concrete, as well as abstract, objects; 2) it requires more than just properties to describe objects; 3) accurately describing object requires extensive formalism; and 4) context and engagement are essential aspects to consider. This contributed to the notion that, except for the last one, these conclusions dominantly reflect the two-world paradigm and are of little use for the phenomenological perspective. In order to develop a hypothesis regarding objects in a one-world context, I further explored context and engagement by means of the device paradigm.

The device paradigm helps to see objects as mediating artifacts and exhibit two fundamental characteristics. 1) Devices make a commodity available to their users. In the context of the information society, the flood of devices enables users to interact with their networks while consuming the products they make available. 2) Devices promote engagement, because it may require effort to operate them, because it may invite users to involve with the environment, or because it can involve the user with the products that become available through the device. The one-world paradigm assumes engagement, therefore, the device paradigm resembles the technological phenomenology.

The contribution of the device paradigm to the understanding of objects is that it enables users to describe what the object – device – gives them without going into formal details about object properties and the like. The phenomenological stance for the framework prevents the use of two-world – positivist – ideas to describe objects. Although there are several conceptual notions on objects, most of them are not appropriate in the one-world paradigm. I conclude that the device paradigm is appropriate in the phenomenological context for governing actors to describe objects. It is the third hypothesis.

The next step after the development of hypotheses on meaning, innovation, and objects was the development of hypotheses on non-functional aspects. These aspects concern what the framework must have in order for users to adopt the framework as a mental-model, and find it easy to operate. The insight from theory on human computer interfacing is the basis for the hypothesis on mental-model. The
framework serves as a mental model if the user adopts it mentally to explain other models or notions during image formation activities. This is the fourth hypothesis. The development on the last hypothesis concerns to what extent users find it easy to work with the framework – comprehension. The insights from empirical research on learning are the basis for the hypothesis on ease of use. The framework’s structure and the relationships among the framework’s constituting elements influence how users work with it. This reflects the fifth hypothesis.

My overall conclusions regarding the developments of the hypotheses are that the phenomenological basis for meaning making has a profound effect on the hypotheses that concern habits of action and objects; one cannot use two-world aspects in these elements of the framework. The development of the hypotheses regarding innovation and the non-functional aspects did not show any noteworthy considerations in that respect.

**Synthesis**

The next step was using the requirements and hypotheses in synthesizing them into a framework; constructing the framework. I took care to use as little as possible visible elements in order to adhere to the requirement on comprehension. The one-world paradigm and the device paradigm contributed to the notion that habits of action and objects have an intrinsic relation. Therefore, these perspectives can bond together in order to position them as a unity opposite to the innovation perspectives. I consider the interplay between object and habits of action as the meaning-making precondition toward the innovation perspective. In order to make responsible choices, the first thing governing actors need to know in evaluating innovative ideas, is whether it means something for the organization; is there an innovation potential?

Because the framework is a rather abstract artifact, I developed some guiding questions for the user. A comprehensive evaluation of the framework is beyond the scope of this chapter, however, I did a rudimentary assessment on its design quality in terms of coherency, comprehension, consistency, conciseness, and essentiality.

**Solution mapping**

The chapter closes with a mapping of all requirements and hypotheses. It is the prelude to a measurement model, which is required for the evaluative case studies.