Supporting Inventory Leveling Negotiations with a Collaborative System

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Abstract

The actual demand for a product or service will almost always differ from the prediction for that product or service, which will inevitably result in an oversupply of both the product and the service. It is essential for logistics experts to devise ways for locating prospective as well as suppressed wants if they are going to be successful in dealing with the surplus. The traditional methods that have been used to manage inventories are insufficient to achieve all of the desired goals. In this regard, the promotion of strategies for goods and service surplus destinations is also taking place with the goal of optimizing the deployment of organizational resources.

An essential component of the surplus destination activity is the negotiation that takes place between the party that is holding excess and the possibly requesting party. This is a procedure in which two separate parties strive for a consensus over their respective interests and goals, attempting to meet both sides' expectations in the process. Therefore, it is of the utmost importance to build mechanisms throughout the process of negotiation that encourage communication and motivation, as well as the capacity for decision-making, conflict management, and coming to an agreement. As a result, collaboration may prove to be the most fruitful kind of negotiation. Cooperation will assist to develop points in common that benefit the negotiation, and the exchange of information and the construction of consensus will play an important part in this process.

In this work, we provide a system to assist cooperative discussions with the goal of leveling inventory of goods and services used by various processes and promoting integration among them. Our system's goal is to level the inventory of products and services utilized by different processes. The system, which will serve as a market for services and items with capacity to spare, will be used by many agencies that fall under the purview of the Brazilian Federal Government's Ministry of Defense. The environment that is being suggested will make it easier for users of the system to work together towards the accomplishment of shared goals throughout the negotiation.

Introduction

Because of the enormous expenditures that they need, organizations' inventories have a major impact on the profitability of the business. Because of this, careful management of inventory piques the attention of logistics experts in developing methods that promote a balance between management expenses and the preservation of a desired level of customer service [3,8]. In many situations, the conventional management practices that are used are insufficient to accomplish this goal, which results in an excess of goods and services. As a result, one of the choices that may be made is to develop strategies for the destination of excesses in order to maximize the uses of the organization's resources.

The negotiation between the interested parties—one of whom is responsible for the demand, and the other of whom is responsible for the supply—is an essential component that must be taken into account whenever an effort is made to apply an excess of products or services. This is an important factor that must be taken into account. The negotiation is a procedure in which separate parties attempt to arrive at a consensus between their aims and interests in order to meet their expectations and arrive at a compromise [7,29,33]. Therefore, it is really important to establish mechanisms to promote communication and motivation during the negotiation process, as well as for the ability to make decisions, administer conflicts, overcome disagreements, and reach an agreement [23]. These mechanisms should also be able to facilitate the ability to reach an agreement.

This research was motivated by an actual problem that was presented by the Brazilian Ministry of Defense. In this problem, the Agencies require a system that can manage information about the excess and demand of products and the capacity of existing services, support the negotiation process between the supplying and demanding Agencies, and record the negotiation details. This research was motivated by this problem.

The purpose of this study is to provide a proposal for a web-based computerized environment that would assist the bilateral negotiating process that takes place between different elements of a supply chain, in which one part is responsible for the demand and the other part is responsible for the supply. another component is to blame for the surplus in both the supply of goods and the capacity of services. The most difficult aspect of this effort will be coming up with a setting that encourages collaboration between different components, which will make the process of integrating and coordinating those components much simpler.

For this reason, in this environment, the negotiation between users is arranged in a well-structured process that is specified based on negotiation processes discovered in the literature. This is done in order to accomplish the aforementioned goal. In addition, users are able to easily access this environment on the web, engage in dialogue with one another in real time, and become closer to one another. The primary objective here is to create a negotiating process support environment that makes use of the principles and applications that are associated with computer-supported cooperative work (CSCW).

