Corporate intelligence in biotechnology

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provided herein.
'Know thy neighbor' is a critical component of today's biotechnology practice. The industry is extremely rich in science and business information, and the pace of change is dramatic. Successful participation in biotechnology will always depend on good technology, management and money. In addition, an ingredient that needs more attention is competitive information-
gathering and analysis. Competitive intelligence can be defined as actionable information that requires the ability to filter and synthesize relevant knowledge for the benefit of the company. Why is this necessary? How can it be done well? What examples are there? These are good questions that are inevitably faced by all biotechnology practitioners, and some answers are

A discussion about corporate intelligence needs some key definitions. An appropriate definition of intelligence is one used by the US National Security system, as below. This definition contains several critical elements – for example, the term 'foreknowledge', which directs us towards trying to anticipate future developments. Also, 'prelude to…decision and action' connects the information we have gathered to some kind of process that results in specific responses. This definition of intelligence is entirely relevant to biotechnology information-gathering efforts, because it suggests that information should help us predict, to a certain extent, future developments and, as a result, respond to the information in anticipation of these developments. Both of these components are daily occurrences in biotechnology, from both the business and the science perspective, as discussed below.

'…knowledge and foreknowledge of the world [is]…the prelude to…decision and action' – US National Security agencies

Another relevant definition is that of an intelligence system. This is critical to the description of an effective effort aimed at obtaining information, deriving future expectations from the information and recommending appropriate responses. The definition used here is that an intelligence system is:

'…the organizational means to systematically collect, analyze and disseminate information as intelligence to users who can act on it' – Herring, J.P. (1997) The Futures Group

Again, this definition is loaded with significant notions. A critical one is that any information-gathering effort should result in a filtered product that is placed in the hands of those in the company who can make best use of it. Simply gathering information for information's sake is of little benefit, except in the context of a primary library function.

Nature of biotechnology information needs

A biotechnology company needs information in two principal areas: science and business. The focus of this information is, in fact, identical for both. Management and company scientists need to know about their own field and about related fields, and, ideally, they need to have an overall awareness of the industry in as many dimensions as possible. Interestingly, the amount of information gathered is different for the science and the business aspects, but the

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Box 1. Information gathering allocation in biotechnology[a]

Information gathered (% of total)	Business track	Science track
Amount	30%	70%
Cost	50%	50%
Time spent on information gathering (%)		
By scientist on business	20%	N/A
By management on science	N/A	30%

[a]Source: BioVista Survey (1998) http://www.biovista.com

cost of the information-gathering in biotech companies is evenly split between business and science users, as shown in Box 1.

More than two-thirds of all information gathered by a biotech company is science and one-third is business information, as measured by journal and database subscriptions and science meetings attended. However, the budgets for the two areas are essentially equal and often reflect higher subscription costs for business databases and more expensive business meeting budgets.

An interesting feature is that scientists do not really spend a lot of time keeping abreast of business developments, and business managers spend about one third of their time looking and analyzing science itself (Box 1). The data in Box 1 are averaged, and there is considerable variability from company to company, but, on the whole, business managers spend their information-gathering and analysis time on business, and scientists on science, with some cross-talk. These results are expected on the basis of the premise that a scientist has enough to do in his/her own area without having to look at the business side, and vice versa for the business manager.

Science and business link

However, in biotechnology, science and corporate business are inexorably linked. It is true that a business manager cannot spend time reviewing primary hard-core science journals, nor can a scientist pour over daily company press releases. Nevertheless, two of the three knowledge categories mentioned above that describe the information needs of biotech companies require that business managers and scientists spend time looking at information that is not absolutely central to their focus. Knowledge of related fields and of the area as a whole means that one must invest in looking at different types of information with a different kind of content. The problem is that, although the goal is noble, it is difficult to achieve in practical terms without an organized effort. At present, most biotech companies do not have systematic information-gathering and analysis efforts that meet the defined specifications given above. They rely mostly on ad hoc efforts by their members.

As an example of a situation that cannot be addressed well by an ad hoc information-gathering effort, consider the issue of keeping track of developments in various platform technologies. Combinatorial chemistry is an area that has captured the imagination and monies of the investment community consistently during the 1990s. There are currently at least 180 companies with combinatorial chemistry programs in place [BioVista (1998) *Combinatorics Industry Review and Company Database*, http://www.biovista.com]. To keep track of their activities is essentially impossible for any ad hoc effort. However, because this is an area that is very active in strategic alliances and technical developments, it is important for participants to be as well informed as possible, both in a global and in a specific way. The only real option is an intelligence system.

