

# **Creativity and the Creation Process in Global Virtual Teams: Case Study of the Intercultural Virtual Project**

Rafik Letaief, Marc Favier, Françoise Coat

SID Team  
CERAG Laboratory UMR 5820 CNRS  
150, rue de la chimie BP 47  
38040 Grenoble, France  
Rafik.Letaief@iut2.upmf-grenoble.fr  
Marc.Favier@iut2.upmf-grenoble.fr  
Coat@iut2.upmf-grenoble.fr

**Abstract:** This article studies the creation process in global virtual teams (GVTs). It determines factors that may increase or reduce their creativity. A case study covering the 25 GVTs belonging to the Intercultural Virtual Project revealed seven stages in their creation process, namely: preparation, incubation, generation, emanation, selection, finalization, and evaluation. The creation process is illustrated as successive interactions between the teams' conscious and subconscious. Our study has uncovered five inhibiting factors and four enhancing factors which can interfere with the creation process and influence the GVTs' creativity.

## 1 Introduction

It is a well known fact that creativity is an increasingly crucial element for companies today [FM00]. Growth in global competition has made creativity a determining factor in company competitiveness and survival. The frantic pace of contemporary change has obliged companies to continually diversify their offer since those that persist in offering products and identical services according to unchanged methods cannot survive for long [Am97][Og98]. Those that prepare for the future by introducing new ideas in sync with our changing world have better chances of thriving [Am02]. Creativity can be defined as the process by which an individual, or a group, placed in a given situation, works out a new or original product or service adapted to the context and the desired outcome of the situation [Mo84][Lu99]. It is expressed by 1) a creative participant (individual, group, organization), who by means of 2) the process of creation provides one 3) creative product or service in response to a micro/macro (4) environment [Rh61]. To totally respond to high customer expectations, the organizational structure must adapt to ensure greater flexibility. Companies continually expand across the globe and get plugged into networks to control cost, quality, and deadlines. Project teams are set up to ensure a fast and high-quality response to customer requirements. Connecting from different countries and belonging to different companies, the members communicate, collaborate, and coordinate their efforts, thanks to a variety of information and communication technologies (ICT). Most commonly designated as Global Virtual Teams (GVTs), these "new participant" must demonstrate creativity and innovation. GVTs are most commonly set up for the development of new products [LVK03] and for decision-making [MC00]. These teams are full of promise, yet they equally present a good many challenges to project managers and their companies.

In spite of the wide range of existing studies on creativity and an increased interest in virtual teams, interdisciplinary research covering the two fields remains rare [MGM04]. More work on the subject would nevertheless prove very useful in a globalized world where innovation is playing an increasingly key role [Ca04].

The purpose of this paper is to understand the creation process in GVTs and to identify factors that support or inhibit this creativity.

## 2 Creativity approaches for GVTs

Creativity is a significant and complex concept. The wide range of works which have been undertaken on the subject attest to its diversity and wealth. The notion of creativity has aroused the interest of many researchers in various fields (art, sciences, education, management, advertising, etc.). Sternberg and Lubart suggest a typology of the various approaches used to study creativity (table 1) [SL99]. Studies interested in virtual teams' creativity remain, however, limited in number and scope [MGM04]. The studies which do exist on the topic use only two of the seven approaches listed below to investigate virtual teams' creativity: the cognitive approach and the confluence approach.

<b>Creativity Approaches</b>	<b>Summarized Definitions</b>
The Mystical Approach	Creativity is a source of external and spiritual force. A creative person is just an instrument of expression.
The Pragmatic Approach	Creativity can be enhanced by adaptive techniques such as brainstorming. There is little or no research basis for these techniques.
The Psychodynamic Approach	Creativity results from the resolution of the conflict between the conscious reality and the subconscious drives.
The Psychometric Approach	Creativity is not limited the study of highly creative individuals (A. Einstein, L. Da Vinci, etc.). "Ordinary people" can be studied and their creativity can be measured by an appropriate test.
The Cognitive Approach	Creativity is a process. Studying creativity is possible by understanding the creative process and its different stages.
The Social-Personality	Creativity is more prevalent in certain personality types and in particular sociocultural situations.
The Confluence Approach	Creativity can only take place when several components are present.

