

## Using Technology Intelligence for R&D

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In today's networked economy, the most effective R&D goes beyond a company's four walls and explores what's going on in the outside world — in terms of technologies, products, strategies, innovations, thought leaders — and how this information can be harnessed and applied to internal innovation. But this is not an easy task. Consider this: in 2007 the global top 1,250 R&D companies spent over \$479 billion on R&D.

This has resulted in an accelerated movement around the information retrieval process and a hunt for technology that accomplishes for business researchers what Google has done for consumers. This is because corporate R&D ends up wasting valuable man hours, brain power, and resources on information retrieval. Some additional statistics:

- According to recent Forrester Research, the volume of the world's data doubles approximately every three years;
- Per week, corporate R&D professionals (scientists and engineers) spend 5.5 hours gathering, looking for or pulling together information, and an additional 4.7 hours analyzing and applying this information.

Simply stated, 1) there is a lot of information out there, 2) companies recognize the value of this information and therefore are willing to spend money to retrieve and analyze it, but 3) seem to spend too much time doing so. Bottom line, people aren't lacking information, but rather need insights gleaned from this information.

Building upon the principles of Open Innovation, there are new techniques and technologies that bring structure, relevance and meaning to unlock content on the Internet for actionable business purposes. This goes beyond simple Google keyword searches, and leverages approaches that intuitively search based on real-world problems and solutions. In doing so, instead of spending weeks and months on R&D, companies are now able to cut this time to seconds and minutes.

### What is "Technology Intelligence" — and what does it mean for the bottom line?

The concept of Technology Intelligence plays an important role here, referring to:

*"...the activity that enables companies to identify the technological opportunities and threats that could affect the future growth and survival of their business. It aims to capture and disseminate the technological information needed for strategic planning and decision-making. As technology life cycles shorten and business becomes more globalized, having effective Technology Intelligence capabilities is becoming increasingly important."*

We're moving from the "Information Age" to the "Intelligence Age." The former was all about building the database — i.e. the Web and its vast amount of content — but today we've progressed to creating contextual access to the right pieces of information to derive intelligence, meaning and insight.

Traditional methods for extracting such "intelligence" range from manually sifting through publications and journals, networking or attending tradeshows and focus groups, hiring outsourced consultants, or just standard surfing the Internet. Yet both in their individual silos, as well as when mapped out across each other, these methods still prove to have a number of drawbacks: difficult to identify relevant information, take weeks or months to complete, resource intensive, expensive, and in the end return unpredictable results.

Going a layer deeper, the actual information that such approaches present often falls short of its potential. For example, any search engine to date, paid or free, provides results in the form of records with citations (i.e.: title and abstract), similar to a Google search. But an important transition is happening in the technology intelligence field, shifting from citations to meaning: actually understanding citations that are in the search results, and then extracting meaning and insights from this query data.

One way to think of this is in a simple formula: CIsquared: providing Intelligent Information within Context. By combining Web content, premium scientific journals and patent information with “smart” search technology and analysis, there is a new breed of technology that allows companies to quickly search and summarize answers that are not available through traditional search tools. The key difference here is in the approach and results: this is a first attempt to cut information overload and find the solutions to technical and business problems with results that are relevant and have meaning.

For example, a Fortune 100 materials company might research who offers a technology that they can license or acquire to complete their product line, and find multiple M&A candidates. Or, a chemical company can search for who they can license existing technologies to, and uncover opportunities with several totally new candidates. In other instances, companies can use it to identify who might be violating their patents in specific areas, and discover multiple infringers in an adjacent market. In other instances companies can use it quickly scan technical approaches to research problems, often uncovering novel or unexpected “long tail” solutions. Let’s look at a specific search...

### **Intelligent Research in Practice — and in Seconds**

A company looking to gather information on how to “green” their facility could set out on a search for innovative methods and strategies manufacturers can deploy to reduce their energy consumption while running cleaner-and-greener facilities. As opposed to hiring an out-sourced consulting firm, tapping into focus groups, analyst research or even doing a keyword Google search, a knowledge worker can use such technology intelligence tools. Basically, just type in “reduce energy consumption” as the “benefit” which you are trying to gather information on, similar to what an end-user would do in a simple keyword search. Further refinement can be made — akin to an “advanced search” — to encompass relevant synonyms that should be included in the query.

When you click “search,” in less than a minute a comprehensive, organized summary of information is returned based on gathering data found on the public web, as well as premium subscription journals, scientific content, patents and abstracts. The initial screen provides a high-level solution summary, broken down into a variety of categories such as products, companies, organizations, thought leaders, and approaches. For example, here the EPA and Department of Energy both returned high results in the “Organizations” category, while lighting and insulation provided a number of solutions in the “Approaches” category.

From this introductory summary screen, you can click on categories or specific items to drill down and look at some of the specific items returned. For example, if you select “heat recovery” as one of the approaches returned, you receive a number of records which highlight the “benefit” (in this case “reduce energy consumption”) and the solution. One such results from a scholarly journal reports that, “In mechanically ventilated buildings, heat recovery from ventilation air is the single most important means of reducing ventilation energy consumption.” From there you can click on the text and be directed to the original content source.

What’s unique is that, because this leverages intuitive search technology called text analytics and “semantics,” the results are analyzed, relevant and organized to be easily accessible and actionable, cutting lots of time from R&D efforts. All-in-all, a very comprehensive, but even more importantly relevant, accurate, and applicable set of solutions are provided in minutes, as opposed to the days and week (or months!) that research would take with more traditional methods.

This approach is a tool that can be leveraged in speeding up the retrieval, access and distillation of data, and thus serves as an agent of this transformation of change.

### **Looking Ahead to the “Intelligent Age”**

Thought leaders in all industries are recognizing the benefits of looking outside one’s organization for information, from academic institutions such as Harvard Law School opening up their scholarly content for public access, to corporate entities like 3M and P&G adopting new technologies such as Elsevier’s illumin8 to transform their R&D efforts. A variety of industries are finding that these tools can serve as a massive boost for the quantity of productivity as well as the quality of output.

The ramifications of such workflow and productivity enhancing solutions help facilitate more efficient scientific research, branching outside an organization, bringing new ideas in and, as a result, developing innovative, scalable products that meet objectives in the manufacturing process. By massively condensing these practices into a consolidated search, companies can exponentially speed time to market to grow quicker than they ever could before. That is the power — and future — of the evolving information age. In fact, I think we might start to call it “the intelligence age.”

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