The research is defensible from two different vantage points: the logistical point of view, and the technical point of view. Because it is so difficult to establish effective mechanisms of integration and information sharing among the various processes that belong to the same supply chain [17,18,32,36,21], the creation of a cooperative environment to support decision making and communication during the negotiation process is of utmost importance from the perspective of logistics. This is one of the reasons why it is so important to collaborate on the environment's design. The suggested atmosphere of cooperative work has the potential to alleviate some of these challenges. The suggested computer environment is a challenge from a technical standpoint since it requires the integration of a variety of different research fields, including the following: CSCW [6,14,22,28,30] (NSS) is an abbreviation for Negotiation Systems Support. [9,11,16,25] Electronic Supply Chain Design, sometimes abbreviated as e-SCD [17,18].

The remaining portions of this document are structured as follows: In section 2, certain concerns concerning the inventory and the causes that may lead to an excess of goods and services despite the effective management of that inventory are discussed. Specifically, the reasons that can lead to an excess of products and services are discussed. It is essential to note that the purpose of this work is not to offer an in-depth study or investigation into inventory management, since that is not the aim of this work. In this part, we will continue to discuss some of the more formal components of the negotiation process, as well as provide a quick overview of the Negotiation Systems Support and CSCW. In Section 3, a condensed explanation of the real-world scenario that served as the impetus for this body of work and the proposed system is provided. In the fourth and last portion of the paper, the conclusion of the study is discussed.

Formal Aspects of the Problem

The Domain of Logistics

The provision of production and the maintenance of sales are the two primary tasks that the inventory is responsible for. The primary purpose of the first function is to ensure that production is not disrupted in any way, so removing the possibility of a halt due to issues with the supply, and

improving how well the production process is carried out. The second role that the inventory plays is to fulfill the fluctuating demand, which in turn helps to improve the quality of service provided to consumers [3,4,21], as customers may be instantly supplied with the items and services they need. This function provides the businesses with a competitive edge, which allows them to prevent missed revenues and even increase their overall sales volume.

There are several circumstances in which it is feasible to build up an excessive inventory without this being an unacceptable management error. The characteristics of the demand have a direct impact on the management of inventories. For instance, a big number of items and services have a seasonal demand, such as the case with things associated to Christmas and Easter. After these seasons, the products and services described above might stay in inventory for a considerable amount of time if they are not sold. The irregular or inconsistent pattern of demand for certain items is another factor that might have an effect on the inventory levels. Ballou [3] serves as a good illustration of this pattern of conduct.

In addition to the features of the demand, it is important for inventory management to take into account the "life cycle" of a product. When seen from

the perspective of logistics, the life of a product does not come to an end with the delivery of the goods to the consumer. It is possible for products to become outdated, damaged, or simply stop functioning properly, in which case they may be sent back to the
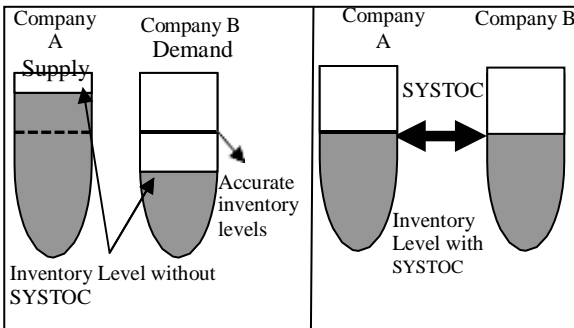
place where they were originally purchased to be discarded, repaired, or recycled. The administration of the product flow in the other direction is referred to as "reverse logistics" [31]. When they are brought back to the warehouse, recyclables, depending on the state they are in, may be handled as an overflow destination.

In light of the information that has been provided, it is of the utmost importance to devise plans for recycling the excess inventory. This can be accomplished either through the reuse of the stock within the sector of the company that it belongs to or through the negotiation of those excess goods and services with other sectors or other companies representing demand that is compatible with the supply that has been created.

