Semiosis & sign exchange: design for a subjective situationism, including conceptual grounds of business information modeling

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What Peircean semiotics contributes is not just the triadic relationship between sign, object and interpretant. The key insight of Peirce, applying a systems view, is to regard their relationship as irreducible. It follows that his concept of semiotics also entails ontology. And epistemology. Or, the other way around, ontology is epistemology is semiotics.

The semiotic hexad (see Chapter 2) is of course equally irreducible. For it retains Peirce’s original elements, but now as a triad of dimensions. Thus, the convergence of ontology, epistemology and semiotics remains. Chapter 4 presents an articulation in addition to the step from triad to hexad. An intermediate element is included for each dimension. The result is an ennead, i.e., a system of nine irreducibly related elements arranged along three dimensions.

The extension to a semiotic ennead results from copying the formal arrangement of concepts that underlies the metapattern, an approach to conceptual information modeling I designed earlier (Wisse, 2001). An overall metapattern-based model consists of related nodes. Every specific node, or signature, connects a specific context to a specific intext. That is, in fact, all it does, but it is crucial. The introduction of elements whose only service is relational is precisely why the step from hexad to ennead is important.

So, a signature mediates. The consequence for information modeling is pervasive. What is modeled are not whole, independent objects. Instead, situationally relevant behaviors of an object are distinguished. Because the metapattern lets signatures be laterally connected, too, what a model reflects about a traditional whole object is traceable through the relevant set of connected signatures. This is subjective situationism’s solution for reconciling the concepts of identity and difference, i.e., for disambiguating multiplicity. This reconciliation is brought about by the three strictly relational elements of signature, focus and object. Their paradoxical nature, i.e., relationship and element com-
combined, removes paradoxes elsewhere.

A context stands for a situation. A signature stands for an object in a particular situation. And the intext hinges through the signature on the context. As such, it stands for a particular situational behavior of the object.

I completed the design of the metapattern before setting out on this treatise. In hindsight, the metapattern already supplies a formal articulation of concepts along two of the three semiotic/ontological/epistemological dimensions. The elements along the real dimension are situation, object and behavior. Along the information dimension, or sign dimension, the corresponding elements are context, signature and intext. Restoring straightforward relationships, for arriving at the ennead a third element has been added to the ideal dimension which now consists of background interpretant, focus and foreground interpretant.

With three instead of two elements along a dimension, the opportunities for shifting conceptual roles (see Prelude 3) have increased. Shifting from one dimension to another is also possible. It happens when a sign is studied as an object in its own right. Or an interpretant as an object, etcetera.

By explaining the metapattern, Chapter 4 makes a twofold contribution to the design of subjective situationism. First, the metapattern is integrated with the hexad resulting in the semiotic ennead. Second, especially the metapattern allows models to reflect multiple situational behavior of objects. It is therefore used to develop concepts, and present them, in the remainder of the treatise.

Ontological design is resumed in Chapter 6. Chapter 5 is a critical intermission; it can be skipped without risk of losing track of the constructive argument of the treatise.
This chapter provides an introduction to the metapattern as a technique for information modeling.\footnote{See my book Metapattern: context and time in information models (2001), Part I, for a comprehensive description. I emphasize that I finished the manuscript of that book before embarking on this treatise.} It helps to clarify the ontology of subjective situationism as I have developed it so far. In turn, I use the metapattern throughout the rest of this treatise for further ontological design. Later on, I also put it to work for critical assessment of assumptions underlying other approaches to business information modeling.

I designed, and will no doubt continue to design, the metapattern in response to an interest in growing complexity of – computerized – information systems, especially the requirement for adequate conceptual models. The metapattern therefore emphasizes reusability (Wisse, 2001). It adds precision through the combination of a finely grained concept of time stamping and a recursive, simple but formal concept of context. The metapattern is particularly valuable for aligning complex and variable requirements, even across a multitude of organizations with different processes. The concepts of context and time are critically important, allowing for adjustment of models to time-induced and/or situational changes. Especially conceptual models must account for change to maintain their integrity.

Elsewhere, I describe the metapattern’s basic concepts, their structure, a comparison with ‘traditional’ object orientation, and a host of practical modeling cases See Metapattern: context and time in information models (Wisse, 2001). Written for an audience of professional practitioners rather than scientists, Metapattern deliberately passes over ontological considerations. I have taken up ontology for this treatise but refer to Metapattern for my pervasive treat-
ment of the concept of time. Concentrating here on context, while explaining the technique of the metapattern in this chapter, subjective situationism is further developed as an ontology annex epistemology annex semiotics. Once again I emphasize that concepts appear in a different configuration; the meanings of familiar terms change accordingly.

4.1 model as sign type

Building upon the previous chapters, I first make (more) explicit what I mean by a model. Model? Why don’t I ‘just’ refer to PEIRCE for the appropriate sign type?

Many commentators of PEIRCE’s theory of signs concentrate on, and often elaborate upon, his sign classification. Academically, it has certainly been taken up as an important theme. As I find myself increasingly baffled, though, C. HOOKWAY’s remark comes as a relief (1985, p. 125):

A familiar feature of Peirce’s theory of signs is a variety of complex and bewildering classifications of different sorts of signs.

At least I am not alone with my puzzlement. For some time I superficially attributed my failure to grasp his sign classification(s) to me being an engineer, rather than the experimentalist PEIRCE professes himself to be. Now I accept it must be something underlying PEIRCE’s classification. For it really starts with difficulties with his ontology of firstness, secondness and thirdness. And

2. Impressive in both depth and width are F. MERRELL’s books *Semiosis in the Postmodern Age* (1995) and *Peirce, Signs, and Meaning* (1997).

As I have already mentioned, it is nowadays impossible to gain absolute certainty about being original. However, nowhere do I discover what I consider the more fundamental development of PEIRCE’s ground such I present here in Chapter 2, and extend in this chapter (see § 4.5). MERRELL, too, does not trace back to this ground but makes instead an intricate play out of the original classification of signs in PEIRCE. In my view, such an expansion of sign use in triadic rather than hexadic terms makes subsequent development of most matters unnecessarily complex. In comparison, situationism provides a relatively simple, straightforward ontology. It is especially the concept of context that MERRELL and other authors use ambiguously, i.e., as referring to both context of sign – which is my own specific, unambiguous meaning – and situation of object.

