

Competitive Technical Intelligence and Commercial Decision Making

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A previous article in *Competitive Intelligence Review* was entitled "Scientific Competitive Intelligence: A Tool for R&D Decision Making," and presented a review of scientific competitive intelligence in R&D decision making (Bryant et al., 1994). This article will assess competitive technical intelligence, a more general term for scientific competitive intelligence, and its effect on commercial and business decision making. It is based on a presentation made at the 10th Annual SCIP conference in Phoenix, Arizona. The goals of this paper are to:

1. Explain and define competitive technical intelligence (CTI).
2. Describe where CTI impacts planning and decision-making processes on the commercial and business sides of a corporation (aside from R&D).
3. Share how and what the CTI group can contribute to commercial and business decisions.

Competitive Technical Intelligence Defined

Competitive technical intelligence is competitive intelligence within the R&D arena (Ashton, 1994; Herring, 1993). It involves three steps which are illustrated in Fig-

ure 1. First, publicly available competitive technical and R&D data which could affect the company's business are collected. Second, these data are *organized*, converting them into competitive technical information. Third, the information is *analyzed* to the point in which strategic and tactical decisions and actions can be made. The final step, which involves analysis, is a key differentiating characteristic of the CTI unit, and it is the competitive intelligence (CI) that results from these analyses that adds value to the corporation.

The basic steps in the CI process are the same for both business and technical competitive intelligence (see Fig. 2). Within the umbrella of competitive intelligence are both business and technical competitive intelligence. The differences are (1) the data with which one starts; and (2) the expertise of the analyst, i.e., technical versus business. Important congruencies between business and technical intelligence are that both processes not only provide competitive information and intelligence, but also gather data and information from a wide variety of valuable sources, including internal associates. Figure 3 illustrates the information flow among the CTI unit and its clients. Note that CTI clients are also important sources of com-

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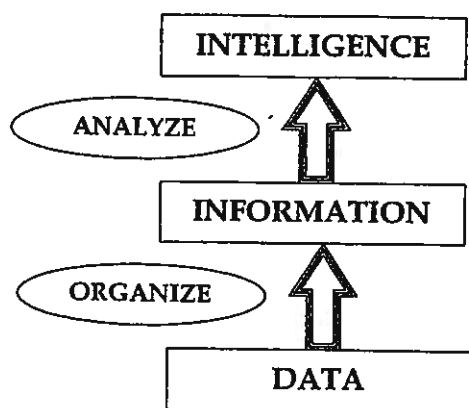


Figure 1.

Competitive Intelligence model.

petitive information. Often, simply increasing awareness throughout the corporation of the primary competitors increases the monitoring efforts on a company-wide basis.

Pharmaceutical Industry Background

The drug development process is long, tedious, and expensive (see Fig. 4). On average, it takes approximately 12 years from discovery of a new chemical entity (NCE)

until the time it is available to patients. Although estimates vary, it is generally accepted that the cost to develop a new drug is between \$250 and 350 million. In addition, only 1 in about 5000 NCEs discovered ever makes it to the marketplace; only 1 in 1000 gets into clinical trials (studied in humans).

Each major pharmaceutical developer has a pipeline of products at different stages of development along this product pipeline, and, in general, those companies dedicated to innovation spend between 12 and 15% of total sales on R&D (PRMA, 1995; Kunze, et al. in press). Decisions to stop project/products occur at any time during this 12-year process. Patents are generally filed within 3 years of the compound being discovered, and often sooner in smaller companies. This may leave a pharmaceutical company with only a few productive years of marketing to recoup its \$250–350-million investment.

The pharmaceutical industry is undergoing major changes as a result of health care revisions throughout the world (Weber et al., 1994a, 1994b). The basis of these changes differs from country to country, but the thrust of these changes is very similar: rapidly rising health care expenses. The changes in health care have resulted in a reduction in the growth in pharmaceutical sales, which is

