KNOWLEDGE MANAGEMENT AND E-BUSINESS

Augusto E. Bernuy

Facultad de Ingeniería Industrial y de Sistemas, Universidad Tecnológica del Perú, Lima, Perú
Facultad de Ingeniería y Arquitectura, Universidad de San Martin de Porres, La Molina, Lima, Perú

Abstract: The goal of the research is to design the concept and architecture for new collaborative e-business model in order to join knowledge management and intellectual capital under the approach of engineering systems. A collaborative system is designed as a part of new assets, called intellectual capital. We build a supply design to understand the collaboration among people, processes and systems inside a holistic approach. To do that the paper presents two models: the first model is the integration among intellectual capital, collaborative systems and e-business; and then the second model is designed to understand the behaviour of software agents. Processes are analyzed on their value, for example we need to know if the results of a process may be important for someone in order to resolve a specific problem. This concept will be used in one controlled environment and to do that we need some functions of the software agents to complete one specific process and evaluate some alternatives for the best solution. As a result we get the new process of a collaborative system, also we define the ability to collaborate and leverage the knowledge giving to software agents some decisions that we take in a real problem. After the process has been completed we have improve the design of collaborative e-business performance under the approach of intellectual capital and knowledge management.

1 INTRODUCTION

"Collaboration is a term that is often misused as a technology and marketing 'buzz word'. And the most of tools do not support either collaboration or coordination but often only different types of communication or only the ability to access specific data" (Coleman and Ward 2000). Now we know three aspects of collaboration: content, context and process (Coleman and Antila, 2006).

Now we introduce a new definition (Bernuy and Joyanes, 2008):
1) We have a problem that needs one or more process to resolve;
2) Theses processes have activities as a context and the content. The information which will be transformed is the content.

The main processes are (figure 1):
1) We need to do something, so we have an input but we are not sure about the results and at the end when we are expecting the output (process level one). While the main process is doing we need to pass through some sub processes (processes level two), from the first to the last one, this is our context;
2) Then we have the ability to identify each different process, but also to identify some alternative sub process and then we do it. If we choose one or another sub process the results will be different;
3) Now each sub process needs to analyze something and it has its own rules and different steps before to do any transformation.
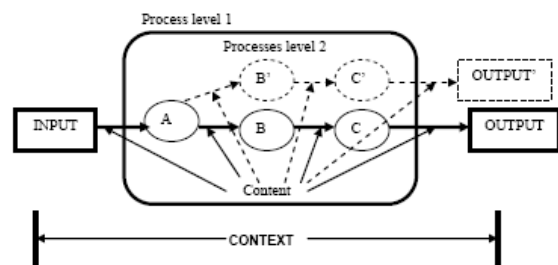

Figure 1: Collaborations aspects. Source: Own.

For us collaboration is the main part of the organization, if you do not have collaboration, any process will fail.

If we think that in the business world the collaborative processes are often highly negotiated,

geographically distributed, and highly sensitive, and they are more vulnerable to error in execution, then the results consume more time, effort and resources; so we need to think in a new way of collaboration.

2 COLLABORATIVE SYSTEM BASED IN KNOWLEDGE STRATEGY

Some collaborative tools help us to solve a very difficult problem, but now we need to create a value into the virtual space team or across a transaction-based business system ((Coleman and Antila, 2006).

Also "Effective collaboration represents the most value, top-line gain for organizations today. It can unlock the potential of the collective knowledge and intellectual capital of a given organization, as well as its value network" (Coleman and Ward 2000).

The new system has two agents (Bernuy and Joyanes, 2008):

1) The main software agent is designed in order to look at the environment and identifies when a task is started, then the agent will resolve the critical factors for success to deploy the best solution for each process.

2) The second software agent is designed to complete the process, its target is evaluates the best alternative for each task based on the information from the previous expertise and process rules database.

2.1 Knowledge Management as a New Approach

The relation between intellectual capital and knowledge management is:

1) Human capital is the source of knowledge;

2) An action over transformation process gives the performance and new knowledge towards all the system;

3) The new knowledge is ready for be registered and used.

The relationship is started with human activity, in any place where one need has been created. Each activity may be registered in previous step, and process rules are designed in workflow system. We need to build an important result in transformation process among different parts of intellectual capital, this transformation process produce new knowledge (Richert, 2006).

Agents are defined to:

a) Identifying status of the process, look for starting and ending processes points;

b) Analyze previous and similar processes;

c) Analyze problems in previous processes;

d) Analyze new problems with available information;

e) Preparing recommendations and send to executor;

f) Registering the results of the process.

