Can Rhetoric help create a European *episteme* of the digital era?
The example of Publication Processing and Analogical semantics

Carole Lipsyc
Paragraphe Laboratory – University of Paris 8
Head of development – Adreva – www.adreva.org
carole.lipsyc@adreva.org

I.   Introduction

Rhetoric and computing have something in common: both are technics that treat information. Of course rhetoric, unlike computing, doesn't treat any kind of data. Rhetoric specializes in producing efficient semantic objects. Thereby, rhetoric could offer an inspiration to solve some challenges that computing faces when treating complex semantic objects and situations. Most particularly, the tools and processes of digital publishing could benefit from the influence and the tradition of rhetoric. Such is indeed the case of *publication processing* and *Analogical semantics*, respectively a *production method* and a *semantic model* for complex digital publishing.

This paper will explore the influence of rhetoric on publication processing and on Analogical semantics, on a descriptive level and on an epistemological level.

On the descriptive level, we'll discover publication processing and its similarities with the Arts of Memory, most especially with the process of *compositio*. We will also compare publication processing, which is information centred, with its alternative, *information architecture*, which is user centred.

On the epistemological level, we'll use the conceptual tool of *symbolic form* to analyse the possible consequences of these two different approaches on our cognition and on our social interactions, i.e. on our *episteme*.

Ultimately, this line of critical analysis will lead us to wonder whether the rhetorical approach to digital publishing and complex digital content could inspire a European way of building the emerging digital society.

II.   Symbolic Form and Intellectual Technology

Symbolic form is a conceptual tool developed within the fields of Philosophy of Art and Philosophy of Culture. It refers to the means and strategies we use to objectify the world. Defined by Ernst Cassirer, this tool can be traced back to the works of Konrad Fiedler[1].

Konrad Fiedler considered that art was a way to get to know the world[2] and that each work of art expressed a unique sensitive intuition about reality[3] [1]. This distinction between the process and the product ultimately led to two different types of symbolic forms: one is phenomenological, the other sociohistorical. [2]

The phenomenological symbolic form has been explored and described by Ernst Cassirer when he explained that each domain of culture (myth, art, science) corresponded to a specific activity of the spirit [3]. This type of symbolic form is centred on the subject: it distinguishes the specificities of the different operations of the mind.

The sociohistorical symbolic, developed by Erwin Panofsky, originally aimed to understand a society through its art, architecture and visual perspective techniques [4]. For Panofsky, these cultural and technical domains revealed the substrate of a civilization, what Foucault would have called the *episteme* [5], which is to say the underlying order that comes into action when we think, we relate, we act, as individuals but also as contemporaries, as a body.

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[1] In the introduction of his fourth unpublished volume on symbolic form, Cassirer pays tribute to Fiedler "who clearly understood the necessity to build the aesthetic system on a foundation that would be more serious in terms of a theory of knowledge." Quoted by Cohn in [1], p.106.

[2] For instance: "Art has and can only have one task which is to take part to the immense work of objectifying the world". Aphorism 57, [1], p.29.

[3] For instance : "The work of art has no idea, it is the idea". Aphorism 77, [1], p.39.

Later on, a similar assumption has been used and developed in the study of technics and most especially in the study of the technics dedicated to knowledge and to memory. McLuhan asserts that the medium is the message [6], Goody that the invention of writing has generated a certain kind of reasoning, a *writing rationality* [7], Eisenstein that printing has made positive science possible [8], Canadian philosopher Feenberg that the future of the human beings is decided as much by the form of our tools as by the action of state men and political movements [9], French philosopher Stiegler that technology constitutes what he calls a pre-individual milieu, an environment that conditions everything else [10] and Carr that Google is making us stupid [11]...

In this second epistemological life, the tool of symbolic form changes its name. It's then called *intellectual technology* [12]. Intellectual technology studies the cognitive processes and the social order, the kind of rationality and the *episteme* that are induced by the technologies of knowledge and memory. Like symbolic form, it can focus on the phenomenological dimension or on the sociohistorical one.

In this study, symbolic form and intellectual technology are used to understand the consequences of the different digital publishing approaches but also to offer guidance in their development. Consequently they have an operating purpose, not only a critical one. They constitute the general background and frame of this reflexion on the digital era and its information technologies.

III.   The digital era, computational rationality and their challenges

A major shift happened in everyday available technologies in the 1980s and 1990s when computing and telematics entered into everyone's life[4]. The conjunction of these two progresses marked the beginning of our digital society. It transformed our everyday life and impacted the way we think, we teach, we learn, we communicate, we relate, we create documents, etc.