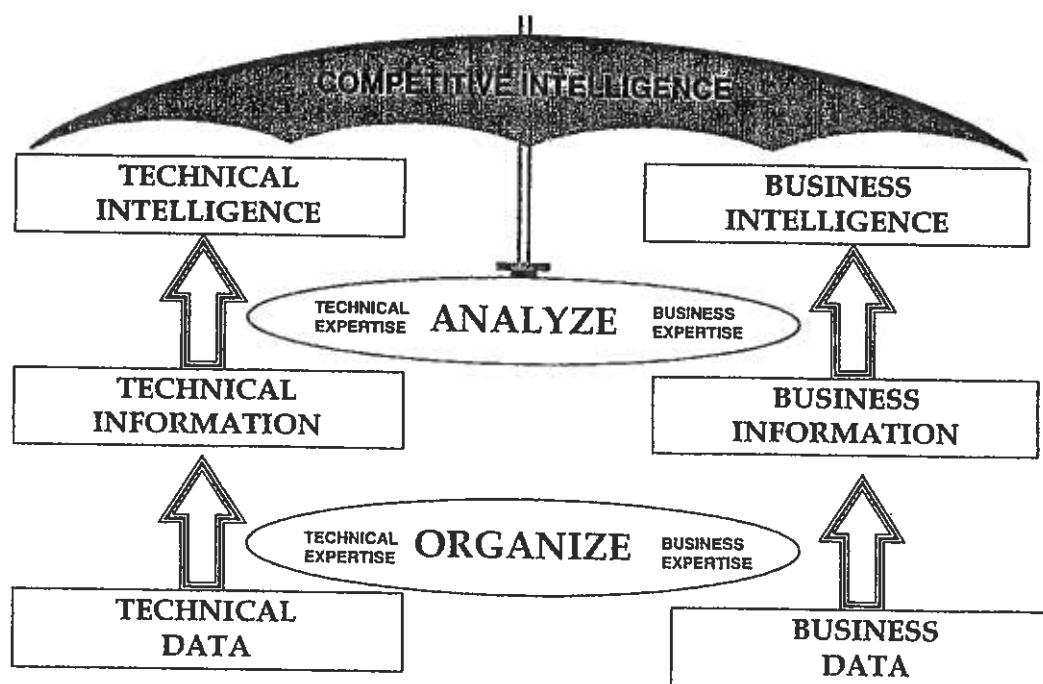


Figure 2.

Technical and Business Intelligence.

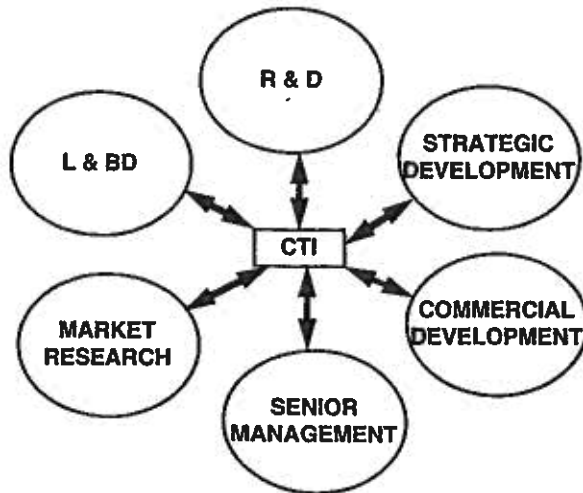


Figure 3.
Clients for Competitive Technical Intelligence.

likely to continue. As a result, it is estimated that the pharmaceutical industry will continue to restructure, develop alternative business ventures, and undergo considerable consolidation. Clear illustration of these changes has already begun to take place in the following ways:

- Significant merger activity.
- Significant increase in the development of strategic alliances with biotechnology and emerging technology companies.
- Reorganization/reengineering within corporations.
- Adjustment of R&D expenditures to reflect a specified percentage of total sales.

Financial analysts estimate that for the pharmaceutical industry, with revenues in excess of \$200 billion, the cost savings of \$40 billion may be necessary. This has resulted in estimates that 100,000–200,000 jobs will be lost in the coming years within the pharmaceutical industry (Lehman Brothers—Pharmapipelines, 1994). These consolidations will also result in reduced total R&D spending for the pharmaceutical industry.

Although the pharmaceutical industry as a whole is changing significantly, other high technology industries have experienced similar trends. Because of these changes, the impact CTI may have on the success of each corporation is estimated to increase in the future.

Commercial Overview

Commercial groups within any company need CTI. Although companies are structured somewhat differently, several basic commercial functions are needed for companies to operate successfully. These functions include, but are not limited to:

- Strategic development—forms long-term corporate strategies.
- Commercial development/new product marketing—forms business and marketing strategies, both global and regional.
- Market research—conducts primary and secondary market research studies.
- Business intelligence (BI)—tracks market-, finance-, and sales-related competitive information for marketed products.