Table 1: Review on research on virtual teams creativity

## 2.1 The Cognitive Approach

Jill Nemiro, based on qualitative research, identified four phases of the creative process: idea generation, development, finalization, and evaluation. These phases are iterative and not mutually exclusive [Ne02]. A special need or a question marks the beginning of the idea generation stage. An individual or a group of individuals proposes an idea and becomes what is called a 'kicker'. If the rest of the team approves of the idea, the kicker becomes a 'champion'. He develops this idea and becomes its defender. The development stage starts when the kicker's efforts are drafted, presented, and disseminated to the rest of team. During the development stage, team members exchange drafts, designs, or prototypes to develop a product, project, or service that meets the initially proposed need. Information feedback and revisions are carried out up until an applicable result is obtained. Once the ideas are developed towards a workable outcome, the creative product is finalized. The finalization stage consists in completing a final review to be carried out by the team before implementation. The evaluation is the final stage. It takes place after product or service implementation and occurs in certain teams. During this stage, team members evaluate the completed project strengths and weaknesses.

This study enables us to better understand virtual teams' creativity process and its various stages. However, the 'buck doesn't stop here'. Additional studies are needed to verify their appropriateness for GVTs.

## **2.2 The Confluence Approach**

Nemiro, along the same lines of Amabile's study on the work environment's influence on creativity [Am96a], developed what she called the "Virtual Team Creative Climate" (VTCC) [Ne01]. VTCC is a measurement instrument capable of assessing the virtual teams' creativity climate. The instrument contains eleven scales gathered according to three dimensions: connection, raw materials, and management/team member skills. This instrument reveals factors capable of supporting or inhibiting GVTs' creativity. Unfortunately, these elements remain largely theoretical. In a more recent study, Nemiro proposes a more complete instrument [Ne04]. It integrates five components of creativity: design, climate, resources, norms and protocols, and continual assessment and learning.

Starting with a case study carried out within the Boeing-Rocketdyne firm, Malhotra and colleagues developed a list of 'best practices' [Ma01]. Key components for virtual teams' creativity include setting strategy, using collaborative technologies such as knowledge management technologies, and restructuring work without changing core creative needs. Further studies are needed to confirm the suitability of the results in other contexts and firms.

The relatively recent study conducted by Ocker [Oc05], identifies nine inhibiting factors of creativity: dominance, domain knowledge, external rewards, time pressures, downward norm setting, structured approach, technical problems, lack of shared understanding, and non-stimulating team members. The enhancing factors include stimulating colleagues, a variety of social influences, example setting, a collaborative climate, and team members who make mistakes—or what she calls 'equivocalities'—which surface, and subsequently decrease. Two major factors limit Ocker's contribution: 1) there is no concern for the creativity process, and 2) it takes place within an experimental framework and uses students as subjects.

## **3 Research Methodology**

### **3.1 Research Design**

As stated earlier, more interdisciplinary studies are needed in this field. The shortage of previous studies and the complexity of the phenomenon call for a qualitative and inductive study [HM91].

### 3.2 The IVP Project

The study sample is composed of university students organized in GVTs and taking part in the *Intercultural Virtual Project (IVP)*<sup>1</sup>. This project is conducted among twenty-six universities distributed throughout fifteen countries. The teamwork consists in the elaboration of a 'totem' and a descriptive draft. The 'totem' is a complex symbol that is created to represent the team members' identity. The descriptive draft is a two-page document compiled by each GVT in order to describe its totem and to facilitate its comprehension. The total duration of the project is eight weeks. Four weeks are devoted to the elaboration of a totem and its description. Each GVT is made up of students belonging to at least three different universities. A calendar is proposed to the students in order to help them get organized amongst themselves and to respect the deadlines. Each GVT use a discussion forum to communicate and share ideas and files. Although the members are free to post their messages, the GVT members belonging to the same university must post at least one message twice a week. Two different sessions are organized annually, one in the Fall and one in the Spring. Our particular study sample is composed of twenty-five teams from a given session. About fifteen individual members compose each team. Ten universities from 7 countries participated in this particular IVP session.

## 4 Team Selection According to Creativity Level

The aim of this study is to understand the GVTs' creativity and identify factors that can enhance or inhibit it. The first challenge is to pre-extract, from the 25 teams at our disposal, those with either a high or low creativity level. The teams with an average level of creativity are not of interest to this study, so we had to exclude them from the sample during this session. Three stages were necessary to achieve this assessment: the pre-evaluation, the evaluation, and the selection.

