

Twenty years after, do we have other definitions of cooperation, coordination and collective activities in the new world of digital culture?

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The Coop group and the Coop conferences

- In the early 90's the COOP group was devoted to the understanding and design of man-machine cooperation, the machine being both a partner in dialogues and a mediator
- Researchers of the COOP group were marked by a vision which was simultaneously cognitive (group problem-solving), oriented towards work setting (design and supervision of processes) and open to the formalization of coordination mechanisms (multi-agent modeling or workflow).
- The encounter with the emerging European CSCW community had been an opportunity for the COOP group to open up to new definitions of cooperation rather well described in the seminal paper by L. Bannon and K. Schmidt (1989).
- During these twenty years other paradigms for the analysis of collective activities and the design informational artifacts have gradually made a place.

Twenty years of evolutions

- The analysis of collective activities opened on diverse theories such as situated cognition, distributed cognition, theories of the actor network, ethno-methodological approaches, theory of trajectories and social worlds, etc.
- Informational artifacts were increasingly apprehended as mobile devices, communities oriented platforms, web 2.0 environments, documents for action, mediated communication devices or more abstractly as boundary objects.
- But ultimately, the fundamental concepts of CSCW have they really changed during these years? The profound evolutions of the economic environment and the widespread diffusion of the digital culture have they transformed the foundations of CSCW researches? In this intervention we shall discuss these central issues

Issues

- Do we have enough invested in the concept of cooperation compared to that of coordination that still tends to be so central in several conceptual frameworks?
- Does our vision of work take sufficiently into account the current emerging socio-economic paradigms compared to those which were dominant in the Fordist period?
- Is not our vision of informational artifacts excessively focused on the coordination function at the expense of other equally essential functions?
- Our difficulties in understanding the changes induced by the generalization of digital culture, including the private sphere, are not they the consequence of this analysis in terms of coordination?
- Our approaches of design currently split between the approaches devoted to the customers and those oriented towards work environments are not they themselves prisoner of these restrictive interpretations?

Work and cooperation in terms of cooperative transactions

Classical CSCW definition of cooperation

- « Cooperative work is constituted by the interdependence of multiple actors, who, in their individual activities, in changing the state of their individual field of work, also change the state of the field of work of others and who thus interact through changing the state of a common field work. ” (Schmidt & Simone 1996)
- The cooperative work is essentially defined by the output produced in common by actor engaged in individual activities.
- To reduce the complexity of cooperative work one must complete a work of articulation to produce coordination mechanisms; computerized or not computerized, highly or weakly formalized -> the purpose of CSCW is to design such coordination mechanisms

Another transactional definition of cooperation based on pragmatism

Pragmatist epistemology (Dewey, Mead, Pierce, etc.)

- The transactional approach:
- Unlike an interactional relationship, a transactional relationship is a relationship in which the related elements are being constituted or mutually transformed by each other (Steiner)
- “Society not only continues to exist by transmission, by communication, but it may fairly be said to exist in transmission, in communication” (Dewey) – [see also the “constitutive paradigm” in communication studies promoted by the Montreal School]

What kind of collective activities correspond to cooperation?

- Authentic cooperation is a transaction and not just a routine interaction
- We have different kind of collective action: some of them are deliberately coordinated (coordination by market, by plan...), others are conventional and traditional, and others correspond to situation of cooperation
- We define the situation of cooperation as situations that provide opportunities for partners to develop mutual learning while pursuing common project (the most common case)
- We will build on the theory of mutual learning of Armand Hatchuel

Theory of mutual learning

- Premise 1. "The actors always fit the meaning of their actions in relationships that underpin their differentiation and interdependence: subordination and hierarchy, communication mechanisms and contracting, membership systems ...
- Premise 2. To act, actors produce and implement heterogeneous knowledge (...) that constitute the content of their activities as well as the fields of their intervention.
- Premise 3. The concept of learning is inherent to action [**individual transaction**] (...). Any action rebuilds the knowledge it needs.
- Premise 4. There is collective action [**cooperative transaction or cooperation**] when actors develop learning challenged, disturbed, or fed by the learning (...) of their partners (...).
- Premise 5. The link between the nature of relationships and the nature of knowledge is a fundamental tension of collective action. "(Hatchuel 1996, p. 105).

Work and cooperation

Specificity of contemporary work in large organizations

- Complex collective action did not wait for modern companies and the modern view of labor: army, great empires, church...
- The capitalist firm is a way of coupling administrative bureaucracy and its legitimacy with the private interests of investors
- A large majority of jobs in the developed countries are in the service sector, a work done in interaction with the customer (very often according to industrialized patterns)

Changes in labor (1980 -> 2012)

- Private interests are represented mainly by pension funds run by a neo-liberal ideology, big fortunes and banks that have increased their power relative to that of managers
- The “work in crumbs” (travail en miettes) in which it is necessary to get rid of the singularity of the knowledge of the employees and of the autonomy of working groups is widely adopted: taylorism, industrial rationalization...
- Mechanical industrialism is a devastating norm even in the service sector where he serves as a model

