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Ontology for interdependency: steps to an ecology of information management

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Abstract:

There's no lack of visionaries referring to the information society. Any vision may be considered a highly abstract design. Often to the dismay of its proponents, a particular vision's credibility, if not outright proof, ultimately depends largely on most practical, mundane engineering. Can it be made to actually work? Is the information infrastructure at all feasible to reliably, readily implement it?
This paper presents as a direction for information management to widen its scope of rigorous relevance. An ontology is sketched for unambiguously capturing limitless behavioral variety. It requires shifting the grounding perspective to interdependency.

Keywords:

Information management, ontology, interdependency, metapattern, behavioral variety, semantics, realism, semiotics, semiotic ennead.

About the author:

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The trend towards ever increasing interconnectivity is unmistakable. Still severely lacking, though, is the recognition in the first place of the need for controlled balance at the emerging global scale of information management. With even an awareness missing, how can such balance ever be achieved? How can especially legitimate demands for security, for authorization, auditability, etcetera be met under qualitatively new conditions of open interconnectivity?
Information management must timely — which is now! — develop from some narrow discipline supporting separate business and government organizations to an essentially interdisciplinary approach covering the whole range of social interaction. A predominantly technical orientation such as interconnectivity doesn't do proper justice to the social variety that needs to be engaged by newly balanced policy, etcetera. What is needed is a framework through which up to an individual citizen's differences are recognized as constitutive for a dynamic open society. Sufficient formalism should guarantee both relevance and rigor. For that purpose, an ontology for interdependency is indispensable.

1.

Distributed information resources can now be instantly, reliably interconnected. It simply follows that such resources should henceforth be treated as interdependent.

2.

Object orientation, on the contrary, is only practically applicable for managing (very) limited information variety. OO is clearly inadequate for information management at the currently exemplary scale of the Internet.
Yet for all practical purposes, the logical conclusion of interdependency — please note, as a practical consequence of open interconnectivity — is still largely ignored, if at all recognized.
So, does it really "simply" follow?
Despite incontestable failures from clinging to OO and related approaches, it appears difficult to leave it behind. Step by step, here a paradigm is outlined with requisite variety for essential interdependency between information resources. In recognition of his ecological orientation, the subtitle of this paper is derived from Gregory Bateson's *Steps to an Ecology of Mind*.

3.

As the label indicates, object orientation implies an ontology with object as its key concept. OO's ontology, or paradigm, holds that a particular object is considered atomic, i.e. every entity is (also read: exists) basically self-contained, autonomous, ìndependent. And when subsequently relationships between such objects are established, their objective independency is assumed to remain intact.

An object's autonomy, or independency, expresses itself through behavior that is intrinsically determined. That is, a particular behavior is always considered a specific object's very own, discretionary property or attribute. In addition, an object's particular properties are seen as generally valid, i.e. regardless of relationships etcetera (which would otherwise detract from its independency postulate).

4.

The difficulty of a genuine paradigm shift may be explained that, in this case, it already takes the perspective of interdependency to recognize limits to independency.
Corollary: A person can only jump over his own shadow when (s)he allows a stronger light from a different direction to illuminate it as a debilitating illusion. Of course, always a new shadow results …

5.

The claim for object independency rests on severely limiting assumptions. When behavior is strictly intrinsically determined, it can be counted upon to be adequately … adequate under correspondingly uniform conditions. Practically speaking with global variety in mind, however, such uniform conditions only pertain locally.

6.

The contradiction of local uniformity with global variety could not manifest itself for OO as long as the practical reach of information technology was still only local, too. What became to be called an application effectively served to secure necessary uniformity for OO's ontological validity.
An application is a declaration of independency. It doesn't work, of course, when being independent has become an illusion.

7.

In an interconnected world, that is, where information and communication technology has developed to the stage where every originally separate, independent locality may be(come) a network node, it seems there are essentially two courses of action.
The first is to try to protect independency. Then, information resources continue to be kept (also read: largely duplicated) under what might look on the surface as independent control. Indeed, OO might still be useful under such conditions of isolated locality (also read, practically: larger-scale redundancy). But then again, already locally, practical variety soon exceeds the limits of uniformity. For even a smallish organization puts information technology to a variety of uses, while requiring a measure of integration, too. Though it might promise control at least for the short term, such

isolationism is not be recommended when a locality is (becoming) undeniably involved with the world at large.

So, the only practical course is to acknowledge interdependency. As it is impossible both to have the cake (remain independent) and to eat it (profit from interdependency), a consistent policy and its subsequent implementation is necessary. Interdependency can mean a large gain, but only when the loss of independency is constructively reckoned with.

Often, a fear of losing independency originates from a misunderstanding. Its loss is believed to lead to dependency. Rather, though, it acknowledges interdependency which is quite different. But, yes, delaying a realistic appraisal of interdependency, and acting accordingly, may indeed lead to increased one-sided dependency (on other actors who've earlier decided to act upon the reality of open interconnectivity and its consequences, including opportunities).

8.

As the concept of ecology should establish, independency in the sense of autarky has of course always been an illusion save for perhaps under the rarest of conditions (and, even then, still dependent on those conditions). Yet, a belief in such independency is popular (and hence difficult to overcome). It therefore requires an existential move, shifting from a belief in independency to one in interdependency.

Decision makers in both private and public organizations in current society seem especially predisposed against quickly adopting, and doing so consistently, the paradigm of interdependency. It explains alienation.

And despite a rhetoric of enterprise application integration, information technology products & services suppliers are equally slow. (Also) commercially understandable as it is for the short term, all such parties are taking longer term risks from missing out on the interdependency movement in information management.

9.

