

West-Asia Global Virtual Team Mediation: Enhancing Innovation and Collective Creativity by Customizing Groupware Interface Design

The Trace Composer

Klein R., Chen J. Smith R., Walls J., Lipsyc C., Letaief R., Pang N., Lubart T., Jin Y., Sam C., Bo H., Chen N., Cao S., Xu L., Rogers C., Ercoli G., Cronje J., Bottazzi G., Quinlivan L., Bamba O., Wright A., Russ S., Russo A.

Abstract

Metis Program's aim is to explore the management of a Global Virtual Team (GVT) and the enhancement of a computer mediated intercultural collective creative process. GVT members interact mainly within the framework of a Collaborative Cyber Community (3C) platform towards the creation of an advertainment for the 2008 Beijing Olympics. Metis was implemented right from the beginning as an interdisciplinary and intercultural "out of the lab" approach between film making, research and groupware engineering. After a few preliminary publications, this pilot project is challenging the GVT with some collaborative writing and storyboarding together with shooting short movies in each member's area. In the course of this work we have found that some e-learning content has to be created to build some collaborative capacity between members. This is especially true if we really expect everybody to get involved in film making, groupware engineering and scientific research. Future research will have to deal with the difficult task of customizing the platform interface design during the project, with a larger GVT. Metis is to envision the potential of embedding some awareness and usability research tools in commercial 3C groupware for systematic HCI follow up and group awareness: The trace composer. Collaborative platforms in the future may have to display an inbuilt R&D function for further improvement and embrace more adaptive design along the lines of Empirical Modelling.

1. Introduction

The Metis project [32] is a wide-ranging exploratory process that aspires to escape the usual logistics of participating laboratories, film studios,

marketing departments and NGOs. It is a project aiming at both promoting Life-long learning in context and creative attitudes for more context sensitive innovations and complex global problem solving. The fast pace of globalization is triggering a more complex environment where information has to become more intercultural and interdisciplinary. That complexity is calling for more skills from the learner to look for coherence but also cope with more chaos with a flexible mind. It is showing the way toward a new style of education more personalized, where information is kept in context and learning is project dependant and highly cooperative.

It means a different role for teachers and experts too. Interdisciplinary education means bringing people with different background knowledge and value systems together. It requires a complex effort of BUILDING CAPACITY, to accept working together as AMATEURS and not only EXPERTS, because we have to take the risk of stepping out of our ivory towers. It is also requiring from each individual, at an early age, to become an active co-designer of technology and learning scenario, and not be anymore a rather passive user/learner.

The virtual document will be a "text" to experiment and not anymore to read only [36].

2. The context for the Metis project

The orientation of the Metis project is profoundly influenced by ethical concerns. A key objective for Metis Reflective Community is the promotion of the broader vision for the Olympics that is embraced by the Humanistic Olympic Study Center [31]. The vehicle for this promotion is an advocacy movie in the form of advertainment: a blend of advertising, artistry and

entertainment. Such a movie will advocate a conception of the Olympics where benevolent motivations for global good conjoin with passion for sports, arts and dedication to one's country – an antidote to the merry commercial and professional process to which the Olympic dream is in danger of being reduced.

Addressing the ethical agenda of Metis has far-reaching implications. Setting up the Metis project involves bridging gaps between the perspectives of science, art, commerce and technology. Its Olympic vision embraces global culture, peace and respect for the environment, but must also emphasise the importance of protecting the rich diversity amongst individuals, communities and ecologies. These vital messages are well perceived in the world: they constitute a powerful reserve of hope and humanistic expression which could be skilfully mediated by new information technologies. But our technologies cannot be based solely on the dominant culture and ideologies of the Western world.

The elaboration of the concept behind Metis can be seen as drawing on the two cultures that come together explicitly in the Beijing Olympics: the Chinese and the Greek. The importance of these cultural contributions is that they give insight into respects in which our accepted understanding of key concepts – such as creativity and technology – has become limited, perhaps in somewhat the same way that the modern conception of the Olympics has diverged from that of the ancient Greeks. These limitations motivate the practical approach adopted in the project, to be described in section 3.