Knowledge pyramids and intelligence digests

Most members of biotech companies would probably classify a corporate intelligence system in the 'nice-to-have' category, but in reality they perceive themselves as being too busy with 'real problems' to do anything about it and do not consider it an essential resource. Later on I will give some specific examples from other industries that might help dispel the notion that such systems are of secondary importance.

Any systematic effort, no matter how small, at collecting, analyzing and disseminating relevant information is as critical a resource for the practice of biotechnology as other more tangible resources, such as patents. However, it does not become a resource that leads to action unless it conforms to the basic structure of the knowledge pyramid (Fig. 1).

The pyramid illustrates that there is a vast universe of information that exists around us that is the starting point of the corporate intelligence effort. Publicly available information is used to extract data that form the basis of another effort to obtain data directly from human sources. This is important, because third-party information is often lacking or biased[1]. The 'system' – the corporate intelligence 'officer' – then combines the third-party data with the direct information and produces an intelligence digest, which has a structure such as that in Fig. 2. The purpose of the digest is simple: to alert, to inform and to lead to action – with the understanding that taking no action is a

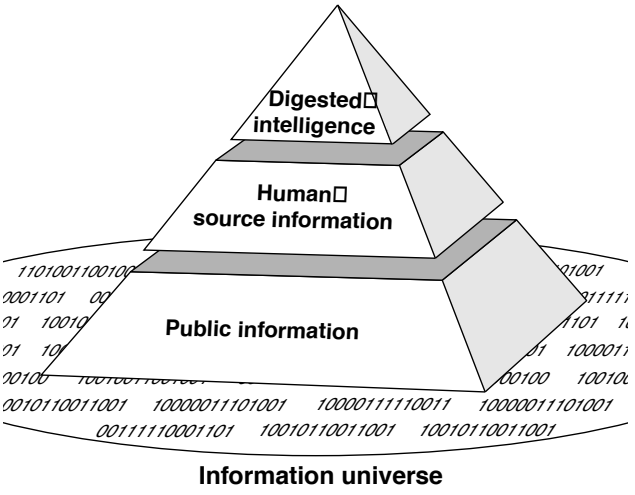

Figure 1. *The knowledge pyramid. A vast universe of information exists that is the starting point of the corporate intelligence effort. Publicly available information is used to extract data that form the basis of another effort to obtain data directly from human sources. This is important, because third-party information is often lacking or biased[2]. The 'system' – the corporate intelligence 'officer' – then combines the third-party data with the direct information and produces an intelligence digest, such as in Fig. 2.*

Intelligence Digest #..... Date delivered: .....

Category: ..... Period covered: .....

(Clinical; Science; Business)

Contributors: .....

Events	Relevance to Company	Interpretation – Action options
		(Threat; Opportunity; Reactive; Proactive)

Sources: .....

Figure 2. *Possible format for a standardized corporate intelligence digest – by definition and requirement such an intelligence alert should be given a higher priority status than any other primary or secondary information source that a manager or scientist would normally look at. The purpose of the digest is simple: to alert, to inform and to lead to action.*

valid response, as long as it is justified.

Figure 2 shows one of many possible formats for a standardized corporate intelligence alert, which by definition and requirement should be given a higher priority status than any other primary or secondary information source that a manager or scientist would normally look at. Even though it is possible to customize Internet-based services to provide the user with his/her own preferred set of pieces of information (for example, daily press releases that contain keywords such as cancer, diabetes, etc.), this is essentially a primary type of information that is unfiltered, except by keyword. It is not combined with other relevant data, and it does not deliver a message that is specific for the user's company interests. This is the key difference between an intelligence digest and any other types of 'information alert' document or message. The latter is essentially passive and raw. The former is proactive and filtered through company needs and specifications.

Established intelligence systems

There is significant evidence from other industries that corporate intelligence activities are taken very seriously. A 1993 survey by the US-based Conference Board, an industry-independent organization that monitors a variety of industrial trends and issues, reported that 5% of multinational firms in the USA and 9% of European equivalents had full-blown corporate intelligence systems in place, such companies being primarily in manufacturing sectors. The manufacturing sector is one where product launches and new product developments can mean life or death for competitors, and so it is not surprising that such companies recognize the value of corporate intelligence efforts, and have systems in place to satisfy this need. Examples of such efforts are listed in Box 2.

The points to note are that these systems are supported by advanced technology, and are focused, not only in terms of their content but also in terms of whom they deliver their product to. Thus they conform to our original definition, which requires a corporate intelligence system to deliver actionable information to those who can act on it. This is a critical point, as it reinforces the notion that naked information in the hands of people who cannot do anything with it is of little corporate value.

