The 2006 World Congress in Computer Science Computer Engineering, and Applied Computing
The 2006 International Conference on Software Engineering Research & Practice (SERP'06)
Las Vegas, Nevada, USA
(June 26-29, 2006)

INTERLOCUTOR SYSTEM

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Abstract *— This paper presents a new boarding of the job of Groupware in the solution of problems. The proposal makes a group of specialists to behave as if they were an only entity. As a result of that methodology, the proposed system works with concepts of Collective Intelligence and socket of decision in group becoming a new tool for the segment of CSCW.*
Index Terms — Interlocutor, Collective Intelligence, CSCW, Groupware.

I. INTRODUCTION

The word interlocutor be associated to a person that speaks with other assigned of representing a group. The Interlocutor System is that capable one of reproducing in a net of computers the human speaker's paper.
This article presents the proposal of a methodology for work in group that transforms ideas, needs, competitions and co-operations, competence and creativity, in the manifestation of a single collective intelligence or group conscience through application software.
In CSCW system, a group of users coordinate to finish a task with a shared work environment, and they need to access the shared data. A problem comes however that these users have different privilege, assignment, and different data has different share range, requirements of cooperation perception and security. So it is important to establish proper access control strategy. Moreover, the research focus in CSCW is not multimedia but the user group, the cooperation need keep to some certain roles, otherwise it will cause difficult, nom-efficiency. Coordination strategy is just the embodiment of these roles (LIU, 2004).
Groupware is a group of tools that has for objective to increase the productivity of the collaborative work, increasing and efficiency and effectiveness. In that way it is right to affirm that any product that allows to the people to work committees, in a complemented way, in order to increase the productivity and the expected results of the process, a product of the segment of Groupware can be considered.
Weiss (2001) detaches that the systems called of collaborative technology support people's groups involved in tasks common in interface of shared atmosphere. Ficheman (2002) complements increasing that: "The groupware can help a group of people in the same physical place or geographically distributed and it can allow the communication and the cooperation through interactions in real time or in asynchronous way."
The considerations of time and space suggest four groupware categories presented in the illustration 1.

Illustration 1 – The four groupware categories (ELLIS,1991)

	Non-real-time	***Real-time***
Same place	Asynchronous interaction	Synchronous interaction
Different places	Distributed asynchronous interaction	Distributed synchronous Interaction

Looking for a new managerial vision and strategic, a lot of institutions, around of the globe, they begin to invest in Portals of Corporate Knowledge (PCK). The goal is to learn, in first place, how to connect their employees' Collective Intelligence to make to appear more sophisticated knowledge nets with extensive communities. PCK can help to improve the connections among people, and frequently they can take connections that would not happen without that tool (TERRA, 2002).

Collective Intelligence (COIN) means a large multi-agent system where there is no centralized control and communication, but also, there is a global task to complete. The proposed framework is focused on the interactions at local and global levels with the agents in order to improve the overall supply chain business process behavior. Besides, learning consists of adapting the local behavior of each entity with the aim of optimizing a given global behavior (SHEREMETOV, 2004).

According to Bessel (2005), in communication, COIN designates the process of knowledge production based on several sources, gathering opinions and people's experiences and different places. Before the popularization of the Internet, that process was practically restricted to the academic and scientific middle.

According Cruz (2000), the groupware technologies can be divided in three groups, as for its category of applications, being them: a) based on organizational communication; b) based on great volumes of data and transactions; c) based on documents in forms.

In the first two groups they are the applications as: e-mail, managers and documents, controllers of flow of forms, workflow, DBMS (Date Base Management System), image managers and recovery of data and information. And, in the last group, they are the applications as: calendar, electronic calendars, videoconferencing and workflow. The application of concepts of areas of the sciences of the computer doesn't guarantee the success in the development of support tools to the cooperative work. The development of these tools involves concepts and technologies of several areas of the science of the computation. Interaction Man-machine's area presents solutions for the project of interfaces with the user.

The areas of Nets and Communications contribute with the support to distributed systems, and the one of Operating systems supplies the models of competition control. The technology of Database is the key in the support to the sharing of information, while the technologies of Multimedia present solutions for the association of the treatment of information multimedia. Concepts of Artificial Intelligence (AI) are fundamental for the intelligent agents' construction in groupware tools.