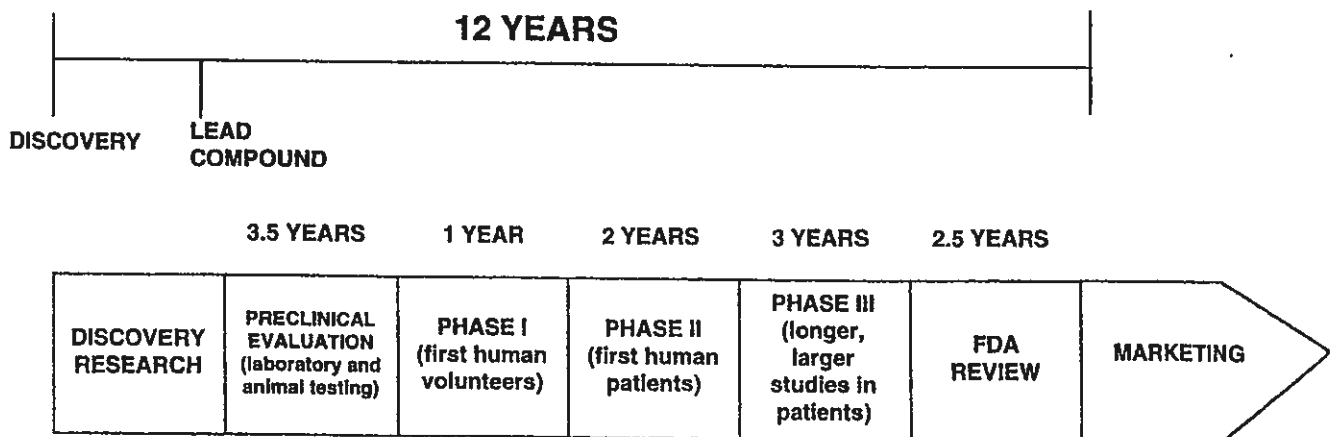


Figure 4.
Drug development process.

- *Licensing and business development—identifies, negotiates, and signs new business agreements.*

CTI in Strategic Development

The CTI group has the potential to achieve great impact on the corporation by interacting with strategic thinkers because recommendations at this level are often evaluated by the senior decision makers within a company. The CTI unit can be an important asset for strategic development personnel in the following ways:

- *The CTI unit can help strategists by meeting their needs for competitive technical information and intelligence as it is required for strategy-based decisions.*

Usually this is done at a very high level. For example, marketing can routinely identify needs within a marketplace in terms of patient needs as well as health care personnel needs. The CTI unit can work together with marketing to match developmental technologies with current market needs in an attempt to forecast which needs will exist 5, 10, 15, or more years later, when some of the developmental technologies are marketed. It is when the strategist ventures out of the current state into the future state that CTI can be extremely helpful.

- *The CTI group can achieve significant impact by participating in strategy planning sessions.*

These strategy sessions can result in significant "eye opening" for senior strategy makers. In order to develop a strategy, it is important to understand not only the current environment, but also the future environment as it is estimated to exist.

- *The CTI unit can act as a consultant to strategic development executives to provide a general sense of technology and its time frame to availability.*

For example, the strategist does not need to know when a competitor product will get to market or when a competitor company will enter a marketplace; they need to know when a new technology will become available or when an existing technology will become obsolete in order to develop appropriate strategies.

- *CTI professionals can help strategists to view "competitor" in a more general sense.*

For example, Alzheimer's disease is currently a diagnosis of exclusion. This means that only after considerable laboratory and clinical tests are performed will a patient be

labeled as having Alzheimer's disease. If a diagnostic test was available to identify those people who would eventually develop Alzheimer's disease, this would significantly affect both the way we study Alzheimer's drugs and the way we treat patients with Alzheimer's disease. In this example, an Alzheimer's diagnostic test is not a true competitor but it will have significant and long-lasting effects for drugs being developed for this disease.

- *The CTI unit may also work with strategists to supply best guess scenarios for the future.*

For example, it may be important for the strategists to know not only which companies are currently leading in sales of drugs to treat diseases that affect the cardiovascular system, but also to know which companies are forecasted to be the leaders in 10 years in the cardiovascular arena. This allows strategic thinkers to think about the best way to approach this marketplace in the future.