### 4.1 The Pre-Evaluation

Three judges conduct the pre-evaluation. Two judges are project coordinators and the third is a professor participating in the project session. The pre-evaluation is done in a subjective and individual manner [Am96b]. Judges rate the creativity level of the work developed by each team (totem + description draft). Three possibilities were given to judges for the assessment of the creativity level: high, medium and low. The pre-evaluation enabled the classification of the 25 teams into four categories: the creative ones (2 teams), the fairly creative ones (10 teams), not very creative ones (8 teams) and the random ones (5 teams).

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<sup>1</sup> We have change the project's real name for confidentiality purposes.

The creative ones are teams whose work was considered creative by at least two judges. The same rule was available for the 'fairly creative' and 'not very creative' ones. Teams which did not obtain the consensus of at least two judges are considered as random ones.

The stage of pre-evaluation made it possible to make a first selection. Among the 25 starting teams, only 15 were chosen. The 'fairly creative' teams (10 total) were eliminated from the rest of the study.

## 4.2 The Evaluation

The 15 remaining works were submitted to the evaluation of 30 judges. To measure the creativity of the work turned in by the students, we used the "Creative Product Semantic Scale" [BO86][Oq89]. The CPSS is a semantic scale of measurement (7 points) developed by Bessemer and O'Quin to measure creativity. The scale contains 55 items divided into three dimensions: 1) novelty, 2) resolution and 3) the elaboration and synthesis.

We follow the recommendations offered by O'Quin by using a reduced version of the CPSS given the length of the scale and the inadequacy of some items in our study. The 15-team final works are presented to the judges for evaluation in a random order. The work evaluation is carried out via an electronic form. The selection process was quite efficient. Among the 30 judges, 22 answered our questionnaire (73%). Altogether, we collected 243 evaluations giving an average of 16 evaluations per work. The principal component analysis with varimax rotation shows that the 15 below items appear in three dimensions of creativity: 1) novelty, 2) resolution, 3) elaboration (table 2).

Scales (Subscales)	Items	Component		
		1	2	3
Novelty (Originality)	Novel	.909		
	Unique	.900		
	Original	.902		
	Unusual	.907		
	Fresh	.854		
Resolution (Logic)	Relevant		.861	
	Sense		.838	
	Appropriate		.861	
	Logical		.853	
	Adequate		.792	
Elaboration (Elaboration)	Skillful			.739
	Well-crafted			.782
	Meticulous			.803
	Well-made			.834
	Careful			.720

Table 2: Principal component analysis with varimax rotation (5 rotations)

The fit indexes are relatively acceptable (table 3). Tables 4, 5 and 6 present, respectively, the indexes of reliability, convergent validity, and discriminate validity. All of them allow us to confirm to the proper reliability and validity of the used.

Index	Value
Chi square/ df	3.6 < 5
p	0.000
RMSEA	0.112
GFI	0.838
AGFI	0.776
CFI	0.947

Table 3: Fit indexes

Dimension	Numbers of items	Rho of Jöreskog
Novelty	5	0.972
Resolution	5	0.933
Elaboration	5	0.947

Table 4: Reliability indexes

	$\Delta i$	Standard deviation	Stat. T	Probability	pvc
Novel	0.924	0.010	88.514	0.000	0.874
Unique	0.925	0.010	89.868	0.000	
Original	0.961	0.006	152.648	0.000	
Unusual	0.940	0.009	109.344	0.000	
Fresh	0.925	0.010	88.972	0.000	
Relevant	0.866	0.019	45.944	0.000	0.736
Sense	0.862	0.019	44.699	0.000	
Appropriate	0.895	0.016	56.245	0.000	
Logical	0.833	0.022	37.434	0.000	
Adequate	0.833	0.022	37.383	0.000	
Skillful	0.873	0.017	50.643	0.000	0.784
Well-crafted	0.877	0.017	52.102	0.000	
Meticulous	0.895	0.015	60.189	0.000	
Well-made	0.904	0.014	65.012	0.000	
Careful	0.878	0.017	52.617	0.000	