The name Metis itself derives from the Greek word for 'wisdom'. In their analysis of the concept, as it relates to ancient Greek culture, D tienne and Vernant [12] observe that: There is no doubt that M tis is a type of intelligence and of thought, a way of knowing; it implies a complex but very coherent body of mental attitudes and intellectual behaviour which combine flair, wisdom, forethought, subtlety of mind, deception, resourcefulness, vigilance, opportunism, various skills, and experience acquired over the years. It is applied to situations which are transient, shifting, disconcerting and ambiguous, situations which do not lend themselves to precise measurement, exact calculation or rigorous logic. D tienne and Vernant contrast this broad concept with Modern Philosophy in which Metis is conspicuous by its absence". This contrast underlies the crucial difference between the path of the ancient Greek Technite and that of a typical contemporary engineer – the modern technicians who have been disconnected from a cosmogonist view of the world because of their extreme specialization.

In the Metis project, the authentic concept of Metis guides the development of a cooperative technology and shapes its associated interactive environments. Of equal

importance is the conception of the cooperative activity itself, and the nature of its outcomes and products. The notions of 'creativity' and 'innovation' have particular relevance (see [16]), both because of the artistic aspect of advertainment and because of the need to accommodate a wide variety of cultural perceptions of these terms.

According to Lubart [23]: Creativity is the capacity to create something which is both new (original, unexpected) and adapted (useful, adapted to constraints). This pragmatic North American definition may be contrasted with the European conception of "being creative", which is understood metaphorically as referring to the willingness to express oneself freely without any practical aim in mind, almost detached from reality [14]. In so far as these two definitions can be construed as referring to a common activity, there are complex socio-political reasons why what is a scientific concept in USA is a metaphor in Europe. As Joas [14] has observed, such common construal is possible provided that the phenomena that are implicitly invoked in 'being creative' can be the target of a real experience.

As described in more detail in [16], the work of the sinologist-philosopher Fran ois Jullien [15] is helpful in looking at Western innovation and creativity from a Chinese point of view. Debray [11] and Latour [20] further stimulate the orientation towards China. Where the Western traditions of thought attach great importance to originality and the contribution of self, Tao recognises only the harmony of individuals on the path originating in the consciousness of belonging to nature. This constitutes the fundamental recognition of correlativity: continuity and connexion between every single thing. In such a Taoistic context, innovation is conceived differently – as making the relationships between things more readily experiential by presenting them in such a way that they are more easily accommodated in the mind of the viewer. In contrast, the Western philosophical conception of innovation involves performance that purports to create radical novelty, and – by implication – promotes a vision of self and present reality that violates the Tao idea of all reality as infinite [15].

The above account of the context for the Metis project has been amplified in several previous publications [17, 27]. It highlights commonplace pitfalls in cross-cultural projects involving information technology. In relation to the Beijing Olympics, to follow the established practice in promoting the Olympics could be viewed as imposing alien cultural values where both the vision for the Olympics and the perception of innovation and creativity are concerned. At the same time, developing an alternative practice that does fuller justice to a broader Olympic vision is

challenging on account of the very practices and technologies that have been developed to sustain Western cultural traditions. This has been the motivation for incorporating 'building the camera' with 'shooting the film', a notion whose consequences are the subject of the next section.

3. Theoretical background and methodology

The framework for the Metis project encompasses three principal goals:

- recruiting an intercultural global virtual team of volunteers composed of researchers in computer science, human sciences, movie professionals, artists, industrialists and students inclined towards interdisciplinary research.

- carrying out some pilot projects and a final advertainment cinematographic project within the framework of Beijing Humanistic Olympic Games 2008.

- developing – through an ongoing iterative process of conception and test – a cooperative platform for the creation, follow up and mediation of the Metis project's artistic, scientific, technological and commercial components.

To date, the Metis project has explored several complementary aspects of its broad agenda, relating to issues such as Innovation Management [8], Ergonomy [25], Multimedia Document Management [8, 9], Education [19] and the technological needs of NGOs [18, 19]. This research has been aimed at clarifying how to organize such an innovative approach, both from the artistic, technological, educational, commercial and research point of view. Some comparative study of aspects of collective creativity in China and other cultures has also been carried out [27].