In democratic states, government is mainly concerned with infrastructure for social interaction. Such infrastructure therefore ranges from a legal framework to a traffic system and so on, with interdependency demonstrated for example by regulations for traffic flow.

It might be argued that interdependency of social interaction is the raison d'être of government involvement. Or is it a tautology, even? However, even government institutions are still implementing their programs for electronic government from the now firmly outdated ontology of object independency. It is an ontology all the more entrenched because it operates implicitly, i.e. from an commonly unquestioned background.

Please note, it is an obsolete ontology at the scale which is now be(com)ing determined by open interconnectivity. Governments' costly failures testify to the difficulty of changing to the paradigm of interdependency.
If government doesn't recognize the need for infrastructural requisite variety, … perhaps academics are already more farsighted? No, they seem equally tied up by limiting paradigms. Interdependency of course requires an essentially interdisciplinary attitude. For academic advancement nowadays, putting it mildly there doesn't seem to be a premium on interdisciplinary work.

10.

A history of social interaction shows that, say, infrastructuralization is always a process. Establishing interdependency for information resources certainly is no exception. At this stage, what is also certain is that it happens sooner or later, simply in the wake of open interconnectivity. About the adoption rate it now still seems impossible to make any serious prediction.

11.

I'll proceed to sketch an ontology of interdependency for information resources. I'll do so in my recognizably personal voice.
There is no way that I, or anyone, for that matter, can avoid circular reasoning. It remains to be aware of such bias. Objections must be made when circularity is recognized as too obstructive.

12.

Let me start, in fact just as the alleged independents do, by presuming a particular object to exist. Later on, I'll treat in depth that my concept of the object is different from the conceptualized object itself, which is yet again different from the sign that I apply to communicate that I hold a concept of some object. So, for now I'll abstract from such semiotic irreducibility. Call it naïve realism, or whatever.
Again, (I assume that) there exists this particular object. The immediate departure toward interdependency is to momentarily switch emphasis. When reading a statement such as "The object exists," I no longer believe that whatever existence applies to is a general property of the object alone. Rather, I aim to suggest a different angle by rephrasing the statement as "The object behaves."

13.

This already is the decisive step, the behavioral turn in information management. Please rephrase the sentence yet again, this time as "I behave."

14.

Are you prepared to admit that your behavior is uniform, also say, universally standardized? Is there really no difference between you behaving in one locality from another?

15.

I'll leave such answers entirely to yourself, but for myself I am strongly aware that "I exist" is actually constituted by a multitude of "I behave's."

And how I behave somewhere may even contradict how I behave elsewhere …, if only that such a contradiction (also) takes on a different meaning with interdependency.

A logic rules interdependency, too, but it is a new logic. The old logic of independency, that is, of ontological atomism, is insufficient to explain it. Hence the requirement for a paradigm shift.

Later on, I'll also return to contradictions when the object as subject is introduced formally.

16.

My behavioral plenitude across localities is impossible to resolve from the solitude of an isolated locality. How do I come to exhibit one particular behavior, rather than any other?

The answer already resides in my analysis of the ontology underlying OO. An object's behavior was seen to hold valid for some specific locality, only. Now social psychology has long since recognized behavioral differentiation, with situation as the selective factor. So, I'll drop the term locality in favor of situation.

17.

The next step is to extend to any object the behavioral variety that I've existentially acknowledged for myself. Can I be sure? No! Do I find it plausible? Yes!

For objects without any situationally differentiated behavior, the extension also continues to hold. They fit the overall scheme with just a single situation posited.

In the opposite direction, it could be objected (pun intended) there might be objects whose differential behavior is still insufficiently covered by situational differentiation. Well, so far I haven't been able to think of any such objects. Until such falsification, the ontology deserves to stand as a valid hypothesis.

Anyway, as I will argue later on, situation is one among an irreducible set of relative concepts. It allows for recursiveness, thus covering a potentially infinite situational variety. So, there's ample room to maneuver for interdependency.

18.

I have already commented on the difficulty of substituting one paradigm (also read: ontology) for another. An especially treacherous practice is that of using identical terminology for different paradigms. Indeed, I've been doing exactly that, too, for it can hardly be avoided. And even if it could, re-use of a specific term provides an opportunity to point out what is essential when shifting from one paradigm to another. Here, for a progression of illustrations I've added explanations on changing concepts, even when old terms reappear in the new system for interdependency.
In figure 1.a, there just the familiar old-style, independent object.

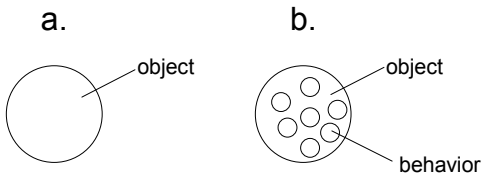

Figure 1: Independent object with its autonomous behaviors.

Figure 1.b distinguishes the object's behavioral repertoire. Please note that those behaviors are all contained inside the object. So, all of figure 1 still reflects independency.

19.

Bringing situation into the behavioral equation might be illustrated as in figure 2.a. However, it is far too abstract. It does not clarify that it is a specific situation that elicits a correspondingly specific behavior by the object.
Figure 2.b includes the correspondence of a specific situation to a specific behavior through the object in question.
In order to let the singular determination of a behavior by a situation come out clearly, figure 2.b necessarily makes sacrifices in several other respects. Of course the object, or at least its relevant part, exists in the particular situation for the corresponding behavior to occur. In turn, that behavior also exists in that same situation (even when it establishes yet another situation). So, when I favor a visualization such as figure 2.b because its makes some essential relationships (more) explicit, I nevertheless hold assumptions to the extent that an object and its behavior somehow reside in some situation (which is depicted in the abstract by figure 2.a).
I'll come to modify this view somewhat after taking departure of the naïve realist approach. Let me add as a generally valid methodological remark that relationships become essential through previous differentiation. So far, situation, object and behavior have been distinguished.