Multi-agent System (MAS) is an approach for solving the complicates problems which a single agent cannot deal with. It derives from Distributed Artificial Intelligence (DAI) methodologies. Because of the complexion of the domain where MAS is applied, coordination and cooperation among a set of agents is required to be emphasized in order to find efficient solutions problems (TA, 2005).

In Oliveira (1992) they stand out some advantages of the work in human committees, such as: a) socket of decision and judgment group; b) coordination of activities in different areas in the search of objectives; c) transmission of information; d) and restriction of the individual authority.

The committees are a form of organizing individuals for specific purposes, and for that, they possess useful life and all the other characteristics foreseen in the General Theory of the Systems. That turns easy to observe the effort of a committee as much defined entity, that it can or not to do part of a more complex structure.

It is also important to point out that the success or failure of the activities of a committee will always be knowledge source and experience for their members and all that know about his existence.

In Wright (2000) and Massaud (2005), they tell themselves that a series of studies was driven, during some time in the beginning of the sixties, for the RAND Corporation (Santa Mônica, California, USA), receiving Project Delphi's denomination. Their precursors were Olaf Dalkey and Norman Helmer, who presented the theoretical foundations of the same in full detail.

The original objective was to develop a technique to perfect the use of the specialists' opinion in the technological forecast. In the developed methodology, this was made settling down three basic conditions: the respondents' anonymity, the statistical representation of the distribution of the results, and the feedback of answers of the group for revaluation in the subsequent rounds.

Like this, in its original formulation, Delphi is a technique for the search of a consensus of opinions of a group of specialists regarding future events.

The method is recognized as one of the best instruments of qualitative forecast. Its area of more average application is the technological forecast and of market, but, little by little, it is being extended for other areas, as the Administration (mainly in Description of Future Sceneries in the field of the Strategic Planning), in the study of the Geopolitics, among others. Its use is more suitable when historical data don't exist regarding the problem that is investigated or, in other terms, when they lack quantitative data regarding the same.

The market for commercially-available GDSS (Group Decision Support System) software is more or less divided between the realms of collaboration/idea generation and decision analysis. Idea generation methods, such as brainstorming or brainwriting, are typically lead by facilitator who elects ideas from a group and uses incremental feedback to categorize and rank ideas. Decision analysis can be used to construct a mathematical model of the decision problem (and proposed solutions) that guides the group towards identifying the most preferred alternative course(s) of action. Additionally, each of these domains comprise several sub-areas of practice and most software packages only focus on a small part of one on these functionalities. Currently, no commercially-available software supports the entire GDSS process by spanning the various techniques of both collaboration/group creativity and decision analysis in multi-user, synchronous environment (CHAMBLESS, 2005).

It is believed that the model proposed in this article can represent the unified vision of a group, a Collective Mind (CM), in a practical and functional way in harmony with delineated common objectives, which can be a contribution for the area of CSCW.

II. PROPOSAL

The system is capable to do a group of people, that they can be specialist or not in a certain theme, to participate in a dialogue as if it was a single entity, a single being, as cultured in the illustration 2.

The proposal of the system is to try to extract of the people's group connected in the solution, answers that they translate the best impression on the theme in discussion.

According to Maturana and Varela (2001), an explanation is always a proposition that reformulates or it recreates the observations of a phenomenon, in a system of acceptable concepts for a group of people that they share a validation criterion.

Illustration 2 - Generated with political cartoons of (GLASBERGEN, 2005).

The answers, that they are emitted by the system, are fruit of a democratic methodology of negotiation. The solution is capable to make instantaneous risings of the participants' opinion during the development of the works.

The solution is limited it a team of collaborators that they play the part of knowledge feeders. Being like this, if the collaborators go experts in the subjects presented to the system, the answers will be generated with the quality of experts.

By definition the proposal was elaborated to be synchronous, because in the industry or in the trade the readiness of state information in real time it is creating a need of reverse-optimization of models and of methods that can repair an action plan quickly in relation to changes of contribution data. This is particularly important for operational problems, where the solution to optimization problem specifies a short-term assignment or schedule of resource use. As a consequence, logistics gets a new focus on optimization of the production process in a very dynamic environment (SHEREMETOV, 2004).

As cultured in the illustration 3, the system needs a net of computers with three software modules: Interface Expresses, Servant, and Interface Interns.

