

How to construct and express the creative thought.

Understanding the communication mechanisms of the collaborative design teamwork.

Abstract:

Given the complexity of the interactive digital artifact, the collaborative design team has to include a multitude of actors with diverse competencies. How the design team fostering diversity [1] manages to create an internal language and how then this language is explained outside the work team through the final digital artifact are the issues that the present paper aims to address. Using methods of inquiry specific to the Activity Theory [2] [3], the paper proposes an in-depth analysis of the communication methods and tools that design professionals employ in the context of the collaborative projects for interactive digital environment, using the example of two concept design workshops[4] [5].

Keywords: *Communication design, collaborative projects, heterogeneous work groups, interactive digital media, activity theory.*

1. Introduction

We start a discussion about a development system that allows an appropriate design thinking advance. In this paper we would stress out how the elastic process of ideas and competences negotiation within a working group is a well-defined and organized practice. Moreover a long design tradition that goes beyond the individual competences comes to support the practice of the design teams.

Like all design process, the design activity is a thoughtful and structured combination of actions, choices and decisions that influence the way in which the participants interact and organize themselves. Nowadays the increasing complexity of the project brings into question several factors: reflexivity, social responsibility, ethical sense and cultural differences. In this knowledge crossing, we will show the interaction design as a development process of new communication practices. These practices transcend the limits of verbal expression of the creative thinking, and ask for alternative ways of approaching design briefs. As Tim Plowman explains:

The products of design whether material like a bicycle or immaterial like a networked computing environment, engage humans through their utility as well as their cultural location – the “situatedness” through which designed artefacts recursively derive their meaning and are simultaneously the object of interpretation. In other words, “situatedness” means the multiple ways people consume and integrate designed artefacts into their lives through interaction (use and embodiment) and through their experience creates understanding.[6]

The challenge that this paper embraces is not only to present the similarities and differences of the thought process developed in designing collaborative digital artefacts in two different contexts, but also to stress out the importance of studying and understanding the dynamics built within the design group. In the mean time given the ongoing changes and developments of the digital environment that bring along unprecedented shifts in the user behaviour, we acknowledge the necessity to continuously update and report the design methods and tools.

The explanation will unfold on three levels: first the passage from individual perspectives to a mutually understood vocabulary of communication specific to each project team will be discussed. What are the methods that help emerge a common ground of understanding and what tools are instrumental to maintain a creative working flow will be underlined in the second part. The third part will focus on how the project is communicated outside the work team and how the internal language is expressed in the final digital artifact in order to be understood by an extended audience. In the second chapter the relevance of the diversity in nurturing the creative flow and maintaining the rhythm of the collaboration team will be considered taking into account the design workshop cases introduced in the first chapter. In the third part the methods and tools that could stimulate the creative thought within the project team will be shown.

Finally, future work on techniques that could support the cooperation and collaboration in the design of interactive digital artifacts will be suggested.

The conclusions shows how the quality of overall working experience stays in the capacity of the team to enhance the uniqueness of the different perspectives brought by the participants and construct a mutual shared language. It will be stressed out how this specific language helps the collaborative team in several ways: to consolidate the cooperative design competences, to manage the creative design aspects and to articulate the operative image of the project.

2. Communication strategies in the context of the collaborative design projects.

As in all the creative activities, the good result of a design process depends on the motivated dedication of the professional. In the same time “the designer” and in particular the interaction is very often a team of designers and not a single individual. This is partly because of the interdisciplinary tasks often imposed by the brief but also because of the complexity of the situations encountered in the design process. Coming to sustain the cross-contamination of knowledge, insights from cultural psychology could help better articulate the argument. In this case talking about the mechanisms of deciphering and making sense of the intricacies of the virtual environment, Mantovani underlines:

We orient ourselves in new situations by drawing on pre-existing cultural references and suiting them to situations which are far from those foreseen in the original cultural map.^[7]

Although the traditional descriptive techniques, could act as a starting point for concept representation, they aren't sufficient to help a participative skills sharing and mutual learning. We will explain how alternative means of expression could be employed more effectively in the collaborative design process.