3. See the essay *The principles of phenomenology* (1880–1910) as compiled, and included in, the collection *Philosophical Writings of Peirce* (1955, pp. 74–97) by J. BUCHLER. I believe my ennead (see § 4.5) takes me in a different direction than PEIRCE. Or, rather, it lets me continue from a different perspective. The fundamental difference is that of PEIRCE’s realism whereas I favor transcendental idealism (see also Chapter 6).
Let me engage in some speculation, at least equaling the obscurity of Peirce’s notions which has been a source of bewilderment with many commentators (see for example Gudge, 1950). Given his numbered classification scheme, I naturally place first-order concepts inside the objectified reality as constructed, or whatever, by the individual’s intellect. Then my second-order classification can more closely resemble Peirce’s original interpretation. With my first- and second-order application, nine combinations result. I suppose that in such an extended and transposed Peircean universe, from realism to transcendental idealism, first-firstness is constituted by pure focus. And first-secondness is the relationship, through that particular focus, of a foreground interpretant with its corresponding background interpretant. It becomes even more complex with first-thirdness. It follows from my scheme that it is the set of interpretants mediated by all directly related foci. Again, all this pertains to the objectified reality of an individual. As a model, it suggests a reality that is organized as second-firstness (pure object), second-secondness (specific behavior of situational object), and second-thirdness (an overall object’s integrated behavior in all relevant situations). The sign, mediating between firstness and secondness, encompasses third-firstness (signature), third-secondness (signatured intext in context), and third-thirdness (all configurations of intext-context that are derived from the same identifying signature).

There certainly is some system in this mapping from Peirce’s metaphysical categories onto my semiotic ennead. I doubt its usefulness, however. And frankly speaking, I might be far off with my application of his numbers. In general, that metaphysical strain of Peirce does not contribute to my argument. Vitally important, though, is the triadic character of semiosis, and his embryonic suggestion of ground. Those concepts have inspired the development of the enneadic model of semiosis, outlined later in this chapter.

Actually, I believe a contradiction arises between the Peircean concepts of semiosis and the triad on the one hand, and those of first-, second- and thirdness on the other. T.A. Gudge (1950) attributes discrepancies in the thought of Peirce to his conflicting frames of reference (transcendentalism versus naturalism).

As Peirce’s special greatness I recognize his insistence that the triad is essentially irreducible. Irreducibility holds that no subsystem can be viably analyzed in isolation. Here, Peirce clearly is transcendental. But doesn’t he also attempt, after all, reduction through his ontological categories? There, it is Peirce the naturalist (or realist). He confuses where he strives after a synthesis of approaches which is logically impossible (and that is why it is equally impossible to grasp conceptually).

I squarely favor his triadic ‘wholeness,’ only replacing it by enneadic ‘wholeness’ for explanation. Any reference to firstness, etcetera, muddles the issue. At the most, firstness, secondness and thirdness are simplified views occurring when bracketing elements of the triad (later: ennead). They are not its constituting elements.
purpose, not as I do for especially the irreducible semiotic triad and the related pragmatism of Peirce. My purpose, that is.

Again, what I look for at this stage of the treatise is to explain what a conceptual model is. Where does it fit the scheme Peirce designed for sign types? Or does it, actually?

I attempt to give a tongue-in-cheek flavor of the problems created, rather than solutions suggested, by his sign classification. For inevitably almost every practical sign is next seen to occupy several classes. Then, what do — such — classes as classes help?

Is a model a “symbolic rheme,” perhaps? I am just venturing a guess, but that would make it a sign of class eight. Then according to Peirce a model would be (1903, p 116) a sign connected with its object by an association of general ideas in such a way that its replica calls up an image in the mind, which image, owing to certain habits or dispositions of that mind, tends to produce a general concept, and the replica is interpreted as a sign of an object that is an instance of that concept.

Does it help? Or does a model simply belong to class five? That would make it an iconic legisign which (ibid) requires each instance of it to embody a definite quality which renders it fit to call up in the mind the idea of a like object.

All in all, based on permutations of his basic categories of firstness, secondness and thirdness Peirce distinguishes “ten classes of signs.” He also explains the workings of a sign belonging to a particular ‘higher’ class by referring to signs from ‘lower’ classes. I don’t pretend to understand him there. But for just a while I continue to communicate the flavor of his approach. An iconic legisign, for example (ibid),

[b]eing an icon, it must be a rhe. Being a legisign, its mode of being is that of governing replicas, each of which will be an iconic sign of a peculiar kind.

I sense a logic, but fail to grasp it. For explaining what a model is I require grounds that I am comfortable with myself. If I may say so, I proceed in an even more Peircean way than Peirce himself does. I return to his ground, in particular to my subsequent development of it which results in understanding

4. See Logic as semiotic. This quotation is from a selection Buchler makes from Peirce’s manuscript of 1903.

5. Markovic remarks that Peirce has (1961, p 173) “noted more distinctions among signs and developed a more intricate classification than anyone before or after[.]”
sign use as hexadic dynamics, rather than triadic dynamics.

In § 3.2 I mentioned the difference between observation and engineering. The engineering attitude draws attention to the fact that, or actually to the situation where, signs are not only read but also constructed. The sign user in engineering mode is therefore an active sign developer. From the model of hexadic dynamics, however, it must be concluded that what he produces is not an isolated sign. It is, by the very nature of — the assumption of — hexadic dynamics, a persistent combination of sign and context.

But, then, is not context a sign nature, too? It is. The difference applies between foreground and background, a difference which simultaneously secures their cohesion. Indeed, a situation is a background object from the perspective of the foreground object. Similarly a mental ground (b-interpretant) is the background figure to the mental figure (f-interpretant).

This really is a key point. For the engineered sign consists of both context and … sign. This overlap in terminology is stretching the postmodern attitude too far. Without explicitly shifting levels of abstraction it is impossible that a particular element (sign) is equal to the set (sign) when another element (context) is present which is non-empty by definition. Figure 4.1.1 depicts this ambiguity.