Table 5: Convergent validity indexes

Divergence	Free model	Constrained model	Difference
Novelty - Resolution	<i>Chi-square</i> = 313.498 <i>df</i> = 87 <i>p</i> < 0.001	<i>Chi-square</i> = 1147.68 <i>df</i> = 88 <i>p</i> < 0.001	$\Delta$ <i>Chi-square</i> = 834.182 $\Delta$ <i>df</i> = 1 <i>p</i> < 0.001
Elaboration - Novelty	<i>Chi-square</i> = 313.498 <i>df</i> = 87 <i>p</i> < 0.001	<i>Chi-square</i> = 0 <i>df</i> = 88 <i>p</i> > 0.05	<i>The constrained model is not available</i>
Elaboration - logic	<i>Chi-square</i> = 313.498 <i>df</i> = 87 <i>p</i> < 0.001	<i>Chi-square</i> = 821.483 <i>df</i> = 88 <i>p</i> < 0.001	$\Delta$ <i>Chi-square</i> = 507.985 $\Delta$ <i>df</i> = 1 <i>p</i> < 0.001

Table 6: Discriminante validity indexes

### 4.3 The Selection

Once the scale has been validated, we can then move on to the team selection based on judges' evaluations. To evaluate the creativity level of the pre-selected teams (15 out of 25 at the beginning), we carried out our analysis based of the average of each team's factorial scores for each creativity dimension (novelty, resolution, and elaboration).

The results of the evaluations conducted by the judges are presented in table 7. In order to gather together the most similar teams in a homogeneous cluster, a hierarchical classification according to the Ward method was applied dimension-by-dimension. Then, for each dimension, we selected the cluster that brings together teams with the highest (bold in the table) and the lowest scores (bold and underlined). For the novelty dimension, for example, the hierarchical classification allowed us to regroup teams 2, 9 and 16 together into one cluster. This cluster refers to the teams that have the highest scores in the novelty dimension. Teams 20 and 21 belong to the cluster with the lowest scores. We use the same logic for the two other dimensions.

A typology may be suggested based on this classification by dimension. This typology divides 15 GVTs into 8 different classes listed below. The first four classes contain the teams that have high score in one or more dimensions. The 3 following classes are those that have relatively low scores in one or more dimensions. The last class gathers all the teams not belonging to either of the two preceding classes.

**Artists:** Artists are teams whose work is considered novel *and* quite elaborate. Only team 2 belongs to this class.

**Pragmatics:** Teams 4 and 7 belong to this class. These two teams have a high level of logic.

Team N°	Novelty	Logic	Elaboration
2	<b>5.838</b>	5.587	<b>5.825</b>
4	4.786	<b>5.720</b>	5.146
5	4.329	5.329	4.870
7	4.552	<b>5.728</b>	5.328
9	<b>5.413</b>	<b>5.854</b>	5.361
10	4.476	5.043	<b>4.265</b>
11	4.724	5.539	4.963
16	<b>5.399</b>	5.612	5.536
19	3.865	4.934	4.587
20	<b>3.237</b>	5.250	4.738
21	<b>3.113</b>	<b>4.724</b>	<b>4.051</b>
22	4.124	5.537	5.063
23	3.567	5.274	4.484
24	4.184	5.458	4.571
25	4.882	5.412	5.222
Mean	4.423	5.395	4.927

Table 7: Evaluation results

**Designers:** the class of designers groups together teams with a high level of novelty *and* logic. Only team 9 belongs to this class.

**Innovators:** the innovators are the teams displaying a highly novel work, as was the case for team 16.

**Rough Copiers:** the teams that belong to this class demonstrate a lower level of refinement in their work. Team 10 belongs to this class.

**Conventional:** the class of conventionals gathers together teams with low levels of novelty. Team 20 belongs to this class.

**Non-creative:** only one team is considered to be ‘non-creative’. Team 21 presents weak scores in all of the previously discussed creativity dimensions.

**Average:** This class gathers teams 5, 11, 19, 22, 23, 24 and 25. These teams have average scores in all three dimensions of creativity. We did not take these teams into account for the remainder of the study.

This process of pre-evaluation, evaluation and selection enabled us to choose eight teams with a highest or lowest level of creativity from among the twenty-five teams enrolled in the IVP session.