- *The CTI unit also works together with strategists to come up with unique ways to evaluate target markets or companies in a "big picture" kind of way.*

For example, current industry changes and health care changes may affect the way studies are performed. Ten years ago, hypertension was studied in an academic environment in university hospitals. Today, to accomplish this task in an efficient manner requires one to perform studies in conjunction with managed care organizations which are not accustomed, nor do they have incentives to perform research. Rather, managed care organizations are founded on the basis of cutting expenses and administering health care to large numbers of patients to reduce costs.

- *Finally, the CTI unit can work together with strategists to identify better approaches to drug development.*

This may be joint ventures or it may be the combination of expertises of several companies into a multiple-point agreement.

CTI in Commercial Development

New product marketing and commercial development represent groups that are responsible for development of business and marketing strategies across the globe, and with maintaining consistencies among countries. In addition, they are responsible for the overall coordination of each facet of product development, including some of the tasks being performed in R&D. It is the commercial development group that tries to roll up all the pieces and

create a strategic and tactical plan for execution of product launches in various countries. The CTI unit can help the commercial development groups with many of their tasks:

- *The most significant benefit to the commercial development group comes by identifying and determining the potential impact critical competitors may have on a new product which is coming to market in the near future.*

Critical competitors are those competitors that have the highest likelihood of taking away future market share of a company's product.

- *Commercial development associates also need to be aware of important developmental issues involved with competitor products which may be company-specific or may be drug-specific and also affect their product.*

For example, one of Murphy's Laws is that as soon as a clinical study begins, the number of patients that suffer from the disease being treated is reduced significantly. In reality, it may also be a result of very specific inclusion/exclusion criteria specified in the clinical study, or highly specific end points that are measured within the clinical study.

- *The CTI unit can also identify unique approaches that may be of benefit in the development of a drug.*

For example, in the United States, conditional release approvals for serious and/or life-threatening conditions in which this new drug offers a meaningful therapeutic gain can result in a savings of 4–5 years of developmental time resulting in the drug getting on the market sooner. In addition, it is possible to develop drugs for specific indications within a disease state that may actually reduce the development time for a drug.

- *The CTI unit plays a significant role in creating an R&D forecast which is done prior to the commercial development associates' sales forecast, and is pivotal in developing accurate assumptions.*

In fact, CTI professionals often help commercial development associates develop assumptions for sales forecasts, which ultimately affect the estimated return on investment (ROI) for a product.

- *Because the CTI unit is composed of technically trained associates, it may be the only group capable of identifying competitors' technical attributes and features. CTI professionals work with the commercial group to translate*

these features into potential benefits and to devise a strategy which is appropriate when compared to competitor product strategies.

- *The CTI unit can also help commercial development by making them aware of any potential breakthroughs that may be expected, and the timing of these breakthroughs. Alternative technologies that are not necessarily breakthroughs can be identified and monitored for their potential impact on the future success of a drug in the marketplace.*

CTI and Market Research

Market research is the group that performs primary market research or secondary market research studies, when needed, and utilizes existing information that may be relevant for marketing decisions. Technical expertise provided by the CTI unit may be of significant importance to market research analysts because they often do not have a technical background, but are asked to find answers related to the technical merits of a drug product. The CTI unit can assist the market research group in the following ways:

- *The CTI unit can add technical expertise to desired market research activities.*
- *The CTI unit can help to identify critical issues being experienced with currently marketed products or those currently in development. CTI professionals can help market researchers identify key questions to ask interviewees, especially with regard to future therapeutic interventions.*
- *The CTI unit can help market researchers identify critical issues that may be associated with a coming new product.*

These critical issues can then be evaluated and perceptions evaluated based on current market trends.

- *The CTI unit can help market researchers put together a competitive map of the future so they can identify or verify the appropriate position for a product in which they are conducting market research.*
- *CTI can also help to identify similar products based on available technology which may be used to give the market research subjects a better idea of what is being asked.*

For example, an analogy of combining two existing products to convey the advantages of the new product may provide a better idea of the questions being asked.

- *CTI can also help to identify breakthrough technologies that could affect market size, position, or market dynamics.*

For the health care arena a breakthrough technology is something that has the potential to permanently change the way a disease or medical condition is treated.

- *CTI can also affect market research in terms of pharmacoeconomics.*

Pharmacoeconomics, the discipline of measuring the cost-effectiveness of drugs, is becoming a very important assessment tool for the marketplace with regard to pharmaceuticals.

