Digital studies:
Issues of organology for individuation
in collaborative practices

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The research program of IRI (Institut de recherche et d'innovation) is deliberately focused on *Digital Studies*, which intends to goes beyond the current term *Digital Humanities*, as the issue is not primarily to equip the human and social sciences with digital tools but to study and design situations in which digital technologies profoundly modify the epistemology of disciplines and skills. More precisely, our approach is focused on a general organology[1] – including the technological, social and cultural – in the digital context. If the map plays an important role in geographic knowledge or the floor plan in an architectural way of thinking, or furthermore if the evolution of books (from analog to digital printing) directly influences literature, what will be the influence of the digital organology of the Web on all our knowledge?

Our approach is both theoretical and practical. We wish to tackle these epistemic issues while adapting and designing new *organons.* For the purpose of this action-research we identified four topics: 1) the figure of *the amateur* in the current context of the economy of contribution, 2) the organization of metadata, 3) the new industrial context for collaborative and contributive knowledge diffusion, and finally 4) the body and gesture intelligence in perceptive loops that are currently largely bypassed by digital organology.

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The organology we focus on, in the philosophical perspective of Gilbert Simondon,[2] is related to *transindividuation*[3] tools, as Bernard Stiegler calls them, which are studied and developed at IRI. Today this kind of organology is mainly represented by the Web, in a context where knowledge, including knowledge that is issued from our larger cultural heritage, is now largely digitized. Yet the Web as we know it is still polarized between the Semantic Web (or "Web of data") and the Social Web (or "web of exchanges"). More precisely, the Web is still built like an information space (dominated by companies like Google) and a conversation space (the Facebook model). Beyond the current dominance of *conversation*, how to study and encourage the development of a web of *contribution,* as attested to by large platforms like Flickr or YouTube, and a web of *collaboration,* as exemplified by Wikipedia, for supporting psychic and collective individuation[4], is the purpose of our research.

1 – Space and time in the individuation process

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[1] From *organon* (tool in Greek), organology studies the psychic, artificial and social tools, which evolve within their mutual dependencies (http://www.arsindustrialis.org/glossary).

[2] SIMONDON Gilbert, *L'individuation psychique et collective,* Préface de B. Stiegler, Aubier, 2007

[3] STIEGLER Bernard, *Etats de choc : Bêtise et savoir au XXIème siècle,* Mille et une nuits, 2012

[4] *Ibid*. 2

New contributive practices are widely developing in all sectors like energy, transport, food and even banking (i.e the Bitcoin project) and now are becoming the basis of a new economy. In this new context, it may be useful to analyze what belongs to conversation, contribution, and collaboration[5], three indivisible individuation processes very much related to the figure of the amateur.

In the context of the Web, although audiovisual material is becoming dominant (80% of resources in 2010 and probably more of the total percentage of practice), reading/writing texts is still the privileged vector of knowledge and consequently of individuation. With the rising success of video-based education web sites such as the Khan academy, one can argue that this situation is shifting. Yet we would like to show in this article that this shift is conditioned by profound organological mutations, which, in the audiovisual domain, are still to come. Access to texts has been considered in our modern history as a purely individual practice, sometimes intimate and preserved from the collective, although historically, through religious, theatrical, or poetic practices, access to texts used to be primarily a collective activity. Today, the Web is bringing reading back to a mostly collective practice if we consider the rising role of the automatic "reading" performed by search engines, which resell to humans their own reading practices.[6] This very organology, mainly performed by one body, Google to name it, is profoundly linking individual and collective reading. Google's crawling algorithms are becoming powerful transindividuation tools for the better and for the worse like all *pharmaka*[7]. What about writing? Just as in reading, we inherit a long tradition of individual writing, also at the basis of the preserved figure of the author and consequently of copyright. However, collective writing has always been practiced, from copyist monks up to the Diderot Encyclopedia and contemporary legal text projects. Again, if we consider industrial literature or, even more widely, automatically written pages, collective writing is the vast majority of current web. Yet if we look at writing performed by humans, the organology for collective individuation (or transindividuation[8]) is still limited to re-writing, text splitting practices, and with the advent of word processors, to text modification monitoring and multi-user text annotation. The advent of social networks has not yet fully changed the way we could *collectively* write. By "*collectively,*" I mean in fact reducing the delay between each successive individual writing in a group to an acceptable cognitive level (slow enough to know and control who is writing what). Here we directly face an organological but also cognitive issues and this can be illustrated in experiments we have performed at IRI with EtherPad (Fig. 1), where we observed that collective individuation is not a mere extension of psychic individuation or its replacement. Even with a high level of speed in a real-time context, the individual cannot be "solved" by the collective, just as musicians playing together in perfect harmony keep their roles in the collective production even if we, as spectators, are lured away and may perceive only one group of musicians or one orchestra.