## **5 GVT Creativity and the Creation Process**

### **5.1 Interaction Content Analysis**

The field of GVT research is challenging both on theoretical and empirical levels. The usual methods of direct observation—whether participant or non-participant—as well as interviews, are not easily conducted given the members' geographical dispersion. Computer Supported Collaborative Work (CSCW) solutions have the advantage of memorizing online interactions. Indeed, all the interactions carried out between the members of a team are recorded in the teams' discussion forum. It is from these discussion forums that we were able to collect the data. We supplemented the data with information available on the project website and the impromptu statements made by some participants.

### **5.2 Data Processing**

The data was processed in accordance with this project's inductive approach. The Grounded Theory, as developed by Glaser and Strauss [GS67], is used as a strategy to make the leap from data to theory. The Grounded Theory proceeds by constant comparative analyses of the data in order to reach a theory. It requires both explicit coding and an analytical and interpretative approach to the phenomenon studied. The categories always emerge from the analysis itself [GS67]. The theory is gradually constructed by grouping together the various concepts and by developing an assessment of the relationships between them. The data coding was completed with the help of the LAC'UNE software (Logiciel d'Aide au Codage version 1.0). LAC'UNE is coding assistance software which was developed especially for this study in collaboration with a student from the Grenoble Institute of Technology, France.

We will present our results in the following way: first, we shall discuss certain theoretical elements in order to enhance greater understanding of the creation process within GVTs. Second, we shall describe factors which either support or inhibit creativity in GVTs.

### **5.3 The Creation Process**

A process can be defined as a set of interdependent activities converging towards a common goal. The creation process within GVTs is a succession of activities that lead to a final product (which in our study is a totem and its descriptive document). This study undertaken on the 8 GVTs selected has made it possible for us to make explicit specific phases and dynamics which we have detected within the GVTs' creation process.

### **5.3.1 Phases of the Creation Process**

The creation process is divided into 7 phases (figure 1). For clarity's sake, we will present these various phases in a linear fashion. The creative process is in fact more complex than appears here because of the iterations and overlappings existing between the various phases.

#### **Preparation**

The preparation phase is that which marks the beginning of the creation process. During this phase, each member of a GVT gets acquainted with of the rest of the team. They share information with each other. They then decide to concentrate on the development of their product (totem and description). This phase generally leads to planning and member commitment for brainstorming.

#### **Incubation**

One of the characteristics of a GVT is the geographical dispersion of team members. Some virtual and local sub-groups can be formed within the same GVT. The incubation phase corresponds to the phase where these sub-groups work in a separate and completely invisible way. Ideas coming from sub-groups are gradually exposed to the rest of the team. This development marks the beginning of the generation phase.

#### **Generation**

This can be compared with the "generation of ideas" phase described in Nemiro's study [Ne01]. During this phase, the members present their ideas and drafts on the product to be created. A central topic of creation is born progressively, through interactions and exchanges. This is the emanation phase.

#### **Emanation**

The emanation phase is a very short phase of the creation process within GVTs. During this phase a code or a central idea emerges which comes to organize and structure the entire set of member contributions on a central topic. For illustration's sake, the Designer team chose "Harmonious and Efficient Co-Operation" as their totem topic; the Innovator team chose "United Cultures", and the 'Non-Creative team' chose "Modernity and Technology Era".

#### **Selection**

The emanation phase and the generation phase are two parallel and interrelated phases. The structuring effect of the emanation phase is significant when it takes place at the *beginning* of the generation phase. With the end of the generation phase, the GVTs are facing several product choices. The members must make a choice. This is the selection phase.

### Finalization

According to the degree of completion of the selected product, members engage in modifications, revisions, and final improvements until they obtain the final product.

### Evaluation

This phase occurs after the work has been turned in. During this phase, team members evaluate the final product and the contribution of each.

### 5.3.2 The Dynamics of GVT Creation: Confrontations between the Conscious and Subconscious

Following research using the psychodynamic approach to study creativity, our analysis has made it possible to note that the process of creation within a GVT is a succession of interactions between two spheres: the conscious and the subconscious (figure 1). ICTs play the role of interface which makes interaction between these two spheres possible.

