

## Strategic Decisions and Weak Signals

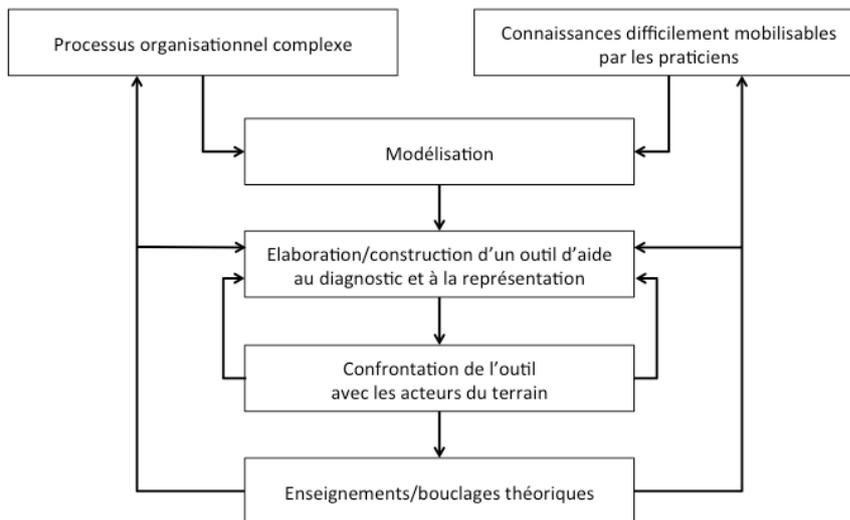
### *Anticipation for Decision-Making*

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#### **Chapter 3. Proposed toolkits: Results of Information System Prototyping research conducted at the CNRS-CERAG Lab (France)**

The expression “**Information System Prototyping**” [BAS 98] denotes a method of experimental **action research**, the response to which involves iterative steps of design and testing of a software tool as a support for decision-making or performance of a task.



**Table 3.1.** *Information System Prototyping*

The starting point for the research is often a lack of knowhow expressed by an organization (an “*in situ*” problem in the field). The research is therefore aimed at producing **actionable knowledge**, i.e. an answer to the question “*How do we...*” which provides an acceptable and practicable solution to the lack of knowhow expressed by the organization’s managers. The research involves the following steps:

- the design of a solution is first presented in the form of a procedure (P) and then in the form of a prototype for a software tool (ST);
- the research question is expressed in the form of a hypothesis: “***IF the software tool (ST) is used in the following conditions, THEN the organization should be noticeably better equipped to make the decision (D)***”;

the results obtained are “**situated**” or “one-off” results. In order to expand their applicability, we need to **repeat the experiment** with other organizations.

### 3.2. APROXIMA, automated extraction of fragments (briefs) which may hold weak signals

#### 3.2.1. Usefulness

APROXIMA is the tool to directly extract the anticipative briefs which can be used by the hierarchy to make decisions quickly. In the process of Anticipative Strategic Scanning, the use of APROXIMA requires the scanning target to have already been built. Its use is oriented toward the search for and exploitation of digital data obtained through the Internet. The volume of such data collections is increasing (referred to as “big data”), meaning that a tool such as this has become absolutely crucial.

#### 3.2.2. Principle behind APROXIMA package

APROXIMA detects **full texts**, extracts **briefs** and distributes those briefs in real time to the appropriate people. Figure 3.7 illustrates where APROXIMA fits in to the generic model of the process of Anticipative Strategic Scanning.

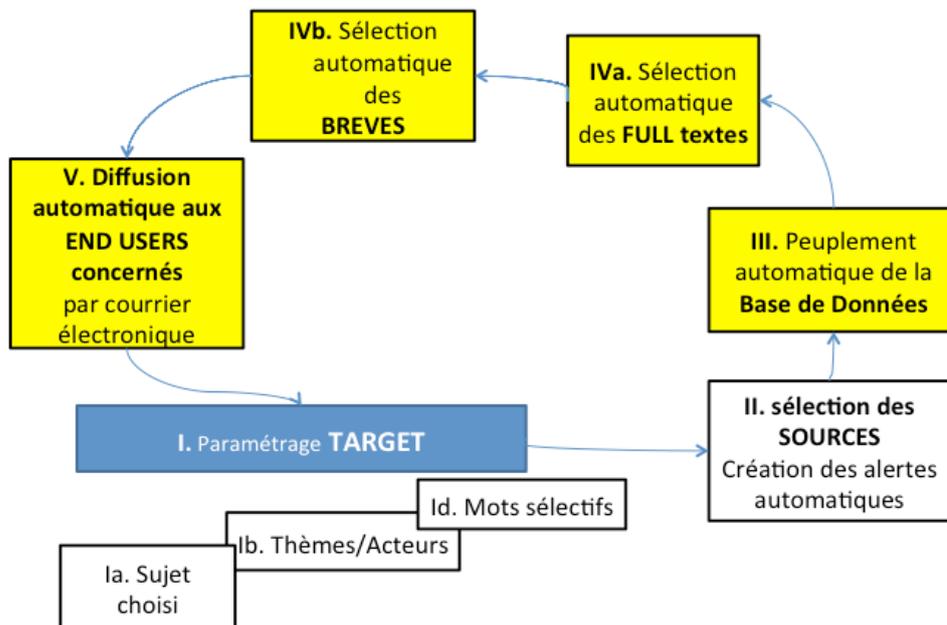


Figure 3.7 Generic model of scanning process with APROXIMA

#### 3.2.2.1. Stages of use of APROXIMA

List of steps during use of APROXIMA		Nature of the steps
SETTING of the scan target	Ia. Chosen subject Ib. Choice of topics and actors to target Ic. Choice of <b>language</b> Id. Choice of <b>selective</b> and <b>anticipative</b> keywords II. Selection of information sources (Internet)	Human/manual  (done once and for all unless update needed)
EXPLOITATION (automated)	III. <b>Collection of full texts</b> and storage in the database IVa. Automatic selection of FULL texts IVb. Automatic selection of BRIEFS V. Automatic <b>distribution</b> to the relevant END USERS in view of their focus of interest, by e-mail	<b>Automated</b>

**Table 3.2.** Steps in the use of APROXIMA

The setting up of the tool requires human/manual intervention, which is easy to perform:

- Ia. build the embryo of a scanning target (this will evolve later on);
- Ib. name a few actors and topics already known to you, which relate to the target domain (e.g. solar/PV power).

