

Collaborative Analysis and Communities of Practice in Health Sciences

Juan Alberto Castillo M.

PhD in Cognitive Psychology,
ErgoMotion Laboratory, Medicine and Health Sciences School,
Rosario University, RENATA – LMS in GRID computing project,
National Minister of Education and COLCIENCIAS, Bogotá-Colombia
`juan.castillom@urosario.edu.co`

Abstract. In the context of the information system in health sciences, the actor requires collaborative models for analysis and diagnoses process. In this purpose, we developed a learning community based on a distributed management model, the model is supported in grid development to facilitate the process of management, storage, distribution and selection of knowledge for perform process analysis, specifically in movement sciences, this project research analyzes the problems associated to learning the principles of human movement diagnoses. The study of the parameters required for the preparation of diagnostics, are presented to students to apply them in collaborative work sessions.

Keywords: Ergonomics, Motion Analysis, Simulation, Community of Practice.

1 Introduction

Today the knowledge visualization as a design activity focused in the solution of knowledge transmission problems; actually this is an area of extensive research in the contemporary context the information use in NTICS technologies and new media. The complexity of the interaction problems and the information management, with which individuals interact, is oriented to driving the need for more robust processes and tools more complex reasoning. In other hand the increased complexity in decision making problem and information management must be addressed with meaningful solutions for people.

The problems in access to encrypted information depend on the establishment of codes or models use in packaging information and knowledge, the question is how every individual can coding and decode that information system. The present and future forms of interaction have changed the way of access to information and knowledge, so the design of these means is necessary to understand the ways of structuring knowledge and the mechanisms of encoding and decoding.

Using a grid, we have created a learning community designed to develop jointly and simultaneously clinical assessments of problems, related to human movement survey, in order to develop collaborative diagnoses and develop common strategies for intervention strategies. Grid work permits while large groups of students observe the process of elaboration of these diagnoses.

This project sponsored by RENATA (High speed national network), COLCIENCIAS and the National Minister of Education from Colombia, search implant a physical infrastructure, of services and applications in networks of high speed using GRID model, that allows integrate of existing projects in movement analyses at the University of Rosario and which they are tried to extend to the academic networks of high speed, for the development in university hospitals in Colombia.

1.1 Structure of GRID Project

The project start with 3 courses for Colombian universities students, after that this LMS platform are including within academic programs of medicine and rehabilitation in others Colombian universities, the project have associate too university hospitals, they can accede to virtual resources, using high speed internet connections. The project uses a computational net (GRID), with a software of e-learning executed on this architecture. The computational net is tried to implant is an own net of MAAT known as MAAT-G and the software of e-Learning also are of MAAT, Known like MAAT-KNOWLEDGE.

In this sense, the first stage of this project will be joined by the Motion Analysis Laboratory at the University of Rosario and the motion analysis center of the health authority of the Autonomous University of Manizales .Thereafter, any associated RENATA University may enter the project and be part of the universities who want to be linked to the platform and resources offered through this computational grid.

RENATA (National academic network) is leading the project GRID Colombia through the Red course with the participation of universities in Bogotá, Medellin and Bucaramanga. The main objective for RENATA is to build a computational grid system that contains universities and institutions that develop projects in the areas of climate, pollution, natural disasters, biodiversity, bioinformatics, health sciences and natural resources

In Colombia, each university has implemented its platform GRID and one of its projects is the integration of these into a single GRID consolidated , managed infrastructure GRID as GILDA (GLITE) , Middleware Architecture for GRID Oriented Services (MEN) , ROCKS , G + .

The project developed installs and configures a Computational Grid (GRID), with E - Learning software that runs on this architecture. The computational mesh installed, is a proper mesh called MAAT MAAT - G and e - Learning software is also MAAT, known as Maat - Knowledge.

Ian Foster, co-director of the GriPhyN (Grid Physics Networks) [1]. Defines a Grid as a system that: 1) coordinates resources not subject to centralized control, 2) Use standard protocols and interfaces, open and general purpose and 3) deliver an important service quality. On the other hand Hai Zhuge [2]. GRID defines as "an intelligent networking environment and sustainable development that allows people and machines effectively capture, publish, share and manage knowledge resources". On the other hand, according to Hai [3]. "Knowledge GRID has social characteristics. In the real world, people live and work in a grid obeying social rules and social and Economic Laws. The grid Provider information flows and Knowledge flows.

1.2 Community of Practice in Movement Analysis

Learning using information and communication techniques in GRID, extending large-scale vision of a flexible, secure and coordinated educational and computational resources, and also expands the dynamic exchange between individuals, institutions and resources [4]. In this project, the objective of a community of practice is to meet different actors in a synchronic action, facilitated for the technologies of communication, the action reciprocates of the actors is oriented to the development of know-how, abilities and attitudes that should be stabilized in the time.

In that community, the modelling of interaction aimed at diagnosis and troubleshooting can be seen in the model proposed by Morse, M [5] provides three scenarios for digital action in cyberspace, specifically identifies the electronic networks as arenas where you can develop a group think model, this is the means to enhance human inter-subjectivity and develop a model of interaction beyond the model of human-machine interaction. In this sense, a distributed LMS in GRID lets you generate a model of user interaction on a technological platform for high performance.