CTI for Business Intelligence

Competitive intelligence can be categorized as technical or business, primarily based on differences in expertise required for analysis, and type of data being analyzed (see Fig. 2). These differences can set the stage for natural division between the two groups. Many corporations require both types of CI to maximize competitive advantage. Business intelligence and CTI groups can reside in the same department, but often exist in different divisions of the company. Regardless, a good working relationship must exist between the two groups to assure open communication and collaboration on related, often complementary, competitive intelligence projects. A key element is that clients need only make a single request and are not sent on a wild goose chase. CTI can be helpful to business intelligence analysts in the following ways:

- *Because both groups track different competitive information, a synergistic relationship occurs as products are analyzed and CI projects are conducted.*

CTI analysts help by identifying and monitoring critical competitors, especially with regard to their technical features and attributes. This allows the business intelligence analysts to translate these attributes into potential benefits and assess the importance in the future marketplace.

- *The CTI unit helps BI evaluate technical merits, attributes, and limitations of the competition, whether it is marketed or soon to be marketed.*

This may be very important because business data often reflect underlying assumptions about scientific attributes, merits, limitations, etc.

- *The CTI unit also acts as a consultant to the BI unit for technical issues and vice versa for business issues.*

Some sources and resources are used by both groups.

- *The CTI unit can work with the BI unit in reviewing the technical features of a product and estimating what the future product labeling may be, based on current clinical data.*

This gives the business analyst the ability to determine future impact of a competitor on their own product.

- *The CTI unit, which primarily works on the R&D side, helps to evaluate studies being conducted for future indications.*

For example, a drug may be approved for the treatment of hypertension and under development for the treatment of angina. In this example it is important for the CTI unit to monitor the developmental progress for the new indication of angina.

- *The CTI unit is in a perfect position to act as a liaison between the technical patent data and the business strategy.*

Thus, the CTI unit often works together with the patent department or patent attorneys to evaluate the significance of competitor patents and relate these in a business sense to the business intelligence analysts.

CTI for Licensing and Business Development

Licensing and business development associates are responsible for identifying, negotiating, and signing contracts for new business opportunities, whether they are for new products, technologies, or research agreements. The CTI unit may help licensing and business development in the following ways:

- *The CTI unit helps identify and evaluate new business opportunities which may affect any part of the organization.*

If the CTI unit is truly an interfunctional and international operation, it can work very closely with licensing and business development to identify new business opportunities when certain boundaries are identified up front. Establishment of clear boundaries initially and working closely with licensing and business development professionals as the effort progresses are perhaps the most important aspects of successful interactions with this group. The business opportunities may range from finding late-stage products for copromotion or comarketing to expanding the company into a new area of R&D.

- *The CTI unit can help identify potential licensing candidate projects or products.*

In much the same way as business opportunities are identified and evaluated, the CTI unit can help to identify and initially review new products which may fit given criteria identified by the strategies. In essence, the CTI unit helps to identify, select, and review the best opportunities.

- *The CTI unit has a value-added function with regard to emerging products because of their technical background.*

In many instances it is necessary to cut through rhetoric or hype about an emerging product and get to the facts. In this way, the CTI unit can help to eliminate less desirable licensing opportunities and prioritize the most desirable ones.

- *CTI techniques can be used to identify and evaluate competitive activity relative to a licensing opportunity whether it be a business venture or a licensing candidate.*

One of the most important aspects of any business opportunity is a critical evaluation of its potential success when integrated with a company strategy. CTI can help in this process by providing a competitive assessment of other companies or institutions which have the capability or product, and what their capacity will be for taking it to the market. Although the competitive assessment should not be the only basis for this decision, it may be important enough to make or break a potential business opportunity or licensing agreement.

- *The CTI unit can identify potential acquisition targets and help in their evaluation.*

The environment in the pharmaceutical industry, as in other high technology industries, is one of increasing competitiveness because the marketplace is growing at a slower pace. In this environment, it is becoming more commonplace for companies to merge with one another, make partial or entire acquisitions of smaller companies, or expand dimensions of business by purchasing a distribution channel. The strategy for a merger or acquisition will determine the impact CTI may have on the opportunity. If the strategy is purely of business nature, CTI will have minimal impact, but if technology is part of the focus, CTI has the potential to have significant impact. CTI can help by evaluating the competitive situation for an entire company's pipeline of products, and determine each product's future role for a disease state.