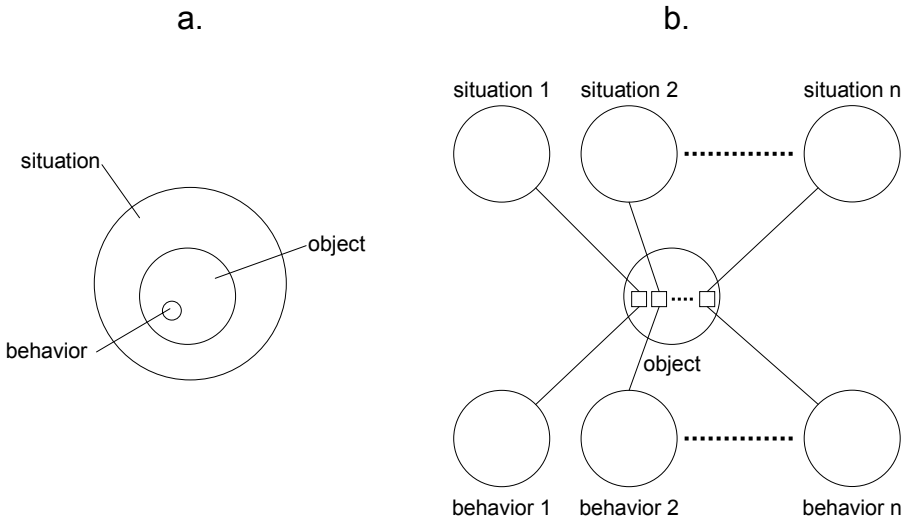

Figure 2: An object's situated behaviors.

20.

It could easily escape attention that the concept of object underwent a significant change from figure 1.a to figure 2.b. I'll dwell on it because precisely that change exemplifies the whole point of interdependency.

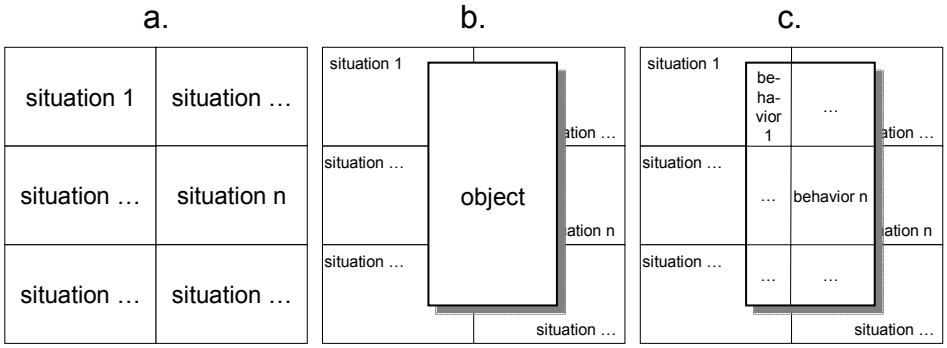

Figure 3: An object as a set of situated behaviors.

Figure 2.b might suggest that relevant situations on the one side, and corresponding behaviors on the other side, all 'lie' outside the specific object I've assumed. However, and continuing to apply such a spatial metaphor, crudely speaking there's at least some overlap where an object partly resides in a particular situation and the situated behavior is partly performed within that object.
Figure 3 is an attempt at visualization. In figure 3.a, a set of situations is presented. Please note that

there's no empty space left between situations. Then, in figure 3.b, an object is projected against the background of situations. Whatever part of that object overlaps with a particular situation, might then be taken for its situated behavior, as in figure 3.c.

21.

What figure 3.c doesn't show is how situated behavior extends an object, in other words, how its behavior may have an effect beyond it. Anyway, establishing distinct boundaries is problematic. Rather than persisting in drawing such boundaries around an object, interdependency argues that they really don't exist with any practical degree of precision. Instead, situations are involved with, included in, etcetera, an object, and therefore so are its behaviors.

Accepting the impossibility of isolating an object from situations and corresponding behaviors, it pays to look closely at the core assumption for interdependency: for an object, situation determines behavior. With the object partly in a situation and partly as its corresponding behavior, the question arises what is left for that object in between situation and behavior? Wouldn't anything belong either to situation, or behavior, after all?

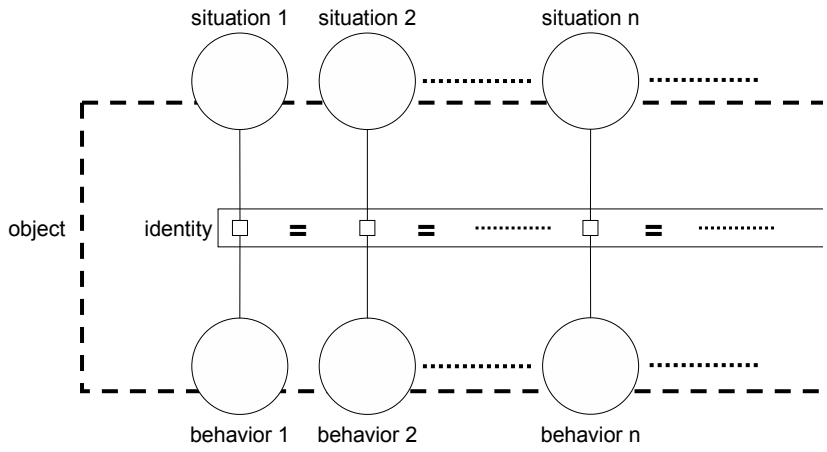

Figure 4: The object's fuzziness is balanced by its identity's precision.