![Figure 4.1.1. Sign as an ambiguous concept.](image)

There is only one solution without the constant need for reference to different situations. For precision either the set-level concept or the element-level concept (or both) must be renamed, leading to different names. I favor retaining sign at the level of the set. There it keeps its widest reach. Yet, it is a departure from using sign at the elementary level of which Figure 2.7.4 is the outstanding example.

Why didn’t I get my terminology straight, right from the start? I feel an earlier introduction of this shift would have risked losing the reader. At all stages, I want to remain on as familiar grounds as possible. Of course the current risk is one of delayed confusion. However, I continue to deal through gradual

6. Whenever I write “by definition” it is actually more instructive to read it as: by subjective situationism as ontology.
exposition with the dilemma of communicating innovation, designing it so that I make myself clear enough at every step.  

What, then, should be the new name for what I originally called sign at the elementary level? I have chosen signature, for reasons that emerge from this chapter. As shown in Figure 4.1.2, a sign consists of a signature in a context.

Figure 4.1.2.
Introducing the label of signature.

The change of terminology is so important that it is necessary to update Figure 2.7.4. Figure 4.1.3 replaces it.

Figure 4.1.3.
Introducing signature: update in terminology.

Construction of a sign should naturally be considered from the point of view of the sign user actually doing the constructing. Making sense out of his sign engineering, then, is to start from his ontology. It is to assume that the interpretants involved are about whatever he believes as reality. By the way, it is important to recognize that here no proof of this last statement is required. For it is one of the very axioms of subjective situationism, underlying sign use as a unique process of hexadic dynamics.

Sign construction will mostly occur unconsciously. Whatever sign he constructs, a sign observer may later analyze as a particular synthesis of signature and context standing, as is the nature of a sign, for an object in a situation. But also the engineering sign user himself may already make a conscious effort to

7. Another advantage of shifting meanings is that it provides a first-hand example of what happens during modeling. It very much is a process of trial and error, of communication strategy, etcetera.
represent — his understanding of — both object and situation, that is, including their relationship. As MYERS puts it in Systematic Pluralism (1961, p 135):

For in taking the universal aspect as well as the particular aspect of the individual into account, we think of him as a perspective of the metaphysical object. [...] p 136] Hence, the view of the individual as a personal perspective gives us true concrete universality, the synthesis of the particular and the universal. [...] p 162 Reality comes to us, not as one system representative of the metaphysical object, but as infinite systems, each uniting a particular with what is common to all. But that common element, the metaphysical object, cannot be isolated; any attempt to do so must at once result in uniting it with another particular, producing thereby another system.

According to hexadic dynamics, the obvious way to create the most comprehensively articulated sign from the sign user's perspective is to develop a signature representing the object, a context representing the situation, and include the signature in the context so that it may stand for the object's existence (with) in the situation. At the basis of these dynamics lies the correspondence between f-interpretant and object, and b-interpretant and situation, respectively. These latter statements are again not hypotheses eligible for empirical tests. They are axiomatic. Figure 4.1.4 shows both the correspondences and the containments of the concepts from the hexad.

![Diagram of Hexadic Concepts](image)

**Figure 4.1.4.** Hexadic concepts: correspondences and containments.

I repeat that the engineer is the observer of his own developed sign, too. This is implied by the dynamics of consecutive steps where the b-interpretant and f-interpretant resulting from one step are the context and signature progressing into the next step in the process of sign use.

At last I can summarize my concept of model. Any sign 'stands for' what the sign user considers objectified reality. That is always his reality, and as objectification it is therefore essentially subjective.

Then a sign is a model when it results from an effort by its engineer to
express (his) objectified reality according to a rationalized ontology. The rationalization imposes a conceptual structure on instances. Whether a sign engineer is conscious or not, and if so, to what extent, of the underlying structure when producing an instance is quite another matter. In Chapter 6 I argue for limits of rational signs, including models of course.

With subjective situationism, the minimal difference assumed in reality is that between a situation and an enveloped object. It follows that the minimal difference constructed onto a model should be that between a context enveloping a signature.

A sign user who is capable of engineering models is also called a modeler, for short. Obviously, a modeler can produce from extremely poor to excellent models.

The metapattern is a technique for consistently differentiating between signature and context. It is nontrivial because contexts and signatures are not absolutes. Neither are their relationships fixed. A model must therefore also support representation8 of shifting points of view as explained in § 3.6.

The metapattern, especially as a technique for model visualization, is about variously directing attention. First of all during construction and secondly for observation, it orders unambiguous shifts in an (overall) sign between what may be taken as signature, and what as context. I emphasize that – regardless of the actual confusion of the sign user the malicious nature of his intentions, etcetera – his interpretants are always taken as his beliefs about reality. The whole argument of this treatise is pointless when its axioms are not taken seriously. This holds by the way for any argument.

4.2 traditional modeling practice

I outline the metapattern’s principles and actual technique by presenting a fictional, simple case study. In this paragraph I first show what assumptions guide a modeler who applies the traditional frames of reference of relationships between entities with attributes and/or object relationships.9 Entity-attribute-relationship modeling (EAR) and object orientation (OO) share the ontology of absolute, independently existing objects.

In § 4.3 I sketch the metapattern-based approach to information modeling.

8. Figures 3.6.1 and 3.6.2 already provide exactly such models. For they are, as part of this text, signs standing for something beyond them that is assumed to exist as objectified reality. 

9. The approaches known as entity-relationship-attribute modeling (EAR) and object orientation (OO) share the ontology/metaphysics of absolute, independently existing ‘objects.’
The adjective of information is added when the purpose of the conceptual model is to engineer specifications which lead to an operational information system. A ‘sign tool’ becomes available for supporting one or more human sign users.

Suppose a modeler goes to work one day. He learns his next assignment is to develop a model to be used as conceptual specification for a computerized information system. All that he hears at the initial briefing is that the users of the prospective information system “have to do with people.”

Following the traditional approach to modeling, he probably concludes from “people” that some number of persons is involved. His likely next move is to assume, at least for the moment, differences between individual persons are not important. Concentrating on their similarities, he moves up a level of abstraction. It is person-as-type that he is now interested in to learn more about. As a consequence of this abstraction, person-as-instance is seen, not as an element that contributes to the extensional definition of the person set, but as a possibility that can be materialized from the set’s intensional definition.