Whereas a systematic knowledge about what methods and techniques are in the designer repertoire, we will show an approach based on our teaching experience closely related to a theoretical background. Given the recent emergence of the interaction design as an area of expertise, the abilities that constitute the repertory of the interaction designer have to be constantly updated. In the following part we will present a specific, approach based on literary insights and direct observation of the design methods. More specifically, we will present the practical examples of visualization tools (digital and analogue) used in three different experimental workshops, which took place in Chinese and Italian universities, respectively on the subject of: design of digital systems, game design and project communication.

These experiences will allow us to support the argument of the relevance of interdisciplinary and multicultural features of the design teams. We will bring into discussion selected techniques and instruments for

supporting the co-creative thinking and the iterative cooperative analysis of the design context, taking into account the above mentioned features.

2.1 G.I.N.A. – an experimental workshop for interaction design education.

The workshop was structured as an experimental workshop and had the aim to raise the students' awareness about all the elements involved in the process of designing an interactive artifact. The students have worked in groups of three for one academic semester (aprox. 4 months). It was interesting to observe how the activity of designing a digital system and more precisely an interactive game implies a delicate idea negotiation, that involves technical and psychological skills and most important a sharp intuitive sense off using the communication languages that go beyond the visual perception. This collaborative practice of mutual understanding of the design visions and tools, is an emerging activity only partially structured from theoretical point of view, and could only be supported by the methods and tools used by the team members. For this reason in GINA, we explored an experimental approach to game design, including not the strategic and tactical sharing of tasks, but formal design methods, theoretically motivated design, and artistic perspectives on design. Without imposing a predetermined work division, we focused on the role that methods and techniques play in the design process. As a matter of fact while the students have chosen the traditional representation tools used in the interaction design, such as storyboard, flow charts, and cognitive maps, to start with, during the exercise practice they transformed and consolidated the tools transforming them in new communication models custom made from the internal use of the team. This specific dynamic of reusing and readjusting of the collaboration techniques is a particularity of the digital game design project where the entire process is a goal-directed process. The ability to balance the given tasks, the dynamics to be designed and the object development, could be seen as the mediating quality between the internal (mental) activities and external (project communication) activity. It is this particular quality that made the difference in how the student groups decided to organize themselves. It is particularly interesting to note that the groups often developed a checklist of project nodes and activities to be completed. This tool proved very useful in handling the dynamics and unpredicted events that could be encountered in the collaborative design of the interaction such as creative blocks, script bugs, work organization. The application of the activity theory [2], [3] emerged naturally in the work of the young designers whom perceived the design process as a holistic activity that helps the mediation between the different languages, tools and the acquisition of fluid design methodologies.

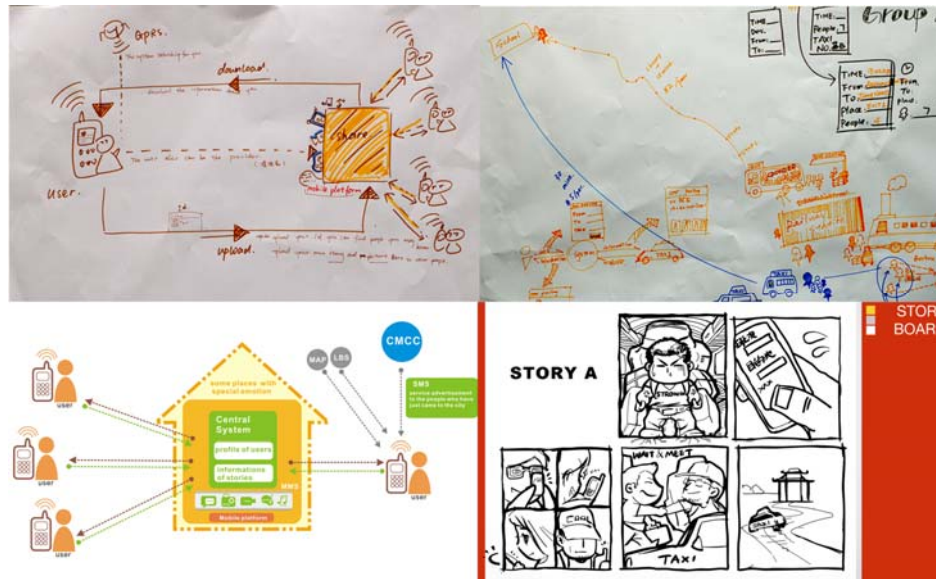


Fig.1 Visualization of the service system prepared during the 15min. brainstorm session.

