

THE CERAMIC TECHNOLOGY OBSERVATORY AS A COMPETITIVE INTELLIGENCE TOOL FOR THE SECTOR

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ABSTRACT

Over the past two years, the Instituto de Tecnología Cerámica, in its on-going efforts to provide the sector with the best available tools and processes, and with the aim of improving the sector's competitiveness, has created and developed an integral Competitive Intelligence system at the service of ceramic companies.

This system, which helps companies take decisions, is known as the Ceramic Observatory and is currently made up of three areas of knowledge defined by the observation and analysis of the ceramic industry from several angles: Market Observatory, Habitat Trends Observatory, and Ceramic Technology Observatory.

In March 2007, the official presentation of the Ceramic Technology Observatory took place, which was the starting point for the activities to be developed within its framework. Since this time, an internet gateway (www.observatoriotecnologico.es) has been at the service of the sector, which acts as the backbone of all the Observatory's activities.

The gateway is structured into two differentiated parts. On the one hand it offers daily news, produced by a technology watch service established through specific computer tools, grouped by type of information, such as: technical articles, grants and subsidies, events, legislation, regulations, news, offers and technological demands and patents. This information is filtered by specialised technicians at the Centre and the contents thought to be of the most interest are published. In the meantime, though less frequently, longer reports providing more in-depth analysis produced from studies and projects generally developed by the Institute suggest new opportunities and challenges for the companies in the sector. Examples of these are reports on emerging technologies, technical reports from trade fairs, diversification studies, etc.

In addition to having this information and communication channel for professionals in the ceramic sector, which has become the Observatory's main tool, other personal communication channels have been created for the different agents involved (meetings between collaborating companies, workshops, etc.) with the aim of learning first-hand the opinion of the companies, thus strengthening the Spanish science-technology-company system.

A year after it began, we are presenting the sector with some initial thoughts on what the first steps of the Ceramic Technology Observatory have meant to the sector, and what contributions it has made, keeping its main objective in mind, which is to strengthen activities in innovation among the ceramic companies, thus increasing their competitiveness.

1. THE NEED FOR A COMPETITIVE INTELLIGENCE SYSTEM

Information is power. It doesn't matter whether it is a company, a country or another type of structure, the one with the most and the best information has the best chance of surviving. However, this is no longer true. Since the beginning of time, Man has needed to know what others are doing. Sometimes this is simply because of curiosity; however, it is often a matter of being ready for threats which may appear because of changes or advances in neighbouring civilisations.

Although this is a well-known fact, there is no documentary evidence of the systematic use of information prior to the 18th century, when the "Den Goteborg Spionen" magazine was published in Sweden. This magazine specialised in discovering new technologies existing in other countries and spreading news about them through its publication.

After the beginning of the nineties, an important change in working philosophy was seen, with all efforts concentrated on knowledge, learning, and information flow. Companies started obtaining important innovative advantages over their rivals through dynamic information management.

In order to do this it is necessary to develop innovative systems for managing information that allow data to be transformed into useful knowledge with high strategic value. These systems are known as **Competitive Intelligence Systems**.

Gibbons defines Competitive Intelligence as the process of obtaining, analysing, interpreting and spreading strategically important information on the industry and its competitors, which is transmitted to the suitable people within an appropriate period of time.

All this evolution in the ways we manage information is due to globalisation, and originates largely from the dramatic evolution of information technologies, which allow us to obtain information or contact anyone, any time, in any part of the world in real time.

2. STANDARD UNE 166006: 2006 EX "MANAGEMENT OF THE R&D&I: TECHNOLOGY WATCH SYSTEM"

An example of the growing interest in and recognition being given to Technology Watch took shape with the publication by AENOR of Standard UNE 166006: 2006 EX

“Management of the R&D&I: Technology Watch System”. Since 2002, AENOR has been developing a series of standards with the aim of creating tools to facilitate R&D&I management. The abovementioned standard was published in May 2006.

This standard defines the characteristics of Technology Watch and a Technology Watch System. It also sets out some of the most relevant points, which are the requirement to be complied with by the Technology Watch System, responsibility for managing the entity, resource management, working methods to follow in the Technology Watch, etc. One of the important points of this standard is the possibility of subcontracting the Technology Watch services within our system for Managing R&D&I, for which the hiring entity is always responsible.