Still within the traditional approach to information modeling, the modeler fits the person at type level with relevant properties. Actually, those are property types, too. His key question at this stage is: What is relevant?

It all depends. What purpose(s) is the information about persons going to serve? As the modeler is not told about any purpose, he has a choice between [a] doing nothing, [b] inventing one or more purposes for himself, or [c] trying to find out about them from (other) stakeholders. With the exception of [a], the modeler will attempt to specify properties to suit.

Is the information system going to support, for example, integrated management of magazine subscriptions? Suppose it will have to. He finds it plausible to assign magazine type as a property of person type. From intension this allows a particular person – John, for example – to be subscribed to a particular magazine – say, *Business Semiotics Weekly*. In other words, first John and next his subscription are instantiated. Figure 4.2.1 outlines what possibilities may be generated from type-oriented modeling.

I don’t supply references to literature about EAR and OO. § 4.2 provides no more, and no less, than an informal sketch. My aim is to facilitate a general introduction to the metapattern.

A reader interested in how the metapattern compares with other approaches can find references to literature on EAR and OO in my books *Aspecten en Fasen* (1991), *Informatiekundige ontwerpleer* (1999), and *Metapattern* (2001). Especially *Metapattern* supplies a comparison with the traditional object orientation to conceptual information modeling. I explain the metapattern’s advantages over OO in detail through a discussion of J.J. ODELL’s challenging collection of OO-modeling essays *Advanced Object-Oriented Analysis & Design Using UML* (1998).
The relationship between the types of person and types of magazine prescribes what relationship at the instance level is possible, allowed, etcetera. When any person can subscribe to any magazine, the ‘opportunity’ exists also for John to have a subscription to *Business Semiotics Weekly*.\(^\text{10}\)

Information models are traditionally almost without exception at the level of types. It arises to a large extent from the nature of popular languages for computer programming and database management systems. They offer built-in support of particular types. It must be understood that those are, say, computer-oriented types. They match the internal, limited variety of digital machine-information types. Nearly always, those are not the types that are directly suited for a human subject’s purposeful classification, i.e., to reflect his purposeful order in reality.

It is impossible to escape completely from the worldview incorporated by current tools. However, a responsible modeler is at least aware of inevitable bias. So, modeling right away at type level is actually jumping to a conclusion. Problems with this limiting approach do not manifest themselves as long as the prevailing type-orientation of the tool (especially read: programming languages, etcetera, for computers) does not cause a fundamental reduction\(^\text{11}\) of the relevant variety of reality. As information technology is applied for increasingly complex tasks, it simply follows that the number of failures will correspondingly grow. Strictly intensional modeling will often be insufficient to support requisite variety. Subjective situationism, with the metapattern as its modeling technique, holds that reality is made up of *particular* situational objects. Instances may of course be grouped into classes, or sets. However,

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10. I hate to make sure, but both John and *Business Semiotics Weekly* must be read as figments of my imagination.

11. This must be understood in the sense of reductionism about which I have to say more further on in this treatise.
extension is what fundamentally constitutes a type; intension can be a convenient shorthand, with all the risks of reduction.

For the remainder of my treatment of traditional information modeling here in this paragraph, the orientation at type level is implied. What other stakeholders usually experience from the efforts of the traditional modeler are extremely condensed schemata. The real problem is that most modelers are not aware of reductionism. They establish a gap that is difficult to bridge. What is left of Figure 4.2.1 after reduction to type level is shown in Figure 4.2.2. Its simplicity is misleading.

![Figure 4.2.2.](image)

Figure 4.2.2.
Model with implicit type orientation.

For the sake of fiction, suppose this is how far the traditional modeler has proceeded. I assume that he now wonders about the quantitative aspect of the relationship between person and magazine. How many – types of – magazines can a person subscribe to? Just one? An unlimited number? Is information about the person registered in advance of his very first subscription? Does personal information continue to be available when no subscription remains?

And what about numbers from the perspective of the magazine type? How many persons can subscribe to it? Etcetera. For a healthy publishing company, the modeler specifies a many-to-many relationship (n:m). See Figure 4.2.3. Those numbers are also called the cardinality.

![Figure 4.2.3.](image)

Figure 4.2.3.
Specifying cardinality at type level.

A many-to-many relationship lacks sufficient precision. It does not support unambiguous selection of information, for example, on the particular maga-
It usually happens only when programming, or related activities of organizational change, etcetera, is well on its costly way that flaws in the conceptual model are discovered. Suppose the modeler later establishes that not only private persons but organizations, too, subscribe to magazines. This is not a problem when they are not at all different from the perspective of subscription management. All it takes is to rename person. Subscriber, for example, comes to mean any party.

12. It should normally be impossible, clearly, to record a subscription instance without both the person instance involved and the magazine instance requested being already present.

What I don’t elucidate in the main text is that magazine instance is meant as an instance of a magazine type. It is possible, and might be necessary depending on the particular purpose, to consider separate magazine issues, and even separate copies of every issue. I don’t want to burden the fictional case study with such elaborations. On the basis of this note I invite the reader to do so for himself.
There often are valid reasons for maintaining – the possibility of – differences between, in this case, person and organization. Where the subscription perspective is dominant, person and organization are established as mutually exclusive subtypes of subscriber.\textsuperscript{13} The modeler adjusts his model as shown in Figure 4.2.5. This option requires controlling the choice between person and organization as a property of subscriber. The diamond-shaped symbol indicates such a mechanism.

Where the difference between person and organization is of primary interest, the traditional modeler resorts to so-called subtypes. This will actually always be the preferred solution when person and organization are not only different, but their respective subscriptions as well. At this stage, the traditional modeler of my fictional assignment produces a model as shown in Figure 4.2.6.

![Figure 4.2.6.](image)

Different subscription types for organization and person, respectively.

Strictly regarding subscription management, often no real differences exist between persons and organizations. The orientation at subtyping, however, makes it impossible to escape from proliferation of differences inside the model where no such differences exist in the objectified reality.

\textsuperscript{13} The diamond-shaped symbol indicates a choice between mutually exclusive results.