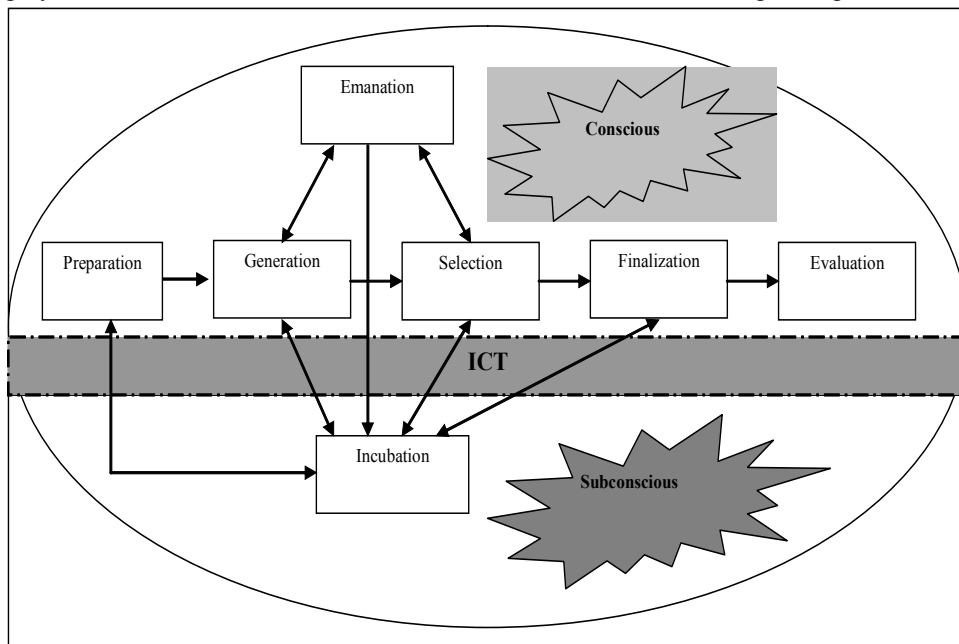


Figure 1: GVT creation process

The incubation phase plays a crucial role in the GVT creation process. During this phase, members of the sub-groups—co-located or virtual—act and interact to set up ideas and develop models which they thereafter will place at the disposal of the team in the shared workspace. These actions and interactions are initially invisible and inaccessible to other GVT members. These actions and interactions are therefore undertaken in **the team's subconscious** sphere.

By applying psychodynamic theory to the particular context of GVTs, it can be put forth that an act (action or interaction) generally passes through three ‘states’ separated by two kinds of ‘filters’. Initially, an act is carried out in the subconscious team sphere (i.e. on a sub-group scale). A first test for this act is done at the level of the sub-group. The sub-group can validate or refuse the movement of the act from one sphere to another. In the case of rejection, it remains on the subconscious level. If the sub-group accepts to show and share it with the rest of the team, the act is validated and moves on to a higher state.

The second level is at that of the **technology used**. Within the framework of this study, team members used discussion forums as a shared workplace. This shared workplace allows members to interact and take actions which are visible and accessible to all team members.

Before reaching the next level, the act validated on the sub-group level must first make its way through a second filter. Different technologies possess differing capacities for information transmission [DL87]. The act’s movements between levels directly depend on the technology used. If technology is able to transmit the act, this act moves to the following level. If not, this act is refused and condemned to return on the subconscious team level. Sub-groups which have already validated the act should modify it to make it transmissible by technology. By failing to do so, the sub-group will condemn this act to remaining on the subconscious level. The second filter is thus a technological one.

The third level is the **team’s conscious** that contain all visible and accessible information, actions, and interactions carried out by team members. More commonly named “collective awareness” [DF05], these bits of information, actions, and interactions participate to create a common and shared vision of the team’s larger context which allows members to implicitly coordinate their activities and behaviours. Once the act crosses the technological filter, it is added to the other acts that are at the conscious level, and takes part in the formation/actualization of the “collective awareness” which contributes to the beginning of a new act formation. The cycle recommences...

## 5.4 Determining Factors for GVT Creativity

A systematic comparison between the different kinds of teams has allowed us to determine five creativity-inhibiting factors and four creativity-enhancing factors.

### 5.4.1 Creativity-Inhibiting Factors

***Team lack of focus and dispersion due to multi-tasking*** constitute the first inhibiting factor. Within the same project, one team can be responsible for the design of several products. Launching the design of several products simultaneously reduces team member concentration and focus.

