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Résumé

Cet article montre comment une solution a été développée afin d'organiser et faciliter la collecte, la gestion et l'exploitation des données. Le but était de rendre des concepts de Veille Anticipative Stratégique et Intelligence Collective (VASIC) opérationnels afin de soutenir la prise de décision stratégique d'une société de logiciel médical. La VASIC est un processus de collecte, interprétation et usage d'information pertinente concernant l'environnement socio-économique de la société, afin de renforcer sa compétitivité durable et éviter des surprises stratégiques désagréables. Le but de la VASIC est de permettre l'action rapide au moment le plus opportun et au plus bas coût. Afin de systématiser le traitement des données internes et externes, 2 applications ont été développées. Un plus grand engagement de la part du personnel de l'entreprise est nécessaire pour que les applications puissent évoluer et prouver leur valeur.

Mots clefs :

Veille Anticipative Stratégique, Collecte de données, Analyse de données, Outils, Méthode L.E.SCAanning®

Abstract

This article shows how a solution was developed in order to organize and facilitate the collection, management and exploitation of data, with the aim of putting concepts of Anticipative Strategic Intelligence (ASI) into operation in order to support the strategic decision making of a medical software firm. The ASI consists of collecting and using pertinent information regarding the socio-economic environment of the firm, in order to create business opportunities and avoid unpleasant strategic surprises. The purpose of the ASI is to allow rapid action to be taken, at the most opportune moment and at the lowest cost. In order to systemize the treatment of both internal and external data, 2 applications were developed. Greater commitment on the part of the firm's employees will be necessary in order for the use of the applications to evolve and also for the applications prove their worth in daily use.

Key-words:

Anticipative Strategic Intelligence, Data collection, Data analysis, IT based solutions and tools, L.E.SCAanning® method

Tools for Anticipative Strategic Intelligence (ASI)

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Introduction

The evolution of an organization consists in a process of adaptation to the future of its market, and even in the generation of new markets; information is not limited to knowledge of the market, it constitutes the base that makes it possible to pass from offering products to offering services; information is, in some way, an extension of the product (Freitas, Lesca, Luciano and Ghedine, 2002). The problem of the firm lies in the transformation from a products sales strategy to a services sales strategy. In order to achieve this change in strategy it is fundamental not only to have access to useful data but also to treat and analyze that data in such a way that they are transformed into information.

This whole set of data that may be of importance in the search for information, be it internal (available in the firm) or external (collected at events), need to be worked by the firm using suitable methodologies. According to Caron-Fasan and Janissek-Muniz (2004, p. 2), the firm “must be capable of collecting, storing and analyzing information concerning the state and the evolution of its socio-economic environment; the implantation of a process of Collective Anticipative Strategic Intelligence, an environmental scanning system, is one response to this requirement”.

The objective was to develop applications in order to answer the question: how to put the concepts of Anticipative Strategic Intelligence (Freitas and Janissek-Muniz, 2006) into operation in order to support strategic decision making within a medical software firm, changing from a product sales strategy to a services sales strategy? The specific objectives were: to map the processes and activities related to the executive problem of strategy transformation; determine the information requirements necessary for the conception of applications for supporting the situation-problem to be dealt with; conceive the functional design of the applications, of instruments for the analysis of data existing within the firm, as well as the tools for obtaining the new qualitative data; and test the solution found for the collection and treatment of data for the production of information aimed at supporting decision making.

Section 1 deals very briefly with the question of decision-making and of the concept of Anticipative Strategic Intelligence (ASI), the purpose of which is to “allow rapid action to be taken, at the opportune moment and at the lowest cost, using the Collective Intelligence of the firm” (Lesca, 2003, p. 10). Section 2 contains a description of the research method, Action Research, due to the possibility of participating in the implantation of a system instead of being a mere observer. Section 3 offers a quick history of the firm, and mainly includes reports of all the stages carried out in the study, from the choice of information used to the implantation of the applications developed. Finally, in section 4, the conclusions reached regarding the study are presented.