The number of instances of for example the 'person' property is at the minimum zero, and one at the maximum. More precision, necessary for unambiguously ‘programming’ an information system, is not provided here.
4.3 modeling with a difference

A modeler familiar with the metapattern responds differently to the same assignment. Now the metapattern is not a complete departure from entity-relationship-attribute modeling and object orientation. It incorporates their modeling aspects of enduring value. But what has changed are, though small in number, fundamentally important aspects.

The metapattern-equipped modeler will, first of all, try to gain understanding about what particular situation is relevant. After all, her ontology is that of situationism. She concentrates for example on: John having a subscription to Business Semiotics Weekly. What she looks for are clues for productively starting to objectify the situation-as-instance, rather than object instances residing in it. She calls a particular situation: subscribership.

She relaxes on a fixed object orientation because – the metapattern determines that – situation and object are relative concepts (Wisse, 2001; also see Chapter 3, above). A particular situation is also object in another, higher-level situation. Likewise, an object can act as situation in which another, lower-level object resides. Situation, then, is a recursive function of object and relationship.

Aware of the opportunity for upward recursion, she investigates whether subscribership in its capacity as object leads to recognition of another, encompassing situation instance. Suppose she cannot, at such short notice, think of any. Neither are there any stakeholders around to suggest such situations with broader relevance. She therefore puts a firm limit – but a limit from which she can always includes changes – to upward recursion. This is easily accomplished in a visual model by drawing a thick, continuous line. That line represents the outer frame, or horizon, of her objectified reality; it provides her the base in (and of) the model.

The situation of subscribership is now included in the model as if it originates from the totality of objectified reality. From the base line, a thinner line is drawn, and a name for the situation is added. See Figure 4.3.1.

![Figure 4.3.1](image)

The bottom line of objectified reality, drawn at the top; a situation instance specified.

Only after a situation has been specified does she give closer attention to persons. Actually, she first includes John – hypothesized or not – as an individual. It optimally tunes her to design relevant differences into her model. Her next sketch therefore looks like Figure 4.3.2.
Again, this procedure especially supports the modeler focusing her attention on how a particular object exists within a particular situation. What is relevant for the modeler about that existence is differential behavior. Because the situation governs – what is different in – behavior, it is John as a subscriber only that the modeler needs to consider at present.

In actual practice, the modeler of course iterates. Behavior is the joint result of object and situation. So, particular behavior is their relationship. Practically she has to start her model somewhere. It is by assuming greater importance for situation. Within this assumption, it is reasonable to speak of situation governing behavior.

Other behaviors by John, or roles that he occupies, may have been relevant in the past. Or they are relevant now, or may be at any time in the future. But they must all be understood within their corresponding, and most likely different, situations. Anything applying to other situations is therefore not relevant within the current focus of the particular situation.

It is this ontologically essential dimension of situation that most characteristically sets the metapattern apart from traditional object orientation (and provides it with important advantages over OO). Compared to an object that (only) exists absolutely, an object believed to exist in a multitude a different situations can unambiguously be modeled – to be equipped – with corresponding behavioral multiplicity.

For information modeling, it is useful to stretch the concept of behavior. And I consider behavior and role synonyms. I habitually use behavior, or role, as a generic term for any set of properties, both static and dynamic. For static properties are really not fundamentally different from dynamic properties. I see the static ones as dynamic, too. It is just that change is valued as absent.

The modeler proceeds to investigate John’s behavior as a subscriber. Soon enough, though, she will also turn to abstraction (with, again, abstraction in the sense of moving from an inspection of instances to the assumption of types). For the prospective information system, is it really necessary to differentiate behaviors of separate individuals? The metapattern consistently urges that fundamentally individual existence must always be honored. But assuming for now that John’s behavior does not differ in kind from the behavior of all other subscribers, she may substitute ‘person in general’ for John.
The number of persons who can be subscribers is now added to the model. This is their cardinality. When she does not want to occupy herself at this early stage with detailing any properties of subscribers, a text balloon suggests that one or more of such properties do exist. Figure 4.3.3 presents what she has modeled so far.

The metapattern’s recurrent focus on situation leads the modeler to question whether only subscription is relevant for persons. Suppose that John needs to be registered as a member, too. She learns that his membership is with the Global Semiotic Society. However, for the time being she chooses to concentrate on John as far as instances are concerned. For the sake of compactness of her model, rather than from type as a principle, she assumes that all members will be registered by the same types of properties as their behavior. This abstraction from member instances to the behavioral type of membership is shown in Figure 4.3.4.

Back again at the level of the individual John, she merges her previous models. See Figure 4.3.5.

In all its simplicity, Figure 4.3.5 shows exactly what the task of the information modeler is. She designs an appropriate balance between sameness and difference. In this case, sameness is expressed by identifying a single object. That is the role of John in her model. But John is everywhere circumscribed...
by difference. First of all, he appears in different situations, i.e., in subscriber-ship and membership, respectively. Secondly, he is attributed with different behaviors. In general – and with my apologies for inevitable obscurity of expression – the difference of situation establishes for the sameness of object the difference of behavior.

Figure 4.3.5.
John with different behaviors in corresponding situations.

4.4 structuralism as method

The metapattern is a formal language\(^\text{14}\) with a strong emphasis on visualization. It is designed to support precisely what is essential to the information modeler’s task. Subjective situationism with its concept of hexadic dynamics of sign provides guidelines for engineering business information models. It is equally possible to describe what is believed to exist (Ist) as what is believed that should be brought into existence (Soll).

The quality of a model improves to the extent that signature and context stand to each other in a way that believably stands for how object and situation are related. The belief part, of course, covers the modeler’s interpretants. Correspondence is not just between sign and objectified reality. That is too crude. Neither should correspondence be understood as merely resting on two separate representational relationships, i.e., one relationship between situation and context, and the other relationship between object and signature.

Rather, a model accommodates irreducibility in the Peircean sense. What

\(^{14}\) The – mathematical – formalization of the metapattern is simple and compact. It is presented in Part I of my book Metapattern (2001). See also Informatiekundige ontwerp(n) (1999).