In order to determine an appropriate inventory level, the purpose of this job is to assist the negotiation that will take place between the users who are responsible for the supply and demand of goods and services. In the context of this research, the term "accurate inventory level" should be understood to mean the sufficient inventory quantity of supplies and raw materials to guarantee uninterrupted production and final products to ensure the level of service offered, without excesses. This definition can be found in the following research:

The firms (or divisions within the same organization) that are participating in the system have inventory levels that are not in balance with one another. As a result, the system need to function as a device for fostering equilibrium between the aforementioned businesses in order to make it possible for each of them to achieve their respective exact inventory levels. This conceptualization of the system is shown in Figure 1: The suggested computational environment may be thought of as a tool for integrating these different enterprises (sectors), with the problem being the need to customize this process. In today's competitive corporate world, the ability to

customize products and services is an essential component of success. Electronic supply chain design is one of the most significant components that makes quick and economical customization feasible (e-SCD). The electronic supply chain design (e-SCD) is a supply chain design that makes use of information technology (IT) to connect and coordinate consumers, suppliers, manufacturers, and logistical routes [17,18]. According to Pine [26], personalization at the level of an individual company is impossible to do. Every single firm that is a part of a significant supply chain or distribution network is reliant on every other company in the chain. In addition, collaboration between businesses is essential for the functioning of a productive supply chain.

Figure 1. SYSTOC vision as a tool for attaining accurate inventory levels

The processes that are engaged in the system are a component of a supply chain and reflect the demand and supply of suitable items and/or services. The system that has been designed would combine various operations by exchanging information across them. This will make it possible to reduce stock at one point in the chain while simultaneously satisfying demand at another one. As a result, one way to look at the system is as a step in the direction of supply chain integration and, as a consequence of this, e-SCD. In this part, various problems with inventory management were discussed, which served as the impetus for the development of the system that was suggested in this investigation. You may get more information on the management of the inventory in [3,4,8].

1.1 Negotiation domain

Discussion is prevalent in various interactions within companies, including those between managers and workers, between employees and suppliers, and between customers and suppliers and businesses. All of these connections involve ongoing negotiation. There are instances in which the success of the negotiator is directly responsible for the difference between profits and losses in a project. Because of this factor, negotiating is considered to be of critical significance for the growth of a corporation.

Negotiation is described as "the process by which group of actors speak with one another in order to attempt and come to an agreement on any topic that is mutually acceptable," according to Lomuscio et al [1.] The importance of the terms "agent," "communicate," and "mutually acceptable" is emphasized throughout this definition. It is not necessary for there to be actual individuals participating in the negotiation process; rather, the parties involved might be any kind of actor, such as software agents. These actors follow a negotiation protocol in their communication with one another and behave in accordance with a strategy. The protocol not only dictates the flow of communications between the parties involved in the negotiation, but it also serves as the set of rules that those parties must comply by in order to communicate with one another. The protocol is easily accessible to the public. On the other hand, the strategy refers to the manner in which a particular party

conducts itself within those guidelines in order to get the most favorable result possible from the negotiation. Because of this, the technique used by each participant is kept confidential [5,37].

There are a few conundrums that may be found in the defining of the strategies, such as whether to cooperate or compete; tell the truth or lie; focus on the short term or the long term. The manner in which these conundrums are resolved will determine the nature of the discussion. Historically, there have been two distinct styles of negotiation: the competitive and the cooperative [2,23,27].

In the framework of Game Theory and Operational Research, competitive negotiation is categorized as Win/Lose. This kind of negotiation is also known as Zero-sum negotiation. The negotiator that takes the Win/Lose stance will favor competitiveness, deception, and a quick resolution to the issue. In this sense, the fulfillment of the desires of one party may directly be harmful to the wants of the other party being fulfilled. The cooperative negotiation, sometimes referred to as the collaborative negotiation, is referred to as a Win-Win negotiation. It is a collaborative process in which concerned parties identify alternative ways of generating shared profits,

Figure 2. Relationships between NegotiationEntities [25]

The process of negotiation, like any other, may be broken down into many stages. An antecedent phase, a contemporaneous phase, and a consequent phase are proposed as the sequential stages to be studied while doing research on business negotiations in Graham and Mintu's [15] article. According to the writers of Kersten and Noronha's [10] article, there are three stages that closely correlate to the three phases of the negotiation. These phases are pre-negotiation, conduct of negotiation, and post-settlement.