The solution works in a continuous cycle. Initially the Customer, which represents the Interrogator, accesses the solution for the Interface Expresses, he makes a comment or he asks. Later the Servant directs the information received for the collaborators' team in the Interface Interns. Individually, then, each collaborator presents his answer. With the collaborators' opinions, according to hierarchy criteria and of configurations, the Servant makes a previous classification and it directs them again to the collaborators for they to choose, they vote

for, the most appropriate. Once chosen an appropriate answer it is introduced to the Customer in the Interface Expresses. The cycle repeats while it is necessary the maintenance of the dialogue.

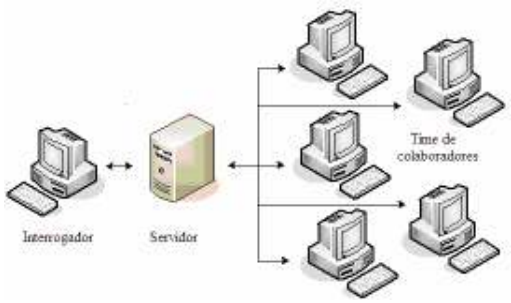

Illustration 3 – System configuration.

III. IMPLEMENTATION

The goal of the operation of the prototype is to test the solution, to verify the proposal is valid and if it is worthy of more investigation and research. For that reason, for the elaboration of the test system they were necessary some simplifications.

The mediation of the negotiations is made by the servant, that controls the reception of the answers and it orders them according to some criterion that comes to be configured in the system. After the classification the system exhibits the collaborators the list of the opinions and these should make their own alterations in the order of importance of the collected material. At the end of the process the solution cleans the best answer and it exhibits it for the interrogator.

The system is configured according to the purpose for which one want to obtain results. The first configuration refers to the specialists that will compose the collaborators' team that will give support the solution, and they should be of the area in which it is making the investigation. The second configuration is regarding the form as the system will classify the collaborators' collected opinions, it will exist some hierarchy among them or no, or even some rule there will be been to be adopted. The interfaces can still be programmed with characteristics for the specific problems (for instance, if a group of specialists are made by chess players the interface can be a chess board).

The diagram of case of use (illustration 4) illustrates where the main actions are confined. The Interface Expresses fits to make the contact with the Customer of the solution, that will feed the system with the questions and he will pick the answers. In the Interface Interns the collaborators' team, the specialists, it receives the request of the external middle and it makes: a selection process, the generation of their comments, they glimpse a pre-classification of the ideas, and they vote for in the best alternative. It falls to the module of the Servant to make the correct communication and the mediation of the processes in development.

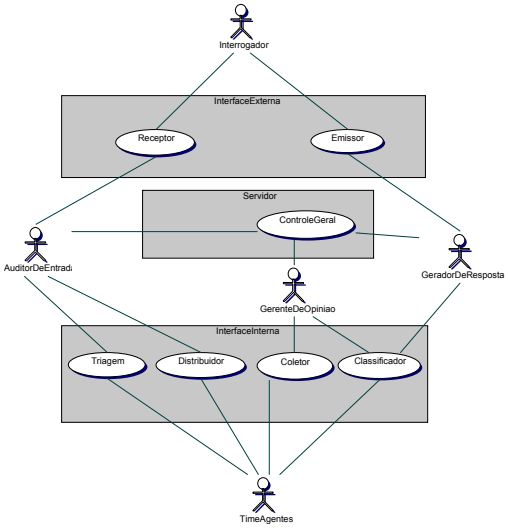

Illustration 4 – The diagram of case of use.

IV. RESULTS

In 1950 Alan Turing (RICH, 1988) it proposed a method to know a machine could think, that it was known as the Test of Turing, where a person making an interrogator's paper in an isolated room has access to a terminal. In this terminal the interrogator begins to type questions and comments and he obtains another person's that he ignores answers. The Test of Turing consists of the interrogator to discover the other person is or no a computer with intelligent programs, simulating a person, or really a person answering in a terminal.

The experience that here it proposes is a variation of the Test of Turing. In a terminal a person makes the interrogator's paper, typing their questions and comments in a screen similar to the screens of chat programs, while on the other side a team of collaborators answers and the system combines the collaborators' answers and it answers to the interrogator as if it was a single person. It falls to the interrogator to discover with whom or what is speaking and to evaluate the intelligence level of that supposed

"person" with which would be maintaining dialogue.
The model can be used in critical situations that demand fast answers with the knowledge of a group, for instance, a critical flaw in the space bus in which dispersed specialists for the globe talk with the astronauts in emergency situation. In case real happened with Apollo 13 in those specialists in the Earth guided the astronauts to build a filter of air with the existent pieces in the capsule.
The system can also be used in several other situations, such as: doctors diagnosing a single patient with a rare disease, a group of people participating in a game with connected virtual scenery in net, a representative assembly talking with a ruler, etc.
The screens of the prototype elaborated for the tests initials can be observed in the illustrations 5, 6 and 7. Through the application it can occur the proof of concept of the proposal.