- *The CTI unit can identify potential licensees for products which have potential, but do not fit a company's strategy.*

As a product progresses from discovery to the time it is approved for marketing in the pharmaceutical industry, it must pass certain milestones. With each stage of development, the cost of doing the necessary research increases. It is wise, therefore, for companies to cut losses as early as possible by determining whether a product is unsuitable for further development. In some cases the product may not fit the company's future strategy, and, therefore, may be considered an out-licensing opportunity. Products can be deemed out-licensing opportunities at any stage of development. CTI can help to identify potential licensees based on current R&D activity taking place by various drug developers across the globe. If constructed properly, arrangements such as these can be a win-win proposition for all companies involved.

CTI in Miscellaneous Commercial Settings

Senior Management

Any competitive intelligence function, whether business or technical, must work closely with senior management to show benefits and gain continued commitment and support. Top management needs to be a staunch supporter of CTI so that the entire organization can contribute. Top-down support of CTI will provide leadership and incentive for the entire organization to accept competitive intelligence activities at all levels of the organization. It is at the senior management level that the most significant impact on the corporation is made. Senior management is most commonly interested in what the competitive environment means to this project, product, opportunity, or business arrangement, both now and in the future, and often has very insightful and detail-oriented questions. CTI professionals can help senior management in all of the previous ways mentioned if or when a project, product, or business opportunity progresses to the senior level of decision making. In essence, senior management requests that competitive intelligence techniques be incorporated into all projects and products before they come to senior management for decision or approval.

Equity Investment Review Committee

Within the realm of pharmaceutical and biotechnology industries, it is becoming more and more commonplace for large companies to purchase equity in smaller companies as a measure of good faith when the two companies enter into a joint agreement, whether it be with R&D, marketing, or both. Because equity ownership represents significant investment monies, generally \$5-50 million, it

is necessary to review these investments periodically. The CTI unit can help review these investments by evaluating how the equity company is performing relative to the competition, both now and anticipated in the future. This analysis can be as superficial or as detailed as is needed. For example, one could perform competitive analyses on each project and product an equity partner has in its pipeline and on the market.

Project and Product Teams

Although the accountability, leadership philosophy, and exact composition of project and product teams differ among companies, most new projects and products will have a team composed of cross-functional units to reconcile problems and share plans so that the overall product plans can be implemented. Project and product teams are charged with design and review of overall development plans, integration of tasks, and strategic and tactical decisions. The CTI unit can help these teams in their strategic and tactical decision making:

- *CTI may affect project teams in a significant way by identifying critical competitors and analyzing what they mean to the company's product.*

These critical competitors can then be monitored on a continuous basis by the CTI group and project team members.

- *CTI presentations often create awareness of upcoming hurdles and help team members realize the repercussions of missed or pushed-back deadlines.*
- *CTI can identify competitor difficulties and help with designing alternative strategies.*

Competitor advantages and disadvantages can be recognized and differentiating characteristics for a company's product can be identified.

- *CTI techniques can be used to identify patient groups or markets that competitors have targeted.*
- *Critical competitor strategies can be approximated and war gaming or modified war gaming can be performed.*

War gaming is the process of identifying a company's most critical competitor, getting all competitive information available about the competitor, and bringing the decision makers in the company together to act as if they were their own counterpart at the competing company (Kurtz, 1992). Many questions and scenarios can be addressed. Better understanding of what the competition may be doing will result.

Sales and Marketing

Sales associates, by their nature and basic function, are focused on selling the most products possible. Marketing is charged with doing whatever it takes to enhance sales of existing products. It is important for both sales and marketing to focus on existing competitors with which they engage on a daily basis. Although most of the competitive information and intelligence needs of sales and marketing are related to business competitive intelligence (e.g., competitor promotional plans, sales tactics, marketing plans, pricing, etc.) The CTI unit can also work toward mutual benefits of both units in the following ways:

- *The CTI unit can help sales understand the technical differences among existing and future competitors and the significance of these differences.*

One of the main missions of marketing is to differentiate products in the marketplace. The CTI unit can be a valuable asset to marketers as they strive to exploit benefits from products.

- *The CTI unit can identify future competitors.*

This helps sales and marketing understand the importance of using certain sales tactics today because of the competitors which are expected to come to market tomorrow. It also gives them an appreciation for how the future environment will be changing, and another topic to discuss with potential customers.