Optional: draw up the list of authorized end users, and the list of actors and topics which are relevant to each of those users;

- Ic. define and load the provisional pre-known **selective** words (the list will evolve later on, on the basis of feedback and experience), to detect the target texts;
- Id. define and load the **anticipative** words and **verbs**. The list evolves on the basis of feedback.

Antipative words (examples)	Anticipative verbs (examples)
Alliance, Hiring, Laboratory, Nomination, Partnership, Possible, Potential, Project, Prototype, Replacement, Researcher, Resignation, Start-up, Sudden departure, University, etc.	Beginning, Constructing, Creating, Developing, Envisaging, Harnessing, Hiring, Integrating, Launching, Naming, Putting in place, Removing, Replacing, Resigning, Updating, etc.

**Table 3.3.** Examples of “anticipative” words and verbs

- II. choose the digital information sources. Two types of sources are used in the present case: those which can be accessed automatically by FACTIVA and newspapers’ websites which are relevant but inaccessible to FACTIVA, such as the newspaper *Le Monde*.

Thereafter, the operations take place automatically:

- III. APROXIMA **automatically** collects **full texts**. It stores them in its database;

- IVa. APROXIMA **automatically** extracts and “cleans up” the full texts as such (it removes purely technical traces). It stores them in its database;
- IVb. APROXIMA **automatically** filters and stores the relevant *briefs*. There is a reference from each brief to the **full text** from which it came;
- V. APROXIMA **automatically sends an alert** in real time to any and all people authorized, about the new **briefs** produced corresponding to each person’s profile.

### 3.2.2.2. Output produced by APROXIMA

The output automatically generated by APROXIMA is as follows:

- the **metrics** of the scanning result: number of **full texts** detected, number of briefs selected and number of **full texts** which contained one or more briefs;
- the full texts detected;
- the automatically-selected **briefs**;

[31]. The **photovoltaic industry will represent 15% of European electrical production by 2030, or 25% “if there is a paradigm shift”**, according to a report from EPIA[<http://www.connectingthesun.eu/report/reports/>], published Wednesday 17 October

Figure 3.8. Example of a brief obtained using APROXIMA

- the **alert messages** automatically sent by APROXIMA to the mobile phones of the authorized end users.



Figure 3.9. Example of an alert message sent by APROXIMA to a mobile phone (search performed in Spanish by a Colombian ministry)

- the **summary of “briefs”** sent automatically to subscribers. The summary is the collection and presentation of briefs on a given topic over a predefined period of time. The summary is formatted and then automatically e-mailed to the authorized subscribers.

Le thème

Resultados sobre el tema de investigación	Findeter	Proyectos	Fecha de Publicación: 25/04/2013 12:53:21 PM
Palabras Selectivas: findeter(Obligatorio), [urrá], *alerta, *corrup, *denun, *despilf, *desviac, *evaluac, *finanza, *incorreec, *indebid, *infi, *malver, *recurs, *regalia, *sospecho, *transfere, acueducto, agua, agua potable, amenaza, apoyo fiscal, avaluo, cedelca, ciudad, compensac, contingencia, contrabando, contralor, credito, crisis, DAF, decreto 028, decreto 28, defensa judicial, deficit, departament, descontento, educa, electric, elusion, embargo, endeuda, evasion, excedente, financia, fiscal, fondo, fonpet, giro, hacienda, hospital, impuesto, infraestruct, inverai, ley 358, ley 550, litigio, loteria, mineria ilegal, monitoreo, municip, obligacion, pasivo, pension, plan, plan de desarrollo, predial, prestamo, presupuesto, programa, proyecto, queja, quiebra, reclam, riesgo, salud, saneamiento fiscal, sentencia, SGP, sistema general, sostenib, territori, universidad, viabilidad, vigencia futura, viviend			
Por favor no contestar el presente correo. Consulte la base de datos de Noticias en <a href="http://www.minkasociedad.gov.co/news">www.minkasociedad.gov.co/news</a> o suscribase el periódico de la Dirección General de Apoyo Fiscal del Ministerio de Hacienda y Crédito Público <a href="http://paper.li/SenalesDeBiles/1338483399">http://paper.li/SenalesDeBiles/1338483399</a>			
Palabras Clave: Manizales, TIM, Cortés Carrillo, Findeter, SETP, Cereté, Colpatría, Armenia, Luis Fernando, Arboleda, BID, Roberto Boenheim Bernal			
Frases			
<b>25/04/2013</b> Titulo(s) : Concejo de Manizales negó liquidar TIM, Temas destacados Autor(es) : GOOGLE NOTICIAS También estuvo de acuerdo Cortés Carrillo, quien manifestó que el <u>proyecto deben corregirlo, pero expuso que si se liquida ,quién asumirá las deudas de TIM y quién quedará cumpliendo con el objeto social", esto por las acreencias, solo con Findeter es de \$13 mil millones, y por las demandas que se vendrán de los actores del Sistema, que no recibieron lo que les propusieron ganar con el SETP.</u> Texto Completo: <a href="#">GOOGLE NOTICIAS - Noticia Temas destacados</a> , <a href="#">GOOGLE NOTICIAS - Noticia Concejo de Manizales negó liquidar TIM</a>			
<b>24/04/2013</b> Titulo(s) : Ya se ven los edificios Autor(es) : El Meridiano de Córdoba Dicho <u>proyecto es adelantado por Findeter y la Alcaldía de Cereté, siendo el constructor la firma Colpatría. "Las primeras 112 viviendas tentativamente serán entregadas el 26 de junio.</u> Texto Completo: <a href="#">El Meridiano de Córdoba - Noticia Ya se ven los edificios</a>			
<b>24/04/2013</b> Titulo(s) : Armenia estará en el proyecto ciudades competitivas Autor(es) : La Cronica del Quindío Luis Fernando Arboleda, presidente del Financiera de Desarrollo <u>Territorial, Findeter, aseguró en un medio nacional que a mediano plazo la capital quindiana entrará a hacer parte del programa ciudades competitivas que coordina la entidad con el apoyo del Banco Interamericano de Desarrollo, BID.</u> Según Roberto Boenheim Bernal, gerente de la zona Eje Cafetero de <u>Findeter, la vinculación al proyecto representará un gran paso para la capital quindiana.</u> " Texto Completo: <a href="#">La Cronica del Quindío - Noticia Armenia estará en el proyecto ciudades competitivas</a>			
Textos Tratados: 8			
Noticias de interés: 3			