**Lack of participation and not meeting deadlines** is the second creativity-inhibiting factor. Several elements can explain this phenomenon: lack of motivation, differences in time perception, etc. It can generate tensions between team members and make the working conditions deteriorate.

**Conflict avoidance for fear of reprisals** can be source of GVT dysfunction. It damages effective communication between members. Compared to face-to-face communication, geographical dispersion and mediated communication deprive the GVT members of certain common communication signals. Ambiguities and uncertainties can thus appear. Assuming the problems and effectively seeking explanations are crucial to GVT success.

**Poor management of 'idea ownership': informal IP issues.** This is a major source of conflict between team members. It is due to insufficiently exploiting group memory, and consists in attributing a good idea and its benefits to someone other than its original creator. This is a factor creating member de-motivation and de-commitment.

**Technical problems and technological insufficiency** can inhibit GVT creativity. Repetitive system dysfunctions disturb the creativity process. Available technologies can also be inadequate and do not fit member needs (awareness, group memory, media richness, etc.).

#### **5.4.2 Creativity-Enhancing Factors**

To be creative, EVGs must avoid the above-stated inhibiting-factors. They can then benefit from one or more enhancing factors to increase their creativity.

**The Presence of stimulating members** is a creativity-enhancing factor. These members do not hesitate to initiate relevant debates on the project or to raise issues of existing problems within the team. Their interventions stimulate the participation of the other members, support proper division of ideas, and reduce misunderstandings between members.

**Ubiquity** is a second creativity-enhancing factor. GVT members take part in several projects simultaneously, so their timely scheduling and participation in the various ongoing projects is a condition for team success.

**Technology appropriation** is the manner in which team members choose, combine, and utilize available technologies. In DeSanctis and Poole's [DP 94] sense, team members must be able to benefit from the technology's structural properties in order to organize their creativity process. Technology is conceived to promote a certain spirit (democracy, freedom of expression and generation of ideas, etc). The use of technology in coherence with its spirit of design is also a factor for GVT creativity.

**Early Emanation** is the last creativity-enhancing factor, and is essential to GVT creativity. It is the essential moment of the team's "Eureka!". It can intervene at various moments during the design process, yet for creative GVTs, emanation takes place early on, at the beginning of the design process. It represents a 'master idea' which serves to harmonize the various member visions.

## 6 Conclusion

In the contemporary context of global competition, creativity is a major factor for success among contemporary firms. The development of GVTs has triggered the interest of researchers and managers alike who are attempting to understand their dynamics and performances. In spite of a growing number of studies on virtual teams, research on GVT creativity is rare. The purpose of this study was to understand the process and the determinants of GVT creativity.

The results presented here corroborate the scarce studies which do exist on GVT creativity. They show that we can divide the creative process into seven iterative phases. Three of them emerged in Nemiro research: selection, finalization, and evaluation [Ne01][Ne04]. The generation phase in our study combines Nemiro's concepts of the idea generation phase and the development phase. In fact, for us, there was no separation between the cognitive and the behavioral generation phases. Team members share ideas and draft them at the same time. Three other specific phases emerged from this study. GVT members are not supposed to know each other before the project's launching. The preparation phase allows team members to "meet" each other and get acquainted. Another specific phase is the incubation. Geographical and temporal dispersion of members support the formation of subgroups within the same team. In these subgroups, members work either as classic or as virtual teams. The manifestation of the incubation phase allows us to conceive of the creative process as an interaction between the team's conscious and subconscious. The emanation phase is an important phase, as it allows team members to share the same vision of the product. Early emanation constitutes one of the four creativity-enhancing factors found in this study. The presence of stimulating members, ubiquity, and technology appropriation are the three other enhancers. Creative GVTs are those benefiting from one or several enhancing factors and avoiding inhibitor factors.

Despite the opportunity afforded by the experimental setting, the use of students remains as major limitation of this study. More research in the field of organizational studies is necessary to control for actual implementation of the results. In spite of these limits, this study opens up considerable prospects for future research. The psychodynamic vision of the creativity process in EVGs sheds new light on the existence and the interaction between the conscious and the subconscious during the creative process. It may be possible to establish links with work carried out in the Human-Computer Interaction field (HCI). After coordination [DB92] and leadership [We02], it would be productive to study the impact of the team's "conscious-subconscious" on creativity and creation process.

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