- *The CTI unit can also help sales & marketing construct appropriate assumptions for sales forecasting estimates.*

This is especially important for forecasts which include estimates for 3 or more years in the future.

- *In the pharmaceutical industry, there are several ways the CTI unit can help sales and marketing with regard to preserving market share of existing products: identify new indications being studied by competitors and interpret the potential impact these changes may have on its own products; identify generic activity and clinical trials; identify new and improved formulations in clinical trials; and identify future drugs which may interact with existing drug and affect the marketplace.*

Sales and marketing associates can also be good sources because they interact with customers that in some cases are consultants or clinical investigators for R&D. This may be R&D for another company!

Legal

Legal activities are traditionally divided into several units in high technology companies including litigation, business contracts, copy approval, intellectual property, etc. In our experience, the intellectual property group interacts the most with the CTI unit. The CTI unit interacts with intellectual property attorneys in several ways:

- *CTI techniques can be used to identify competitors.*

These competitors can then be monitored in terms of patent activity. Important insights can be learned about a company's R&D unit based on their patent activity over time.

- *The CTI professionals and intellectual property attorneys can be of help to one another.*

CTI professionals can help identify unpublished information that can often be helpful to the patent attorneys and patent attorneys can help CTI professionals in determining the full extent and length of patent protection certain patents offer. In the pharmaceutical industry, this is important because it takes 10–12 years to develop a drug, and the patent may have 5 or less years of exclusivity left. In addition, the Waxmann Hatch amendment has allowed additional years of exclusivity for new chemical entities.

Commercial groups are high users of CTI. In our experience the CTI work dedicated to commercial groups is about 50%, whereas the other 50% is performed with R&D. Some projects are with both groups. The range of services for CTI should perfuse the entire corporation, and resources allocated based on activities that have the most significant impact on the success of the corporation (Krol et al., in press).

Rationale for Internal Competitive Intelligence

In recent years, many companies have begun out-sourcing more and more activities. The pharmaceutical industry is no exception. One of these activities may be the competitive intelligence function. In our experience, this is a significant disadvantage to the overall health of a corporation because internal competitive intelligence units will benefit the corporation in the following ways:

- *Sensitive issues and confidential issues remain inside the company.*
- *Technical expertise already resides within the corporation and often becomes difficult to find outside the corporation, especially when it is linked to appropriate legal and ethical competitive intelligence activities.*

- *A.D. Little and others estimate that 75% or more of the competitive information and data required for decision making already lies within the walls of your company (Gilmont, 1991; Ettore, 1995).*

It is the duty of the CI groups to retain and analyze the appropriate competitive information. In addition, sources can often be consolidated and evaluated for accuracy, completeness, and timeliness for the company as a whole (Krol et al., 1995).

- *In the long run, the products received from the CTI unit will result in cost-effective plans.*

These plans may take the form of improved planning, reduced surprises, improved portfolio management, better strategic and tactical decisions, etc.

- *Relationships with internal associates and internal and external networks can be enhanced and utilized more effectively with internal associates.*
- *Timeliness is less of an issue with an internal CTI group because high-impact requests get first attention.*

In essence, competition for the CTI groups efforts is only between other associates within the corporation, not other corporations.

- *One cannot underestimate the necessity for current awareness of the internal environment and the knowledge that this may have in terms of improving the competitive intelligence and its usefulness for strategic and tactical decision making within the corporation.*
- *Loss of the internal learning process will occur if competitive intelligence is not performed within the corporation.*

This learning of how to perform CI is of benefit to the analysts in any future career endeavor, which benefits the company if this person remains in the walls of that company.

The CTI group can be organized so as to have maximal impact on the corporation (Bryant et al., in press). External consultants should not be excluded from the process, and often can be used to leverage workload or expand networks (Krol et al., 1993).

Conclusion

CTI involves organization and analysis of technical information by technically trained professionals to achieve decision and actions which generate the highest impact on

the corporation. CTI impacts both R&D and commercial groups. In general, the benefits of CTI to any corporation in a technology-based industry can be summarized as follows:

- Improves planning assumptions company-wide.
- Eliminates surprises from science and technology.
- Improves portfolio management and prioritization.
- Provides basis for better strategic and tactical decisions.
- Gives insight on internal strengths and weaknesses.
- Increases awareness of threats to proprietary technology.

The impact a CTI group can have on the success of a corporation is related to its involvement with commercial groups as well as R&D. CTI can serve as a helpful navigational aid to commercial groups.

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