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[5] Conversation is meant as the dominant mode of interaction on current social networks (i.e SMS, chats, walls, …). Contribution refers to the upload of documents. Collaboration means in this context a focus on collaborative document editing.

[6] GIFFARD Alain, STIEGLER Bernard, FAURÉ Christian, *Pour en finir avec la mécroissance,* Flammarion, 2009

[7] *pharmakon*, in ancient Greek both means poison, remedy and scapegoat, Ibid 1

[8] Stiegler's concept derived from Simondon to point out individual/collective individuation mutual influences mediated by techniques and technologies, Ibid 1
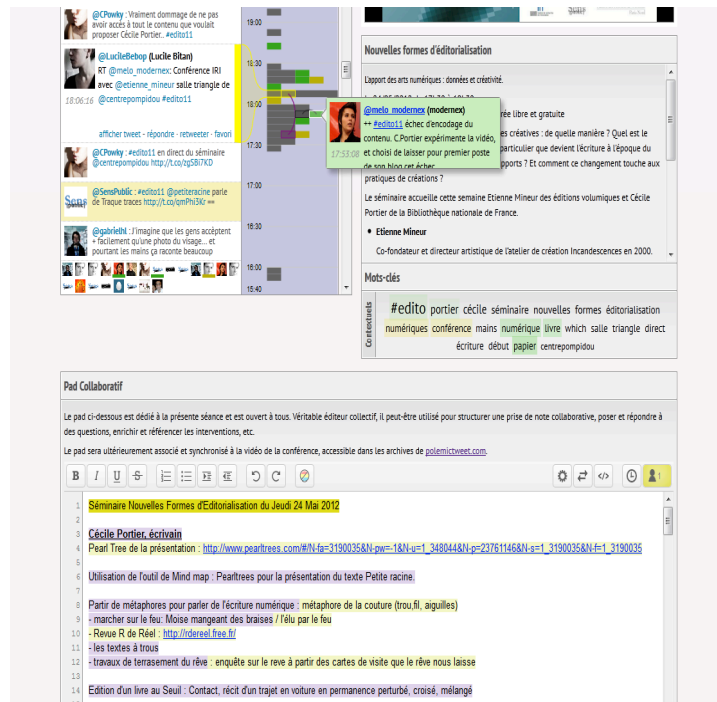
Fig. 1: Real-time collective comment of a conference using EtherPad

In the audiovisual domain, unlike texts, transindividuation organology, still orients towards communication and contribution, and not so much towards collaboration. Indeed, major audiovisual web platforms like Flickr, YouTube, and Dailymotion are in fact not yet fitted for collective writing if we take for granted the "90-9-1" rule where 1% of YouTube users are contributors, 9% are annotators/raters, and 90% are only viewers. This observation of social practice is quite conditioned by the digital organology, not to mention the fact that tools are mainly oriented towards browsing, rating, or commenting of videos with minimal space and incentives for annotation, tagging, and – above all – sharing (done currently through Facebook although Google's YouTube now recommends Google+ as an alternative competitor). Curiously enough, these video uploads and even social sharing tools often hide a high degree of isolation and individualism in social practices (individualism is to be read here as the opposite of individuation). Audiovisual collective writing tools are still rare on the Web, firstly because collective practice in this domain lacks references in the physical world, secondly because temporal objects (which we have studied for a long time at IRI) are still not easily indexable and consequently shared and manipulated, and thirdly because the current dominant social networks favors textual conversation but not yet audiovisual interaction in perfect synchronization with video playback.[9] Among other philosophical issues, these are some of the key points of the Social Web project we are currently conducting at IRI.[10]

If we try to relate collective individuation with upcoming transindividuation tools dealing with temporal objects, it may be worth looking at the current writing tools in Wikipedia. Although mainly textual at the moment, the collective writing tools in place may be inspiring because they managed to deeply integrate the three individuation modalities we are interested in: *conversation* (which seem to go on for sometimes endless intervals before a single word may be added to a page), *contribution* (which unfortunately often relies on only one contributor) and *collaboration* (with an intelligent yet somehow too complex process for