My proposal for making an ontology of interdependency as consistent as possible is to add a radical assumption. An object behaves in different situations, yet I still want to — be able to — consider it as some whole, too. So, what entails the necessary and sufficient condition for connecting an object's situated behaviors? Is should be 'something' that re-appears across situations. As the name suggests, I have developed a concept of identity to connect situational behaviors for interdependency. Figure 2.b is redrawn as figure 4 to reflect the change from independency to interdependency for the concept of object and the interdependent concept of identity.

22.

In an ontology of interdependency the concept of identity is both situationally and behaviorally indeterminate. For (only) its radical minimalism makes it optimally suitable for supporting interdependency. An (arbitrary) identity combined with a situation uniquely determines a behavior for the object.

23.

An interdependent identity is characterized by, say, a singular emptiness in support of the multiple fullness of its object.

As far as such separation of concerns is … concerned, it might be compared to a hinge which allows, by pretending to be neither in any way, a door not to be a wall, vice versa.

An ontology of object independency necessarily struggles with identity, usually identifying object-as-whole with (its) identity. Within a single situation, such identification still makes perfect sense. Across situations, however, it invariably leads to inconsistency.

In an ontology of interdependency, the concept of identity (an arbitrarily chosen link, only) has changed into more or less the opposite of what it means in an ontology of independency (equivalent with object). Interestingly, Justus Buchler didn't yet take this step. Framing an object as a natural complex, he certainly recognized its essential differentiation (calling ordinal what I prefer to call situational). Rather than admitting, due to possible indefinite extension of orders (also read: situations), to the indefinite nature of an overall boundary, Buchler opted for the concept of contour as the object-as-whole. It nonetheless suggests an objective closure which I choose to avoid. Open interdependency requires especially a concept of identity to match.

The requisite variety at the scale of open interdependency is facilitated by radically reduced identities serving to differentiate between situational behaviors for objects, yet allowing for their integration. Identity and difference(s) are thus reconciled.

24.

Precisely how an object overlaps each relevant situation and behavior is no longer a relevant issue. For a particular situation, the object's identity unambiguously connects it to a behavior.

The strict boundary between what is internal to an object, and what is external, dissolves with interdependency. Identity, situation and behavior are all objective.

25.

Surely, though, situations overlap? In the figures so far, specific situations have been presented as disjunct. Is that realistic?

I believe their disjunction, or non-overlap, should indeed be assumed for any object. An object's interdependent nature is emphasized accordingly.

Below, I'll explain how situations, and behaviors, for that matter, can, and at the scale set by open interconnectivity certainly do, overlap in the sense that one larger-scale situation may include one or more smaller-scale situations. Here, though, I'm concerned with one particular object and how 'its' immediate situations are mutually related. (Yes, my added qualification of immediate will also be explained later on.)

Again I take my cue from the perspective of specific behaviors. Then, my requirement for an object's behaviors is that they should be disjunct. When different behaviors for an object continue to exhibit overlap, well, they're not yet really different in the interdependent sense. I find that radically factoring behaviors for an object is realistic.

A specific behavior results from combining the object's identity with a situation. Since the identity is by definition … identical throughout, it follows from different behaviors that they occur in equally different situations.

26.

Different is easily confused with independent. Usually, that's a serious mistake. It might even constitute a particular object that some clearly distinct behaviors yet demonstrate an especially high degree of interdependency.

I repeat, an identity functions as the key to interdependent behaviors for an object across situations.

27.

Radically factored behaviors also suggest a reappraisal of behavioral consistency. The measure of such consistency shrinks from the object as a whole (whatever that is, and thereby from reality as a whole) to the single determining situation.

Within some situation, the question for consistency dissolves. For that situation, the object's behavior exists. To put an additional label on it, behavior is always only positively present on account of its situational specification.

In the very same situation, there is no room for what would traditionally be called such behavior's negation. As it is simply different, another situation accounts for such behavior, and so on.

A situational logic of interdependence is consistently positive. The mechanism of two-valued contrast between an affirmation and its negation is included in infinite-valued situational differentiation. A situation can be tuned to any degree of differential behavior.

28.

It should not come as a surprise that a single object's different behaviors may contradict each other (but of course they don't have to). Here, to call it a conclusion would in fact amount to circular reasoning. For it was recognition of such inconsistency in the first place that led me to reject traditional ontology and subsequently research & develop one more suited for information management in an era of open interconnectivity and thus interdependency. So, the possibility of inconsistent behaviors counts as an assumption. Above, I've merely explained it in some more detail. Many dilemmas of social life can at least be (more) adequately expressed through a framework of possible inconsistency and interdependency.
For example, a person is sentenced to prison for criminal behavior. (S)he may act perfectly law-abidingly in other situations. Yet, being of one body establishes interdependency. A prison term impedes access to situations where the person could have continued to live without transgressive behaviors.

29.

Non-overlapping, that is, disjunct behaviors guarantee for a particular object that relevant situations are also, and correspondingly so, disjunct. I hasten to add a provision, though. Only an object's immediate situations are required to be different, too. What does that constraint imply?