French engineer of knowledge Bachimont names this cognitive transformation, *computational rationality* [13]. Computational rationality succeeds to Goody's writing rationality. It can be considered as the phenomenological symbolic form of the digital era.

Computational rationality is forged by the fact that digital content can be fragmented, combined, enriched and transformed in a continuous and unplanned circulation. This particularity results into four factors:

- The arbitrariness of interactivity[5];
- The inflationary, even entropic, profusion of documents and data;
- The existence of different types of participatory authorships that makes it hard to trace the origins, modifications and intentionalities of the content;
- The variable and proteiform use, shaping and display of content according to the different publishing choices available and compatible.

These four factors create a complex informational context and induce three major challenges:
- The emergence of knowledge instead of the production of noise;
- The creation of coherence and of meaning instead of the development of chaos and of senselessness;
- The establishment of what Pragmatics calls *shared meaning*[6], in other words a dialogical capacity, where original intentions are acknowledged and understood, instead of the reign of solipsism where everything is integrated into a self-justified monologue.

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[4] Computing deals with the treatment of information, telematics with its transmission.
[5] The arbitrariness of interactivity relates to the fact that the creator of a digital informational object cannot know beforehand what the user will choose to read, watch or listen.
[6] Shared meaning [*sens commun*] designates the ability to understand correctly what has been expressed thanks to different kinds and levels of norms or topics. [21]

To solve these difficulties, there are two main approaches. The first one is user centred. The second one is information centred.

IV.   The user centred solution to digital complexity

The information centred approach to digital complexity wishes to satisfy the user. Consequently, it aims:

- To keep things simple, effortless and quick;
- To give the user what he is looking for, nothing else and nothing more.

In order to achieve these goals, any impression of complexity must be avoided even if it means to ignore and to erase what could be, and sometimes what should be, complex.

A word has even been created to describe this ability to give the user what he's looking for: *findability* [17]. And another word has been created to express an effortless and intuitive user-experience: *usability* [18].

Findability and usability are the two keys of a successful *user experience*[7]. And a successful user experience is currently the basic requirement for any digital project (websites, mobile apps, software products, browsers, operating systems, platforms, etc.). All the stakeholders of any project expect it: the users, the designers, the owners, the evaluators, etc.

So as to achieve findability, usability and a successful user experience, there are two complementary solutions: *Information Architecture*, the design and structuring of pleasant information spaces, and *data mining*, the automatic quest for the proper information through the use of algorithms[8].

This necessity to keep things simple, intuitive and attractive must be examined in the light of symbolic form. What does it reveal about our relationship to effort and to learning? Can we reduce all stakes to attractiveness, which is to say, ultimately, to success and profit? Is the user centred approach really compatible with literacy and digital literacy? Indeed, can we reasonably expect digital literacy to be spontaneous?

Of course, we could also consider that the question of digital literacy is irrelevant and that we only need to rely on beautiful devices, excellent algorithms and very agile thumbs, that is to say, until we don't even need our thumbs anymore because something easier then writing and typing has been invented.

This effortless vision of accessing knowledge and information might well contribute to what is often denounced as a loss of the attention ability and as a fading of thorough and structured knowledge in favour of a more superficial one, in the digital era. Nevertheless, there is an alternative that could have more positive effects on computational rationality: the information centred approach.

V.   The information centred solution to digital complexity

What matters, in the information centred approach, is to respect the complex nature of digital information and to make the best out of it. The primary purposes of publication processing are not simplicity, findability nor usability but coherence, meaning, shared meaning, relevance, comprehension and traceability.

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[7] The expression « user experience » is usually replaced by a fashionable acronym: UX. This popular nickname reveals the symbolic power given to the concept as well as its scope. It is also interesting to note that the second letter of the acronym is not the initial, as requires the tradition, but the shortcut used in texting to transcribe the entire first syllable, thus inscribing the expression in a culture that doesn't take in account literacy in writing.

[8] Data mining is also connected to what is called *Big data* and *Smart data*, which correspond to the analysis of massive information in order to profile customers, to predict needs and events, to help decision making or problem solving.

In order to achieve these ambitions, it is necessary to prepare the data as soon as it is created or when it is introduced into the information system. In other words, creating content includes creating metadata. Metadata are information about the content, what is also called secondary information. Metadata help contextualize information, trace it, combine it, channel it, use it, find it, cross-reference it, etc.