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Figure 3.10. Example of summary of three briefs (search performed in Spanish by a Colombian ministry)

### 3.2.3. Case study: Application to the topic of “Solar/Photovoltaic” power

#### 3.2.3.1. Organization’s issue

The CEO is wondering about the possibility, for his organization, of involving itself in the sector of solar energy. He is aware that there are major difficulties in this sector on an international scale, and that its medium and long-term future does not look promising at the moment. However, he thinks the future could, in fact, be different. He therefore wishes to gather elements of ideas and put them to the Board of Directors.

With this goal in mind, he asks the animator of the Anticipative Strategic Scanning to look for information useful in guiding the thought process. To begin with, he specifies that the initial search will be limited to digital sources, written in French. It will be limited to a recent and short period of time, merely for exploratory purposes.

#### 3.2.3.2. Use of APROXIMA

The animator thus makes use of APROXIMA in the following way:

- timespan: 18 February 2013 - 18 June 2013;
- selective words: *photovoltaïque* (photovoltaic) and *solaire* (solar). These are the generic topics of the scan target;
- sources consulted: Factiva and the newspapers *Le Monde*, *Libération* and *Le Figaro*.

### 3.2.3.3. Output automatically generated by APROXIMA

The results comprise the following elements:

- metrics;

Metrics	Results
Number of <i>full texts</i> detected	651
Number of briefs extracted (see example below)	567 (~1-4 lines in length)
Number of <i>full texts</i> from which one or more briefs have been extracted	322
Number of <i>full texts</i> which produced no briefs	329

**Table 3.4.** Examples of metrics

- the briefs themselves;

Results for topic ' <i>Solaire</i> '. Date: 29/11/2011 09:56:40 a.m.	
Selective words: energ, photovolt, solaire	
Sources	Briefs
UE/ÉNERGIE: plan solaire méditerranéen, un cap est franchi (25/11/2011) Source: AEFR	Siemens, ABB et Deutsche Bank, rejoints en 2010 par l'italien Enel Green Power, le français Saint-Gobain Solar, l'espagnol Red Electrica et le marocain Nareva Holding, Desertec est un projet de réseau de centrales <a href="#">solaires et fermes éoliennes dans le nord de l'Afrique et au Moyen-Orient, qui veut couvrir jusqu'à 15% des besoins de l'UE en électricité d'ici 2025</a> . View <a href="#">ENVJOB [ENVJOB] - Nouvelle ENR : "Le tiers financement est l'avenir du photovoltaïque"</a>
Le projet solaire géant Desertec a trouvé son réseau (24/11/2011) Source: FIGARO	Pourquoi les pays d'Afrique du Nord devraient-ils exporter de l'électricité alors que leurs besoins énergétiques progressent plus vite encore que leur <a href="#">croissance économique ? "Vendre leurs kilowattheures à un bon prix aux Européens permet par la suite de faire baisser le prix du courant sur le marché intérieur"</a> , explique Cédric Philibert, chargé de l'énergie solaire à

	l'Agence internationale de l'énergie (AIE). <a href="#">View Content</a>
OFFRES DES PAYS DE LA RIVE SUD DE LA MÉDITERRANÉE (24/11/2011) <i>Source: EURPTQ</i>	L'ambition du Maroc est de produire d'ici 2020 des fermes solaires d'une capacité totale de 2 GW. <a href="#">View Content</a>

**Table 3.5.** *Examples of briefs*

– the **full texts** from which the briefs were extracted. To obtain the **full text**, users need only click on the blue hyperlink (“View Content”) following the brief.

The animator gives the list of briefs to the CEO. What happens next? Here is the most usual scenario.

### **3.2.3.4. Examples of reactions from managers**

The CEO reads through the list of briefs. His attention is drawn to some of them in particular, possibly because a contradiction is immediately apparent, or because one of them triggers an idea, etc.

#### **EXAMPLE 1.**

A **contradiction** which draws the attention: the Swiss competitor ABB is acting in an unexpected manner:

- on the one hand, there are numerous records of bankruptcy and abandoned projects by organizations in the PV sector;
- on the other hand, the Swiss group ABB is buying up competitors who are on the verge of bankruptcy.

**ABB 7 briefs** express the strategy of the ABB Group in the PV sector and for the future, in spite of the “volatility” of that sector – for instance:

[261]. “**ABB** has bought out Power-One for 1 billion USD. The company admitted that the photovoltaic market was likely to remain volatile in the short term: 2013 will be a difficult year.”

[266]. “...the directors of **ABB** remain confident in the future of photovoltaic... confirming the group’s intention to place renewable energy at the very heart of its strategy.”

[454]. “Photovoltaic energy; **ABB anticipates a revival...**”.

This apparent contradiction causes questions to begin being asked: What is the strategy being exercised by our competitor, ABB? Should we draw inspiration from them, or should we, in fact, stay on our guard? What will the International Energy Agency (IEA)’s forthcoming report (26/06/2013) say? Etc.