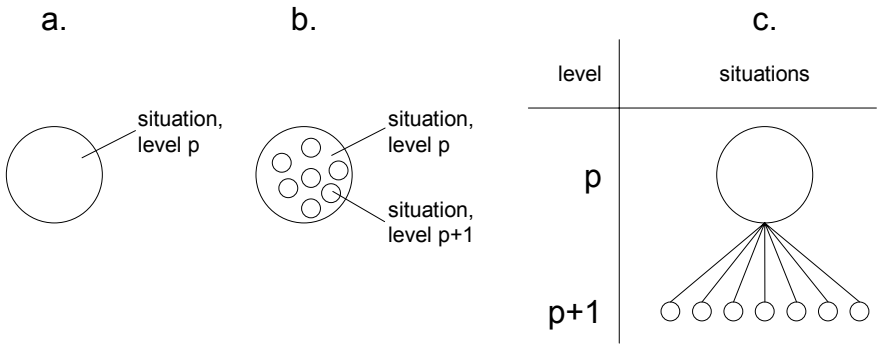

Figure 5: A hierarchical ordering of situations.

Until now I've used the concept of situation as if all situations exist on a single, say, level. Isn't it more realistic (more on modes of realism, later on) to admit some sort of hierarchy? Applying a vertical formalism, a higher situation would encompass one or more lower situations. For so-called levels to appear explicitly, sub-situations are no longer drawn within the confines of the supra-situation (as in figure 5.b), but 'taken out' and positioned below (see figure 5.c).
Please note the correspondence between figures 1.a and 5.a, respectively 1.b and 5.b.

With such different sub-situations alone (called immediate, above), already a necessary and sufficient condition is available in order to combine with an object's identity to arrive at specific behavior. Figure 6 displays the connection for just two sub-situations.

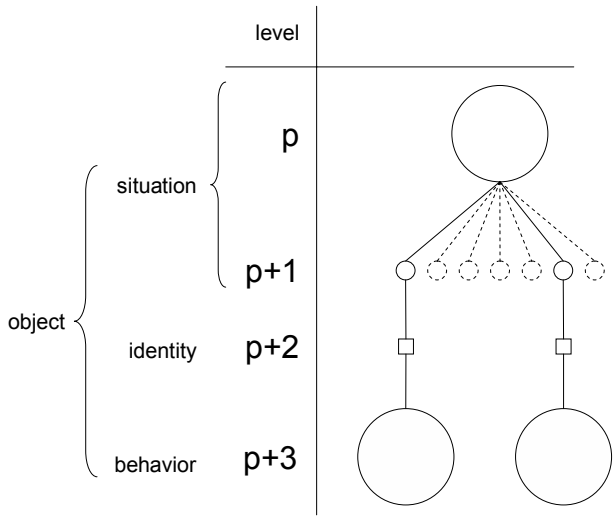

Figure 6: Situational factoring for behavioral differentiation.

30.

The two immediate, sub-situations for the object in figure 6 share a supra-situation as their immediate situation. It most likely is an exception for most objects. It makes an object's overall situations minimally, yet already sufficiently different for directing its differential behaviors.

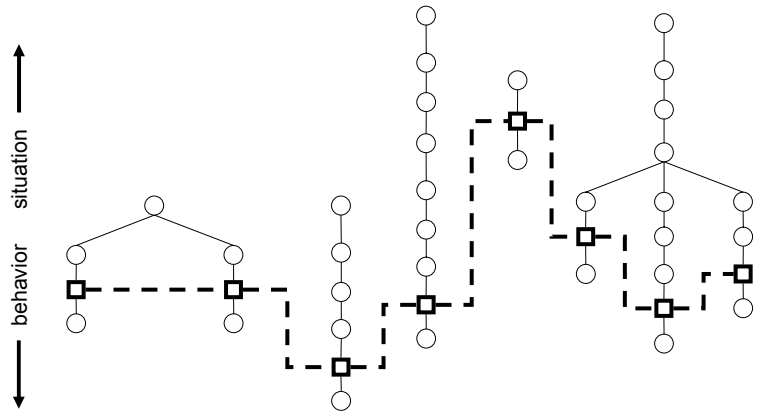

Figure 7: Cohesion regardless of scale.

In fact, the whole point of an ontology of interdependency is that there's absolutely no constraint at all on the distance between situations that are relevant for an object. Given an order for situations, an object's identity can be 'hooked onto' any (partial) situation, regardless of the level of situational decomposition. Figure 7 is an attempt to illustrate how widely dispersed across situations an object's behaviors may be. All occurrences of an identity in figure 7 pertain to one particular object; interdependency is shown by lateral connections between those identity instances.

31.

Figure 7, on the other hand, is too liberal. Despite the label open, interconnectivity does have limits. It is always interconnectivity within a system of connections.
By default the same argument holds for interdependence. It is simply most practical, then, to assume that such a system equals the largest, widest, whatever relevant situation. Simply derived from figure 7, how all lower level situational decompositions are ultimately parts of the single system-level situation is shown as a principle in figure 8.

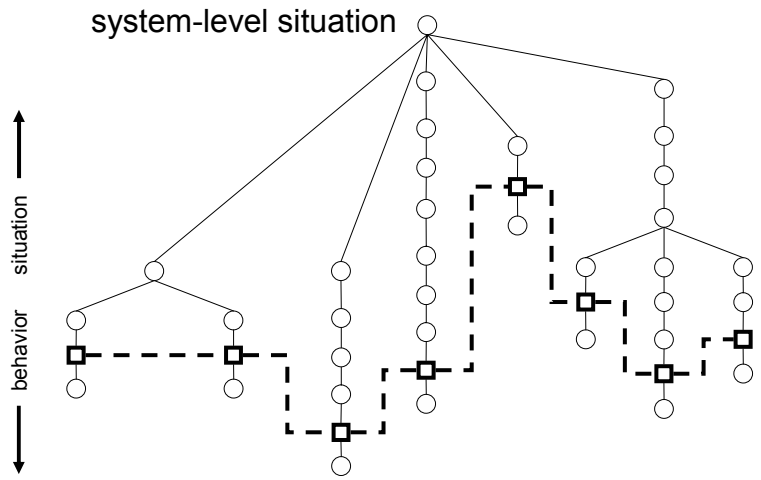

Figure 8: Systematic interdependency.