It is already possible to be certified under the standard and under UNE 166006: 2006 EX. Being certified under this standard means having much more effective R&D&I than those who do not have a system with the same characteristics, i.e. it means being better prepared to face threats and the innovations produced will have a higher percentage of success, so the possibilities of surviving will be much higher and the possibilities of gaining competitive advantages in a changing environment are much greater.

3. COMPETITIVE INTELLIGENCE SYSTEM IN THE CERAMIC SECTOR

In the same way, the ceramic sector, faced with the changes taking place in the national and international competitive ceramic sector area, is finding it increasingly more important for its companies to have instruments to provide them with specific types of information to enable them to introduce new action strategies to deal with threats and permit them to make the most of the opportunities that are constantly arising.

To be able to meet the unavoidable need for information it is necessary to have a system or tool that enables this information to be compiled, analysed and valued, providing companies with an objective, reliable basis for focusing their future strategies.

Over the past two years, the Instituto de Tecnología Cerámica, in its on-going efforts to provide the sector with the best available tools and processes, and with the aim of improving the sector's competitiveness, has created and developed an integral Competitive Intelligence system at the service of ceramic companies.

This system, designed to help companies take decisions, is called the Ceramic Observatory and is currently made up of three areas of knowledge that are defined by the observation and analysis of the ceramic industry from several angles.

- **MARKET OBSERVATORY**

The Market Observatory is a Competitive Intelligence system that provides objective information to all the companies in the ceramics market, covering the entire value chain, from suppliers, manufacturers and distributors to the final demand. The information is provided as a whole for the sector and also in individual, personalised reports for each participating company.

It is based on continuous observation of the environment, using market research techniques and statistical methods to ensure it is both objective and representative. The main purpose of this is to provide objective information for preparing strategies and taking business decisions.

- HABITAT TRENDS OBSERVATORY®

The Habitat Trends Observatory® is a system for producing and publishing knowledge relating to trends in the habitat at the service of companies in the Autonomous Region of Valencia. It is a multi-sectoral project (ceramic, furniture, and home-textile) and multidisciplinary in nature, i.e. it studies different sectors related to the habitat and does this from different points of view. This is why the team comprises three technology institutes, which are AIDMA, AITEX and ITC itself.

The multi-sectoral nature of the Habitat Trends Observatory® is determined by the need to consider any object to be used in the home in relation to an overall habitat, i.e. which exists alongside other objects and structures. To do this the furniture, home textile and coverings sector is studied, but also the other objects that make up the home. It is also considered necessary to widen the concept of a habitat product to its communication and distribution, as it is understood these processes form a very active part of the process that determines the success of a product.

- TECHNOLOGY OBSERVATORY

This is a system for Technology Observation, based on observation, analysis and specialised information, organised and structured to strengthen the capacity for detecting technological changes of interest to the ceramic sector.

Its main purpose is to obtain and spread highly valuable technological information in a dynamic manner, helping reduce uncertainty when taking strategic decisions in the company, providing the user with the ability to anticipate.

This goal is achieved by using the most up-to-date Technology Watch tools to obtain the information, which is subsequently analysed and transformed into a series of high added value services for the companies.

4. CERAMIC TECHNOLOGY OBSERVATORY

Going deeper into the central theme of this communication, which is the Technology Observatory as a tool for Competitive Intelligence for the sector in the technology area, as has already been mentioned above, watch or monitoring activities are intrinsic to human beings and cannot be considered something exclusive to our times.

This does not mean that over the years and thanks to technological advances over recent years, monitoring techniques have not changed. Until the internet appeared and developed, more conventional watch techniques (let's call them "traditional watch") involved reading books, technical journals, printed bulletins, going to trade fairs and congresses, contact with clients and suppliers, etc.

At the end of the day, the main cause can be found in the great advances in computing that have taken place in recent years. These have enabled the internet to appear and develop, but also the development of powerful computing tools with the ability to handle large quantities of information as well as a proliferation of network databases.

Another important factor is scientometrics. This tool is based on all the results of research materialising in technical articles, patents, reports of congresses, etc. By analysing all these documents and using different bibliometric indicators we can extract extremely interesting information. One example of this would be discovering which entities and companies are involved in a certain line of research, what a certain company is researching, new lines of research or emerging technologies, scientific activities in countries, outstanding centres in certain lines of research, and a host of other possibilities.

All these circumstances have greatly helped Technology Watch to become an extraordinarily important activity, capable of producing information of great strategic value when it comes to taking decisions on technological aspects in all these entities.