In the time before actual negotiations begin, gaining a grasp of the subject at hand is the primary focus. In this stage, you will be analyzing the circumstance, the problem, the opponent, the problems, the choices, your preference, the amount of reservation you have, and the approach. In addition, during this phase, the negotiators establish the agenda for the discussions and construct their best alternative to a negotiated agreement (BATNA). BATNA is an abbreviation that stands for "Best Alternative To a Negotiated Agreement." Roger Fisher and

that is, ways that cater to the interests of all of the involved parties [2,23,27].

The authors Huang and Mao [25] provide an intriguing and unique perspective on the process of negotiating. The writers of this book assert that negotiation is a process that includes a collection of elements that are connected together. The writers' point of view is shown in figure 2. On this diagram, connections are shown as arrows, while entities are represented as rectangles.

According to the authors, a negotiation is comprised of a collection of tasks, such as problem definition, alternative generation, alternative evaluation, modeling preference, and building consensus. These tasks are orchestrated by a set of events and carried out by the parties that are participating in the negotiation. On the other hand, a negotiation will entail a number of topics, and each issue will have a number of different options to choose from. In addition to this, the variety of problems could also be limited by a specific group of requirements. Each of the concerned parties has a collection of different approaches that it may use to generate its own set of preferences about the problems and solutions. Each side has a different set of priorities when it comes to the following: Willian Ury [7] were the ones who came up with the term. You may get further information on the BATNA in [7,24,29]. The second phase of the negotiation is called the Conduct of negotiation, and it consists of back-and-forth exchanges of messages, offers, and counteroffers depending on the various negotiating techniques and types. The only thing that happens during the post-settlement analysis phase is an appraisal of the results that the negotiation activity ultimately produced, which is followed by further negotiation. These outcomes include the knowledge regarding the compromise, as well as the pleasure of the people doing the negotiating.

No matter the location of the negotiators or the method of negotiation that is used, the negotiation process needs to be expedited and conducted in a cooperative manner in order to accommodate the actual organizations that are currently operating in a dynamic market and that are geographically distributed. This is necessary in order to account for group decisions that involve participation from all parts. Therefore, technology has become incredibly crucial to satisfy the need for processing and managing data and information connected to each circumstance. This enables them to make the appropriate choice in accordance with the organization's goals. As a result, it is essential to design apps that provide assistance to the process of negotiation by presenting the most accurate information.

management by the use of suitable resources, such as the Internet, for example.

In this scenario, the electronic negotiation is present. E-negotiations are negotiation procedures that are carried out wholly or partly with the use of electronic media (EM), which makes use of digital channels to transfer data. E-negotiations are also known as digital or online negotiations. EM may facilitate simple communication acts between the participants (such as email or chat), or it may offer tools that enable more complicated, multimedia interactions (such as e-markets or
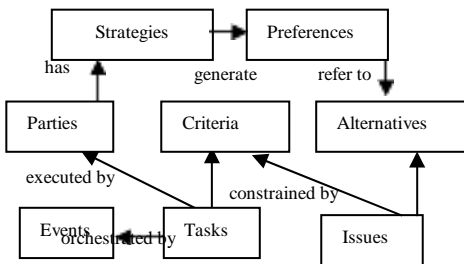
electronic tables) [11,20]. According to Huang and Mao [25], the five most important qualities of e-Negotiation are as follows: it is Interactive, Informative, Irregular, Integral, and Inexpensive. [Citation needed]

It is possible to differentiate between three kinds of information systems that are utilized in e-negotiations when one considers a medium as a place (either real or virtual) in which the negotiation is being conducted and the agents who interact in this space. These categories are as follows: During the negotiation process, a decision maker may get assistance with communication or decision duties via the use of negotiation support tools, such as DSS and NSS. Human negotiators are completely replaced by negotiation software agents (NSA) in all aspects of decision-making, communication, and other tasks related to bargaining; E-negotiation media are information systems that consist of electronic channels that process and convey data among the players participating in a negotiation. Additionally, these systems offer a platform where transactions are managed via agent interaction. They use a protocol for the negotiating process to put the norms of communication into action.