This treatment of information is what the French school of Documentation science calls *éditorialisation* [19], which is translated here as *publication processing*. Publication processing covers the entire chain of digital publishing. At each step of this production cycle, it resolves the issues due to the main characteristic of digital content that has been mentioned earlier, the potential of fragmentation-combination. Publication processing guarantees that this potential doesn't result in decontextualisation, untraceability, incoherence, etc. It prepares combinations that actually build new coherent media objects. In fact, in this aspect, publication processing is very similar to speech. Though, unlike expression, instead of producing utterances, it produces *media objects*. Publication processing is thus a process of *mediatisation*.

Obviously, publication processing relies on knowledge and requires efforts, even learning and training, both from content creators and from content users. Why? How does publication processing work? What is it exactly?

VI. Overview of publication processing

Publication processing covers the entire chain of production of informational objects, using digital tools to collect, store, prepare and display the content. It includes six phases: metamodeling, modeling, creating, enriching, publishing and performing.

a. Metamodeling
A metamodel is a typical structure of information, an organization that works for all projects because it relies on general epistemic norms. Analogical semantics proposes a metamodel inspired by Pragmatics, rhetoric, cognitive sciences and the Semantic Web. Others can exist. The field of metamodeling is yet open to research.

b. Modeling
When a project is launched, the metamodel must be adapted to fit its needs and subjects. This activity is called *modeling*. Modeling produces *one* specific model that matches one specific project. This model aims to structure and determine the body of data related to the project, i.e. the *content matrix*. In Analogical semantics, this content matrix is called *topos*.

c. Creating
Digital content matrices are composed by rich-media documents that can be specifically created for the project, collected or recycled. They are managed by an information system. In a publication processing approach, these documents need to fit the model's requirements and so does the information system.

d. Enriching
When the documents enter the information system, when they are added to the matrix, they are enriched by metadata and by links. The metadata classify and tag the documents in order to organize them accordingly to the model ant to the information system. The links create new knowledge, they are abductive and heuristic.

Analogical semantics has determined rules for linking documents that are based on rhetoric and on cognitive sciences. These rules assure that the links rely on cognitive reasoning processes shared by everyone and not on subjective and personal associations [20]. These links can be considered as *rhetorical figures*. A rhetorical figure, like for example metaphor or irony, can be defined as what creates a secondary meaning that is added to the first and literal one [24].

The science of connecting data is, like metamodeling, an interesting and new field of research[9].

e. Publishing

Well indexed and linked, the content can be easily and coherently be combined in order to be displayed. Different apparatuses can then be conceived: sites, apps, non-digital solutions such as books, speeches, exhibitions, etc. During this phase, and only then, information architecture is necessary in order to build attractive and efficient display apparatuses.

a. Performing

At last, when the publication processing cycle is completed, the content is available to the user[10]. Among all publishing options that could have been displayed or have been displayed, among all combinatory possibilities offered by the interactive platforms that have possibly been designed, the user performs one single path and has one single experience.

Nevertheless, thanks to the whole modelled process, his experience is meaningful[11]. It is also faithful to the intentionalities of all mediatisation agents.