To avoid (too much) cluttering, and applying an apt metaphor, I've dubbed the system-level situation horizon. In figures that follow, the horizon appears as a thick horizontal line drawn at the top.

32.

The horizon is fixed, that is, a horizon is always believed to exist. What should remain open, though, as the realm of interconnectivity and thus of interdependence changes and most likely increases, is what the horizon encompasses.

More situations may become relevant, how they are optimally decomposed to cater for the behavioral differentiation of objects may change, more objects in the first place, etcetera. In short, the order is essentially variable.
According to an ontology of independence, what needs to be considered for change is always the object as a whole. On the basis of interdependence, unambiguous precision, also known as rigor, is supported. Change is by definition limited to relevant situations with corresponding behaviors.
OO necessarily encapsulates behavior in the object. With interdependence, behavior is radically excapsulated with only — an instance of — identity serving to direct from specific situation to behavior.

33.

Situational variety is not limited to hierarchical decomposition, on the contrary. Any (sub-)situations may be related for establishing an additional situation as required for making an object's different behaviors consistently disjunct.
For example, specific behavior may be attributable to someone (person x) being an employee of a particular organization (y). It requires employee x-at-y to be settled as the immediate situation; see figure 9.

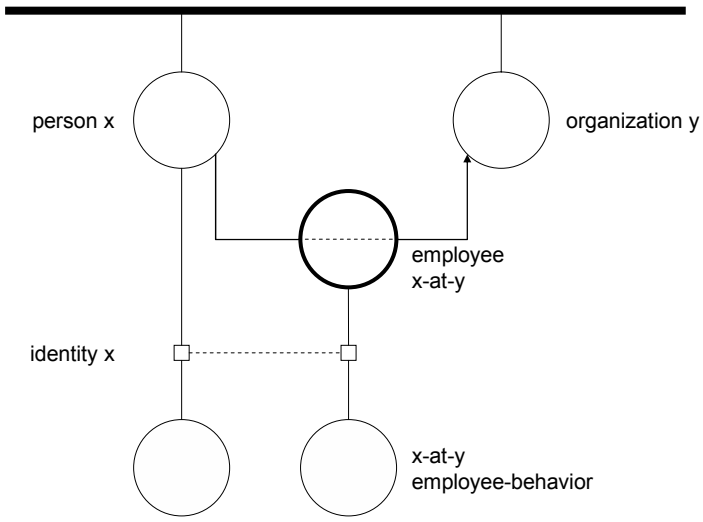

Figure 9: Situational differentiation.

34.

The proof of interdependency lies in behavioral differentiation. The variable superstructure of situations classifies behaviors.

35.

Just as situations may be decomposed, so can behaviors. I've already pointed out the similarities between figures 1 and 5.

Building upon figure 8, figure 10 includes the symbol for horizon and elaborates on the different behaviors of the object in question.

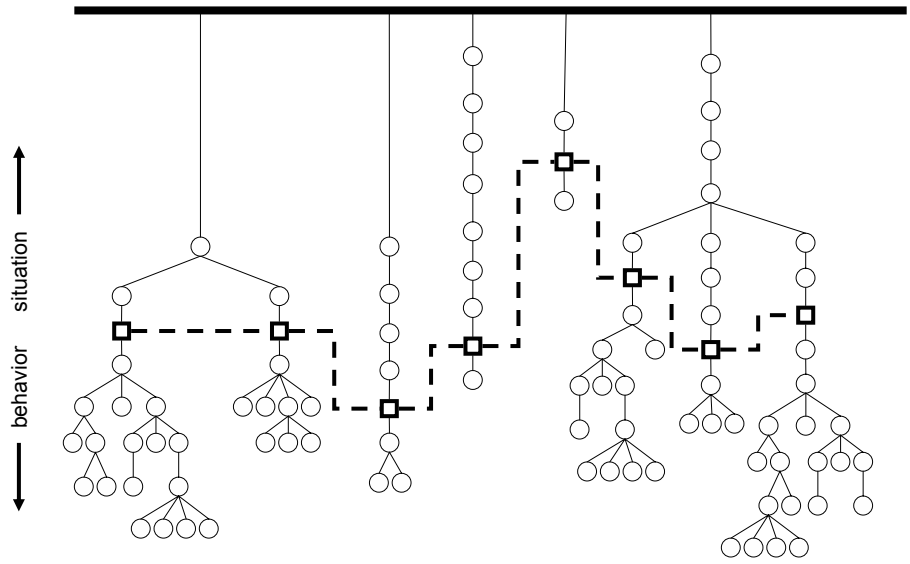

Figure 10: Adding behavioral decomposition.

36.

The next development in interdependency is recognizing that so far I've only dealt with one object's differential behavior.

Decomposition both upward (situation) and downward (behavior) is actually repeating the procedure. When moving perspective upward from a particular object, its immediate situation turns out to be another object. Then, the original object is seen to partially constitute that other object's behavior for what counts, further upward, as its situation. Just as the original object, the other object's behavior is situationally differentiated. So, too, only its identity mediates between situation and behavior. In figure 11, an object's immediate situation has also taken on identity, only. Please note, the two identities displayed in figure 11 stand for different objects.