2.2 JADE Agent Platform

JADE (Java Agent DEvelopment Framework) is fully implemented in Java language. It has the FIPA specifications and through a set of tools that supports the debugging and deployment phase.

The architecture offers flexible and efficient messaging, where JADE creates and manages a queue of incoming ACL messages, private to each agent; agents can access their queue via a combination of several modes: blocking, polling, timeout and pattern matching based.

The full FIPA communication model has been implemented and its components have been clearly distincted and fully integrated: interaction protocols, envelope, ACL, content languages, encoding schemes, ontologies and, finally, transport protocols. The transport mechanism, in particular, is like a chameleon because it adapts to each situation, by transparently choosing the best available protocol (Laclavík, 2005).

3 IMPROVING COLLABORATION IN E-BUSINESS

The base line is the hide relationship among human capital, structural capital and social capital. They are working together and doing the transformation of the resources in the organization.

It is happening in the day-by-day routine. This transformation obtains good results when we have collaboration, in otherwise the results normally fail.

3.1 Collaborative Process and Performance

The new process based in intellectual capital is defined as a collaborative system (figure 2). The activities of the agents are:

1) The agent is searching for a new task, when it is founded the agents obtains the specific context and the information about the request and the
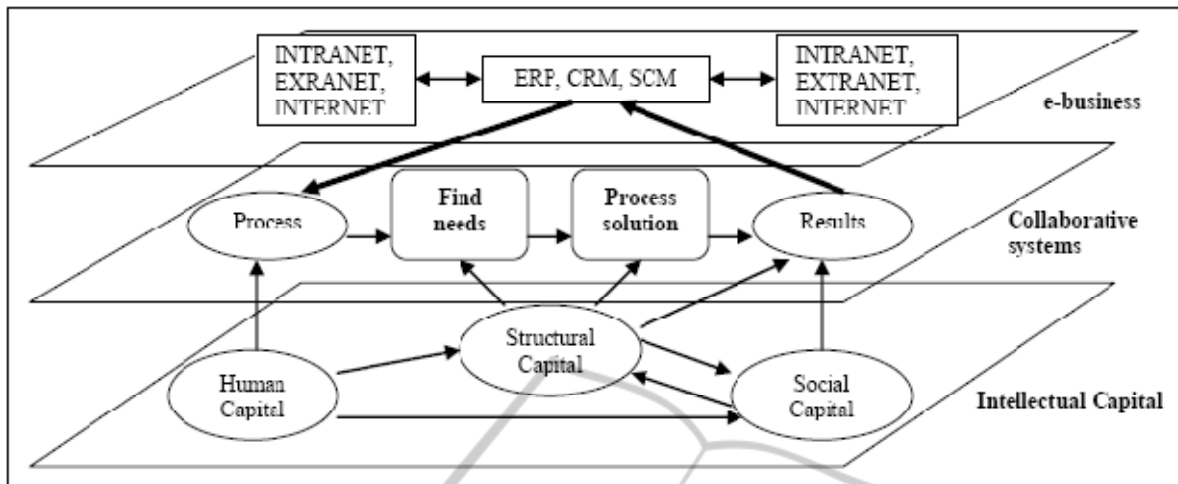
Figure 2: Collaborative process framework. Source: Own.

process level 1 is related with;

2) The agent finds information about the main objectives of business related to rules of the process and obtains the sequence of the process from the workflow;

3) The agent looks for new information about expertise or changes in previous rules;

4) The agent prepares a message and transfers the control to process level 2.

These activities are an example for one process that needs review information and evaluates previous experience before take a decision. As not always the results are goods, we need evaluate the results and design a way to learn.

In process level 2 the second agent is designed to evaluate and delivery the best solution:

1) The agent receives the control and information from the process level 1, immediately the agent analyzes the data and looks for common and complex problems from the knowledge data base

2) The agent evaluates the best option and prepares the recommended solution in order to follow politics about the critical success factors;

3) The agent evaluates if exists new problems or need more information and resolve the process;

4) The agent prepares action set to delivery and generates results for learning.

The design has a better performance with non-structured and complex decisions, where is not easy to know the result, and the previous experience are not enough. That is the reason to build a learning process inside the system.

When the results are good, and the agent had to choose among several options, also we have better options to get good results again in future similar situations. When a new element is registered in the workflow rules we need to know which the impact of the decision and the results is.

4 EXPECTING RESULTS

In the most of cases we are expecting results as building source code and data processes by the new systems, but now we have another kind of results.

This model to allow gives collaboration under the approach of intellectual capital and software agents.

If you remember the figure 1, we had defined to levels of processes: process level 1 and processes level 2. Then we defined the logical structure among intellectual capital, the collaboration systems and e-business process in figure 2.