The primary distinction between these two systems is the degree of negotiation and automation of the decision-making process [37], which is where we find our starting point. The parties involved in the negotiation share information with one another in order to communicate the goals and objectives they have for the agreement. The parties make choices on how to proceed with the negotiating process based on the information that they have received as well as their original aims.

The act of making a choice may generally be carried out in one of three ways. The first approach is one in which individuals are responsible for making choices. The second scenario is one in which humans make the ultimate choice, but a computer system provides either the assistance or the alternatives for making that decision. These pieces of software are together referred to as Negotiation Support Systems (NSS). The last method is when the judgments are made entirely without any involvement from human beings, also known as totally automated. The phrase "automated negotiation" is the one that is most generally used to refer to this kind of negotiation [5,37].

1.2 Negotiation Support Systems

The abbreviation NSS stands for "negotiation support system," which refers to a specialist subcategory of group support systems created to assist negotiators in reaching the best possible agreements. They were primarily put to use in a research and instructional capacity inside a laboratory setting, but they saw very infrequent use in actual clinical settings.

However, there are commercial NSS solutions available, in addition to empirical data demonstrating the effectiveness of NSS. However, the use of NSS in businesses has only seen limited success thus far [9,11,25,34,35]. Because of this reality, a number of researchers decided to investigate the possibility of implementing NSS. In the article [16], the authors investigate the elements that influence corporate managers and executives' intentions to implement NSS.

According to the authors of the article [35], there are two distinct types of NSS that may be distinguished from one another: solution-driven NSS and process support NSS. A NSS that is solution-driven offers the parties involved in negotiations many potential solutions or makes suggestions for possible agreements. A process-support NSS will not provide any recommendations for potential solutions. It is intended to provide assistance to the process of negotiating, beginning with the stage of preparation and continuing all the way to the stage of contract signing. A solution-driven NSS does not cover the following two dimensions: expanded communication channels and cooperative work: they are addressed by a process-support NSS.

Internet technology and the World Wide Web made it possible for a new generation of negotiation support systems (NSS), which are referred to as web-based negotiation support systems (WNSS). In the paragraphs that follow, several examples of NSS are provided for your perusal.

[910] INSPIRE, which stands for the InterNeg Support Program for Intercultural Research, is a network support system (NSS) that is based on the Internet and is used for research and training in intercultural and intra-cultural dialogue. INSPIRE is able to analyze the suitability of an offer, evaluate whether or not the offer is suitable, and examine the history of a negotiation. With the use of the Pareto-optimality methodology, INSPIRE is able to assist with the duties of preference evaluation, alternative offer analysis, offer exchange, counter-

offer evaluation, and assessment of the efficiency of compromise. Even though INSPIRE makes it easier for negotiators to communicate with one another by facilitating the exchange of messages, it does not address the interactions that take place between the various parties involved in negotiation activities. Another kind of WNSS [34,35] put to use for educational and scientific purposes is known as WebNS. Its primary emphasis is on providing assistance for processes, including the structure of text-based interactions and the automated documenting of processes. The specification of problems as well as the discussion of those concerns is supported by the WebNS system. Experiments conducted with these two systems demonstrate the potential of WNSS for use in research, as well as in teaching and self-learning. They also demonstrate the potential of analytical methods for the preparation and conduct of electronic negotiations; 75% of almost 5,000 Inspire users stated that they would use a system like Inspire in actual life negotiations, and 85% of those same users stated that they would use such a system to prepare themselves to participate in actual life negotiations [12]. Commercial NSS include CyberSettle (available at www.cybersettle.com), LiveExchange (available at www.moai.com), EcommBuilder (available at www.ozro.com), and SmartSettle (available at www.smatsettle.com).

[11] provides readers with further details pertaining to the aforementioned systems.

