Viewpoints as a paradigm for designing an information system

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Plan
1. Viewpoints : 3 common meanings
2. Semiotic origins of viewpoints
3. Signification process and viewpoints
   - Signification = conception
   - Signification = elicitation

1. Viewpoint : three common meanings
   common meaning 1

Viewpoints :
Position from which one sees better than from another position

Viewpoint ➔
- One thing to be seen: Basque coastline
- Someone who observes this "thing": one of the tourists…

.. who use the little train which leads to the viewpoint

"La Rhune" mountain in the French Basque Country
Viewpoint: common meaning 1

Attracting viewpoint ➔

**Observation conditions**
- fine weather
- binoculars
- ...

1. Viewpoint: three common meanings
   common meaning 2

**Viewpoint** : opinion

**Example**
In a chapter of "Hitchcock" book (1960):

- opinion of
  - Claude Chabrol and Eric Rohmer
  - about "Rear window" picture
  - by Alfred Hitchcock
1. Viewpoint: three common meanings

common meaning 3

At theater
Performance = representation of a play
Meeting place of
• previous Viewpoints
• a designing / production process of one object "performance"

The Viewpoint exists \( \leq \Rightarrow \) other Viewpoints exist
Viewpoint: common meaning 3

As an object, the performance
- is the production of the stage direction process
- acquires "good qualities" iff "good" relations are established between viewpoints

"good qualities" <=> signification

The object performance exists if and only if it acquires a signification
Quality?

Qualities of the object
- Signification = features

Qualities of the process
- Signification process for every actor involved

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2. Semiotic origins of viewpoints

- Semiotics: Study of signs and their signification
- Study of the signification process
  - production,
  - codification
  - communication of signs.
- All types of signs (gesture, sound…) not only words as in semantics

Sign

Entity:
- which signifies something, i.e.
- which represents an information
- for somebody (individual, group, society)

**Linguistic sign (F. de Saussure)**

A **sign** is a 2 faces **relationship** between
- **signifier**: perceptible element – form – expression plan
- **signified**: meaning given to the signifier (is registered in a code) – concept – mental representation of a thing – content plan

**Sign** = **smallest** signification unit

Every sign is defined against the others by **difference** → signs system

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**Linguistic sign**

Example: driving rules

- **signifiers**
  - red, orange and green lights
- **signified**
  - stop, caution, permission

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**Sign for C.S. Peirce**

A **sign** is a sign only if

- there is an agent - interpretant – which understands it as
- an object which carries on information
- for a cognitive agent, i.e. competent enough to
  – interpret it
  – use it according to her / his requirements: needs, wishes or interests

Adapted from Peter Stockinger. Sémiotique In : Dictionnaire encyclopédique de l’information et de la documentation

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**Peirce’s “triad”**

<table>
<thead>
<tr>
<th>Sign</th>
<th>Signifier</th>
<th>Symbol</th>
<th>Expression</th>
<th>Concept</th>
<th>Interpretant</th>
</tr>
</thead>
</table>

A sign **isn’t** the smallest significant unit.

Every thing, every phenomenon, complex or not, may be considered as a **sign**
as soon as it enters a **semiotic process**
Semiotic process (Peirce)

Example: driving rules

- **monadic quality:**
  - « redness »
- **dyadic fact:**
  - The circle 🟢 is red
- **triadic law:**
  - circle + red → stop

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Example • A red piece of paper, viewed as a sample (representamen / expression) of a can of paint (object), only indicates the red colour (interpretant / concept) of this object, the object being supposed known under all its other features (conditioning, material, usage, etc.).

- If the interpret knows it is a can of paint, then – and only then – the sample gives her / him the information "this can of paint must be red".
- The piece of paper
  - expresses the colour of the can of paint is red,
  - does not tell anything about the other features of the object.