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[9] Changes could be coming from Microsoft in their new social network (SOCL) if they manage to integrate well with Skype, which they recently bought

[10] HUI Yuk, HALPIN Harry, *Collective Individuation: The Future of the Social Web* (à paraître dans "*Unlike Us*" Reader, ed. G. Lovink, Institute of Network Cultures, 2012)

proposing changes and validating them). If we look more closely, the better the correlation between these three modalities is established, the better the conditions for collective individuation are in place. In our view, this correlation relates to certain important organological issues: 1) the "unit of meaning",[11] the discussed part of a document, that conditions very differently collective individuation depending on whether the unit is one page, one paragraph, a film, or a video segment, 2) the writing (or annotation) tool which is, even in video, still very close to the metaphor of an annotation in a book margin,[12] 3) the visualization of collective activity, in which the ability to recognize individual contributions is a key motivational factor (even if the contributions are anonymous) and where representation of contribution in time, space, and semantics are also strong issues in Wikipedia and more generally in the CHI (Computer-Human Interaction) community.[13] Even the most powerful research of Google partly failed to find the right level of integration between these modalities in the Google Wave project where conversation, contribution, and collaboration did not match properly (Fig. 2). One can guess new attempts to find the right balance within a social network like Google+ will arrive soon. HUI Yuk, HALPIN Harry, *Collective Individuation: The Future of the Social Web* (à paraître dans "*Unlike Us*" Reader, ed. G. Lovink, Institute of Network Cultures, 2012)
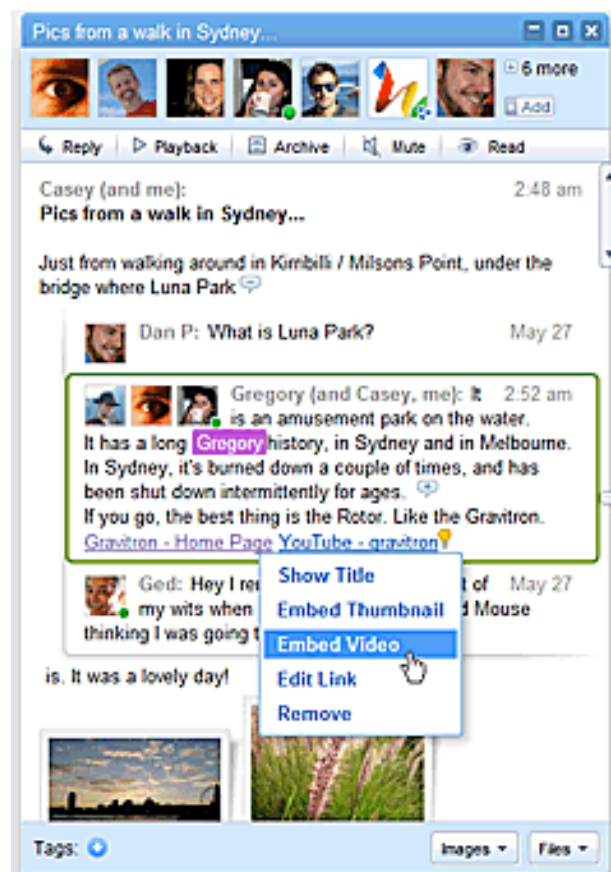

Fig. 2: Video insert of a text collectively written in real-time in GoogleWave

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[11] See the concept of *unité de sens* and *grammatisation* in STIEGLER B. *Time and technics, The fault of Epimetheus*, Palo Alto, Stanford University Press. Also *Ibid.* 1

[12] See Co-ment from SopinSpace, company created by Philippe Aigrain (http://www.sopinspace.com/)

[13] HURON Samuel, VUILLEMOT Romain, FEKETE Jean-Daniel, *Towards Visual sedimentation,* VisWeek 2012