1. Anticipative Strategic Intelligence

The undertaking of transforming a business strategy based on product sales into one of service sales in software, involves, in the case of this study, a differentiated exploration of information as a vital resource for decision making. It is intended to give special attention to information that exists in the environment outside the corporation and that are difficult to obtain and analyze. Potentially, this will allow for changes in the market to be anticipated and appropriate action taken. This particular approach finds support in the ideas of a group of Brazilian (Freitas, Janissek-Muniz) and French authors (Lesca, Caron-Fasan), who have published studies on the concepts of ASI (Janissek-Muniz, Freitas, Lesca and Caron-Fasan, 2005).

Lesca (2003) defines ASI as the collective, proactive and continuous process in which the firm’s members collect (in a voluntary way) and make use of pertinent information related to their socio-economic environment and changes that might occur, looking to create business opportunities, innovate, adapt to market evolution, avoid unpleasant strategic surprises and reduce risks and uncertainty in general. The objective of ASI is to allow acting quickly, at the opportune moment and with less cost, using the firm’s collective intelligence.

According to Lesca, Freitas and Janissek (2003), one should attempt to obtain anticipative information, which concerns the future, with quite specific characteristics; information that is non-repetitive, ambiguous, fragmented or contradictory. Anticipative information is then hard to be collected and analyzed using traditional information systems. There’s a need to create new mechanisms, new tools, new methods, new procedures, new systems to do so.

ASI constitutes the base upon which the methodology applied in this study was defined, with retrospective information (interaction with end-users) and with anticipative information (expectations and wishes of the users).

2. Research Method

This Action-Research method was chosen based on the possibility of the researcher taking an active role in the firm being studied, with the opportunity of maintaining direct contact with one of the directors and having total access to all necessary data, within the study context, for four months (August to December 2005). There was the opportunity to suggest improvements in the data collection process, in the data analysis model, in the set of data analysis filter dimensions and in the development of practices with a data volume analysis tool.

In the diagnostic phase, the possibility for improvement or a general problem to be resolved is defined. In planning, the actions to be taken to achieve the improvement or resolve the identified problem are considered. Action

implies the selection and execution of one of the alternatives considered in the planning. In the assessment phase, the research evidence is consolidated, which, based on the implementation of the selected action, produces learning.

Prototyping was the technique used to produce managerial support solutions. For this, two groups of information were selected: (1) previously available data from CRM used by the organization; and (2) data captured at events by means of a questionnaire form. Kendall and Kendall (1991) emphasize that the greater the participation of the user from the beginning the shorter the development time, leading to rapid results, with back-feeding and assessment, gradually meeting the expectations and achieving the satisfaction of the user in such a way as to suit the learning capacity of each individual.

There was intense interaction with the director of the firm during the development of the study. Several meetings took place with the director in order to discuss our progress and what to do next and also many meetings had the participation of the firm's employees.

3. The research environment and the tool developed

Here are some elements about the research environment, a medical software firm in Brazil, which offered us the adequate condition and access to better perform our task, from August to December 2005. The firm was founded in 1991 and was one of the first firms in Brazil in the area of management software designed for the health sector. At the time, they've already had more than 20,000 copies of their main products installed. Their team was formed by 43 people, 12 of them on the software development activities and other 15 on the end-user support tasks. They have a CRM tool running in order to control the client-firm relationship.

In order to achieve the main objective (to develop applications for organizing and facilitating the collection, management and exploitation of data, with a view to operationalize Anticipative Strategic Intelligence concepts to support the strategic decision making process in a firm within the medical software sector), a number of stages, listed below, were carried out.

3.1. Information Requirements

Knowing that the firm wished to move from a products based strategy to one based on the sale of services with the focus being the clients that used Personal Med® software, it was clear that it would be necessary to look for information regarding the users of this software. A great deal of information on these users was already available to the firm, stored in the CRM solution. With each enquiry made to the "CSU" - Client Support Unit, the support area staff access the data on the client via SIGwin® (CRM system developed by the firm itself). Using this system they access client data while dealing

with the client, and have access to data such as when the software was purchased, which version the user has, when a problem was last reported, what the problem was, etc. The staff not only access the client data, they also register, at each enquiry response, free remarks in a field designed for this purpose in the CRM system. There are thousands of registers available in the system. This, then, represented an important source of data on the study target, the physicians using Personal Med® software.