2.2 CHITA 08 – a workshop on service design for mobile communication.

The CHITA08 workshop is an ongoing teaching and research collaboration between the School of Design, Jiangnan University (JU) and the INDACO department at the , Politecnico di Milano (Polimi), focusing on how to promote the sustainable everyday life using a service design approach and how can this be supported by mobile communication. The workshop was organized to be a service design exercise with different phases and lasted for five months starting with July, 2008. Each student group completed a service design project. The co-lecturer team was composed of teachers and researchers from JU and POLIMI and had 26 student participants. The POLIMI lecturer team, included 6 PhD researchers, and visited JU in the first two weeks of the workshop in order to launch and co-organize the activities in the concept design phase, 3 lecturer teachers from JU joined the group during this period. The students were organized in groups of three or four people and each approached a different topic (for example food chain, car sharing or information exchange).

The most challenging factors that the groups had to deal with were both the ethno cultural differences and the cognitive differences. Although multiethnic, the lecturer group shared the common internal language of the service design discipline, meanwhile the group of Chinese students all came from a product design background. One of the most important issues that the lecturers encountered was the passage from the concept of material product towards the digital, intangible artifact, in this case a service intended for mobile communication. The explanation of the tools specific to the design of interaction in the context of service design, such as scenario building, storyboards, personas method, or flowcharts, had to be reinterpreted and adjusted in order to overpass the ethno-disciplinary differences. The complete immersion of the members of the lecturers' team in the student groups had an important role in the design process. According to the participatory action research methods of inquiry [8] the teachers acted as mediators in the design groups, this fact allowing for a close observation of the group dynamics and the anticipation of the possible conflicts or misunderstandings of the feedback given. Unlike in most of the traditional design workshops, the groups had to identify real issues present in the community through an intense field research practice. This had a strong impact on the understanding of the storyboard and persona method. The characters of the service became real persons represented, sometimes with certain ingenuity, as such in the scenarios constructed. Perhaps the most difficult to grasp was the idea of representing the service

as a whole in a synthetic system map. If in the beginning the students were enthusiastic by the novelty of the field research and captivated by the narrative of their ideas, the more technical and abstract tools of representation were received with reluctance. In order to reestablish the balance of the creative flow in the teams, the lecturers organized a 15 minutes brainstorm session in which the students have been asked to draw the system map (fig.1). This created a rupture in the decreasing level of energy and helped regain the work rhythm. In the mean time it forced the students to externalize and put together in a coherent manner the service interactions that up to that moment remained disparate pieces of internal thoughts.

It is interesting to underline how the communication took place on three levels: first the internal communication within the students' groups made the result of their work to be different from one team to the other, second the didactical content discussed by the lecturers had to be updated according to the students' level of understanding and the communication strategies had to be developed ad-hoc according to the emerging demands of the students, finally the guest / host dynamic established a third level of acknowledging the other group and so also the development of again another layer in the communication language.