It is also important to keep in mind that it is not just companies, but countries too, that participate in corporate intelligence efforts in support of their own industrial sec-

Box 2. Key features of selected corporate intelligence systems[a]

AT&T
- Advanced internal integration
- Focused on customers and competitors
- Supports operations and strategic planning

Motorola
- Company-wide integrated system
- Focused on competitors
- Supports CEO and senior management

Kodak
- Advanced information management
- Focused on market and competition
- Supports marketing and strategic planning

[a]Source J.P. Herring (1996)

tors. For example, Sweden and Japan are considered leaders in the field, and one can even find university courses on these subjects in these countries[2].

In the biopharm industry

In the biopharmaceutical industry, the situation is somewhat different. Although all major companies have their own libraries and library services with extensive on-line database subscriptions and capabilities, the degree to which they have systematic and organized intelligence systems with defined content specifications and target recipients is highly variable. In fact, the functions of a corporate intelligence system are distributed among different operations within such companies. For example, Japanese biopharmaceutical companies often have 'technology assessment' offices in other countries, primarily the USA. These offices monitor science and business developments literally *in situ*, and are the outstations that unearth new venture opportunities for consideration by the mother company. In this capacity, they act primarily as opportunity identifiers. Big European pharmaceutical companies also have equivalent offices in the USA.

These technology assessment offices of pharmaceutical companies highlight an important feature of corporate intelligence systems. They are to be considered not simply as threat alert sentinels, but also as opportunity monitors[3]. In addition, such offices and intelligence systems in general often look for trigger events that have been identified as indicative of emerging situations that require a specific company response. For example, a successful Phase II clinical trial is a good indication that a Phase III trial will follow. At this point, companies often strike strategic alliances, so looking for a successful Phase II result should trigger consideration of an alliance with the company having the positive clinical results. Other events include the issuing of patents; indeed systematic monitoring of patent information and activity is one of the most useful ways to keep track of developments in an intellectual property-rich arena such as biotechnology.

Large pharmaceutical companies do, actually, have advanced scientific information departments whose job it is to monitor science and deliver responses to specific corporate requests, as well as to issue sectoral summaries that might be of particular interest to various groups within the organization. It is not clear whether these departments also act as intelligence systems in support of the business track in the manner previously defined, namely by delivering actionable information in a proactive fashion. Interestingly, most major pharmaceutical companies are members of the so-called Pharmaceutical Documentation Ring, first established in 1958, and with a total of 26 members as of September 1997. The purpose of this network is to enable the exchange of nonconfidential methodological advances in information-gathering and analysis, and the group has annual conferences that address issues such as end-user searching, electronic journals, electronic archiving and document delivery[4].

Resources for a corporate intelligence effort

Not many companies can afford the 100% dedicated intelligence system that some large companies have. In fact, very few biotechnology companies have a 'chief knowledge officer', although this trend is changing little by little, and, in addition to chief executive, operating, scientific and financial officers, the new breed of knowledge officers is emerging to address some of the information issues outlined above.

An intelligence system that is dedicated can consist of anything from one to five or more people. The cost is essentially the salaries plus overheads, plus their travel and meetings budget and the various information subscriptions they have above and beyond the ones the company would have anyway. In addition, there may be additional infrastructure costs if there are multiple sites served by Intranets. It is also possible to devise an intelligence system that does not have full-time employees, but is a virtual one. This system consists of specific tasks that are assigned to already existing employees who would be required to spend no more than, say, half a day per week each on the system. Such tasks include information-gathering on specific topics and also general ones from databases, personal

network-derived information-gathering, and then synthesis, digestion and preparation and presentation of the intelligence digest. Contributors to this effort would include science managers and directors and also business development officers. Ultimately, the synthesis and interpretation would be the responsibility of one or two individuals, with basic input from the remaining contributors.

Conclusions

Biotechnology is a very dynamic industry, which requires the ability to know what is happening in the field in a proactive manner. Enter corporate intelligence systems, which are commonplace to various degrees in other industries, and which in some companies are integral decision-support mechanisms. The ultimate deliverable of such a system is actionable information, which serves to reveal new developments, opportunities, as well as threats. In all cases, the system provides information formatted to induce a response. At present, most companies have ad hoc mechanisms that are essentially individual-driven to address their information needs. However, it is possible to establish a corporate intelligence system in a small or medium biotech company with a modest investment. The returns are invaluable, especially in areas involving the tracking of platform technologies, clinical trial outcomes and new drug leads entering development pipelines.

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