For Lesca and Lesca (1995), information from outside the firm allows certain alterations within the socio-economic environment to be anticipated. Such information is, by nature, ongoing, rarely repetitive, uncertain, ambiguous, fragmented and contradictory. It represents weak signals, to which we rarely pay due attention (Caron-Fasan, 2001; Lesca, 2001). Combined with other information of the same type or otherwise, it can lead us to certain ideas, perceptions, and to infer actions to be performed. In order to collect external data a report/capture form was elaborated based on a model from L.E.SCAining® (Lesca, 2003), to be used by professionals from the firm at medical events. At the same time a Web application was also developed in order to allow the collected information to be entered and treated instantly online.

3.2. Instrumentalizing the stages

The present study supported different stages of applied research activity developed by Gensas (2005), which was intended to align the firm's needs to the concepts of ASI. The stages are listed below:

Stage 1: Defining the target – The definition of the target consists in the firm "identifying the important actors within its business environment and the topics that are in its interest to monitor. It is equally necessary to specify the different sources of information that might offer some knowledge on the actors or topics" (Caron-Fasan and Janissek-Muniz, 2004). With regard to the firm, in the present study, the targets are physicians using the Personal Med® software, in other words, physicians that are clients of the firm. They are the potential purchasers of the services that the firm will come to develop. The focus of the research is linked to the level of experience of the client in the use of Personal Med®, (following the decision to buy, adaptation and use, the user increasingly wishes to be able to make decisions), as it is in this phase that he/she is apt to relay important information and become a potential purchaser of services to be offered. Two divisions of the firm are involved as actors in the process. The first being the client service division, known within the firm as the "Client Support Unit". "According to data gathered within the company on July 20th, 2005 (which encompassed the year 2005, from January 1st to the date the statistics were generated), the CSU staff were in contact by telephone or e-mail with approximately 2,700 users per month, with an average of 10.52 minutes spent attending each user; the source was the firm's CRM" (Gensas, 2005). The second is the sales division, specifi-

cally the sales personnel participating in medical events (conferences) in which the firm presents its products. In these events, besides making contact with several potential clients, the professionals also talk to users of the software, which offers an ideal opportunity to obtain valuable information for the firm. There, then, is the definition of the actors and consequently the sources of information that will be used, each one related to each actor.

Stage 2: Data collection – Accordingly, data relative to the actors and topics identified in the preceding stage and which can be used to generate information for the firm need to be collected (Caron-Fasan and Janissek-Muniz, 2004). To do so, it is necessary to choose the data gatherers, assign the mission and furnish the necessary resources for the task. Two sources were used for the collection of data: the firm's CRM system and new data obtained with the use of the report form. Daily Interaction Data – The first source of information was the firm's CRM, used by the firm since 1993. The CRM system, SIGwin®, was developed by the firm and contains 195,051 entries (on 25/07/2005). Client identification data are stored in the system, among them: since when he/she is a client, the version of the software possessed, name, address, e-mail, etc. In order to make the study with these data feasible, the Sphinx® application (data analysis and research system from SPHINX Brasil) was used. The collected data are qualitative, above all the 'enquiry response': in order to produce useful information from this, the data will be transformed using lexical and content analysis techniques, based on Freitas and Janissek (2000). Dictionaries will be elaborated, giving rise to categories of analysis that will then make it possible to generate certain automatisms in the data analysis.

Systematization of the collection of qualitative data at events – The second source of data to be exploited consists of new data obtained with the use of report forms. These forms were adapted from the L.E.SCA^{ning}® method, and a model is shown in Figure 1. The forms were distributed to the sales personnel from the firm, who were trained in their correct use, and then applied at three medical events (Brazilian conferences) held in 2005: the Brazilian Congress of Cardiology (Porto Alegre/RS – 18th to 21st of September, 2005), the Brazilian Congress of Traumatology (Vitoria/ES – October 28th to November 1st, 2005) and the Brazilian Congress of Gynecology and Obstetrics (Rio de Janeiro/RS – 22nd to 26th of November, 2005).