Some similarities exist between metapattern and mind mapping. However, a mind map (T. and B. BUZAN, 1993) seems to be a visualization, only. There is no attempt at formal expression. Also, explicit support for multisituational behavior is missing. My idea is that mind mapping is a monosituational subset of the metapattern. It therefore – and still quite apart from consistent treatment of behavioral changes over time – misses the degree of freedom that is especially impor-
the hexad suggests are not only immediate correspondences such as between the elements of the original semiotic triad. In addition, the progression to dimensions supports correspondences at the structural level. Resulting from semiosis to which his “cognitive mass” contributes in a major way, through the structure of his interpretants the sign user infers the structure of reality from the structure of the sign/model. Figure 4.1.4 already diagrams such dual relationships, i.e., of correspondence and containment. I hypothesize sign use as a process with simultaneous dynamics at two tightly connected levels. In fact, the hexad from Chapter 2 is the static model of exactly this process.

So, there is also the structural level. The assumption that reality is structured makes the sign user look for corresponding structure in the model. This takes him to the level of elements, and their specific relationships. What is recognizable as being contained by what else? One is the signature, and the other is the context. Whatever structure the sign user interprets in the model-as-sign he then believes to stand for reality’s structure. As the model suggests elements standing to each other, they are taken to represent real objects similarly related.

The above description of sign use owes much to the work of CLAUDE LÉVI-STRAUSS (1908- ). In his book Totemism (1962, p 84) he presents a summary of structuralism:

The method we adopt, in this case as in others, consists in the following operations:

1. define the phenomenon under study as a relation between two or more terms, real or supposed;

The concept of mindmap is derived from what in cognitive science are called semantic network models for representing how information is supposedly structured in human memory (referring to a few textbooks among many; see L.E. BOURNE, R.L. DOMINOWSKI and E.F. LOFTUS, 1979; S.K. REED, 1982). There have been important attempts to escape from strictly hierarchical models (R.M. QUILLIAN, 1968; J.R. ANDERSON and G.H. BOWER, 1973). Though structurally similar to the metapattern, the latter distinguishes different intexts for corresponding contexts. In fact, that is the metapattern’s primary purpose. As semantics suggests that word is the unitary concept, in a semantic network different paths may lead to one and the same node and leave it at that. Pragmatics reflects on behavior. Therefore, in order to accommodate separate behaviors it takes separate nodes as foci for one at the same object. But the metapattern does not show an object-as-a-whole as a single node.

J.D. ANDERSON points out that (1985, pp 298-299) “[l]ong before cognitive scientists began modeling the semantic memory, indexers were constructing artificial ‘semantic memories’ or thesauri to facilitate consistent and effective indexing and retrieval by organizing concepts and controlling their number and the terms used to express them.”
2. construct a table of possible permutations between these terms;
3. take this table as the general object of analysis which, at this level only, can yield necessary connections, the empirical phenomenon considered at the beginning being only one possible combination among others, the complete system of which must be reconstructed beforehand.

Though the applications of LÉVI-STRAUSS look on the surface different from what I propose, the metapattern is deeply structuralist. What he, as an anthropologist, elucidates is how one culture ‘behaves’ as opposed to another culture. Structuralism is all about comparisons. It recognizes the dual nature of analysis. Wholes cannot be compared to each other without recourse to their respective parts. But then, parts don’t make sense outside a particular whole (also read: situation).

Logical positivism does not consider structuralism a scientific procedure. Positivism recognizes just a single level in analysis. What naturally follows from its limitation is a view of signs that presupposes a one-to-one correspondence between object and sign. My development of PEIRCE’s ground, and the closely related ontology of subjective situationism, undermine the idea of one-to-one correspondence. Contrary to what positivists fear, the result is not chaos. The metapattern provides both the sign engineer and sign observer with the tool to recognize, without getting lost, a structure as a whole and sort out its parts.¹⁵

The acceptance of structuralism suffers from exactly this dual, simultaneous emphasis on both the set level and the level of elements. Rather than unscientific, though, it deserves recognition as a serious method that can serve scientific activity well. Including ‘structure,’ it acknowledges more variety in reality than ‘elementary’ methods do.

Actually, situationism introduces yet another simultaneous emphasis. It concerns the sign user. Precisely this inclusion of the subject in an ontology helps to demarcate so-called poststructuralism. Thus, it is structuralism

¹⁵. What is also known as emerging behavior first of all requires recognition of a system that actually ‘does’ the behaving. Explanation ideally follows from the so-called causal loops connecting the system’s elements to each other, and to the environment (which is implied by what has been considered as system). A pioneering publication on modeling of system dynamics is Industrial Dynamics (1961) by JAY W. FORRESTER. The approach has more recently been popularized by P.M. SUNGE with The Fifth Discipline (1990). Also relevant are Systems Thinking, Systems Practice (1981) by P. CHECKLAND and Soft Systems Methodology in Action (1990) by P. CHECKLAND and J. SCHOLES. In fact, there is a host of interesting publications on the systems approach. One of my favorites is R.L. ACKOFF’S Towards a system of systems concepts (1971). See also General Systems: Its Scope and Applicability (1981) by T.D. BOWLER.
enriched by the dimension of the individual knower.

It is not the purpose of this treatise to elaborate on possible differences between subjective situationism, postmodernism, and poststructuralism. Here, they may be considered equivalent concepts. I just remark that especially the explicit dimension of situation allows to critically examine whatever discourses occur by the names of postmodernism and/or poststructuralism. It helps to sort out what are rational theories, and what are not. The latter may only entertain their label to pass for science, without any credible claim to it. Responsibly accounting for its system of axioms, subjective situationism aims to support rational explanation.¹⁶

¹⁶. A conversation with my friend JAN KOSTER brought out that the terminology of modernism and postmodernism is habitually applied to designate two fixed and consecutive historical periods in the development of Western society. From a wider perspective, however, modernism and postmodernism are relative concepts. There exist many publications hinting at this. See for example De Onvoltooide Rede: Modern en Postmodern (especially pp 118-157, 1987) by W. VAN REIJEN.

The separate linear extrapolations that I believe are characteristic of modernism (see also § 1.8) ultimately fan out in territories which are experienced as uncertain. Such overextended modernism may then be called postmodernism. When efforts of subsequent mapping of those (phenomenological) territories, i.e., the new rational frontier, are declared successful, the ground is cleared for the next round of linear extrapolations. Thus, a new modernism sets in, etcetera.