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Semiotic process (Peirce)

Example

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- The piece of paper
  - expresses the colour of the can of paint is red,
  - does not tell anything about the other features of the object.
A viewpoint embeds knowledge at stake in the signification process:

- relative to the categories constituted by
  - each "pole"
  - each relation between 2 or several poles
- communicated between actors and other poles during the signification process

### Plan

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### Signification process and viewpoints:

**Signification = conception**

Object: car

Expression $e = \text{nice car}$

Expression $e' = \text{small and blue}$

Actor-designer a

Actor-designer b

Expression by means of natural language

Object: cooperation policy

Expression $e' = \text{"Cooperation implies help"}$

Expression $e = \text{"Cooperation signifies win-win"}$

Expression by means of natural language
Signification process and viewpoints:
Signification = conception

- **Signification process**
  - designing each viewpoint
  - designing the object
    - communication between the actors

- **The object** exists if and only if one of the 2 equivalent conditions is verified:
  - it acquires a signification for each actor
  - each actor exerts a viewpoint on the object

Signification process and viewpoints:
Signification = conception

Signification = conception

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Signification process and viewpoints:
Signification = elicitation

**Signification process**
One actor exerts a viewpoint on an object
- which she / he knows
- which she / he is looking after

**Elicitation** (finding – understanding) the object

**Relations** between
- the actors = organisation
- the concepts = conceptual system
- the expressions = linguistic system
- the situation
- the intermediate objects = system of objects
Viewpoints for Knowledge management

- The viewpoint can embed knowledge related to the object, if this object is already known by the actor, by means of a collateral experiment which takes the form of other viewpoints, always antecedent.
- Viewpoint mapping of existing viewpoint
- Viewpoint management

Atomic versus Generalized viewpoint

Generalized viewpoints take into account:
- several actors with their social organization
- several concepts with their conceptual structure
- several expressions with their linguistic structure
- several objects and their system of objects
- several situations and their structure.

Atomic versus Generalized viewpoint

**Actors:** \( <A, R_A> \), where \( A \) is a set of organizational relations between actors \( a_{i,1}, a_{i,2}, \ldots, a_{i,n} \) that is, \( R_A, a_{i,1}, \ldots, a_{i,n} \) is a set of organizational relations among actors.

**Concepts:** \( <C, R_C> \), where \( C \) is a set of intensional relations between concepts \( c_{i,1}, c_{i,2}, \ldots, c_{i,m} \) that is, \( R_C, c_{i,1}, \ldots, c_{i,m} \) is a set of intensional relations among concepts.

**Expressions:** \( <E, R_E> \), where \( E \) is a set of syntactical relations between expressions \( e_{i,1}, e_{i,2}, \ldots, e_{i,p} \) that is, \( R_E, e_{i,1}, \ldots, e_{i,p} \) is a set of syntactical relations among expressions.

**Objects:** \( <O, R_O> \), where \( O \) is a set of relations between objects \( o_{i,1}, o_{i,2}, \ldots, o_{i,q} \) that is, \( R_O, o_{i,1}, \ldots, o_{i,q} \) is a set of relations among objects.

**Situations:** \( <S, R_S> \), where \( S \) is a set of relations between situations \( s_{i,1}, s_{i,2}, \ldots, s_{i,r} \) that is, \( R_S, s_{i,1}, \ldots, s_{i,r} \) is a set of relations among situations.

where \( i, j, k, l, m, n, p, q, \) and \( r \) are natural numbers.
Atomic versus Generalized viewpoint

General universe of viewpoints:

\[ V_G = \langle A, R_A \rangle, \langle C, R_C \rangle, \langle E, R_E \rangle, \langle O, R_O \rangle, \langle S, R_S \rangle, R_G \rangle \]

A general viewpoint includes the relational structures of each component of a generalized viewpoint:

\[ R_{G,i} (\langle A_i, R_{A_i} \rangle, \langle C_i, R_{C_i} \rangle, \langle E_i, R_{E_i} \rangle, \langle O_i, R_{O_i} \rangle, \langle S_i, R_{S_i} \rangle ) \]