Figure 1 – Report Form
Source: Adapted from LESCA (2003)

The report form is divided into four parts: the Actor, the Respondent, the Collection and the Information. The fields are intended to contain the following data:

- a) The Actor:** Actor: name of actor; Gatherer: the person who fills out the form. It will be a professional from the Sales Center or a professional from the CSU; Date: date on which the information was gathered.
- b) The Respondent:** Information on the person with whom the actor is interacting. If it is a client, try to identify the name of the client, if it is not a client, attempt to find out if the respondent uses competitor software.
- c) The Collection:** Topic: potential services that may be of use to the client that the actor is able to define through interaction; Source: the source is registered globally and may be software data from the CRM or an Event; Event: name of the event (example: Brazilian Cardiology Congress); Confidence: classifies the captured data according to a scale (Low, the information was obtained taking into consideration a possible idea expressed, though not totally verbalized, by the client; Medium: summarized information on an interaction with a client on a subject; High: the information expresses the opinion of the client on a subject); Circumstance: in the great majority of cases the circumstance will be a conversation, a telephone call or something read, however, it is possible to define a different circumstance;
- d) The Information:** Comments: free comments where the gatherer can describe how the interaction occurred; Information: collected from the client, main "weak signal" type information; Service Focus: details the service topic to be furnished to the client of the firm.

Stage 3: Organization of Data for the Creation of Information – According to Caron-Fasan and Janissek-Muniz (2004), this stage consists in organizing both the internal circulation flows and those originating externally to the firm. This stage would be incomplete without the

installation of an information storage procedure, in a more or less elaborated database or data warehouse form. The objective is to make it accessible to the firm's decision-makers. Both the data from the CRM software used at the firm and that from the report forms were stored for exploration using the Sphinx® system. In order to store, treat and analyze the data from the CRM it was necessary to carry out a technical procedure, exporting the entries to a file that could be imported by the Sphinx® system. Once this importation process was concluded (which could be interpreted as the data collection stage), it was possible to organize the data and begin treatment in order to then analyze the data. It is important to note that once accomplished and well documented, it will be possible to easily reproduce this procedure in the future for the analysis of data included in the CRM. With the report forms, the procedure was different. The collection was done by the professionals present at the events in which the firm was present. In order to store, treat and analyze the data, an application was developed with the Sphinx® system that functions entirely on the Internet. This survey remains stored on the server of SPHINX Brasil, the exclusive distributor of the system in Brazil. Access to the survey is online, via a browser, with the possibility of having a password in order to protect against unauthorized data entry, restrict access to the responses and the results, etc. The data is entered and the responses are viewed in the Web environment. A report containing the results is also instantly available and can be accessed at any time.

Stage 4: Creating Meaning from the Data – The use of the tools available on the Web (forms and views) will help the team from the firm to produce the discussions and come up with ideas that will facilitate the generation of meaning from the data in order to feed the decision-making process. The tools will make it possible to anticipate, based on client's demands and expectations that are not clear right away but when analyzed with other clients' demands and expectations start to come out. In other words, the tools will help in detecting "weak signals" and creating ASI. With this being true, the tools will in this way support the strategic decision making process.

3.3. Application Design

As previously stated, two data sources were used in the study carried out at the firm. The first source was already within the firm in the form of the data contained in the CRM system known as SIGwin®. The second was the data collected through the use of report forms at events where the firm participated. The text below offers more details on what was done to treat and organize the data in order to facilitate its analysis.

To go ahead it was necessary to find a way of "taking" the data from the firm's CRM system to the system chosen for organizing the data, the data research and analysis

system Sphinx®. It was then necessary to export data from the CRM that were in the Paradox format, to some other type of database compatible with Sphinx®. A Microsoft Access® database was chosen for this task. This step was carried out with the help of a member from the technical staff at the medical firm. Obtained at the end of September 2005, the database contained 201,853 registers.