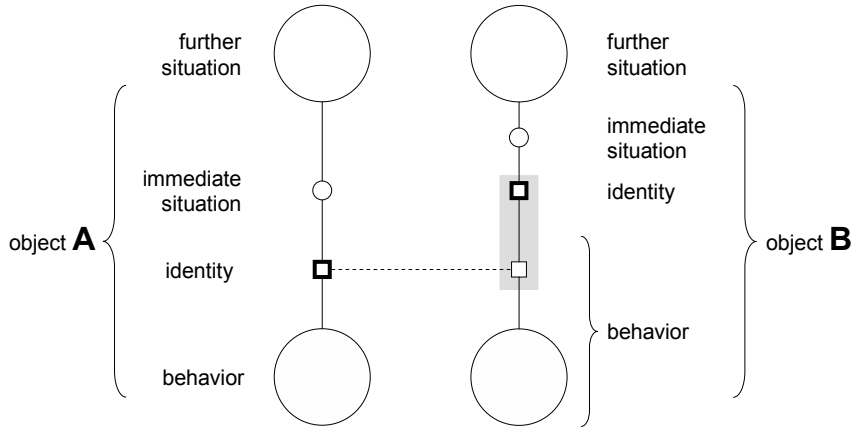

Figure 11: Connecting identities, only, of different objects.

Downward, the same principle applies. What essentially results are networked identity instances. Through recursion, situation, identity and behavior are mutually relative concepts. It always requires an explicit perspective to establish sense. Take some arbitrary set of identity instances configured relative to a horizon, as in figure 12.a.

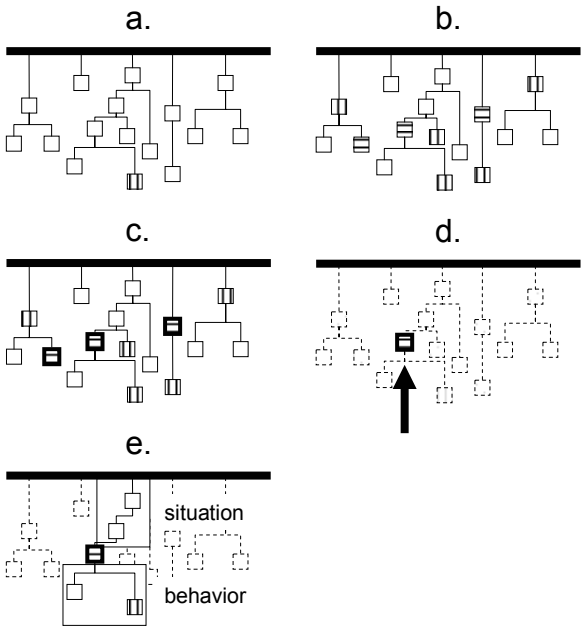

Figure 12: Applying perspective for precision.

Figure 12.b distinguishes between two objects, with characteristic identity instances for each object. Other identity instances have been left indeterminate.
In figure 12.c, identity instances for one of the objects are highlighted. Figure 12.d indicates a

particular perspective. Consequently, in figure 12.e are shown what make up the relevant situation and behavior.

37.

The sustained decomposition of both situation and behavior to the detail of interdependent identity is the practical method for requisite variety at the scale of open interconnectivity.
However, there's more to it. Information management cannot rest content with a naïve realism.
Already more sophisticated is the formal distinction between reality and representation. It is the root of classical semantics.

38.

The term representation is of course heavily biased. My interpretation reads that what is essentially assumed is some real presence. Say, an object. Apparently, though, its presence is evasive, after all. The original object, whatever it may be, therefore requires being re-presented. An unambiguous correspondence is believed to exist between the object as real but beyond reach on the one hand, and its representation within reach.
Classical semantics, then, can be partly seen as the struggle to come to terms (!) with obvious exceptions to the correspondence rule. It has been unsuccessful.

39.

Some of semantics' classical puzzles dissolve when the objective articulation into situation, identity and behavior is also adopted for representation, or sign. Please note that the latter term is already less biased.

40.

Sign is not different from reality at large. It is not even a separate reality. What 'really' happens is that a significant perspective adds a dimension for comprehending reality.
In a naïve realism, there's only the objective dimension which therefore goes unnoticed. With the addition of a significant dimension to reality, the previously single objective dimension of naïve realism changes accordingly to accommodate the two-dimensional framework of semantics. The concepts of object and sign are irreducible.

41.

For irreducibility to hold, articulation along the objective dimension of reality must be accurately matched along reality's significant dimension. My proposal Metapattern for added mutually relative

concepts is: context, signature and intext. Figure 13 outlines the articulated correspondence between dimensions of — the expanded semantic mode of — reality.

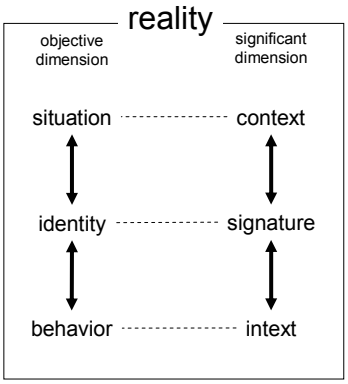

Figure 13: Irreducible concepts along the articulated dimensions for object and sign.

Recognition of variety is of course nothing new. Both context and situation have long since been used to indicate, say, differences of the same. I find those terms have been applied (too) loosely, even adding to confusion when combined as with contextual situation or situational context.
My classification is quite formal, where situation always refers to an objectively taken dimension of reality and context equally consistent as its counterpart from reality as viewed along a significant dimension.

42.

From the vantage point of the articulated semantic mode, what has so far been presented from the perspective of a naïve realism should be reappraised. The objective dimension recedes behind the horizon. All that can be 'seen' lies before it as networked signature instances. A specific signature instance connects some context to an intext, thereby implying the existence of an object's situational behavior. It all depends on the signature instance in question, which provides a significant perspective.

43.