When it comes to naming this activity Technology Watch or Intelligence, there are two reasons why the second term has been chosen. In the first place, there are authors who consider this change in terminology is a result of the terms being modernised and the negative connotations that seem to be connected to the word “watch” in its closest connotation to the word “espionage”. The second reason we would mention is that to a large extent it reflects the spirit this platform intends to transmit, and that using the term Intelligence introduces a more proactive point of view.

What’s more, we believe that Technology Intelligence goes beyond the limits of Technology Watch in terms of the following aspects:

- It covers the gathering of information from any source and in any format, regardless of whether this is formal (e.g. a document) or informal (e.g. a conversation).
- It covers all types of contents: technical information, economic, commercial, regulations, etc, provided this is of interest to the company.
- It explicitly includes other additional forms of information: assimilation of the contents, taking decisions and protection of the results.

Disseminating the contents considered of high strategic interest is not the only intention. The purpose is that these contents, through the corresponding tools for reflexion developed to interact with the industrial agents, should give rise to the development of studies and projects the result of which are reports that contain more highly developed content.

Once again, as can be seen from all the above, spreading the information is one of the pillars of Technology Intelligence. Delivering the information produced to the right people is a fundamental aspect, otherwise the whole exercise is pointless. To respond to this in the best possible manner and bearing in mind that the system is at the service of an entire sector, an internet gateway was considered the best tool to use

for this purpose. This tool not only allows contents to be distributed, but also serves as a platform for developing certain instruments for interacting with companies.

The main tool for interaction developed to date on this gateway, with the aim of facilitating communication and discussion among the different agents belonging to the scientific-technology-company system defended by the current R&D&I policy, is a forum where discussion topics are dealt with based on content, reports, etc. Although this forum is intended to serve as a regular meeting place through virtual interaction among the interested persons, personal contact is considered particularly important; therefore, two different types of event have been introduced, which are:

- Presentations open to the sector

In these presentations all the interested parties are shown, after prior notice of the meeting, those technologies that, according to an established criterion, are considered to be potential working tools to improve current management and manufacturing processes. At these presentations real solutions are offered, both technical and economic, to make introducing them more economical and simple, especially for SMEs (small and medium-sized companies).

- Meetings with collaborating companies.

This type of meeting aims to strengthen the different subjects discussed in the forums and to hear the opinions of experienced people from the companies about the potential research and development lines to be carried out, based on the results of the activity devoted to searching for and analysing information conducted by the Technology Observatory.

5. DESCRIPTION OF THE WEB GATEWAY

The layout of the gateway responds to the differentiation between Technology Watch activities (located on the left of the screen), and activities requiring more preparation and whose results are a technological report of high strategic value (located on the right). The latter appear under the heading "Advanced technology services". Figure 1 shows a screenshot of the structure to which we are referring.

As you can see, inside the Technology Watch section, there are up to nine tabs that allow us to view the information in different ways, depending on our needs or the information we are interested in. Exactly the same goes for the Advanced Technology Services, where there are up to five tabs. The information can also be viewed by subsectors, enabling the user to filter the information that it not useful or unnecessary for the type of company.

With regard to the centre of the screen, there is a screen showing the most recent content published, with the oldest content disappearing at the bottom, and information published on the day of viewing appearing in bold. Lastly, at the bottom, you will see six boxes framing content considered to be particularly relevant when it is published. The aim is to keep them visible on the main page for longer, and at the same time, attract the user's attention.



Figure 1. Home page of the Observatory internet gateway

Users are given the option to register, which involves a series of benefits. There are contents on the gateway which require user registration in order to download the documents attached (if not, the corresponding download icon will not appear), and registration also enables users to apply for a bulletin with personalised content, and to participate in discussion forums for which they are authorised.

In addition to the above, users can use the RSS format for content syndication to gather the content of the most relevant sections without needing to access the application.

Lastly, and with regard to the working tools on this page, there is a search application that allows archived content to be recovered by using one or more words from the title and/or summary.

6. EXAMPLES OF ADVANCED TECHNOLOGY SERVICES

To give a more in-depth view of the advanced technology services, an example of each of the current categories defined is set out below.

A) Report on “Possible innovative uses of Biotechnology in the ceramic sector”

This report is the result of an important work of documentation and information analysis, which for the first time has used all the tools and resources available at the Technology Observatory, and also has the advice of an expert in matters of Biotechnology and the collaboration of the departments of the Institute that are directly related to the areas of knowledge involved.