What is going to change (2012 -> 2042)

- Awareness that we absolutely must look to other models of development under threat of ecological disaster and major health implications
- Awareness that other stakeholders must be taken into account in companies: employees, customers, local communities, etc. -> sustainable development, social economy, ethical funds, etc.
- Awareness of the limitations of the "mechanical industrialist" model who wants to exclude in principle any possibility of personal interactions to save time and increase productivity

Rehabilitation of cooperation

- The opening on multiple stakeholders implies being able to cooperate with them -> mutual learning
- The new models of economic development open to the diversity of stakeholders should allow progressive deconstruction of routines to enable learning by the actors involved in the production (deconstruction/reconstruction of selves and objects)
- More fundamentally, cooperation is not only a source of stress but an activity that creates value by itself (for employees, for customers...)

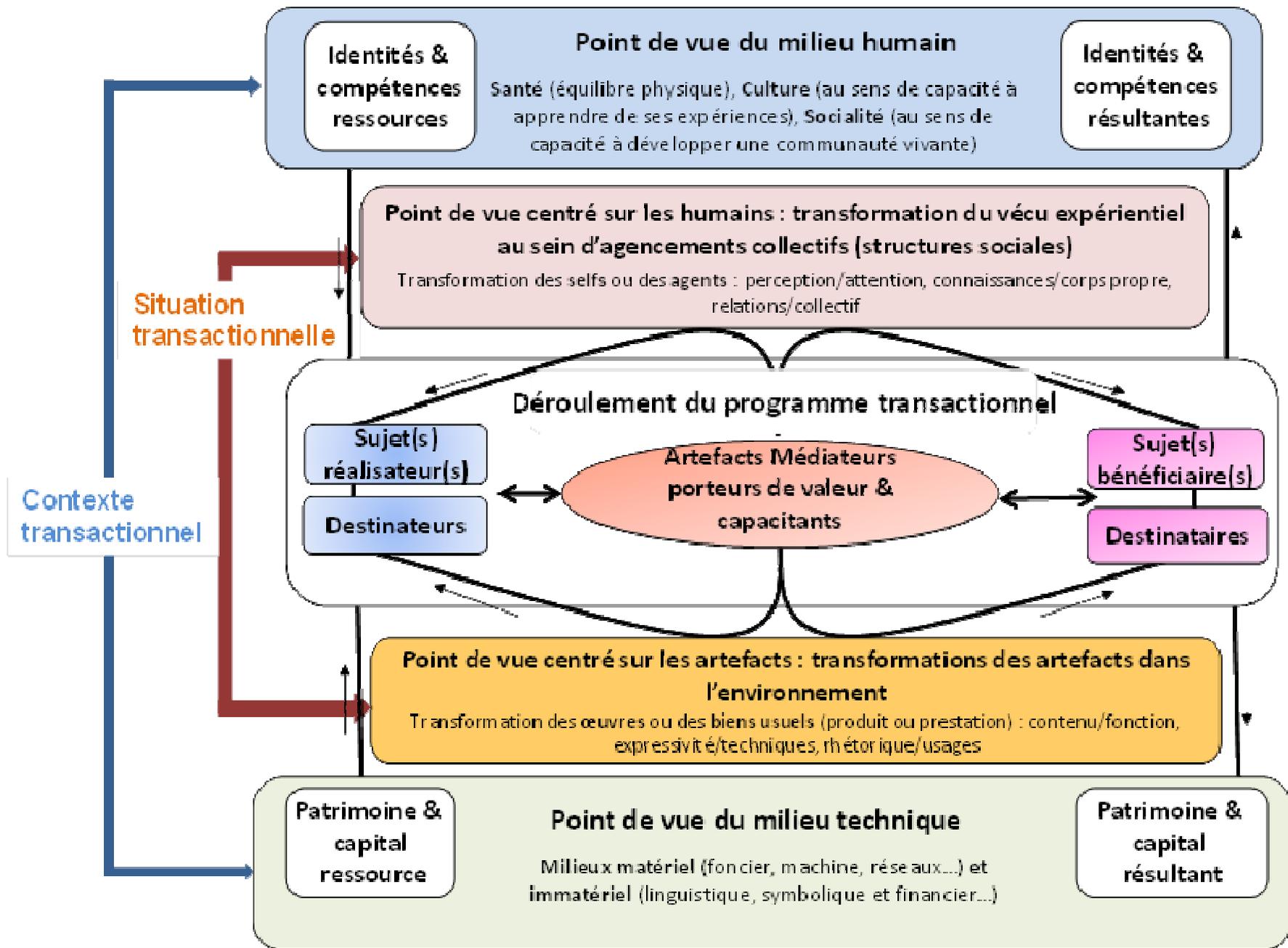
Status and design of mediating artifacts (focus of CSCW researches)

What are the mediating artifacts in cooperative transactions?

- Cooperative transactions are most often associated with meetings but may also be largely asynchronous
- They allow the transformation of the mediating artifacts and of the participants
- An individual person may be engaged in a transaction with itself.
- Artifacts that mediate the transactions can be as diverse as a conversation, a meal, a joint movement to move a physical object, writing, dance, assembly of components, etc.