The Communities of Practice [5], as a process of social learning that occurs when people who have a common interest in a subject, our "Communities of practice are groups of students who share a concern or a passion for movement analysis, they do and learn how to do a better diagnosis, as they interact regularly in case study and on-line events."

2 Design Model of Community of Practice

The design of the learning community is based on the principle of diagnose is due to make from elaborations to understanding and structuring the movement problem. This action is due to develop in two dimensions: collective and individual. The objective is to facilitate the transference of the concrete experience to the theoretical elaboration.

The search and exploration of the solution to identified the problem, must be oriented from the collective perspective, this with the purpose of constructing, diagnose could be anchored in the collective experience.

The development of processes of reflection and discussion on-line and real time, facilitates the collective process of the problem deconstruction and construction of the solution. The GRID offers the possibility of a high volume of data flow. These data could be examined from individual point of view, also could be treated from the collective point of view.

For the development of double flow process, a series of resources has been designed that can be consulted on line and that also can be shared by the members of the community. Additionally each individual can annex information that comes from its experience with the purpose of enriching the collective knowledge of the community.

It is important to remember, that in the diagnose elaboration in the field of the health, is necessary the participation of several referring ones with the purpose of validating internally and externally the decisions that are due to take.

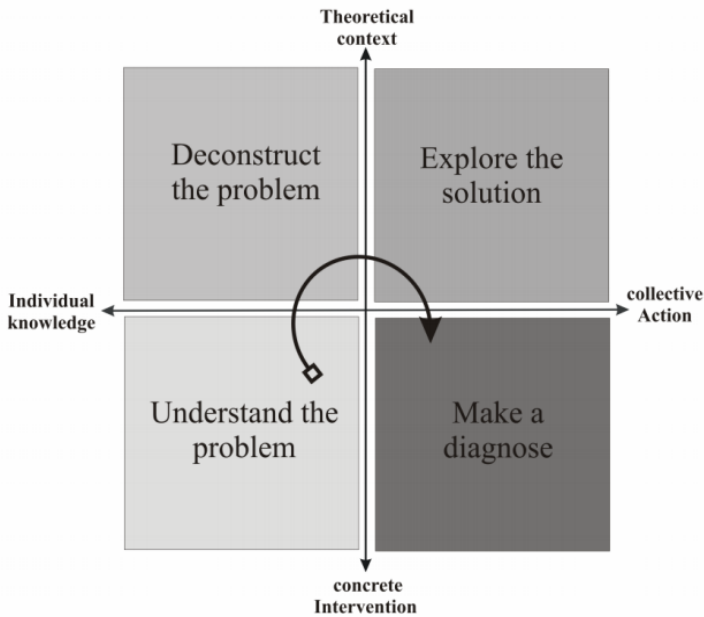


Fig. 1. Model developed for the interactions design community. (Castillo, J. 2010)

2.1 Interaction Activities

The interaction activities are developed in two contexts. The community organizes itself in different groups, each group interacts internally with the purpose of developing an own knowledge base. In the second context, the different groups interact to each other, in order to develop a common base of knowledge.

The development of a common knowledge base, is organized in two dimensions, the dimension practices that it compiles the knowledge to do of each one of the experts who monitoring the community and the knowledge to make of each one of the students members of the community. The second dimension is oriented to the development of corpus theoretical specialized in the problems that must be treated in the knowledge field of the analysis of the movement.

The interactions between the members of the community are developed in the practical and theoretical field. The development of abilities in these two fields with the purpose of sharpening the processes of analysis and diagnosis of the cases treated by each one the members outside the community. The development of the community requires east validation process in the experience of each individual in its personal practice of the processes developed collectively in the community members groups.

Finally the development of a community based on GRID, facilitates the massive interchange of data (videos, photography's, descriptions). With the purpose of allowing to the members the development a precise representation of the problem treated, it is important to emphasize that, in the movement analysis a high volume of objective information, is required it comes generally from systems of digital registry and analogous reports elaborated by the analysts.

References

1. Foster, I., Kesselman, C., Nick, J.M., Tuecke, S.: The physiology of the grid: an open grid services architecture for distributed systems integration. *Global Grid Forum* (2002)
2. Zhuge, H.: A knowledge grid model and platform for global knowledge sharing. *Expert Systems with Applications* 22(4), 313–320 (2002)
3. Zhuge, H.: Communities and Emerging Semantics in Semantic Link Network: Discovery and Learning. *IEEE Trans. Knowledge and Data Eng.* (2008)
4. Foster, I., Kesselman, C., Tuecke, S.: The Anatomy of the Grid: Enabling Scalable Virtual Organizations. *International Journal of High Performance Computing Applications* 15(3), 200–222 (2001)
5. Lave, J., Wenger, E.: *Situated Learning - Legitimate Peripheral Participation*. Cambridge University Press, Cambridge (1991)