2 – Organology of metadata

Another major organological issue is related to metadata, since metadata is the hidden basis of collaborative spaces and conditions the level of confidence of users in their navigation of data. Proper metadata relates to what users perceive as truth and trust in a digital environment[14] and has a considerable impact on the creation and development of digital communities. Metadata conditions tools, rules, interfaces, vocabulary, and creates what Scott Lash describes as an "atmosphere," which refers to the architectural thought of Peter Sloterdijk. Furthermore, one can argue that today in the digital context, metadata is also building communities of amateurs, just as in the past a given amateur practice was related to a given organology. From the engraving techniques promoted in the XVIIIth century by Baron de Caylus up to the Super8 camera for amateur film makers, the "amateur 2.0" is today developing its own metadata and fighting to find the right balance between exposition and control over them. Artists have been probably the first to realize the importance of metadata and to develop the interest to play with metadata in their productions. An excellent example was given in an installation by George Legrady, commissioned by Centre Pompidou in 2001, where visitors were invited to take a picture of one of their favorite objects and to add metadata selected by the artist with the ability to adjust the weight of each item of metadata. This capturing of interest via metadata relied on the fact that the exhibition capture interface was identical to the search interface on the web,[15] creating a very coherent organology for "writing" and "reading" (Fig. 3-4). Similarly, many amateur web sites are now built around a central production organology, not to mention *Machinima* web sites gathering large communities of video-game builders with a simple interface for production[16] or more recently the initiative proposed by Studio Broceliande for collaborative cartoon design[17] (Fig 5).
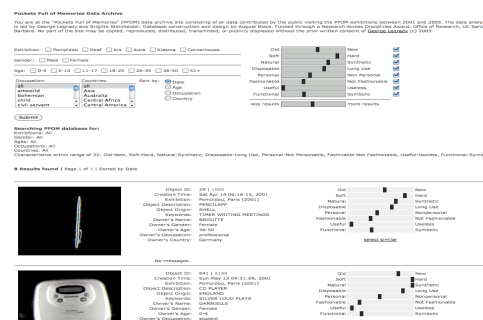

Fig. 3: Legrady capturing interface

Fig.4: Web search interface

Fig.5: Interface for collaborative cartoon design

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[14] STIEGLER Bernard (sous la dir. de-), *Confiance, croyance, crédit dans les mondes industriels*, IRI/Fyp Editions, 2012

[15] *Pockets full of memory* (http://www.mat.ucsb.edu/g.legrady/glWeb/Projects/pfom/Pfom.html)

[16] http://www.machinima.com/

[17] http://www.portailthd.fr/tribes/tribe/MESSANN/

In the rising context of economy of contribution, the momentum of amateurs generates a lot of non-controlled (or bottom-up) metadata also called *folksonomies*. Bridging this bottom-up metadata with top-down metadata (taxonomies) is a key issue of efficient collaborative tools for amateurs and more generally in the context of open or contributive science, which is what we have described previously as *digital studies*. In this context, IRI is conducting several experiments with historians, sociologists, and cinema critics, by designing organologies that question the epistemology of their disciplines. This is the case within CineCast,[18] a project on collaborative practices in cinema initiated by IRI where public film libraries like French National Library, Cinémathèque française, Forum des images, BPI, Ina, and also private companies like Allo Ciné, VodKaster and UniversCiné try to stimulate new practices like film annotation (Fig. 6), film mashup, (Fig. 7) and "on demand" cinema.

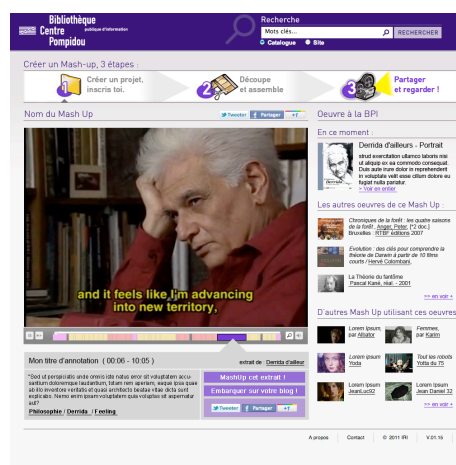*Fig. 6: Film annotation on AlloCiné*

Fig. 7: Film mashup at BPI

Beneath these transindividuation tools we are trying to implement new metadata models for a better convergence between (top-down) taxonomies and (bottom-up) folksonomies. For instance, we currently are working on ontologies dynamically built by tagging using formalisms like Nice Tag.[19] Such tagging systems should not impose too many constraints on users while delivering more information on the intentionality and the semantic context of a tag based on social systems manipulated by users themselves. A key point is the ability of such systems to visualize networks of meaning to be edited manually, for instance in the form of a "mind map" (Fig. 8).