With two dimensions available, both real, a more fundamental way of perspectival change can now be easily explained.
A sign may be considered as an object. It means that its objective nature is taken as a situation with pertinent behavior, too. Of course, also such objective behavior of some sign may be further differentiated, as necessarily reflected by additional contexts and corresponding intexts.
As for some of semantics' classical problems, for example a homonym, or polysemy, simply dissolves

across relevant contexts. However, in order to appreciate resolution through applying articulated dimensions I should emphasize a vital property of signature.
Remember that identity for interdependence has changed into a concept completely empty of situational and/or behavioral specification. Likewise, in keeping with as tight a correspondence between dimensions as imaginable, signature doesn't carry any contextual and/or intextual significance. Now ordinary language's flexibility, that is, its infinite variety of usage, comes from investing signs with context. It therefore makes such 'normal' signs useless as signatures, as their unbiased identification for interdependency is not at all guaranteed. A name, too, should be structurally taken as some object's situational behavior. So, an unambiguous model only results when names, terms, etcetera from regular language(s) appear as intext.
In fact, in terms of old-style entity-attribute-relationship modeling, treating names as attributes rather than entity keys is an especially powerful modeling heuristic. It invites relevant situations being differentiated, helping the modeler well on her, or his, way to adequate support of interdependency for information management.

44.

Improvements of an order of magnitude can already be achieved for information management when the articulated semantic mode for interdependency is systematically applied. It teaches that is it impossible to extrapolate starting from a single application and expect to arrive at requisite variety when an essentially open set of applications should operate in an interconnected fashion. Forget it! Instead, recognize an ontology for interdependence. Then, already existing applications can usually be accommodated, for example by including each as a difference and labeling it accordingly with a particular context. Once it is part of the interdependent infrastructure, such applications are easier to integrate. Essentially, they should lose their isolated character, benefiting from and contributing to interdependence.
I'm afraid such semantic interdependency, perfectly logical as I've made it out, though, may still take long to materialize in information management at an infrastructural scale. Even so, I don't feel deterred to point out that articulated semantics is still too limited for an interdependency that is yet more realistic. I'll now take the necessary step to add another distinction: subject.

45.

Regardless of articulation into dimensions, only distinguishing between object and sign still doesn't yield requisite variety to explain many essential differences. Enter subject.
Simply put, a subject interprets a sign, with the resulting interpretant constituting a belief in an object. This reflects Charles Peirce's classical triad of semiosis.

It could of course be called a semantic perspective, too, now expanded to include subjective differences. Peirce favored pragmatic, because an interpretant didn't just mean something, basta, but as belief it occasioned a corresponding behavior by the subject in question.
So far I've several times laid stress on concepts necessarily being irreducibly related. It really is a strict lesson I want to credit Peirce for (although he himself, at least as far as I can judge, didn't always apply it). What Peirce thus helps to appreciate, is how a concept changes from one system of irreducibility to another. So, when object and sign are interdependent concepts for the semantic mode, for the pragmatic mode this requirement holds for object, sign and subject. Confusion, and often worse as battles between fundamentalists testify, can only result from expecting to hold what, for example, a sign 'means' semantically in an otherwise pragmatic framework (also read, of course: situation).

46.

How I proceeded from naïve realism to semantic realism is a perfectly applicable procedure for taking the step to pragmatic realism. It is exemplified not by two, but three dimensions. Please note that these dimensions correspond to Peirce's original irreducible elements. Once again articulation is made to match, also yielding three concepts along the interpretative dimension of reality. Figure 14 sketches the resulting semiotic ennead, i.e. entertaining nine irreducible concepts.

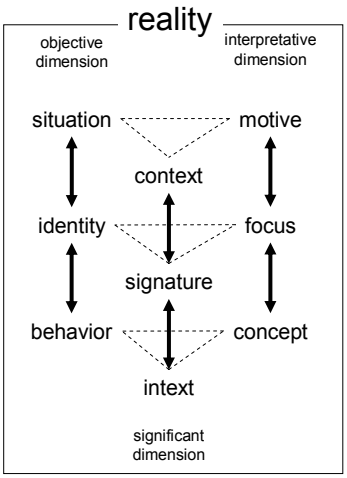

Figure 14: Semiotic ennead for pragmatic realism of interdependence.

The semiotic ennead (on which I've elaborated extensively, elsewhere) represents another big step to an ontology of interdependence. In fact, conceptually it is my final step. I'll conclude with some pointers on how it enables an ecology of information management.

47.

The ennead is formally reflexive, meaning that one of its irreducible concepts is … concept. The expressive apparatus available for a particular concept consists of context, signature and intext for which an appropriate configuration should be modeled.
Variety for information management can now encompass subjective differences, i.e. to be included into interdependency. It requires the shift of perspective where a subject is considered an object. The subject-as-situation allows to further differentiate between her, or his, motives, and so on.

48.

Pointing at the possibility of including such subjective (also read: private) details in an infrastructure of interdependently managed information resources does not mean that I personally believe it is a desirable development. In fact, I don't really know, anyway not at this stage. But I do have a strong sense of direction for information management.

References

Bateson, G., *Steps to an Ecology of Mind*, originally published in 1972, Ballantine, 1983.

Buchler, J., *Metaphysics of Natural Complexes*, originally published 1966, second, expanded edition, K.A. Wallace, A. Marsoobian, and R.S. Corrington (editors), State University of New York Press, 1990.

Buchler, J., editor, *Philosophical writings of Peirce*, Dover, 1955.

Wisse, P.E., *Metapattern: context and time in information models*, Addison-Wesley, 2001.

———, *Semiosis & Sign Exchange: design for a subjective situationism, including conceptual grounds of business information modeling*, Information Dynamics, 2002.