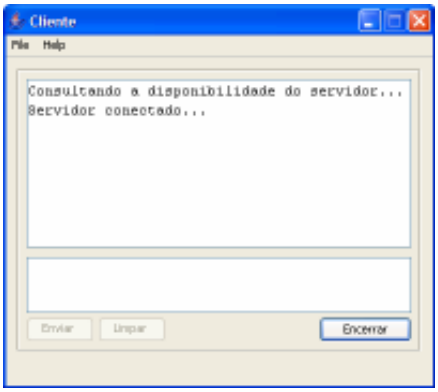

Illustration 5 – Screen of the Interface Expresses.

Illustration 6 –Screen of the Interface Interns.

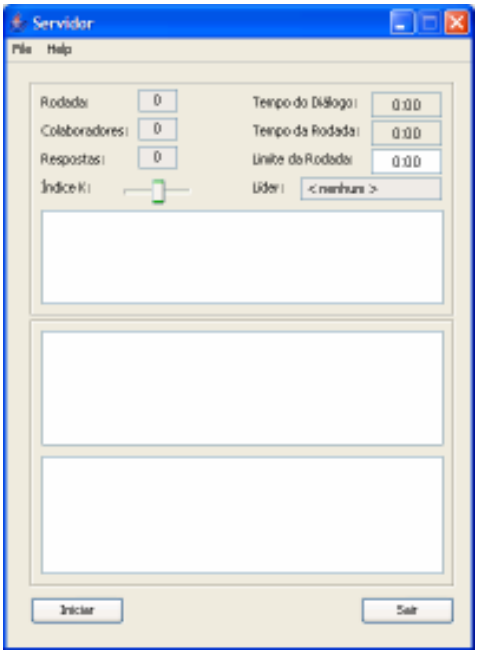

Illustration 7 – Screen of the module Servant

V. CONCLUSION

The communication nets have its strategic role in the humanity's evolution, with to strong tendency of integration of the nets. As different equipments are interconnection to the global net its potential grows exponentially with the number of connected devices. As it expands, the Web is going acquiring intelligence and sensibility, becoming a neural organism of world extent. Just as it happened with the alive organisms, that, with the unicellular beings' union, they form colonies and gradually more complex and sophisticated organisms, once having memory and communication capacity, the same will happen with the world net, that it is acquiring an own planetary conscience (ZUFFO, 2003).
As part of the natural evolution of the tools of CSCW, the Interlocutor System represents one more contribution for the solutions with planetary characteristics.
The proposal is unpublished as for the form of agglutinating the individual thinking efforts, however the proposal was not tested in all its potential. It still was not investigated, for instance, the ideal number of collaborators that should participate in a configuration or even it is not known if the need of a maximum number exists.
As a future work, the Interlocutor System can be incorporate in a corporate net to evaluate its

acting in the decision process. An interesting case would be the director of a company to be seen he gets to "talk" with his team of employees, these being a single entity in the proposed system.
Another task to be verified is been two different groups can talk as if they were two different entities, as acted in the illustration 8.

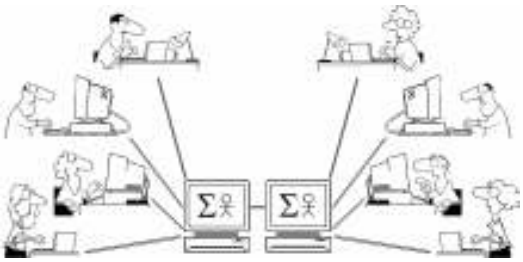

Illustration 8 - Generated with political cartoons of (GLASBERGEN, 2005).

Still thinking about other future possibilities, it would be also interesting to make a statistical analysis of the individual and collective acting; besides analyzing as the answers of the system they are formed.
There is possibility close to for works specialists of the most varied areas of the human knowledge and, for each area, the solution can be configured as the needs go being delineated.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the efforts of Daniel Arndt Alves, who collaborated in the implementation of the prototype.

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