The guiding principle behind the Metis project is that – in order for contemporary actors to exercise their artistic creativity and exploit radical technological innovation to the full – their interaction should be mediated by an appropriate interface through which they are sensitized continuously to what makes the core of humanities: Metis. This entails enhancing awareness beyond the scope so far envisaged in the CSCW literature – in ways that are not merely concerned with enriching the interaction between the members of the virtual team, but also with increasing each participant's reflective perception and self-awareness during the creative process. The intended effect of this enhancement is twofold. It broadens the focus of attention so as to take account of a larger and more comprehensive set of variables that are deemed to impact on the ongoing creative process. It also augments the role of the computer so that, in addition to supporting the automation and repetition of routine

tasks, it can help to address the uncertainty which is highly specific to innovation and creative processes.

The proposed tool for enhancing awareness is a Trace Composer. The function of this tool is to support information capture and integration in order to help the team members during the creative process. To this end, the Trace Composer will increase feedback that relates both to individual and collective activity. The monitoring of each virtual team member's activity is to be both voluntary and assisted. Using the metaphor of the "mirror", the team member should be able to express – as far as possible – information about their own environmental, social, cognitive, emotional, and conative state. This kind of information is also intended to improve awareness of meta-cognitions and hidden cognitive automatisms. The objective is to plunge the team member into a holistic view of their activity "in context", giving the kind of open systemic view that activity of an analytical nature rarely provides. In relation to teamwork, it enables each team member to have some idea of the state of mind and direction of thinking, action and expression of other members: the confrontation with the activity of another team member (allo-confrontation) is an effective way to foster metacognitive regulation, more effective than reflecting to one self's activity (auto-confrontation) [38]. This can help to ensure that a new idea is not simply generated 'spontaneously', but is connected to the context and may take into account current constraints. It can also raise the profile of inappropriate hidden assumptions and automatic responses that can be constructively challenged. This potentially stimulates a re-generation of the creative process that leads to greater freedom of choice or flexibility, and a better understanding of the relationship between original ideas and valid constraints. Those "instant" archives are commons and set the stage for a collective short term memory and enhanced community awareness, an important part of the life-long learning process.

So complex and mysterious is the creative process that capturing every associated influence and aspect, both individual and collective, is out of the question. Yet, as Fischer [13] observes: "The power of the unaided individual mind is highly overrated. Much human creativity is social, arising from activities that take place in a social context in which interaction with other people and the artifacts that embody collective knowledge are essential contributors. Metis aspires to a CSCW environment that can help to identify the exact nature of this contribution, and so enhance it.

Where the influence of group interaction on individual creativity is concerned, there is an important distinction between synchronous and asynchronous activity. Some influences are present as immediate perceptions of feelings and ideas and relate to current

"synchronous" activity. Other influences that are perceived in the present relate to "asynchronous" activity, performed in the past, but having direct relevance to the current context. Asynchronous activities that provide access to useful information during the immediate creative process are typically associated with lengthy experimental procedures. Such information may be potentially misleading, since it was collected at another time and within a different context. It may not necessarily take a handy form that can be exploited in fast short-term creative processes. Traces of such activities may still contribute to the generation of archives to be used at a later stage.

Developing the Trace Composer presents major technical challenges. In order to promote cross-cultural communication and maximise the immediate impact of synchronous and asynchronous activities, it will be necessary to create a suitable medium. To this end, quantitative and qualitative traces of interactions (via the keyboard, mouse, screen and peripherals) should be transformed from typically dense textual information into visual information. The use of cues such as colour, link, thickness and shape facilitates understanding much more effectively than do texts, patterns, rules and numbers [37]. But while visualization techniques, quantitative observations, and traces of the activity involving team members, the server and the clients are important, it is no easy matter to extract meaningful information from them. Appropriate instrumentation is needed to mediate the traces of each team member's local activity, and raw logs of the server activity. Communication between one member and another during a collective or individual creative session poses a particular difficulty. Such interaction is not usually observed on the server, but may be an important ingredient in explaining the member's direction of development and train of thought. It then seems that, rather than instrumenting a team member's computer so that their interaction is observed, it is preferable to identify diverse roles (observer, self-monitor, group-monitor, learner, mediator) and ask each member to provide explicit information about their current mode of activity.