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[18] http://www.cinecast.fr
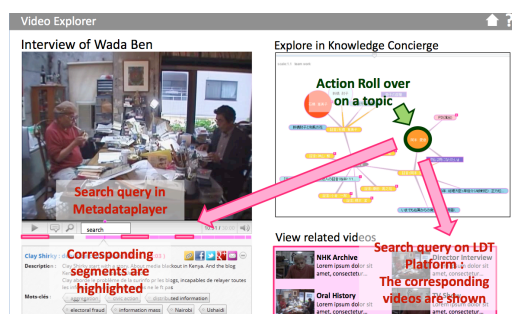
[19] MONNIN Alexandre, LIMPENS Freddy, GANDON Fabien, LANIADO David, Speech acts meet tagging: NiceTag ontology. In Proceedings of the 6th International Conference on Semantic Systems and the 5th International Conference on Pragmatic Web, 2010

Fig. 8: Visualization and edition of mind maps connecting film tags and annotations and related video segments (Hyperplateau project, IRI-Hitachi Systems-Un. of Tokyo, 2011-2012)

3 – Collaborative knowledge technologies and ecology of attention

In order to study the organology of transindividuation, a third criteria that is important to us, is the ability of digital systems to articulate different attentional regimes within a new articulation of both synchronous and asynchronous processes of contribution. As presented by the Google Wave model, the synchronous approach as influenced by the model of chat, tends to prioritize conversation and consequently disperse attention or hyper-attention rather than encourage sustained deep attention[20] as accomplished by Google Doc (the collaborative editing of a text in a quasi-synchronous mode). In the audiovisual domain, this issue of the articulation of attention is more recent but quite critical with the advent of Twitter and *SocialTV,* the latter being fitted with "second screens" dedicated to metadata and contribution. What is at stake in this context is the ability to synchronize two different temporal flows, one of broadcast media and another of the contributions to this media. Thus we would like to give three illustrations of how synchronous and asynchronous processes may be articulated.

The use of collaborative tools such as "Ligne de temps" highlights the difficulty in reading comments that do not have a consistent approach regarding the regime of attention. It has been particularly observed in a workshop on collaborative annotation of the film "Entre les murs" conducted in collaboration with researchers from Institut Mines-Télécom[21], IRI and teachers (Fig. 9). Faced with the same"retention and protention" program, participants used the tool in different ways, generating a juxtaposition of points of view of a very different nature, of which the synthesizing tool (rendering tool)'s could have created a hypertext, a "mashup" or a mind map in order to support a reader's attention.
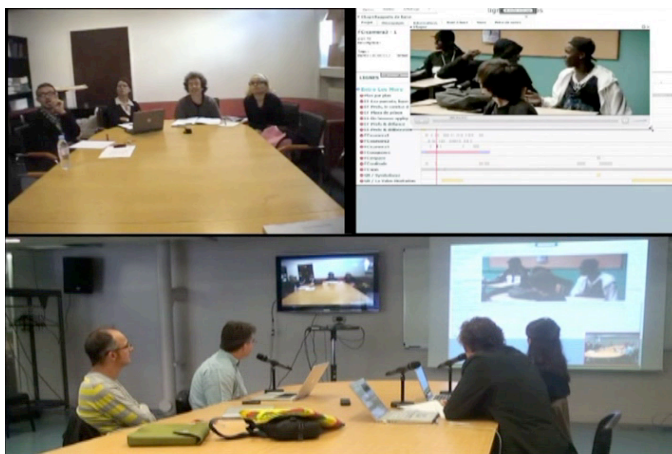

Fig 9 : Live Collaborative annotation collaborative with Skype and Lignes de temps

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[20] HAYLES Katherine, *Hyper and Deep Attention: The Generational Divide in Cognitive Modes*, Professor 2008 (http://media08.wordpress.com/2008/01/17/my-article-on-hyper-and-deep-attention/)

[21] BEAUDOIN Valérie, FOURNOUT Olivier (Institut Mines-Télécom), FERRARESE Estelle (Strasbourg University). *Annoter un film à plusieurs : retour sur une nouvelle forme d'expérience de la critique*

An extreme example of real-time articulation of two synchronous flows is given by a Japanese equivalent of YouTube called *Nikoniko Douga.* This collaborative video platform is turned in to a forum for free expression on films by the massive use of tagging in real-time via a context where the data (the film) is hidden by the metadata (the tags). Using specific vocabularies like onomatopoeia, the system is mutated into an intermediate form between "graffiti style" tagging, collective video gaming, and real-time chat. When the tags are carefully produced in synchronization with the film, this definitely produces a new form of collective individuation for both anonymous or identified participants (Fig. 10).
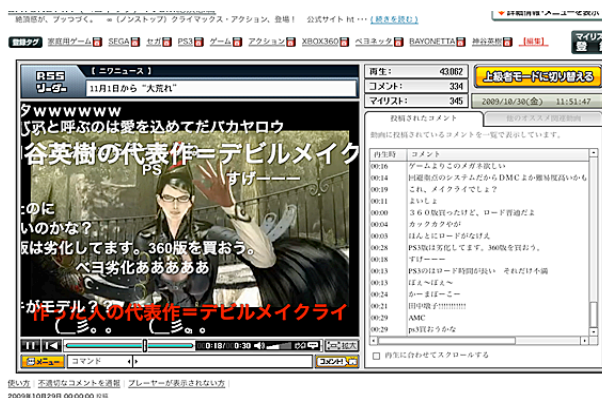