In mid-June 2013, the animator of the Anticipative Strategic Scanning brought the following brief to the attention of the hierarchy: “**ABB Surprise resignation of the CEO (Joe Hogan) of the Swiss giant ABB Group /.../ The news has taken all analysts entirely by surprise /.../ During his ‘reign’, Joe Hogan increased the corporation’s turnover from 35 billion to 39.3 billion dollars**” Les Echos 13/06/2013

### EXAMPLE 2.

Energy management of buildings: would this be a promising area for us?

[157]. "... **Saint-Gobain Solar**: 'We need to bring photovoltaic energy into the mains grid of the **building**', confides one of the organization's managers."

[275]. "The inverter is only one part of what they are offering, alongside communication, monitoring and supervision systems, connecting boxes, electrical devices, electrical security and surveillance systems, transformers and delivery stations, etc. "Our position on the photovoltaic market relates to all of electrical conversion", points out Ignace de Prest, from **Schneider Electric**."

The construction of all sorts of buildings has a very bright future in many countries: China, Indonesia, the Middle East, etc. The potential markets are enormous. Should we take an interest in this area? Schneider Electric is already capitalizing, but there should be room for us as well: almost everything still remains to be done in this domain. Could Schneider be a potential partner for us?

### EXAMPLE 3.

"Innovating to find an answer to a crucial question: how can we store electricity? Electricity storage is a dream in most countries, but it is one we are not able to deliver at present. Anyone who finds an acceptable economic solution will have many excellent business opportunities."

Should we orientate our "RADAR" toward labs and start-ups working in this field?

#### 3.2.4. Recap on APROXIMA

APROXIMA enables users to quickly circumvent the problem of information overload with textual data obtained from the Internet:

- it directly provides briefs a few lines long selected on the basis of the selective words input at the beginning. These briefs can be used directly for collective creation of meaning sessions (e.g. using the Puzzle method);

- it only gives anticipative briefs, if we want it to.

In addition, with APROXIMA, it is possible to tweak the Anticipative Strategic Scanning target: on reading the briefs obtained after an extraction, users will realize that certain **full texts** selected in fact hold no interest. In discovering why they hold no interest, we can pick "selective" words to filter out, so the program will no longer select a **full text** containing one of those words. This feedback operation is highly useful in dealing with information overload. The figure below illustrates the process.

- Manuelle
- Automatisée

Figure Aproxima : Rétroaction pour piloter la cible de veille

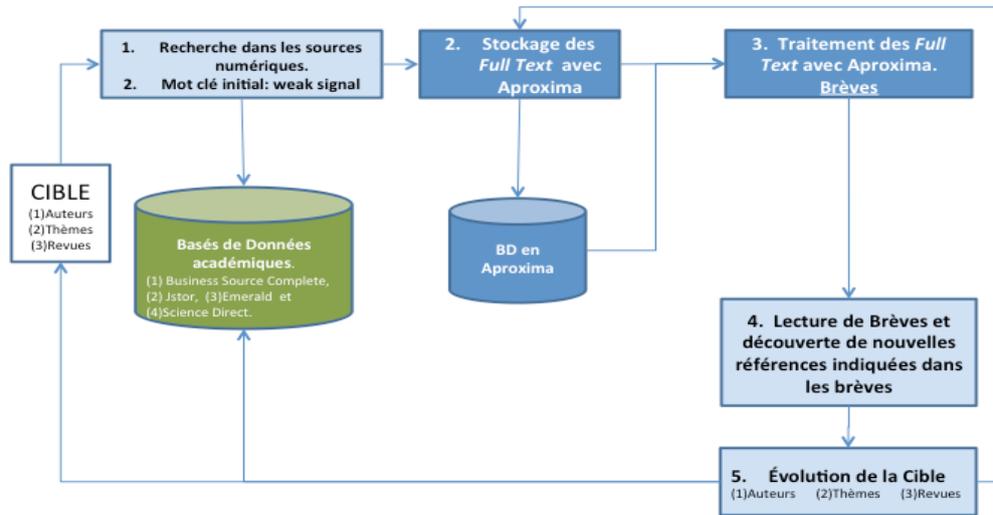


Figure 3.11. Rétroaction vers le ciblage.

### 3.3. ALHENA, an aid to finding connections between weak signals

#### 3.3.1. Usefulness

ALHENA is able to detect **full texts** which have elements in common. Those elements could be identical words, but also synonyms. The full texts sharing elements are referred to as “*adjacent information*”. Adjacent information fragments are grouped together and presented in the form of a graph, appropriately known as a “constellation”. Automated adjacency detection applied to raw data helps identify any possible connections between the information fragments.

The concept of “adjacent information” is useful when comparing two (or more) pieces of information not necessarily written in identical words. The aim of the comparison is to:

- lend credibility to one (or several) of the texts;
- supplement information lacking from one (or several) of them with information from the other(s);
- demonstrate an inconsistency or contradiction between two pieces of information;
- facilitate the interpretation of that information set;
- reveal a new extension of the initial issue;
- envisage links between pieces of information (complementarity, inconsistency, contradiction, etc.). Examples are given in the case study.

Figure 3.12 shows the position of ALHENA in the generic model of the process of Anticipative Strategic Scanning.