The main objective sought with this study was to detect technological opportunities in a practically unexplored field for ceramics – Biotechnology – to favour and incentivise technology research and development projects in our sector. The detection of technological opportunities in this field and their later development can represent important advances for the sustainable development of the sector.

Through an initial study of the main fields of action of Biotechnology (red, green, white and grey) we conducted an in-depth investigation into the one closest to the companies in the sector (white biotechnology, which is also known as industrial technology) without neglecting the fields that have been found to be of interest among the rest.

Finally, the report has been divided into four, clearly differentiated areas of interest, which are: bioenergy, biomaterials, bioremediation and biomimetry. This report has been edited and distributed among the companies in the sector.

B) Presentation “Advanced software for planning and programming production”

Among the activities involving searching for and analysing information carried out at the Observatory, two computer applications were discovered which, in principle, may be extremely interesting for companies in the sector owing to the area for which they are designed. After the corresponding analysis of these tools and having confirmed their potential, not only was the report prepared but a workshop was organised during which the companies had the opportunity to find out more about their possibilities.



Figure 2. Cover of the Report

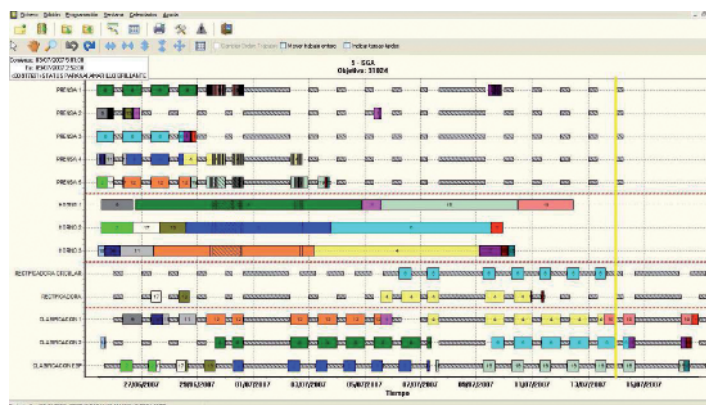


Figure 3. Detail of production distribution scheme by the software

C) Report of the “HANNOVER MESSE 2007” Trade Fair

Trade Fair reports are another type of activity carried out at the Observatory, which consist of preparing technical reports showing what we consider to be the most outstanding new ideas at these events, always in terms of technological innovation.

The aim is to create a document containing sufficient information to allow technicians from the companies in the sector to find out and assess the particular value of a certain new idea, without needing to go to these trade fairs.

Specifically, with regard to the Hannover Fair, it is an annual event and has been selected because it is considered the leading industrial exhibition in the world. The corresponding report is divided into new processing ideas and new product ideas. In this case a total of six new procedures and eight new products were described in the report.

D) Project “Study of diversification opportunities for ceramic machinery manufacturers”

This project is an example of the activity carried out in the diversification studies category. This project is designed to analyse the different possibilities for diversification of the equipment goods companies and identify different business opportunities in other client sectors. It is hoped to cover these client sectors with the companies’ current technology and the capabilities of its current workforce, in order to avoid delocalisation of the machinery manufacturing companies for the ceramic industry and as an alternative to their business growth.

E) Report “Use of SFF (Solid FreeForm Fabrication) technologies to obtain complex ceramic pieces”

SFF technologies are technologies created by addition to produce directly functional products or pieces using electronic information. The geometric freedom provided by this new method of manufacturing allows the limits of design to be pushed back and for advanced materials to be used that allow new fields of application to be glimpsed.

The success achieved through the application of these technologies in other sectors such as jewellery, automation and medicine and the development of new ceramic materials during recent years, has prompted us to approach the study of the application of Rapid Manufacturing technologies in the ceramic sector.

The main purpose of this report is to provide a compilation of information and laboratory tests that will allow us to glimpse possibilities in the development of specific ceramic materials for this field and high-performance ceramic products that can be addressed with the traditional forming techniques.



Source: Patrick Jouin
Figure 4. Ceramic lamp

7. CONCLUSION

This work has shown the structure and some of the activities already carried out by the Technology Observatory. At ITC it is considered a work tool which can be very useful for companies in the ceramic sector. Success will depend to a great extent on the efforts made by people who work there, but the collaboration of companies in the sector is required since, thanks to them, we can focus the activities with a more applied vision that is closer to industrial reality.

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