There were some issues with texts (variable NOTE), and the direct importation of the Access® file became complicated. After several days work and effort, finally the inverted commas were found to be the problem and were then substituted in the Access® table, making it possible to complete the proper importation into Sphinx®.

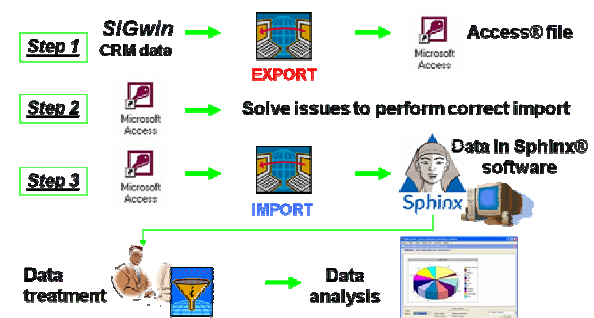


Figure 2 – Functional diagram of data collection in the CRM system

The 201,853 registers were now available for treatment. It is easier to visualize this process of data exportation and importation in Figure 2. A manual detailing how to perform the export-import process was written in order to facilitate its later use by the firm (Freitas, 2005).

In order to analyze the text variable, already cited as being of greatest importance, dictionaries of the most important words were created. First, the words were regrouped, so that all the similar words with the same meaning were gathered together, as were all those containing typing errors. Furthermore, they were also regrouped by word root. It was decided to use a 6 character root in order not to run the risk of having words with different meanings grouped together. Later, 3 dictionaries were created containing 15 words, one with technical words, one with words related to the doctors, another with words related to management. These dictionaries are text files that follow the syntax seen in Figure 3.

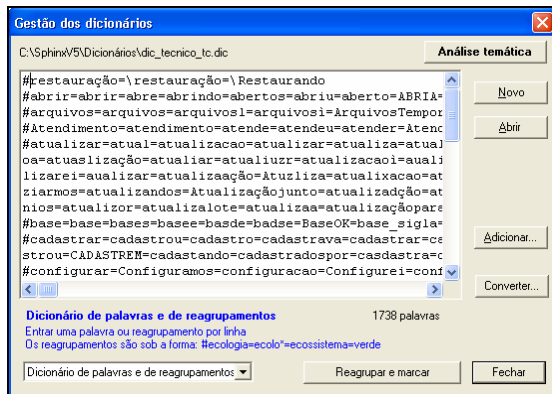


Figure 3 – Dictionary of words and regroupings
Source: Sphinx® Software

These dictionaries were applied to the variable NOTE, generating 3 tables. Following this, some cross-referencing was performed with this variable. A crossing was made between the variable NOTE and the variable REGIONS. This was also done with the variable NOTE simplified by the medical dictionary and with the variable NOTE simplified by the words related to management. Another crossing was made between the variable NOTE and the variable SPECIALITY. This was also carried out for the tables created from the variable NOTE simplified by the technical, medical and management dictionaries.

The objective with these crossings was to detect “weak signals” that could eventually show up and then allow to anticipate. Crossings with the variable REGIONS as well as crossings with the variable SPECIALITY could potentially provide information on which regions of Brazil or specialties of doctors to act first.

This information will support the decision making process, to change business strategy from sale of products to sale of services, possibly outlining where to begin a more strong services approach.

As previously stated in section 3.2, data were also collected at 3 medical events. These forms were entered in the online application designed to store and analyze the data. The firm has access to the application and can insert data with the use of a link (Figure 4).



Figure 4 – Collection of new qualitative data
Source: Online application on SPHINX Brasil Server

The form was to be completed once the employee understood that some information regarding a possible service to be created or improved was being communicated by the client or potential client with whom they were maintaining a conversation during the conference. The most important point was not to focus on technical and specific requests, but on “weak signal” type information. In the same way that a manual was produced for the import of data from the firm’s CRM system, a guide was produced to show the steps needed to successfully complete the forms. Figure 5 shows the procedures followed in collecting and storing the information.

