THE BEER GAME,

WITH THE POSIBILITY OF THE USE OF EDI,

THROUGH THE INTERNET.

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Within the objectives of the Computer Assisted Management Research Group (Grupo de Investigación en Dirección de Empresas Asistida por Ordenador-GIDEAO) is the creation of business simulators which facilitate a greater understanding of the complexity of the different management systems, thus favoring managerial decision-making. One of the lines of work of the Information and Communication Technology for Business Research Group (Grupo de Investigación enTecnologías de la Información y Comunicación en la Empresa- GITICE) is the difusion of communication technologies including Electronic Data Interface (EDI) in the workplace. One of the fruits of the colaboration of these two groups has been the creation of a computer application which allows the simulation of the Beer Game with or without the use of EDI.

Objectives of the Application:

This computer game seeks to attain various objectives: the *first* of which is the offering of a virtual alternative to the traditional board version of the Beer Game: the program automates all of the bureaucratic tasks necessary for its development and permits each player to be in different locations (including countries), therefore facilitating **distance learning**. The *second objective* is the comparison of the results obtained in both modes of the game, board and virtual, to observe the possible influence to get greater concentration by the player (not having to carry out bureaucratic tasks) can have on the results obtained (this work is in process). The *third objective* would be the comparison of the costs in a market that uses EDI for the transmission of business documents (orders), between different economic agents, with one that does not use it, in identical conditions; the comparison will permit the observation of the effect of this advanced system of telecommunications in the market, in addition to the logical atenuation of the oscilations in the system due to the elimination of delays in the transmision of information. The *final objective, which arises* out of the former, consists of the utilization of the model to demonstrate the advantages of EDI to different firms, encouraging in this way the difusion of this technology.

Structure of the Application:

The application is composed of two main programs: The Server and the Client. The **Server** is charged with managing communications and recording the players data; it is only accesible to the Facilitator of the Game. The client allows a player to participate in the game by communicating with the Server, and through it, with the rest of the players. Each player has at his disposal a client, with four possible players using the same program so, that the only way to differentiate one player from the rest is by the position occupied by the player in the game (retailer, wholesaler, distributor, factory). Since each player can now be separated from the others, on any computer connected to the Internet, one of the original premises of the game is favored: the prevention of the the exchange of opinions and information among the different players.

The **client** program, that which each player uses, is responsible for presenting the necessary information for the development of the game. The information for the corresponding period is shown in the main window: *inventory arrivals* and *incoming orders*, in addition to *stock* and *backlog*. In this same window, the player inputs the *order* which he is going to make to his supplier and finally send the information to the Server. Besides this primary window, the player has at his disposal, other accesories which allow him to observe the evolution of the game in its different phases, either graphically or in tabular form. In both windows the player or the Facilitator of the game can choose what series of information will be shown, being able to present various series simultaneously. However, each player can only see his own information, not having access to that of the rest of the players, unless the Facilitator allows this.

The server program is in charge of receiving the *orders placed* and the *inventory delivered* by each player, redirecting them to their respective supplier and clients in the appropiate period, and maintaining the general information of the game. It will also know the identity of each of the players and his situation (by the identification number of the computer). In the case of a player who slows down the game excessively, it is possible to exclude him from the game by "sleeping" him, he will be "punished" by being prevented from making decisions, which will be substituted directly by the client program. This characteristic also allows, if so desired, that the game proceed without the need for four human players. It is also possible to develop more than one game simultaneously, since the Server can execute copies of itself, to simulate various games at the same time; this allows the use of the same Server for different games. The number of simultaneous games will depend on the characteristics of the computer used by the Server.

The use of the Internet to transmit the information permits each player to use his own computer without having to change location as is usually the case in the majority of games of this type. This makes possible **distance learning** since the Director of the Game can do by

Internet the briefing as well as the debriefing of the game. One advantage of this version is the universality of the network; each player can be in a different country. The tests carried out have shown that within Europe, the delays are due more to the time spent in decision-making by players than to the transmission of information; intercontinental use depends on the time of day. In addition it has been anticipated that in the future, players will be able to share one computer even without a connection to the Internet.

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