The mediatisation agents are all the persons who have contributed to the publication processing cycle. Each one of them has actually expressed a certain intentionality, which bears significance. Publication processing guarantees that these intentionalities are not lost, that they can be acknowledged, used, interpreted and even questioned.
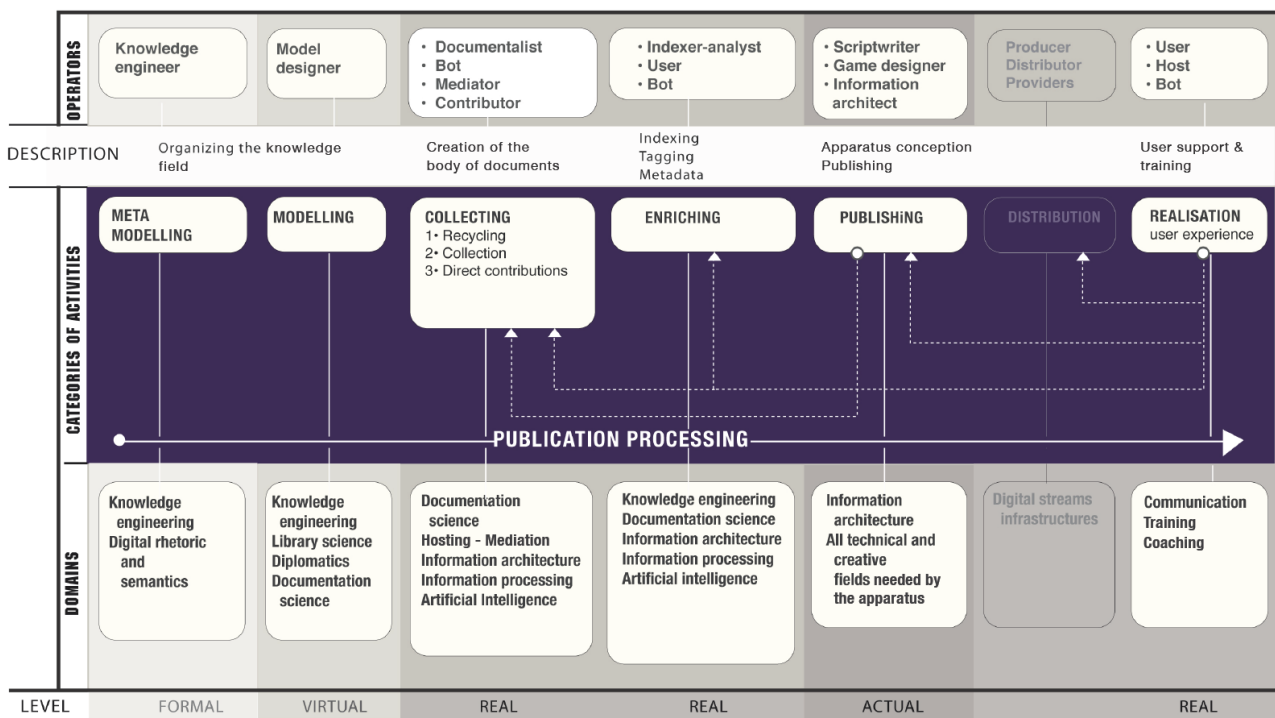
The cycle of publication processing [27]

VII. Rhetoric and publication processing

a. Metamodeling and digital rhetoric

At the first phase of publication processing, metamodeling, can be considered as an activity that belongs to the field of *digital rhetoric*. A metamodel indeed offers what could be considered as a

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[9] This field of research could even extend to Artificial Intelligence.
[10] The process is not as linear as it seems as the user can in fact intervene at any phase of publication processing. S/he can contribute to modeling, creating, enriching and publishing through cooperative actions.
[11] Actually, in science, a *model* is a guarantee. It assures that a set of rules will lead to certain results. [20]

rhetorical vision of how digital content matrices should be organized in order to be exploited at the fullest of their ability. It is a formal epistemic knowledge that provides optimal solutions, just like the Art of Rhetoric does.

In Analogical semantics, the metamodel follows a framework designed in Pragmatics by Georges-Elia Sarfati and, more precisely in what he has called the General Topic of Communication [21]. A *topic*, in this context, refers to a set of norms that allows shared meaning.

Topic level	Social	Configurational	Discursive	Generic	Textual
Linguistic context: Speech process – General Topic of Communication (Sarfati)					
Description	Normative possibilities of a language	Norms of a field of practice	Norms of the common knowledge of a specific group	Conditions of an utterance	Utterance
Digital content context: Mediatisation process (Analogical semantics)					
Description	Semantic and documentary norms Standard documentary structures	Norms and standards of a given information field or knowledge field	Needs and practices of a group of persons or of a project	An apparatus and its structuration	User performance
Activity	Metamodeling	Modeling		Publishing	Interactive reception
Epistemological level	**Formal:** epistemic structuring	**Virtual:** the information that can exist within a given frame and purpose		**Actual:** the information as it is made available by an apparatus	**Real:** the information as it has been combined by a user, in a definite state

Speech and Mediatisation [27]

b. Publication processing and the Arts of Memory

Besides this similarity between metamodeling and rhetoric, publication processing can be considered, at each of its six phases, as the digital equivalent to the Arts of Memory.

Digital content matrices, or *topos*[12] as they are called in Analogical semantics, are actually the equivalent of memory palaces. Memory palaces were mental spaces where rhetoricians kept their knowledge and ideas [22]. Like memory palaces digital topos store, in an organized way, argumentations, documents, texts, all kind of content, in order to provide them when needed, in an appropriate way.

On the epistemological level, memory palaces and digital topos are both virtual objects because they are constituted of information which is not yet final and manifested, which is still, as Bergson suggests it, out of reach.