1.3 Computer Supported Cooperative Work(CSCW)

CSCW stands for Computer Supported Cooperative Work, and may be defined as the research discipline for the techniques and methodologies to support group work. In this section, some important definitions of CSCW will be introduced. However, it is not in the scope of this work to review the CSCW area. More details on the CSCW area can be found in [6,14,22,28,30].

The word 'groupware' was firstly used by Peter andTrudy Johnson-Lenz in 1982, but was adopted by the CSCW community to define the technologies that attempt to implement CSCW systems [14]. Thus, while CSCW is used to determine the research in the group work area and how the computers may support it, groupware has been used to determine the technology (hardware and/or software) created by the research in CSCW [28].

For Ellis et. al. [6], the objective of groupware is to give assistance to groups in communication, cooperation and coordination of their activities. Those authors define groupware as "computer systems that assist groups of people involved in one task or common purpose through an interface to a shared environment".

According to Baecker [28], CSCW and groupware represent a change of paradigms in the computer science, because what is detached is the coordination, communication and solutions to problems between human-human instead of human-machine. Baecker also mentions Lynch, Snyder and Vogel (1990) to make a distinction between common software and groupware software: "... groupware makes the user aware that he is part of a group, while most other software seeks to hide and protect the users from each other..." Alternatively, Borges [22] considers that the systems that promote communication among the members of a group work, as the electronic mail, are groupware systems, because they contribute to a bigger result than the total of individual contributions.

Therefore, tools to support cooperative work include communication mechanisms that allow people to see, listen and send messages to each other; sharing mechanisms that allow people to work in the same work space at the same time or at different moments; and information-sharing mechanisms that allow for the work of several people on the same information base. In the next section, some CSCW tools used in this work are presented.

2. SYSTOC: A Collaborative System to Support Inventory Leveling Negotiation [An Inventory Leveling Negotiation Support System]

An actual situation that was given by the Brazilian Ministry of Defense served as the impetus for this investigation (MD). In order to prevent losses and the unnecessary use of resources, the agencies have shown an interest in making items and services

that they have in excess available to other agencies and departments. In an effort to find a solution to the issue, the MD mandated the creation of a blueprint for the establishment of a computer environment accessible through the World Wide Web that is capable of making it possible to negotiate prices for goods and services. The software should provide a user interface that enables users to register their supplies and/or demands for a product and/or service, negotiate for those products and services, record all of the relevant data referring to the negotiation and the fulfillment of requirements, and make this information accessible in the future.

Registration of the goods and services need to take place in accordance with a categorization that is supplied by the users of the system. This categorization establishes the categories for the various items and services. It is permissible to establish a subcategory under each category; the hierarchy and granules of this subclass should be based on the characteristics of the goods and services in question. For instance, in order to register tablets of a certain painkiller, the individual using them must conform to the following classification: Analgesic and pain medication for your health. As a result, the software should provide an interface that makes it possible for the user to navigate this hierarchy without having to do any extra tasks.

The supply and requests have to be registered with some information related with it. In addition, in order to register a supply or a demand, the product or service that is linked with either one must first be registered in the system. Information that is common to both supply and demand includes the following: the type of product or service that is being supplied or demanded; the identification of the product or service; its value; the quantity of the product or the amount of time required to complete the service; and its quantity. For the supply, in particular, the users need to indicate the time of delivery of the product or the needed time of preparation to execution of the service, as well as the product shelf life and the kind of negotiation that is required. Exchanging, acquiring, giving, or taking out a loan are the forms of negotiations that are permitted.

The suggested system places an emphasis on providing assistance for processes, starting with the pre-negotiation phase and continuing all the way up to the point when the agreement is signed. Every kind of negotiation has its own unique set of circumstances that need to be taken into account. Therefore, we may make the generalization that there are processes associated with these different types of negotiations that, if carried out well, have the potential to provide better outcomes. In the course of this study, these standard operating procedures will be taken into consideration, which will enable the system to be

equal or several sources of supply meeting the same need. Supply and demand negotiations with many users are prohibited in the system. As a result, in each of the aforementioned scenarios, consumers face a decision-making challenge.