Their cyclic nature explains that one modernism’s postmodernism is simultaneously the next modernism’s premodernism. I stress that, as with NIETZSCHE’s ewige Wiederkehr, there is no overall, unidirectional progress implied by the dialectics of modernism and postmodernism.

Pessimism and intellectual paralysis may result from an overwhelming experience of uncertainties at a cultural scale. A both elitist and romantic example displays T. MCFARLAND in Shapes of Culture (1987, p 178): “The chaos of the modern cultural situation is unlikely to witness another resurgence of formal determinants, and its anarchy will in all probability prevail against attempted reorganizations either of educational systems or of the cultural canon. In time, the limited capacity of human attention will doubtless make it necessary to dismiss many of the cultural objects, and much of the cultural data, currently available to our consciousness. These rejected structures will be relegated to the memories of computers, from which specialists or other computers will only occasionally summon them. But those that remain as subjects of living thought will almost certainly continue to present themselves as monadic shapes of culture, not as chronologically cumulative and culturally interrelated forms.”

A similarly conservative cultural program presents A. BORGMAANN in Holding On to Reality: The Nature of Information at the Turn of the Millennium (1999). His confusion lies in applying for example the label reality to different concepts, with a reality that is a part of the whole of another reality (p 5): “The far-
4.5 sign in the ennead: context, signature and intext

Meanwhile, the modeler has continued with her assignment. She reaches the point where she has modeled – actually, she has made preparations to model – two behaviors of John. One behavior is as a subscriber, the other behavior as a member. Suppose those behaviors are completely disjunct. It means that no overlap of properties exists, at all. This raises the question about what counts as minimal information required to connect John’s behavior to the situation.

At the point where John enters the situation even the barest identification is sufficient. The metapattern separately establishes this minimal point. That, and
only that, is John’s signature. But what in the model, then, informs about John’s behavior in a particular context? This is named, as a pendant of context: intext. As Figure 4.5.1 indicates, the model-as-sign is a variable configuration, not of two, but of three concepts: context, signature, and intext.

The repositioning of signature underlines that an identification only minimally ‘stands for’ an object. It provides the barest reference possible, no (other) representation. What really characterizes an object is its behavior. In fact, given a particular situation, that behavior is the situational object.
The articulation of both a sign and objectified reality each into three, rather than two concepts, should be reflected in the model of sign use dynamics. It makes sense to assume that a structural equivalent of situational object and – its – signature is present in the intelligence of the sign user. I choose to call it focus. What results is an ennead, replacing the hexad. This development from six to nine constituting elements is shown in Figure 4.5.2.

The ennead is a powerful interdisciplinary device. It retains the original elements of Peirce's triad as dimensions. Along each dimension, three concepts are now arranged. Compared with two concepts per dimension for the hexad, the ennead allows correspondence in more detail, again including the structural level.

In Voloshinov’s (1929) sense, the only material reality belongs to the sign. Applying the metapattern, from the sign-as-model it is possible to infer more rationally about both the configuration of interpretants and the configuration of reality (with the latter of course inferred from the interpretive structure which the sign mediates through semiosis). Independently from Peirce, Voloshinov remarks about the configuration of interpretants (1929, p 26):

[17] The inner psyche is not analyzable as a thing but can only be understood and interpreted as a sign.

The radical conclusion from the orientation at situational behavior is that an object's identification, its signature, is behaviorally meaningless. The modeler does not have to explicitly include something like an original signature in all her models. Essentially a privileged situation may implied. It serves the only purpose of guaranteeing sameness or, its equivalent, persistent identity across (other) situations. Being a situation in its own right, when included in a model it is represented by a separate context. Made explicit or not, its role is to authenticate an object's identity in other situations by establishing the signature in other contexts.

![Figure 4.5.3. A separate identity context.](image)

This touches upon the reasons why I introduced, in § 4.1, the term signature. A signature itself does not carry information except for leading to an intext as a

17. Voloshinov also publishes about the psychoanalytic theory of Freud.
particular context directs, vice versa. This way, it stands for an object where it exhibits behavior in a situation. Figure 4.5.3 shows the model accordingly expanded.

Literal through the concept of signature, context and intext become concepts that are (more) independent from each other. For how instances of context relate to instances of intext can always change around signatures. This explains the modeling power of the metapattern (Wisse, 2001).

As a consequence of its behavioral emptiness, an object in its identity situation is considered propertyless. No intext therefore appears in the model. Again, an identity serves to preserve an object’s sameness across situations and its corresponding behavioral differences. Conversely, when an object is established in a situation, the modeler must draw its signature from its ‘central’ identity. When that object has not yet been observed in any situation, its identity must be established as a prerequisite for entry in any (other) situation. Obviously, when an object’s existence in the past, present and future is no longer considered relevant in any (other) situation, its otherwise empty identity is also no longer required.

Through lateral connections between signatures, an object’s existence in one situation may be derived from its existence in another situation. As Figure 4.5.4 shows, such relationships are included in the model as curved, broken lines with their arrow pointing at the ‘original’ signature. As a matter of principle, directly or indirectly, a signature is always derived from its identity. As an axiomatic value, the identity’s signature is considered equal to the identity.

![Figure 4.5.4](image)

An object’s continuity across situations: making derivative relationships explicit.

It is too cumbersome to include these fundamental relationships to an object’s central identity in all information models. When they are absent from a particular model, they should be presupposed.

The modeler continues to concentrate on situational behavior. She models situations onto contexts with the purpose of eliminating behavioral duplication. Disjunct behavior defines situations as disjunct.

Initially, for example John as a subscriber and John as a member both
require his address specified in the respective intexts. It probably sounds contrived at first but the additional situation of, say, personship, eliminates the duplication. It is evident John exists as a natural person before he can ever be considered a subscriber and/or a member. Derivations of signature are therefore as shown in Figure 4.5.5. The privileged identity situation is left out for the sake of the model’s compactness; it resides in the background.

There is more to be said about an object’s identification being behaviorally meaningless. And about why the object in its identity situation is essentially propertyless. Especially the name John should not be taken as the individual’s signature, not even where his personship is involved. Rather, any name is better considered a property. The relationships leading from the objects in other situations to personhood, guarantee that John-as-name can be made available there, too.