The French philosopher describes indeed virtuality as a distance between a body and a danger requiring an action. As long as the danger is out of reach, the action is virtual. When the danger happens, when there is no distance left, the action is real. As such, "the real action passes and the virtual action lasts" [14]. This metaphor allows us to understand how virtuality designates a state, out of space and time, when an object or a situation is not yet manifested but already exists. It can still take *many* forms, but not *any* form. It is unknown but not undetermined nor undefined.

As there are rules to build memory palaces, there are also rules to build digital topos. As we have already stressed it, in publication processing, these rules correspond to the metamodel.

The specific memory palace built by one person, following the rules of the Arts of Memory, corresponds to the specific model built by a knowledge engineer for one project, according to the

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[12] When used in Analogical semantics, the greek plural form of *topoi* does not apply.

metamodel. During this modeling phase, the engineer determines, defines, prototypes categories just like the rhetorician created specific places in his palace, the famous *topoi* or *loci*, and designed paths called *itinerari.*

The collecting phase happens then, just the same way in both the Arts of Memory and publication processing: content can be created or recycled.

In both domains, the content then needs to be prepared. The rhetorician chooses a *locus* to keep it and an *imagen* to symbolize it. Similarly, the publication processing agent chooses the proper categories to mark it and then enriches it with all necessary secondary information and decides to link it with other existing data.

Actually, this phase is very important. It determines the future interpretation, combinatory use and findability of the content. Indeed, the significance of digital content is as much determined by the content itself as it is by its mark-ups and links. If this step is skipped, if it is poorly of wrongly executed, future meaning and coherence will be altered. Proper metadata are the key to the significance of digital content. They are part of its rhetoric.

Furthermore, the publishing phase in publication processing is the equivalent of *compositio* in the Arts of Memory. *Compositio* designated the creation of a speech, preach, or document with the argumentations and texts that were stored in the memory palace [23]. First, the rhetorician needed to meditate to choose its subject and to determine his perspective. This phase was called *cogitatio*. In the same way, in publication processing, the publisher of a specific informational project must decide what will be published, according to which specific subject(s), for which audience, displayed on which platforms, etc.

In *compositio*, after *cogitatio* came *inventio*. *Inventio* was a hunt. The rhetorician had to find in his palace the proper information that matched his purpose. Mary Carruthers stresses that two things were very helpful to find the proper information: the structure of the palace (*loci* and *itinerari) and* the emotional power of the *imagenes* [23].

In his hunt for the proper data, the digital publisher can rely on two equivalents: the structure of the model and the emotional and heuristic power of the links, on condition that the links rely on solid motivations and are really rhetorical figures, as is the case in Analogical semantics.

After *inventio*, came *formalization*. All the hunted elements had to be assembled. Often, memory palace practitioners used determined patterns to operate the formalization phase. These patterns were really precise. They were designed as maps or schemes. They were called *dispositione*.

In publication processing, this is the work of information architecture. We could say that the information architect designs *dispositione* that display properly and efficiently the content. Indeed, information architecture isn't put asides in publication processing; it is given a specific role at a very precise moment. It exists, it is necessary, but it is not all encompassing.

Finally, both in *compositio* and in publication processing, the polishing and embellishing phase takes place.

On an epistemological level, the phase of *compositio* corresponds to the moment when the virtual object that was out of reach, because it was stored in one's memory or in an information system, comes into reach [14], because all conditions are now present to display it. This phase is called *actualization*. The virtual object is now *actual* [15]. It is no longer virtual, out of reach, and it is not yet real, performed, passed, fixed, in contact. It is *at reach*.

At the end, when the speech is released by the rhetorician or performed by the user, the object is *real*: it takes form and it exists as it is. And, this is the last phase of the mediatisation process, in both domains.

Hence, in *compositio* and in publication processing, there are four epistemological phases:
1. The formal level (the metamodel, the rhetorical rules),
2. The virtual level (the memory palace, the digital topos),
3. The actual level (the *dispositio*, the display apparatus)
4. The real level (the creation of the rhetorician, the realization of the user).

In sum, we can conclude that both operational and epistemological processes are similar in the Arts of Memory and in publication processing.