These new processes give high efficiency and additional competitive advantage in:

1) Real time process and synchronous work between actors of the value chain;

2) Create a learning curve for rapid productivity;

3) A holistic approach to challenges of collaboration, among people, processes and systems.

This is the moment to create intelligence in collaborative e-business.

We propose to translate some human behaviour to systems; we have better results across the organization. It is possible when we are able to produce rich information for decision-making and capture best practices for future situations like the Collaborative Project Portfolio Management (Smith, 1998), but now these functions will have the ability for start to work in automatics ways.

As we showed (figure 2) we can to identify the intellectual capital based on transformation processes from human resources to structural capital and relational capital. This is the challenge for the next research will be find the transformation about resources.

5 CONCLUSIONS

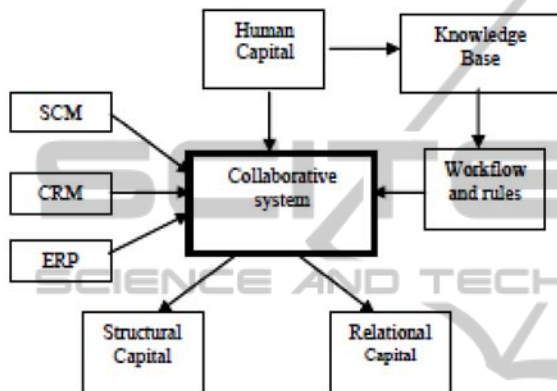A new solution needs a new approach to understand and run the knowledge management (figure 3).

Figure 3: Collaborative concepts for e-business. Source: Own.

We can see the collaboration through the organization. We can to share information, also understand intellectual capital approach.

Each organization needs a specific database to obtain its workflow structure. We need both, common and complex problems and the expertise that exists in the environment.

We want to improve the processes and some problems like spending an inordinate amount of time looking for information, or documents, or contents or people expertise.

Knowledge management is present in each activity of people, organizations, and its value is in to obtain itself, to register itself, to analyze itself and finally to give to others users.

People need to share knowledge, but in the most of the cases they are not prepared to do that, because they feel that their knowledge is the source to keep their job and their reason to live.

We need a cultural change as new conditions for the success, like ethic, transcendental motivation, which ones will be joined and interchanged with e-business processes. The system identifies collaboration needs, and creates new ways for give collaboration based on both, software agents and

information systems.

The system creates value while people put their experiences and knowledge about different problems and solutions, without fears, always having the main goal on the organization.

The new concepts will be development into one controlled environment in order to improve the competitive advantage in the organization.

REFERENCES

Coleman, D., Ward, L., 2000. Realizing the potential of e-collaboration. *A white paper by Collaborative Strategies,* California.

Coleman, D., Marcus, A., 2006. Collaborative Project Portaolio Management. *Collaborative Strategies*, California.

Coleman, D., Antila, D., 2006. Enterprise Collaboration. *Collaborative Strategies*, California.

Bernuy, A., Joyanes, L., 2007. Propuesta de un Modelo de Negocios basados en el Capital Intelectual, in Proceedings. CollECTeR Iberoamérica *Collaborative Electronic Commerce Technology and Research*, Universidad Nacional de Córdova, Buenos Aires, Argentina 6-9 Nov 2007.www.collecter.org.ar

Bernuy, A., Joyanes, L., 2008. Collaborative e-business and software agents. *Proceeding of CISSE2007. International Joint Conferences on Computer, Information, and Systems Sciences, and Engineering.* University of Bridgeport, Bridgeport USA 3-12 December. http://cisse2007.org/

Bontis, N., 1998. Intellectual capital: An exploratory study that develops measures and models. *Management Decision. 1998*, Vol. 36, Núm. 2, pp. 63-76.

Bueno, E., 2005. *Dirección* del Conocimiento en las Organizaciones. *Asociación Española de Contabilidad y Administración de Empresas, AECA*. Madrid. http://www.aeca.es/pub/documentos/po16.htm,

Castillo, A., 2003. Modelos y Plataformas de agentes de software móviles e inteligentes para la gestión del conocimiento en el contexto de Tecnologías de Información *Department of Software Engineering. Universidad Pontificia de Salamanca*. Madrid.

Laclavík, M., 2005. Ontology and Agent based Approach for Knowledge Management Thesis submitted for the degree philosophiae doctor Institute of Informatics, Slovak Academy of Sciences.

Richert, E., 2006. Technology Support for Distributed Collaboration: Begin with Team Behaviors. *European 1st Conference on Collaborative Working Environments.* http://www.cwe-europe.org/main.php/04_RICHERT_CWE06.pdf?fileitem=1655627