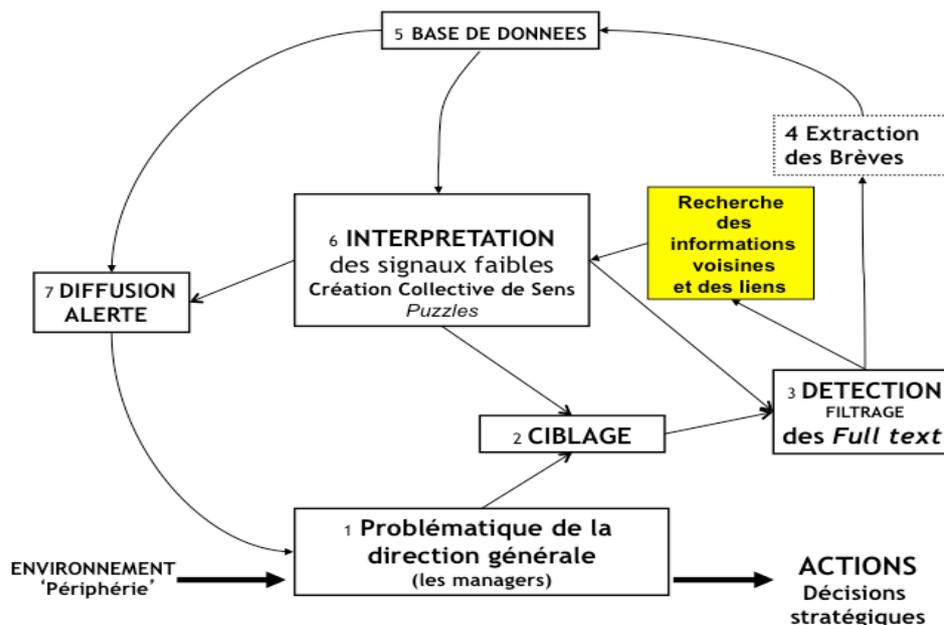


Figure 3.12. Position of ALHENA in the generic model of the process of Anticipative Strategic Scanning

### 3.3.2. Principle behind ALHENA package

#### 3.3.2.1. Stages of use of ALHENA

**Full texts** which are relevant to the organization's issue are fed into ALHENA. These texts will have been selected beforehand (possibly by APROXIMA, for example). They are provided in unordered form. There may be several hundred of them at a time.

The full texts are automatically processed by ALHENA. The duration of the processing step may be between one and several hours, without human intervention, depending on the number of *full texts*. All the full texts will be written in the same language.

#### 3.3.2.2. Output generated by ALHENA

The output is given in visual form of drawings; an example is given in Table 3.6. The adjacent information fragments are grouped together on the computer screen. Each of them is represented by a number, assigned by ALHENA. There will be as many groups as there are "clusters" of adjacent information fragments. In view of its appearance, a group is known as a "**constellation**".

Generally, the processing step yields more than one group (or constellation). The whole of the graphic result is called a "**galaxy**", because of its similarity in appearance to a starry night sky. Each **full text** belongs to one, and only one, constellation.

If we click on its number, the **full text** is displayed on the screen, along with information helpful to the user (an example is shown in Figure 3.12).

### 3.3.3. Case study: Application to the topic of "CO<sub>2</sub> Valorization"

#### 3.3.3.1. Organization's issue

The directors of the organization "*Durability*" (chemical sector) decided to explore the possibility of exploiting CO<sub>2</sub> as a primary material with the aim of diversifying the organization's activities in a strategic orientation for the future. A think-tank session of the board of directors was convened. The question on the day's agenda was: "*To explore the possibility and financial relevance of valorizing CO<sub>2</sub> as a potential primary material*".

The person (called the animator) in charge of preparing the **full texts** likely to be used for the next board meeting gathered 299 **full texts** which might be applicable to the issue at hand, but it is impossible for that person to read all of the texts in the short time available (raw data overload).

In order to prepare for the meeting, the animator must perform the following tasks:

- search for and extract the full texts potentially applicable to the topic at hand, and likely to contain possible anticipative information signaling changes in the organization's relevant environment. By scanning a number of sources (using APROXIMA), the animator was, in this case, able to gather **299 full texts**;
- evaluate the degree of **reliability** of each text;
- refer backwards and forwards numerous times from one **full text** to another to guide the participants in their reflections and interactions during the meeting.

Here are some examples of interactions, recorded during previous sessions attended by the animator:

| **VERBATIM.** (interactions between participants in a collective creation of meaning session)

“**Comparing** this piece of information with that one makes me think that...”

“Those two pieces of adjacent information seem to be **inconsistent**, unless...”

“What you’re saying certainly **fits in** well with what’s on the screen... it’s the missing link between the two pieces of information...”

“There is, however, something, which should suggest that...”

“Looking at what we’ve written on the screen, I remember that last week, someone told me that...”

“We need to look for ... to supplement the information...”

“Are we certain that the information we’re discussing here is **reliable**?”

“Do we already have any “adjacent” information for this – anything which could **back it up**?”

**Constraints/Time pressure** – The CEO insisted that the **full texts** be prepared in as short a time as possible in order to reduce administration costs and increase the organization’s reactivity. He had already declared: “*Unless a significant time gain is made, the strategic scanning will be abandoned!*”

**Hope/Hypothesis** – It would be very helpful to divide the 299 **full texts** into small groups of “adjacent” information (these groups are called “local constellations”) demonstrating the cases above.

This is precisely what the ALHENA prototype allows us to do.

### 3.3.3.2. Preparation for Board of Directors session

A collective reflection session, bringing together many members of the Board of Directors, was convened. The agenda was framed as: “*To explore the possibility and financial relevance of valorizing CO<sub>2</sub> as a potential primary material*”. For the meeting, therefore, the animator needs to be able to:

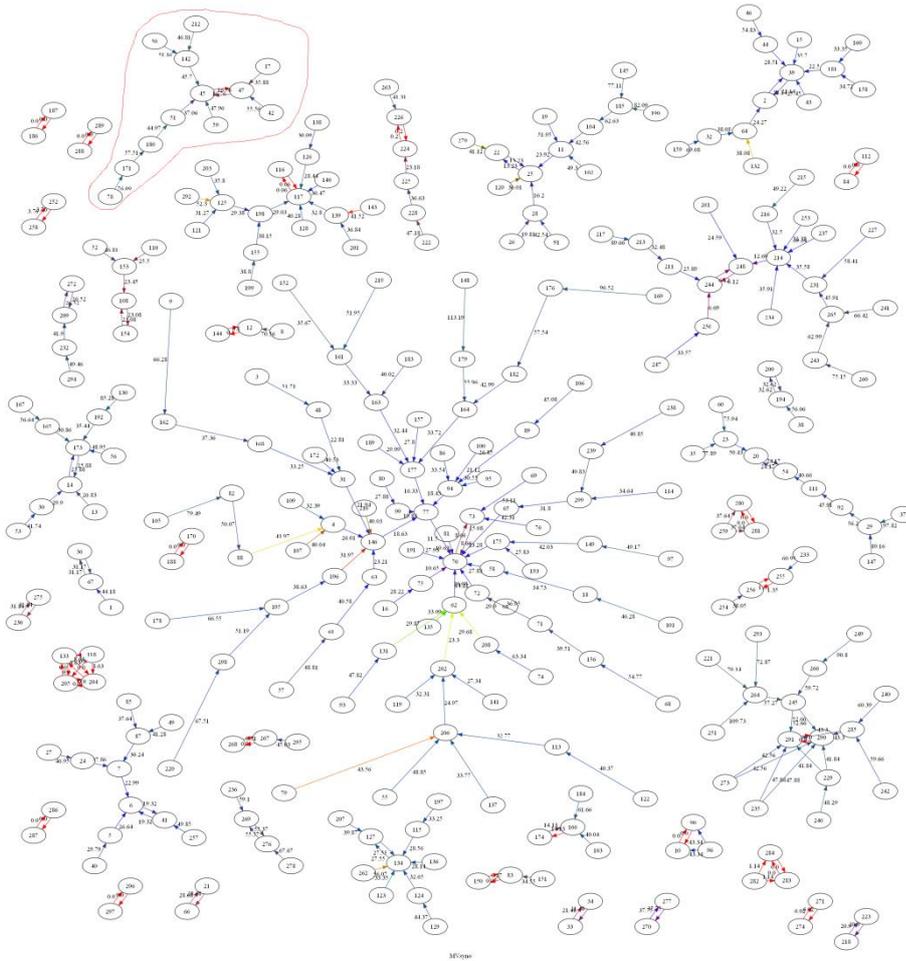
- present the full texts selected, if necessary, in as visual a manner as possible;
- respond very quickly to any requests the participants may make as the meeting proceeds;
- without interfering with the rhythm of the participants’ interactions, accompany the discussion with a projection of the full texts which may aid in the collective reflection;
- respond, quickly and as and when required, to any questions such as: “*Is this information reliable? Do we have any other information which could supplement it? Does any of our other information contradict or undermine it? etc.*”

The ALHENA prototype was designed and built with a view to providing an efficient aid to fulfilling such conditions.

### 3.3.3.3. Visual output generated by ALHENA

ALHENA displays the visual representation shown in Figure 3.13. The diagram shown here is reminiscent of a “**global galaxy**”, in which the 299 **full texts** are identifiable by their number. The animator sees three types of graphical shapes:

- double-ended arrows indicating the position of the “**nuclei**”;
- small **local constellations** centered at their nucleus (a set of double-ended arrows);
- **local constellation arms** – arms made up of series of **full texts** connected by single arrows.



**Figure 3.13.** Output from Alhena: Global galaxy made up of various local constellations, one of which is circled in red here (top left)

### 3.3.3.4. Use of output by the animator

The steps taken by the animator are as follows. First, the animator clicks on a local constellation, which we shall denote as LC (for example, the LC circled and centered at the nucleus 45-47 in Figure 3.13). He obtains:

- a page with the graphic representation of the local constellation;
- the table showing the word cloud for the local constellation.

The word cloud for the local constellation gives the animator a general idea about its subject. The word clouds on the branches give the animator an indication of the way in which the subject is dealt with in each of them.

The animator need only read the text of the nucleus:

- either to decide to give up on reading all the full texts in the constellation: this represents a time gain, and a reduction in overload;
- or to be alerted to the usefulness of reading at least the full texts in the initial corona around the nucleus: this increases the attention paid to these texts.



– instantly, the main keywords in **full text 45** are displayed in the top left-hand box, while the full text is displayed in the bottom left-hand box;

– **full text 47** is displayed on the right, with main keywords in the top box and the full text in the bottom one.

Thus, the animator is able to compare texts 45 and 47 if he needs to (see Figure 3.14). The comparison is facilitated by the fact that the words common to texts 45 and 47 are highlighted in salmon pink by ALHENA. If there are synonyms, these are shown in blue, whilst any co-occurrences of words are underlined.