Arts of Memory	Publication processing
Operational process	
Rhetorical general principles	Metamodel
Memory Palace	Digital Topos
Topoi/Loci	Topical categories
Elements transformation into *imagenes* Elements location in the *loci*	Tagging – Indexing - Linking
Compositio	Publishing
Cogitatio	Editorial & publishing choices
Invention (hunt) • based on *loci* and *itinerari* • based on the emotional power of the *imagenes*	Selection – Data-mining • based on the structure of the digital topos • based on the emotional power of the analogical links (rhetorical figures)
Dispositio	Information Architecture
Polishing, embellishing, producing	
Epistemological process	
1. Formal knowledge (rhetorical rules, metamodel) ⇨ 2. Virtual object (memory palace, digital topos) ⇨ 3. Actual devices (*dispositio*, apparatus) ⇨ 4. Real information objects (rhetorician's creation/user's performance)	

This common operational and epistemological construction between publication processing and the Arts of memory does not exist in the user centred approach of digital informational.

Indeed, the user centred approach doesn't take into account the virtual object. It doesn't even acknowledge its existence. In fact, information architecture only deals with apparatuses, with the actual level. And data mining only deals with informational matter, with the real level.

VIII.   Symbolic forms of the user centred and the information centred approaches

Based on these epistemological elements, we can now try to understand the symbolic forms of the two different approaches of digital content.

The user centred approach refuses complexity, promotes effortlessness, satisfaction of the user, in all matters, including knowledge acquisition. It focuses all attention on the individual. It ignores the virtual object and concentrates on the interactions with the actual objet (the apparatus) and on the production of the real object (data mining).

This is very close to what Jean Piaget has called the sensorimotor stage of cognitive development. At this stage, the child has not yet developed the ability to represent the objects and the spatial environment. He is trapped in a string of detached and meaningless interactions with things. He is still in a kind of solipsist state [25].

Besides, Jean Piaget has also stated that when the environment changes, humans – as a species-need to accommodate. They need to shift, collectively, their cognitive abilities and processes [26].

Thus we can make the assumption that the user centred approach corresponds to an early stage of accommodation to the new digital environment we are living in. Indeed, this environment is quite different from the phenomenological milieu we have been inhabiting so far. Constituted by information, displayed by medias, generated by mathematics, it is, as Bachelard states it, *phenomenotechnical*. This phenomenotechnical environment does not follow the natural rules of the phenomenological environment and it does not take any solid and stable form[13]. It is virtual and its objects are virtual.

But, to become a mature society, which means, people living together, not only self-centred individuals but responsible persons having a dialogical ability, to be able to deal with complexity, to really acknowledge the digital environment and its virtual objects, we need to go beyond the sensorimotor stage, beyond the user centred approach. We need publication processing and rhetoric.

IX.   Conclusion

Nevertheless, is-it plausible to develop, alongside the dominant user centred approach, which keeps us in an underdeveloped cognitive state, an information centred approach, which favours cognitive maturity and social dialogue? Indeed two major obstacles exist:

- The user centred approach is the mainstream paradigm in academics, in business, in *doxa*, in funding, in the evaluation criteria of committees and buyers, in the making of law, most particularly in the making of the Intellectual Property laws;
- The information centred approach is hard work and users just don't want it.

To overcome these obstacles, it is necessary to use information architecture so as to build more attractive and acceptable information centred technologies. Yet, it won't be sufficient. Above all, political decisions are needed in two areas: research and development funding policies and digital literacy policies.

Such decisions are possible if and only if there is an acknowledgement of the importance to create technologies of knowledge and of memory that are beneficial to the development of our cognition and to our common social existence, and not only technologies that are attractive and profitable. All doesn't sum up to return on investment when it comes to building a society, its reasoning patterns, its cognitive abilities, and its models of interactions between individuals. Return on investment is not only financial. The design of technologies can also integrate an ethical dimension.

An ethical design of technologies rests upon understanding symbolic forms. It chooses not to witness and observe what computational rationality gets to be but also to influence it consciously and willingly.

This choice to engage in an ethical design of the digital technologies of memory and of knowledge could define a *European way* of developing digital technologies. First of all, because Europe is the original breeding ground of rhetoric and rhetoric would be a corner stone of this ethical design.

Secondly, because Europe needs to create business alternatives where the Americans are not yet the leaders and where European companies can be. The user centred approach has indeed been developed by emblematic American companies such as Apple (information architecture) and

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[13] In Analogical semantics, this phenomenotechnical environment, manifested through the media, generated by mathematics and generating an editorial space is called the *digimedia environment.* [20]

Google (data mining). It is also well promoted by American structures such as the Information Architecture Institute.

Finally, because Europeans have a tradition of valuing education, culture and literacy. And, undeniably, ethical digital technologies of knowledge will require ambitious educative policies and actions. They don't rely on spontaneity and intuition, they require a knowledge that would be the equivalent to what grammar has been to writing and rhetoric to expression, they require literacy.

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