3. The relevance of cultural and disciplinary diversity in the design team.

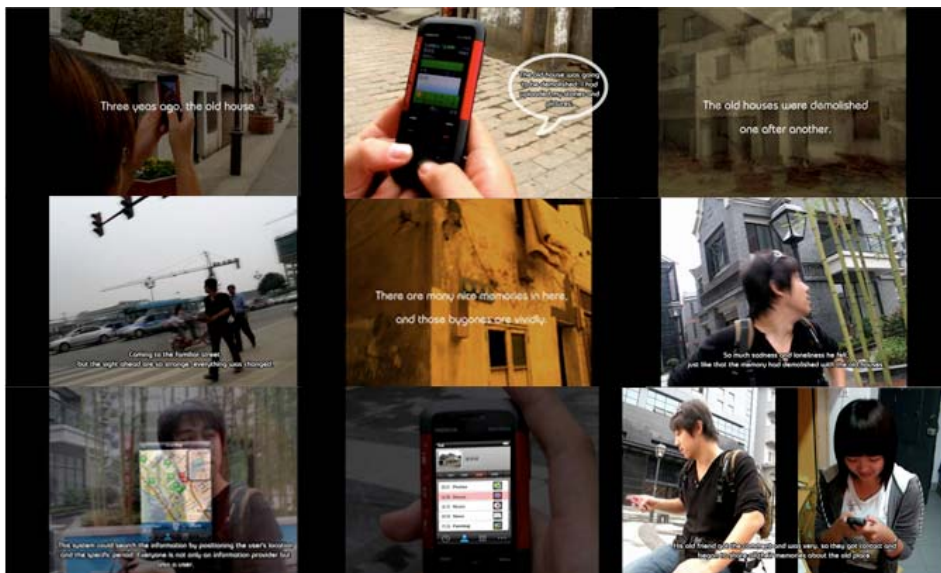
Taking into consideration the previously shown examples this chapter aims to address a simple question: will a design team that host diversity work better than a homogenous one? What are the factors that make the result more meaningful? In the previous examples the students had to complete a similar sequence. In the beginning by reading and discussing the brief, the members of the group start knowing each other on professional and personal level. They start acknowledging the affinities and anticipate the differences in opinion. The individual designers begin weighting their capabilities and seeing themselves as a group that has to accomplish certain tasks that will eventually lead to the desired outcome. Most important the identification of the motivation that stands behind the idea of the project helps reinforce the interpersonal relationship and buildup the creative flow. These first phases of the design process mark the key moments when the team builds a common ground of understanding and reach a consensus. Moreover the team constructs a common identity and learns how to interact with the teaching staff as a group. It is in these moments that the team members become conscious of the cognitive and identity differences [9] and start to mitigate the terms of understanding. The same stands true in relation to the project coordinator(s) or teacher(s). An important feature of the design profession is the use of both visual and verbal ways of communication. While the verbal conversation and one to one interaction increases the personal bond in the group, the written sign has the double role of helping to visually articulate the ideas that emerge in the conversation and providing a concrete trace of the conversation. We can consider the verbal and visual conversation the enabling tools in reaching a consensus within the group. In the same time through consensus, the members of the group will be able to build a commonly shared communication language.

Once identified and thoroughly understood, the diversity that in the beginning created the gaps in the communication flow could potentate the creativity of the design process. Envisioning the issues to be addressed from different perspectives and being able to weave a tissue of interchanged ideas are key factors in preparing the group for a collaborative process.

3.1 The application of communication methods and tools in the design work team.

The increased change speed in the development of the Information and Communication Technologies (ICT) brings to surface the need for a careful consideration of the role and prominence of communication tools and their design. In the activities mediated by interaction the participants involved are all connected and collaborate in the construction of their experience. More and more often the term “design” becomes a notion transversally used in different disciplines that spreads with the help of human mediated interactions. From this perspective design could be seen as a “lingua franca” [] in the communication dynamics among the participants involved in the process. Considering this phenomenon the notion of design isn’t anymore used only to identify an object or software application, but is seen as a process of problem identification and solution generation. Nowadays we acknowledge the transformation of the term design in a cross-disciplinary notion that we all, as designers and participants in the process of design, help redefine through our behavior and communication practices. This stands true especially in the shared contexts, where plural perspectives need to find a common operative way of movement.

Design as process is emerging as the most important knowledge shared by the participants. We are referring to a drastic change that goes beyond the specific terminological or technological acceptance. Following the design cognition study and the action theory, the tacit design experience has become an explicit, cumulative and reusable knowledge that is shared by the work team members and research groups. This specific knowledge is linked to the peoples’ ability to make use of the communication tools and materials that are not limited anymore to the traditional visual representation methods but have to be continuously updated with alternative, multi-media means of expression.



3.3 From internal to external communication, the digital artifact.

The previously shown examples , although coming from two distinct disciplines of design (service design and game design) had in common not only the final result -the digital artifact- but more important the inner dynamic shared by the team members. If, as explained before, the ethnic and cognitive cultural differences could enhance the level of creativity at the concept level, in the next part, the passage from the internal communication language of the group to the explanation of the project in a coherent form of the final artifact will

be discussed. Once the members of the team achieved a level of mutual understanding getting accustomed with a certain set of tools that enable them to communicate within the project, they acquire a certain distance from the surrounding environment. This could create a disruption from the final aim of the project – the successful involvement of the users with the specific project. The externalization of the tacit knowledge gathered by the team in the process of designing, that leads to the craft of the final digital artifact is the keystone in addressing the issues stated in the original brief. In this phase the critical sense of the team members is one of the most important factors. The psychological passage from being the designers of the project towards acknowledging and evaluating the weak points of the project constitutes an extremely delicate task. This is where the role of the instructor/professor becomes most evident. Moreover the diverse cultural background of the instructors could help ensure a fair and objective evaluation of the completed work. Consequently this will help the team externalize their creative process and materialize it into the digital artifact.