Fig. 10: Real-time tagging in Nikoniko Douga ("w" is the first letter of "Waraï", which means a "smile/laugh" in Japanese)

Although the web is becoming increasingly audiovisual, textual contribution is still dominant as proven by the success of Twitter. However "vocal" contribution may be the next step as soon as automatic transcript or automatic metadata extraction from speech-to-text will become reliable in most languages. The *VoiceThread* application (Fig. 11) engages users to produce voice-over comments upon videos and consequently inherits and extends the tradition of amateur family films, and so is a good example of natural asynchronous contribution.
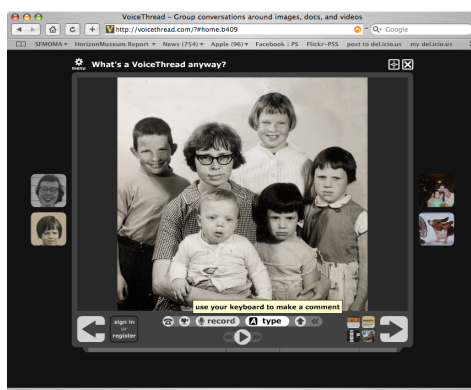

Fig. 11: Vocal annotation on family films in VoiceThread

Our third illustration of the issue of attention ecology may be found within the rising context of SocialTV where several contribution systems on the *second screen* are proposed,[22] mostly based and supported by Twitter practices and data visualizations. Indeed, in November 2009, IRI first experimented synchronizing tweets with conference video

recordings (Fig. 12). In 2010, the *polemictweet* application[23] was designed in order to stimulate engaged comments by using a simple syntax for human-based *sentiment analysis,* if we dare to use this term that we are now so devoted to in the scientific community. Signs such as --, ++, ==, ?? express opposition (displayed in red), adhesion (in green), bringing a reference (in yellow) or asking a question (in blue). This information produced by humans is much more reliable than that extracted by machines using linguistic technologies.
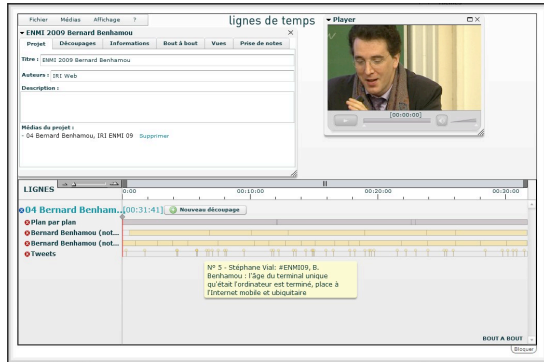

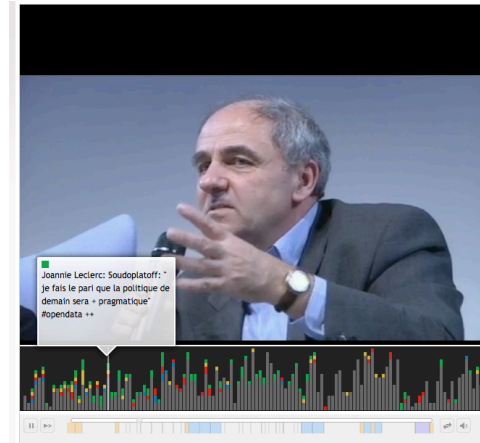**Fig. 12: Indexing video with tweets in Lignes de temps (2009)**

Fig. 13: Navigation in opinions (colors) using Polemictweet

This opinion collection system opens a lot of possibilities not only for data representation but also for knowledge editing and publishing, which is our main interest in relation to epistemic issues. Again interfaces must be designed according to the ecology of attention both for real-time synchronous contribution like with the polemictweet interface (Fig. 1) and in an asynchronous context as shown previously with the mashup (Fig. 7) and mindmap interfaces (Fig. 8). In a synchronous context, the visibility of individual contributions is particularly crucial,[24] while in asynchronous situations like with mashup and mindmap, the activity is in most cases natively based on individual contributions.