The technology that is ideally required to support this vision for communication is quite unlike the document-based interaction that is characteristic of many CSCW environments. Signals about team members' activities should be constantly sent in a form that does not require a transition to phonetics, but establishes augmented consciousness through exploiting dynamic figures, pictograms or icons. If such an idea is hard for orthodox alphabet users to conceive, it is far more plausible to Chinese users, who are accustomed to learning to read new sinograms very easily. In fact they learn mostly English words that way until middle school

and cannot read new words phonetically unless some reading help is provided by their teacher and the new word is memorized. Acknowledgment of such a process is important for ESL teaching and ESL e-learning platform design, at least until the end of primary school in China.

For instance, WuBi – recently introduced in Chinese – is a precedent for purely visual communication of this nature, involving translation from sign to meaning without any transition through phonetics. Such communication could be supported by developing a specific device, similar to the WuBi Chinese keyboard that allows the direct entry of Sinograms (see Figure 1).

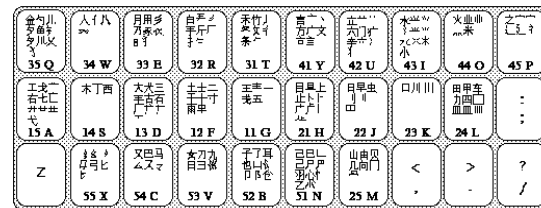


Figure 1: The WuBi keyboard

An essential feature of the communication medium that underlies Metis is its capacity to evolve as the project develops. It is envisaged that all the members of the global virtual team will participate actively in the development and experimental use of the Trace Composer. Conceptual support for such a vision can be found in the research of Pierre Levy [21], who seeks to capture the way in which experience is conditioned by the frames and forms of the surrounding culture that shapes the ever-evolving nature of meaning in context. Levy's Information Economy Meta-Language (IEML) [28] – a product of his research on "dynamic ideography" – may provide the theoretical background for the challenging task of integrating the interdisciplinary information. The traces of the Trace Composer, multimedia in nature, might then comprise a set of linked units, each composed of an expression of subjective intention, a fixed or dynamic image, sounds, music, a conceptual referential from IEML, and an optional compendium of items (such as an object, drawing or storyboard) that increases the chance of conveying the meaning of "any complex personal experience".

Our experience based on the cooperation expression of "needs" and "desires" is named: rezodune. It means that if we start from a well defined cooperative setup, the unexpected will happen but will stay rather coherent like the desert dune will always be made of sand while moving from one shape to the other [36]. It is close to the concept of media content fuzziness that we have described elsewhere [8].

We believe that coherence is important when it comes to cooperative expression but we also acknowledge the need for cooperative tools and cooperation strategies allowing for a more chaotic experience where the personal experience of the unknown, the mysterious and the meaningless, could be a priority over a coherent product (text, images, movie, etc). Although we know that experience is not collectible and as such is not a contemporary art form as yet.

The theory of evolution tells us that the tools used and or designed by Man, or the specific use of his own body seems to have always contributed to the evolution of his mind. The blind will use more efficiently the sounds and using only his feet to walk has freed the man's hands. Semantic web is one side of the technology development trying to automatise and adapt machines to the current use of technology by users: user centred design. On the other end we might think that Men will always have to adapt the technology they use because constraints are part of the nature of any tools: Technology centred design. But there may be another path to technology design, which is to help men to contribute to the design of the tool to build capacity and improve both the tool and the mind. This is emphasizing the life-long learning potential of using and co-designing the technology we use too learn. Beyond commercial strategy, search for technology or human resources efficiency and beyond teaching objectives, we believe that the current state of development of technology is opening the chapter for a more broadly distributed opportunity for awareness and processes, broadening opportunities for sharing fuzzy experiences beyond the typically measurable variables. It may appear to stray away from coherence and draw closer to acceptance of chaos.

4. Conclusion

Such an epistemological paper is calling for new ways to approach computing modeling for Humanities. We are exploring at the moment how Empirical Modeling [1,2,3,4,5,6,7] could be an appropriate computing approach to the Metis project. Results have been published elsewhere [34,35].

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