45	47
<p>cellulosique    enerkem    greenfield</p> <p>production    éthanol</p>	<p>cellulosique    enerkem</p> <p>greenfield    éthanol</p>
<p>ÉTHANOL GREENFIELD ET ENERKEM ANNONCENT UN PROJET COMMUN DE PRODUCTION D'ÉTHANOL CELLULOSIQUE</p> <p>381 mots 18 mars 2008 eSource Canada Business News Network Anglais Copyright 2008 Business Information Group. All Rights Reserved.</p> <p>Éthanol GreenField et Enerkem viennent de signer une entente de principe visant la production d'éthanol cellulosique sur une échelle commerciale.</p> <p>« Nous sommes ravis de travailler avec Enerkem pour faire de l'éthanol cellulosique une réalité commerciale au Canada », a déclaré Bob Gallant, président et chef de la direction d'Éthanol GreenField. « Les consommateurs canadiens veulent une solution de rechange plus verte et peu coûteuse aux combustibles fossiles et GreenField répond à cette demande en accroissant de façon significative ses activités de production de nouveaux biocarburants », a dit Frank Dottori, directeur général de la division d'éthanol cellulosique de GreenField.</p> <p>Selon l'entente, les deux sociétés collaboreront, à parts égales, à des projets répartis dans des régions spécifiques choisies et visant la conception, la construction et l'exploitation d'usines de fabrication d'éthanol cellulosique utilisant la technologie d'Enerkem. L'emplacement de la première usine a été choisi au Canada et sera annoncé au cours des prochaines semaines. Une deuxième usine est en cours de développement.</p> <p>La technologie d'Enerkem transforme la biomasse comme les déchets solides municipaux triés et les résidus forestiers en éthanol cellulosique et autres biocarburants. Elle permet l'élimination de plus de deux tonnes de gaz à effet de serre par tonne de matières résiduelles utilisées dans le procédé. Les fondateurs de la société ont consacré plusieurs années à développer cette technologie de gazéification. L'usine pilote d'Enerkem, qui, depuis 2003, cumule plus de 3 000 heures d'opération, fabrique du gaz de synthèse, du méthanol et de l'éthanol cellulosique. De plus, la société construit actuellement une usine de démonstration de taille commerciale pour la production d'éthanol cellulosique à Westbury, au Québec.</p> <p>« Ce partenariat est une étape déterminante dans l'atteinte de l'objectif d'Enerkem qu'est la commercialisation d'éthanol cellulosique », a dit M. Vincent Chornet, président et chef de la direction d'Enerkem. « En unissant nos forces à celles d'Éthanol GreenField, nous sommes confiants de devenir des chefs de file canadiens dans la production et la distribution de biocarburants de nouvelle génération. L'expérience de GreenField dans la construction et l'exploitation d'usines industrielles sera essentielle à l'expansion de notre production », conclut M. Chornet.</p>	<p>Éthanol GreenField et Enerkem annoncent un projet de production d'éthanol cellulosique d'envergure commerciale</p> <p>835 mots 11 mars 2008 14:44 Canada Newswire Français Copyright © 2008 Canada NewsWire Ltd. tous droits réservés.</p> <p>TORONTO and MONTRÉAL, le 11 mars /CNW/ -- TORONTO and MONTRÉAL, le 11 mars /CNW/ - Éthanol GreenField, le plus gros producteur d'éthanol au Canada, et Enerkem, une entreprise de premier plan dans le domaine des technologies de gazéification et de catalyse, ont signé une entente de principe visant la production d'éthanol cellulosique sur une échelle commerciale.</p> <p>"Nous sommes ravis de travailler avec Enerkem pour faire de l'éthanol cellulosique une réalité commerciale au Canada", a dit Bob Gallant, président et chef de la direction d'Éthanol GreenField. "Les consommateurs canadiens veulent une solution de rechange plus verte et peu coûteuse aux combustibles fossiles et GreenField répond à cette demande en accroissant de façon significative ses activités de production de nouveaux biocarburants", a dit Frank Dottori, directeur général de la division d'éthanol cellulosique de GreenField.</p> <p>Selon l'entente, les deux sociétés collaboreront, à parts égales, à des projets répartis dans des régions spécifiques choisies et visant la conception, la construction et l'exploitation d'usines de fabrication d'éthanol cellulosique utilisant la technologie d'Enerkem. L'emplacement de la première usine a été choisi au Canada et sera annoncé au cours des prochaines semaines. Une deuxième usine est en cours de développement.</p> <p>La technologie d'Enerkem transforme la biomasse comme les déchets solides municipaux triés et les résidus forestiers en éthanol cellulosique et autres biocarburants. 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L'expérience de GreenField dans la construction et l'exploitation d'usines industrielles sera essentielle à l'expansion de notre production", conclut M. Chornet.</p> <p>À propos de l'éthanol</p> <p>-----</p> <p>L'éthanol est un carburant renouvelable fabriqué à partir de céréales comme le maïs et le blé, ou à partir de la cellulose qu'on trouve dans les plantes et la biomasse. L'éthanol est peu coûteux et offre des avantages environnementaux uniques. Le modèle GH Genius de Ressources naturelles Canada indique que l'éthanol produit à partir du maïs permet de réduire les émissions de gaz à effet de serre (GES) de 40 à 60 pour cent comparativement à l'essence. L'éthanol cellulosique peut réduire les GES de 87 pour cent selon le modèle GREET du ministère de l'Énergie des États-Unis. L'engagement du gouvernement fédéral à ce que l'essence comprenne une moyenne de cinq pour cent d'éthanol d'ici 2010 permettra de réduire les émissions de GES d'une quantité équivalant au retrait d'un million de voitures des routes canadiennes chaque année.</p> <p>À propos d'Enerkem</p> <p>-----</p> <p>Enerkem, dont le siège social est situé à Montréal, a des bureaux d'ingénierie à Sherbrooke. C'est un chef de file dans le développement de biocarburants cellulosiques. La technologie de gazéification, de conditionnement du gaz synthétique et de catalyse d'Enerkem transforme les déchets solides municipaux triés et les résidus forestiers en éthanol cellulosique et autres biocarburants. La société exploite une usine pilote depuis 2003 et construit actuellement au Canada une usine de démonstration de taille commerciale pour la production d'éthanol cellulosique. www.enerkem.com</p> <p>À propos d'Éthanol GreenField</p> <p>-----</p> <p>Éthanol GreenField, auparavant Les Alcools de commerce, est le principal producteur d'éthanol au Canada. Chaque année, la société produit 250 millions de litres d'éthanol à ses usines de Chatham et Tiverton, en Ontario, et de Varennes, au Québec. Sa plus grosse usine jusqu'à présent, d'une capacité de 200 millions de litres, à Johnstown, en Ontario, sera opérationnelle en décembre 2008. Une usine de 145 millions de litres est en cours de développement à Hensall, en Ontario. GreenField participe activement au processus de développement d'une technologie biochimique visant à produire de l'éthanol cellulosique à ses installations de pointe situées à Chatham, en Ontario. Le carburant d'Éthanol Greenfield est offert dans plus de 1 500 stations service, partout au Canada. Pour plus d'information, veuillez visiter le www.greenfieldethanol.com.</p> <p>Melissa Armstrong, Éthanol GreenField, (416) 304-1700, poste 8431, m.armstrong@greenfieldethanol.com; Marie-Hélène Labrie, Enerkem Inc., (514) 875-0284, poste 224, mlabrie@enerkem.com</p>

mot trouvé dans les 2 textes  
synonyme trouvé  
mots rapprochés par la distance google

Figure 3.14. Visualization and comparison between texts 45 and 47 in the nucleus

**Surprise** – In the second row, the software displays the words most commonly occurring in the two texts. In this case, these words are: “Enerkem”, “GreenField” (both actors in the chemical industry), “éthanol” and “cellulosique” (cellulosic [relating to or derived from cellulose]). The participants, the members of the board of directors, ask themselves: might Enerkem and GreenField, whom no-one has so far mentioned at Durability, be potential competitors for us, of whom we were not aware, with regard to the strategic path of “CO<sub>2</sub> valorization” being explored here?