Figure 4.5.5.
Elimination of duplication in behavior results in situations that are by definition disjunct.

Figure 4.5.6.
An object’s common name as a property in an appropriate situation.

The radical nature of signatures, only serving to connect context to intext, allows the models to be presented more simply. In Figure 4.5.6, John-as-a-name is now a property of an individual, no longer his signature. The same figure also does away with some unusual naming of situations. I have renamed them according to the role the object plays in that particular situation.

In computerized information systems, the ‘machine’ can easily provide a single identification value across the different signature instances for a partic-
ular object. A user may never notice how an object’s sameness is organized through actual information. All he experiences are meaningful situations from his perspective(s) and, within every situation, meaningful properties of any object.

For her next step, the modeler can again choose for abstraction. She then has to include, as in Figure 4.5.7, her idea about the number of objects that may exist within every situation. Text balloons remain because they alert to unfinished modeling. Relationships shown for derivation provide additional information about the number of objects in a situation. As the dotted arrows for example make clear it is impossible for a member to exist without a natural person for its ‘origin.’

![Figure 4.5.7.](image)

Again, moving from object instances to situation-determined types of behavior.

### 4.6 relative configurations

The metapattern’s principles for handling multiple contexts have now been explained. Continuing to apply them, the fictional modeler produces a model introducing magazine and subscription. See Figure 4.6.1.

![Figure 4.6.1.](image)

After mastering the metapattern’s basic technique, models can be elaborated.
A provision is still missing for organizations to subscribe to one or more magazines the same way that persons do while elsewhere maintaining the difference between persons and organizations. The radically minimal notion of identity in reality, and correspondingly of signature in the model, makes for a simple solution. Assuming that a person-as-subscriber is indeed not different from an organization-as-subscriber, the separate situation of subscribership is useful. It ‘contains’ by definition only one kind of behaving object. They are subscribers. How those objects behave in other situations, and whether or not their behaviors elsewhere are different between objects, is of no concern from the perspective of subscribership. Whatever behavioral differences are ‘supported’ by other situations does not matter. What for example is considered a car elsewhere may also entertain a magazine subscription. Why not? to transpose FEYERABEND’s “anything goes” (1975).

To indicate that a choice exists at the level of individual signatures, and how they fundamentally connect to sameness in different situations, in Figure 4.6.2 a pertinent symbol is added to the arrows of derivation.

![Diagram](image.png)

Figure 4.6.2.

Objects with heterogeneous behavior elsewhere are all placed in the same situation when their behavior is homogeneous within that particular situation.

The unorthodox idea of making cars eligible to magazine subscriptions is not shown above. But modeling it is simple enough. Situations eliminate the need for this kind of subtyping. With these particular situations juxtaposed, so are their types. For by definition, situation is the type for all objects behaving in it.18

The modeling case has progressed far enough to emphasize that context, signature, and intext are not fixed categories. Above, it already says that situation is a recursive function of object and relationship. This is actually inferred from the metapattern’s concept of context, i.e., as a recursive function of sig-

nature and relationship. Take, for example, the signature highlighted in Figure 4.6.3 as the point of view.

Figure 4.6.3.
A metapattern-based model invites the sign user to choose focus.

Figure 4.6.4.
Support of different interpretations (also read: sign uses).

It is precisely a signature that supports a focus. The experience of a signature or a point of view is a focus, even. Starting from a particular signature, its context
is the specification of the situation. Its intext is all what specifies behavior of the situational object. Every change of point of view/signature changes the context and the intext, too. The metapattern thus supports a large variety of sign use with compact models. Figure 4.6.4 suggests two different ‘readings’ from the same model. Every interpretation is driven by a focus. It establishes the signature, and subsequently the related context and intext. A different focus results in the experience of a different signature, etcetera. Already a model small in size can yield a rich harvest in semiosis.

Especially from the perspective of structuralism it may be argued that context is not just the narrow definition of a situation. For a situation does not exist in isolation. It exists with other situations. One situation is determined by other situations; similarly, that situation participates in the establishment of other situations. The narrow context, then, is just the linear path leading from the model’s horizon as the overall perspective to the signature in question. And the wide context is everything the model presents except for that particular signature and its intext. This structuralist view of information, emphasizing context, is shown in Figure 4.6.5.

![Figure 4.6.5. Narrow context is linear, wide context is structuralist.](image)

It takes practice to successfully apply the metapattern, including the theory (also read: ontology) it incorporates. For another taste of possibilities, Figure 4.6.6 shows how the modeler may have proceeded with her fictional assignment. She takes up the suggestion that persons need to be registered as members, too. Next, she hears a person can only subscribe to particular magazines in his capacity as a member. Her model is easily adjusted to simultaneously accommodate different situations of subscribership. It should be clear that the model of Figure 4.6.6 also covers organizations receiving a magazine as part of some membership. A subscriber can be either a person, an organization or a member. And a member is either a person or an organization.
Figure 4.6.6.
Modeling a network of unambiguous behaviors.

My description of the metapattern is limited to what is required for the ontological design of this treatise. However, it has more characteristics. For example, from applying the metapattern time receives pervasive treatment. Every node accommodates time. For one thing, it serves to integrate aspects known from data warehousing into operational information systems. Audit trails are also intrinsic. Such features are documented elsewhere (Wisse, 2001).

This chapter outlines the metapattern as a technique for modeling both actual and planned reality in general. Its models abstract from (also read: idealize) any tool construction applying digital information and communication technologies.

The metapattern treats context as a variable within the scope of information models. A key assumption is that an object may exhibit multiple behaviors. Every behavior is unambiguously tied in with a particular situation. With a context representing a situation and signature as an object's barest situational identity, through a number of signature instances a single information model represents an object in multiple contexts.

Another vital assumption is that context is a recursive function. Highly compact models result, yet with large structural and behavioral variety. For underlying the metapattern is the design of combining both situation and context even as recursive functions in an encompassing, interdisciplinary semiotic framework of enneadic dynamics. Constituting the ennead in an irreducible way, its concepts acquire new meanings.

19. On idealized design (Ackoff, 1978), see note 1 in Chapter 1.