Therefore, the system should process a Ranking among competitive users at the level of decision in the pre-negotiation phase by defining an evaluation scheme of the possibilities among these users responsible for supply (in case of more than

adaptable to various forms of negotiation.

The functions of the system were developed based on the phases of the negotiation process that were presented in section 2.2 and were divided into four categories: the identification of supplies and compatible demands; the support of the pre-negotiation phase; the support of communication between the users; and the support of the negotiation. The goals, challenges, and possible applications of computer-supported cooperative work (CSCW) were brainstormed and mapped out for each individual course in order to simplify the execution of the goals and overcome the challenges. The next paragraph will go into more depth on these courses.

3.1 Identification of supplies and compatibledemands

Finding a market for which there is supply that can be recorded is an important goal of this investigation (s). The user may determine this distinction by perusing the system's information. But the proposed system would be able to identify itself automatically. When supplies and corresponding needs are found, the system should alert the users in charge of the demand and supply, respectively. As a result, the technology may provide a boost to the discussions and perhaps speed them up.

A virtual user, or "Negotiation Agent," should be developed for this purpose. As soon as one of the parties to the potential negotiation logs into the system, a fictitious user named "Negotiation Agent" should pop up on the screen and a message alerting the user to the presence of the potential negotiator should be delivered to the user. For customers who aren't in the habit of checking their inbox often, this feature provides a virtual claim and added convenience.

3.2 Support to the pre-negotiation phase

As soon as a supply that meets the defined demand is found, the interested parties may begin bargaining. Getting ready to negotiate is the first step. Pre-negotiation assistance may be broken down into two categories: user support and decision support.

At the user level, each person who signs up for the system will have their own personal space, called My Information, where they may keep track of crucial details about the negotiation, such their best alternative to a negotiated agreement (BATNA). Nobody else will be able to see this data except you.

The system must detect such crossed data and alert the concerned users if there is only one supplier that can meet a given demand. But it's probable that there's more than one desire for

one supply) or users responsible for demand (in case of more than one demand). The concept of a digital user is now able to be understood. As a decision agent, the "Negotiation Agent" may help the users who are ultimately accountable for the supply and/or requests arrive to a consensus. It's worth noting that this decision agent is passive, in the sense that the user with the appropriate permissions will always make the ultimate call.

Users need to set priorities among the linked data supplies and requests for the system to process that ranking. For commodities whose prices might fluctuate depending on demand, the nature of the negotiation is the most important factor in determining a

fair price. If two supplies are available at the same time, one for sale and one for donation, the system should favor the latter. The supply's worth and the products' turnaround times are two other considerations. The user in charge of the demand should tell the system which supplies are most crucial, and based on that knowledge, the system should prioritize them.

However, one criteria to prioritize competing requests is to assess them by analysis of their supply history; that is, the system should reward users that show a greater number of product or service supplies. It is recommended that the examination of supply history be used to establish a priority among competing requests as a means of encouraging participation in the system and, by extension, collaboration among its users.

3.3 Support to the communication betweenthe users

The flow of information and the growth of the negotiation process rely heavily on user communication and collaboration, both of which must be encouraged throughout the process. Asynchronous communication between users of the system may be enabled via the usage of electronic mail services.

In order to establish contact with other users and share information in real time, CHAT may make use of the features offered by various Instant Messenger applications. It is crucial to the effectiveness of the negotiating process that these users have a casual communication channel. It will be termed the "Window of bargaining" chat window.

Further, all users in a negotiation will have access to a shared space (named "Our window") where they may post crucial information, such as the discussion's agenda. In order to do this, we will make use of a bulletin board, a computer-supported cooperative work (CSCW) technology that enables users to engage in asynchronous communication with one another in a public, shared space by posting messages, reading those of others, and replying as needed. Users who want to place a more detailed advertising of their goods for sale or wanted may do so on the bulletin board. This option gives its users a visual means of emphasizing the benefits of their suggestions, both in terms of the goods and services they provide and the ones they need.