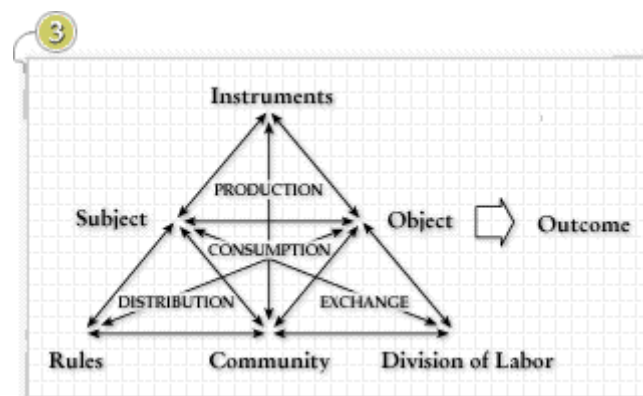


Fig.3 The structure of human activity (Engeström, 1987, p. 78)

4. Evaluating the group work with the help of activity theory.

The activity theory framework is proposed in the following chapter as a method of evaluating the human activity that stands behind the design process of a digital artifact. This method of inquiry was applied in the direct observation of the activities carried out by the design teams and proved particularly relevant in Human Computer Interaction [10], [11], [12]. The potential of the activity theory stays in the rigor of the structure that is presented through its basic principles of analysis [13], and could provide a filter for reading and understanding the social interactions situated in a specific context. In order to appropriate the language of this method of inquiry to the discipline of design, a certain re dimensioning it is necessary.

Taking into consideration Engeström's structure of human activity [14] (fig.3) and interpreting it from the design perspective, we can approximate the object of work as the brief that comes from the identification of a real need of the end user. The outcome is in this case the digital artifact that satisfies the request of the brief. Moreover an unintended but valuable outcome is represented by the feedback given by the user. This could provide insights on the alternative behavior while using the artifact. The instruments are all the communication methods and tools that enable the work team to craft the design of the digital product. As explained in the previous chapters the tools involved are not constrained to the traditional visual means of expression. The community has in the case of the design project the double entity of the coordinating / teaching group and the students' group. The different student groups could be seen in this case as different competing communities.

Although in a design team the skills of the participants could differ and therefore the division of labor should follow the level of competence, it is not unusual that the members of the team shift tasks in order to maximize the efficiency of the group work. We are referring to a set of rules in order to understand and optimize the use of time at the group level, but also to help evaluate the outcomes and establish the reward criteria at the coordinator level.

4. Conclusions

Using the concrete examples of the two experimental workshops, the paper showed how in the continuously changing present reality the relevance of the diversity in the interaction design collaborative groups has to be acknowledged and fruitfully used. This is due to the increasingly connected virtual world for which the interactive digital artifacts are designed. Being either a product intended for learning and entertainment, as in the case of the game design or targeted to a specific collaborative community as in the case of the service design, the outcome is not anymore a closed project. The design process extends even after the actual product was completed through the interaction behavior patterns constructed by the end users themselves. In order to anticipate the above mentioned behavior, the designer has to acquire the capacity of communicating in a multidisciplinary environment in which the construction of a communal language of understanding it is essential. All the above mentioned changes in the dynamics of the design discipline ask for tools that could help depicting a clear view of the state of art of the knowledge making process within the collaborative work group and the changes that occur during this process.

The paper presented suggested the appropriation of the activity theory methods for the context of the interaction design discipline at didactical level. Being a well consolidated framework of inquiry in the field of human-computer interaction (HCI) the language and terminology of the activity theory has to be revised and adapted for the specific field of interaction design. With the present paper we intended to underline the ongoing shifts in the interaction design discipline and the need of constantly updating the communication methods and tools. The discussion about the appropriation of concepts and methodologies from different disciplines and the cross-contamination of terminologies is only at the beginning. The process is not only relevant from the knowledge creation point of view but also from the perspective of team building and positive work flow and maintenance.

We suggest that future developments could focus more in detail on the mutations of the role of the trained design professional in the context of collaborative teams and the emergence of the user as designer of the virtual environment. Moreover the appropriation of alternative inquiry methods, borrowed from other scientific areas of research, could enrich and consolidate the understanding of the design research.

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