Mediating artifacts: purpose, the means and condition of the transaction

- Artifacts are both one of the purpose of the transaction and the necessary condition for linking people
- Indeed, all transactions must be mediated either by the gestures or words of people in the presence of each other, or "remotely", through perennial artifacts circulating from one body to another



Status of mediating artifacts in the transactional program: the semiotic of cooperative transactions

- Inspired by the Greimas semiotic and the concept of narrative program based on the analysis of the narratives structure of stories
- For stereotypical steps :
 - Virtualization (manipulation)
 - Competence
 - Performance
 - Evaluation (sanction)

	Virtualization (Capacitation ex-ante)	Competence (Capacitation ex- ante)	Performance (creation of value)	Evaluation (capacitation ex- post)
Steps	Development and co-development of the transactional program	Acquisition by the producers or co-producers of the knowledge, tools, resources	Production, co-production, acquisition, consumption of an artifact carrier of value	Acknowledgment of the performance of the producer by the beneficiary
In a fairy tale	Freeing the princess	Acquire a sword and a horse	Fight against the dragon	Getting married with the princess
Artefacts	Capacitating virtualizing artifact (promise)	Capacitating qualifying artifact (sword, horse)	Artifact carrier of value (princess)	Capacitating evaluative artifact (gift of the king)

The same artifact can acquire different status in a narrative program

	For one self	For third party
As an end (artifact bearer of value)	Purpose of personal consumption (baked potato for direct consumption)	Product to sell (potato in the shop of a merchant)
As a means (Capacitating artifact)	Instrument or personal technique (potato ingredient to a prepare a dish)	Technical device (potatoes as seeds for a planter)

- **Tab 1** Artifacts as end and means, for one self or for third party

Example of the change in status of the MA in a creative transaction with learning

- Awareness of the existence of a new MA needed to make a photomontage: is essential to achieve an effect
- Experienced for itself the editing software (MA) becomes a “carrier of value”: ludic experience of the software whose use is wanted for itself and takes precedence over the result
- Once the new MA is mastered it becomes an instrument for the production of another artifact carrier of value

What is coordination?

- Collective action is coordinated when it allows a set of actors to achieve a result without mutual learning (cooperation):
 - ***two prototypical examples of coordination mechanisms are the market and the plan***
- Coordination is based on different artifacts that correspond to coordination mechanisms (see C. Simone & K. Schmidt):
 - ***The actors are more acted by the coordination mechanism than they are its co-producer***

Medium for cooperation

- If an artifact is apprehended solely as a coordination mechanism that means that it has not been designed to allow individual or mutual learning in the making of the performance but to articulate independent contributions
- In contrast, an artifact will have the status of **medium of cooperation** if it raises mutual learning: it is malleable and open, like the boundary objects, and it is sometimes predominantly instrumental, sometimes carrying a value for itself
- In CSCW this means that at any time the informational (or semiotic) artifacts that we design could at some time be experienced for themselves

The design of media for cooperation in the context of digital culture

Digital culture

- We talk of digital culture as one used to talk of writing culture or of print culture
- The uses of digital media invaded numerous practices, professional, of course, but also relational, of leisure, of communication, etc...
- The generalization of digital culture is also a consequence of the fact that all contents converge towards the same devices that combine contents of very different nature
- As a result, but also because of their complexity and constant changes, digital artifacts imply frequent learning activities and quickly change their status from instrumental to carrier of value and vice versa

Problem of disconnection between design practices oriented towards customers versus workers

- Classically one considers that what is designed for work setting must be “functional” in a restricted meaning and that what is designed for customers must also be associated with pleasure (experienced for itself).
- Conversely it is sometimes considered that what is designed for customers must provide essentially pleasure in a restricted way without enabling learning - it's the same symmetrical error

Coordination mechanisms vs cooperation medium oriented design

- Coordination mechanism oriented design exclude most often aesthetics, pleasure, interest in favor of a strictly functionally oriented ergonomics
- This design does not allow individual and mutual learning (think of workflow and ERP), unlike the features found in the 2.0 platforms
- The results of cooperation oriented design for workplace should also raise a genuine interest from employees, connected to other areas of cultural experience in broad meaning

Culture as an integrative medium of the various fields of experience

- This brings us to a different vision of design practices for workplace without separation between a strictly utilitarian and strictly aesthetic dimension:
 - Good design of cooperative media for workplace comes within the context of a professional culture who is not itself stranger to culture at large
 - The aesthetic of consumer goods and the aesthetic of professional media feed and enrich mutually as the aesthetic of public and professional places do

Thank you for your attention

Brouillon

Degree of autonomy of the mediating artifact (MA)

- A reproducible and conventional gesture is considered as a mediating ephemeral artifact (e.g. speech)
- A MA is independent when it can move independently of its presence to exert a remote effect on the recipient (in terms of space or time)
- Conversely, an MA is incorporated into the producer's gestures when it has no existence independent of its current activity.