3.4 Support of the negotiation process

Once a matching offer and demand have been found, the users in charge of making the offer and placing the order will need to affirm their willingness to enter into negotiations (or service).

Assuming your interest has been verified, you may go on to the system's "Preparation for Negotiation" step. The pre-negotiation phase begins when users click the "My information" tab. When everyone is ready, one of the users should initiate communication. The system then changes the negotiation status to "Negotiation in progress," and users get access to the Arena of Negotiation, which includes the various means of communication described above.

Users may communicate with one another via the Window of negotiation by sending messages, making offers, and counteroffers. CHAT encourages interaction between users by

2. Conclusion

In order to define the parameters of the system sought by the

identifying them automatically online and facilitating chat. Furthermore, via 'Our window,' the negotiation becomes speedier, and the chance of losing this knowledge is lessened.

The signature of the commitment term or agreement is often the next stage in talks after the agreement. In the suggested method, the automated generation of the EFA starts after users affirm their interest in the negotiation. By increasing the following data, the system takes on responsibility in this form:

users' names, positions, and agencies, as well as a description of the bargained good or service and the nature of the negotiation, are required (changes, donation, acquisition).

On the other hand, users need to decide early on in the negotiation process who will be responsible for filling up the subjects that are ultimately agreed upon. They are the "responsible user" of EFA. After an agreement has been achieved in the "Discussion in progress" stage, users must notify the system so that it may move the negotiation to the "Pending EFA" stage. Thus, the accountable user for EFA must complete the form, and once submitted, it will be instantly sent to all relevant users for approval. When the EFA is accepted by all parties, the negotiations will be concluded. The negotiating status is changed to "Completed" at this stage. The negotiation will remain in the system in the "Pending EFA" stage until this occurs. It's possible to think of this feature as an electronic signature on a contract, given that the discussion is not finalized until all parties involved have given their consent and the agreement has been recorded in the system.

The development of SYSTOC's negotiating process is shown in Figure 3. Each rectangle represents a distinct phase of the process, each arrow represents an activity responsible for moving the process forward, and each ellipse represents a key step along the way.

details about demand and related information: http://www.link demand identify.com Follow this link to cancel your supply order: http://www./link cancel supply. This monitoring may be seen as an additional facilitator to the process, as it can detect and stimulate potential discussions while also encouraging speedier negotiation among system users.

The system keeps a record of past negotiations, including information on the parties engaged, the bargained good or service, the date and time the negotiation began in the system (during the pre-negotiation stage), and any exchanges of value that occurred. The users will also have access to a section where they may rate the dedication of the parties involved in the discussion. You don't have to do that assessment. As a result, we may use this data as a basis for further discussion.

Brazilian Ministry of Defense, a study of the Inventory and its Management was required. This research helped us determine when an inventory overage occurs regardless of whether or not a management error was made. This paper proposes a system whose primary function is to facilitate consensual discussion of

the excesses as a means of addressing the issue at hand.

Use of CSCW and NSS resources has been studied in the system. As a result, we were able to single out resources and capabilities related to those domains that may be tailored to the various phases of the negotiating procedure.

Users are encouraged to work together and may easily exchange information thanks to the system's usage of CSCW technologies. When one is there during a negotiation, it stimulates and quickens the process. Having a ranking amongst competing users is helpful when choosing a choice. One of the first steps in any potential talks is the automated identification of available resources and those with similar requests.

In addition, the data kept in the system may be useful in producing insights for users in future talks.

The system helps to standardize the process of bargaining. Negotiation should follow a well-structured process, beginning with preparation (including the development of a best alternative to a negotiated agreement; BATNA); continuing with negotiation (including the development of a negotiation agenda, discussion of issues, and the exchange of offers and counteroffers); and concluding with the fulfillment of essential negotiating objectives (EFAs).

Therefore, this study tackles a new setting in which IT may provide value, by means of the CSCW, in order to aid in the Negotiation Process between enterprises and to promote process integration in the Supply Chain.

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