4 – Sensory-motor loops and individuation

This last issue is related to the necessary loop between perception and action (or between reading and writing) in the individuation process. As research in cognitive science and enaction[25] has demonstrated, following Von Uexküll (1920) and Varela (1999), the body plays an important role in the process of perception through "sensory-motor" loops of action. Indeed, perception is highly dependent on our capacity to embody, play, and reproduce what we perceive. As understanding music comes through our capacity to play it (even if it is just by singing the melody in our head or by beating in time with the melody with our foot) and understanding a painting largely relies on our ability to paint, consequently it is important to recover these feedback loops in the digital context, precisely where these loops have been largely short-circuited.[26] This is possible by using the metaphors of adaptive dynamics and by designing systems with now affordable tactile interfaces (Tablets, Kinects, Wii,…). This has been the goal of an IRI project started with Thierry de Mey in 2007 on gestural perception of

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[23] http://polemictweet.com, developed at IRI by S. Huron, Y-M. Haussonne and R. Velt

[24] http://dev.fabelier.org/bubble-t/ and the bubble-TV application experimented with France Télévisions

[25] STEWART John, GAPENNE Olivier, DI PAOLO Ezequiel A., *Enaction, Toward a new paradigm for cognitive science*, MIT Press, 2010

[26] In the GoogleArt project (http://www.googleartproject.com/) high definition gives access to the perception of textures (brush, grains) but with no links to the tools that have been used to produce them.

dance films. Thierry's first experience in this domain comes from his music composition *Musique de table* (Fig. 14), for which he designed a gestural score to be interpreted by percussionists. We extended this vocabulary to canonical gestures and motions analyzed by Thierry in his own film *One flat thing, reproduced,* a film about William Forsythe's choreography.
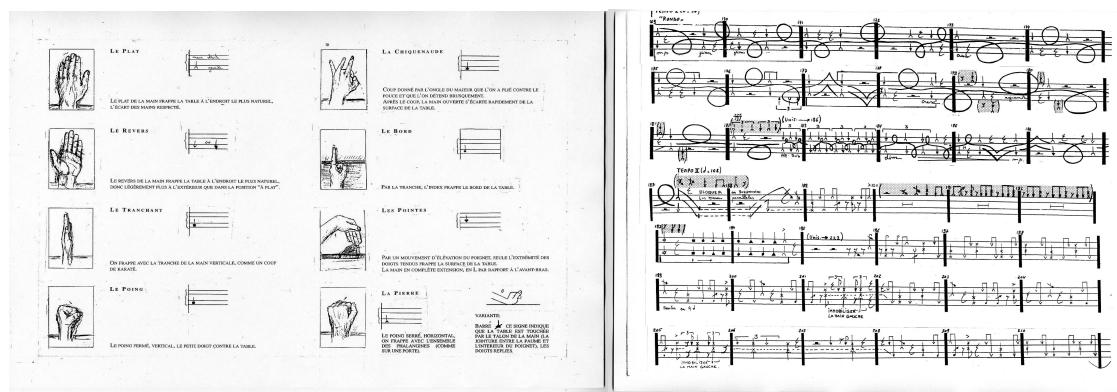

Fig. 14: Gestural score of Musique de table, Thierry de Mey, 1987

These graphical transcripts of the motions of dancers have been adapted first for a large tactile interface[27] and recently for the Kinect.[28] Our first experiment showed it was natural to tag dance films not only using text or voice (as exemplified before) but also with gesture. While sensory-motor loops were easily perceived in an individual situation, we also tried to explore collective individuation by designing a system accessible to four players around the table (Fig. 15). Indeed collaboration strategies appear when players exchange their tags (by simple drag and drop from one screen to another) and decide to split the tagging task amongst themselves. In our second experiment, the system was adapted for gestures captured by a non-contact interface (Kinect) that attempts to navigate dance films by dancing. Although some interactions created satisfactory sensory-motor loops, the system still need improvements and does not allow gestural annotation. This project strikes us regarding the standardization and industrial control over our gestures, extending the current debate over the protection of personal data to our body traces, making organology a political issue.