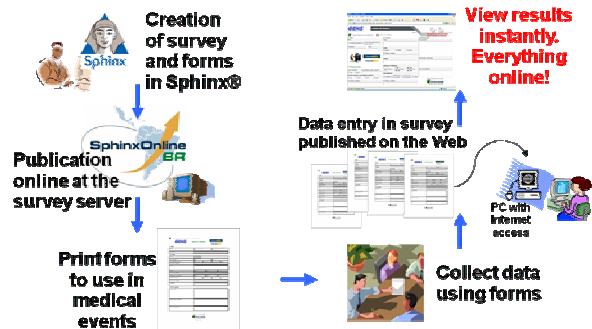


Figure 5 – Functional diagram of the collection of new qualitative data

The firm can consult the data at any time. As data is inserted, it is possible to see the completed forms (Figure 6), which are updated live, using a specific link.

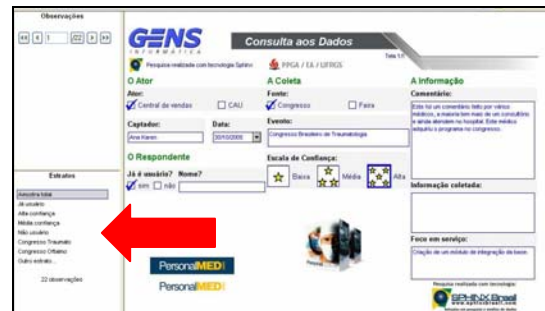


Figure 6 – Consulting the new qualitative data
Source: Online application on SPHINX Brasil Server

Filters were created that can be applied during the data consultation. In order to activate a filter, one only needs to click on one of the pre-defined filters that can be viewed in the area indicated by the red arrow in Figure 6. The pre-defined filters allow the observations of respondents that are already users or of those that are not users to be seen separately; it is also possible to view only the observations from a specific event and even to view by the level of confidence attributed to the collected data.

A report on the results of the forms was also prepared. This can also be instantly viewed in the same Web environment. The report can be accessed at any time after all the cards have been entered or during the process. In Figure 7, a report can be seen showing some general data.

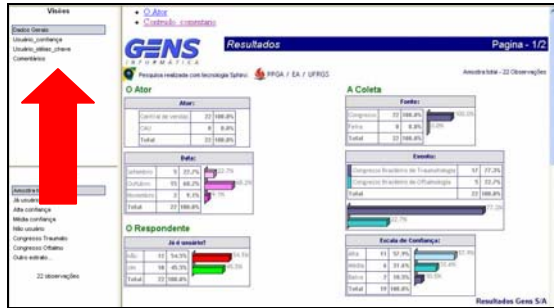


Figure 7 – Report with some new qualitative data
Source: Online application on SPHINX Brasil Server

The pre-defined filters can also be used in the results, as it is also possible to make different views of the results available. In Figure 7 it can be seen that some pre-defined views are available, indicated by the red arrow. A different and interesting view is a composition tree that shows the total population distributed in users and non-users and later distributed by the level of confidence of the data obtained. It should be remembered that access to the data entry and consultation forms, as well as to the results report can be restricted, ensuring data security.

Both the data obtained from the CRM system internally and the data obtained in medical events can be enriched every time the firm judges it has new data to import from the CRM or it participates in a new medical event. New data will provide new information about the firm's environment, making it possible for new weak signals to appear when analyzing these data.

4. Conclusion

The objective of this study was to develop applications to help in organizing and facilitating the collection, management and exploration of data, with the aim of putting into operation the concepts of Anticipative Strategic Intelligence (ASI) in order to support the strategic decision-making process in a medical software firm.

The strong interaction with the director and employees of the firm proved the choice of Action-Research to be a right one. The propositions made were well accepted and the tools developed can really improve the way data is used by the firm.

It can be stated that the proposed objective was adequately accomplished, given that applications were developed and tested for both the enhanced reading and utilization of the firm's internal data as well as the collection and analysis of new qualitative data from external sources.

In practice, based on the Web, an attempt was made at formalization and systematization. Beginning with relatively simple operations on a computer and with the use of data analysis software it was possible to achieve the objectives established for this study. In this, the role of the software employed was fundamental as a means of developing forms and views that ensured the portability of the applications.

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