Other observations:

- 45 and 47 have many words in common, but they are not duplicates, as they do not have the same **number of words** (381 for text 45 and 835 for text 47); their **original sources** are not the same, and neither are their **dates of publication** (11 March 2008 for 47 and 18 March for 45). The animator may suggest that 45 and 47 give one another credibility, or at least that they significantly **confirm** one another.

- Durability is exploring the possibility of valorizing CO<sub>2</sub> by producing ethanol using algae. In these texts, though, cellulosic ethanol is mentioned: could this be a competitive avenue... using a **competitive technology**? Does Durability need to worry about this? The Attention is **alerted** to issues which the managers might not yet have considered.

In summary:

- the software draws attention to the entry points in the 299 **full texts**: the nuclei of the local constellations;

- if we point to a nucleus, the software suggests numerous elements to feed into the strategic thinking of Durability’s Board of Directors;

- the time needed is very short in comparison to what it would have been if the animator had had to do everything manually. The time gain is a convincing argument in the eyes of the hierarchy (because of the cost reduction). Yet this is by no means the only contribution made by the ALHENA prototype.

#### 3.3.3.4.2. Small corona around the nucleus

The animator wonders whether the information fragments 45/47 could be supplemented or rendered more reliable. He therefore examines the full texts making up the near corona around 45/47 in the constellation displayed on the screen: 51, 142, 17, 42 and 59. By clicking, one by one, on each of these numbers, the **full texts** appear, as do the most frequently occurring words, shown in the second row (see Figure 3.14).

The animator can very quickly see that all the texts in the corona of the 45/47 nucleus (except for 42) provide elements of additional information about the actors “Enerkem” and “GreenField”, on the one hand, and the topic “cellulosic ethanol”, on the other. These additional elements can therefore help to reassure the board members about the reliability of texts 45/47. They may also draw their vigilance to the potential competitors Enerkem and Greenfield, because neither these actors nor the topic of “cellulosic ethanol” were included in the initial Anticipative Strategic Scanning target.

#### 3.3.3.4.3. Constellation arm

The participants may ask the animator why **full texts** are connected to one another to form a local constellation arm. For example, 78, 171, 180 and 51 constitute the longest arm of the local constellation 45/47. If the animator clicks on 78, ALHENA displays the **full texts** 78 and 171. It also indicates: the words common to the two texts (salmon pink); synonyms and any co-occurrences (as mentioned above). Then the animator can click on 171, for example: this displays texts 171 and 180, and so on until the nucleus is reached.

The texts we pass through on the journey from the outer end of a local constellation arm towards its nucleus will be increasingly short, and the main keywords will play an increasingly important relative role: in this particular case, those words are “Enerkem” and “cellulosic ethanol”.

#### 3.3.3.4.4. *Summary*

For the above explanations, we chose to use information fragments 45/47, connected by a double-ended arrow and situated at the center of a local constellation (see Table 3.6). Thus, we have been able to demonstrate that the existence of a local constellation such as this is capable of drawing attention to a sub-issue which might not have been mentioned previously by Durability’s directors, but which may cause a reaction when discovered. The hierarchy’s “field of vision” is increased, where previously there was a blindspot! Yet the global constellation contains other local constellation which need to be examined in the same way.

An examination of all the nuclei in the global galaxy (see Figure 3.13.) was done by the animator during his preparation. The time required was around two hours: one hour of the program running (without human intervention) followed by one hour of “human work” for the animator to analyse the galaxy. The result was that only one other nucleus also appeared to be possibly interest-worthy: the nucleus 70/73, which draws the attention to the “Food Industry” avenue for CO<sub>2</sub> valorization. When pursued, this avenue caused surprise in the Board of Directors: it had never previously been mentioned. The following strategic questions were raised: “Should we take an interest in this area? Are there already serious competitors at work in this field? Should we consider going into partnerships? What results could this produce over the course of the next decade? Etc.”

#### 3.3.3.5. *Recap on the ALHENA prototype*

The hypothesis about the usefulness of a tool such as ALHENA has gone a long way toward validation by replication of the approach employed in this experiment in new fields of application.

The application made of ALHENA shows us that the animator need only read the text of the nucleus:

- either to decide to give up on reading all the full texts in the constellation: this represents a time gain, and a **reduction in overload**;
- or to be alerted to the usefulness of reading at least the full texts in the initial corona around the nucleus: this **increases the attention** paid to these texts.

In addition, ALHENA provides an answer to the question “How can we **Zoom in**” suggested by Moss Kanter (see Chapter 2) and how to expand the field of peripheral vision and thus discover any existing blindspots.

**VERBATIM.** (examples of reactions from the Board of Directors)

*“A huge body of **full texts** is replaced by a figure which fits on one page or on the projector screen. This changes everything – it’s much easier to use!”*

*“The simple fact that we immediately know which **full texts** have elements in common with which other **full texts** already helps to make sense of what was, previously, just a mountain of raw data.”*

*“Visualization immediately triggers reflection.”*

*“I have the feeling of navigating at a variety of altitudes with this possibility of zooming in and out.”*

## Conclusion

APROXIMA enables us to directly obtain briefs, i.e. information fragments likely to be interpreted as possible weak signals. APROXIMA performs four tasks:

- consultation of the digital information sources indicated to it;

- selection of the articles (in **full text** form) corresponding to the selective words input by the user;
- storage of the articles in its database;
- extraction of briefs (text fragments) in view of the selective words and anticipative words input by the user.

ALHENA processes a big volume of (say, a thousand) **full texts** which are fed into it to reveal groups of “adjacent” information fragments. The **output** is groups of information fragments presented in graphical form, called “local constellations”. A local constellation contains all the full texts which deal with the same subject. The program helps to find links between **full texts** previously stored in unordered form in the database (links such as confirmation, contradiction, etc.).