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[27] http://www.microsoft.com/surface/   and   http://www.iri.centrepompidou.fr/experimentations/fingersdance-2/?lang=en_us

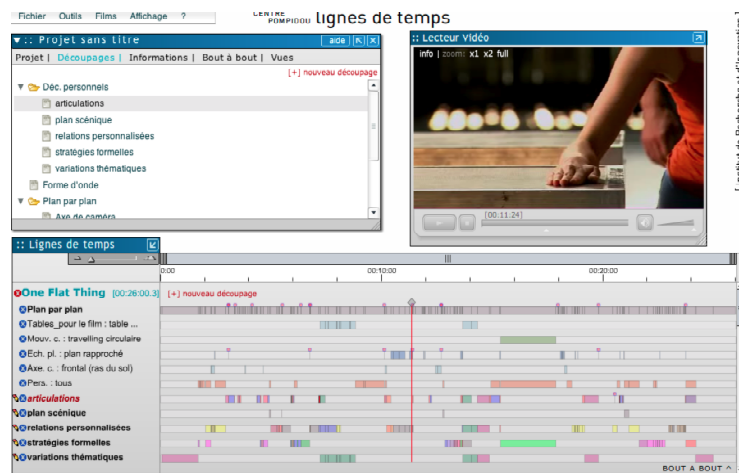[28] http://www.iri.centrepompidou.fr/evenement/browse-by-motion/
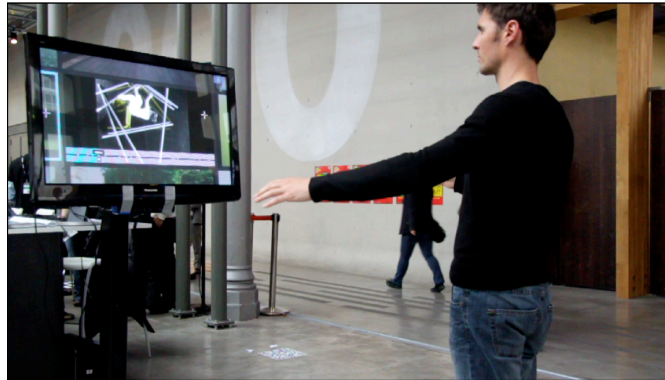
Fig. 15.1: Gesture analysis in Lignes de temps

Fig. 15.2 et 15.3 : Gesture analysis in Lignes de temps, Gestural collaborative tagging on Surface (dec 2009), Browse by motion (Futur en Seine festival, June 2012)

5 – Conclusion

The four issues we tried to illustrate regarding a new organology for individuation are still quite theoretical for many researchers in the Digital Humanities: the effect of space and time on individuation, metadata, the ecology of attention, and sensory-motor loops. However, several papers recently focused attention on the influence of the organology of the Web on knowledge under the influence of what Sylvain Auroux[29] called a "revolution of grammatisation", which has been illustrated by Yuk Hui within the organology of Web standards (from HTML to Web ontologies) where the level of abstraction is linked to the capacity to support relations which consequently makes a digital object meaningful within such a relational network[30]. Another organological issue raised in the same volume of *Metaphilosophy* is the impact of "time and space" of the Web on attention[31], issues tackled in the first and third sections of this article. The issue of metadata, discussed in our second section, is also highlighted by Thomas W. Simpson with the epistemic role of search engines and their cognitive performances in term of *timeliness* (the time necessary to find relevant information)[32]. This attempt to draw relations between organology and collective individuation is perhaps even more clear in Paul R. Smart's article where Smart details features that currently are lacking on the Web to support "cognitive extension" in the *Web of data* such as format independence, filtered representation, semantic enrichment (social enrichment is not mentioned) and even sensory-motor interfaces (p. 457-458)[33]. In conclusion, the categorization proposed earlier under the terms communication, contribution and collaboration is an other attempt to qualify the collective individuation process with identified (but not limited) features that are attached to the current organology of the Web. It is our belief that this organology deeply affects epistemic issues in all disciplines of knowledge and should stimulate more research in what we propose to be called *Digital Studies*.

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[29] AUROUX Sylvain (sous la dir. de-), *Histoire des idées linguistiques, t. 2 : Le développement de la grammaire occidentale,* Liège : Mardaga, 1992

[30] HUI Yuk, *What is a digital object?,* Metaphilosophy, volume 43, number 4, July 2012

[31] VAFOPOULOS Michalis, *Being, Space and Time on the Web*, *Ibid*. 28

[32] SIMPSON Thomas W., *Evaluating Google as an epistemic tool*, *Ibid*. 28

[33] SMART Paul R., *The Web extended mind*, *Ibid*. 28