



QTIP: Quick technology intelligence processes

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Abstract

Empirical technology analyses need not take months; they can be done in minutes. One can thereby take advantage of wide availability of rich science and technology publication and patent abstract databases to better inform technology management. To do so requires developing templates of innovation indicators to answer standard questions. Then, one can automate routines to generate composite information representations (“one-pagers”) that address the issues at hand, the way that the target users want.

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1. Introduction

How long does it take to provide a particular Future-oriented Technology Analysis (FTA)? We traditionally perceived the answer calibrated in months, particularly for empirical technology analyses. This mindset contributes to many technology management or policy decisions relying primarily upon intuitive sources of knowledge. That need no longer be the case. This paper makes the case for *quick* text mining profiles of emerging technologies.

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I describe what we call “tech mining”—deriving technology intelligence especially from R&D information resources [1,2]. The phenomenon of interest is *speed*, but with provision of information that truly facilitates technology management. The time to conduct certain technology analyses can be reduced from months to minutes by taking advantage of *four factors enabling QTIP—Quick Technology Intelligence Processes*:

- 1) instant database access,
- 2) analytical software,
- 3) automated routines, and
- 4) decision process standardization.

The first QTIP factor concerns information availability. A defining characteristic of the “Information Economy” is enhanced access to information. Of particular note to FTA, the great science and technology (S&T) databases cover a significant portion of the world’s research output. These databases can be searched from one’s computer, enabling retrieval of electronic records in seconds. Many organizations have unlimited use licenses to particular databases that allow for thousands of records to be located and downloaded on a given topic at no additional costs. Various databases compile information on journal and conference papers, patents, R&D projects, and so forth. In addition, many researchers share information via the Internet (e.g., physicists increasingly post their papers at arXiv.org). Other databases cover policy, popular press, and business activities. These can be exploited to help understand contextual factors affecting particular technological innovations. All told, this wealth of information enables potent technological intelligence analyses.

The second QTIP factor consists of expedited analyses using one form of “tech mining” software. This paper employs *VantagePoint*, but the specifics are less important than the principles. Namely, many aspects of data cleaning, statistical analyses, trend analyses, and information visualization can be done quite briskly.

The third contributing factor, automated routines, makes a huge difference. As a loose analogy, consider the change from the hand-made automobile to the assembly line Model T Ford beginning in 1908. Once we identify a set of analytical steps that we want to do repeatedly, we can script (write software programs or macro’s) that automate those steps. Now the analyst devotes energies to refining results, presenting them effectively, and interpreting them. For instance, suppose we have a certain S-shaped growth model that we find highly informative for a particular family of technology forecasts. We now “push a button” to generate and plot such a model. We then inspect it, decide a different growth limit should be investigated, and “push the button” again. In a minute or so, we can examine several alternatives, select the one(s) for presentation, extrapolate to offer a range of future possibilities, and give our interpretation. As with the Model T, standardizing greatly expedites production and enables automation.

The fourth factor profoundly changes the receptivity to empirical analyses. A major impediment to the utilization of FTA results is their unfamiliarity to managers and policy-makers. Today, major organizations are *standardizing* certain strategic technology and business decision processes. Stage-gate approaches set forth explicit decisions to be sequenced toward particular ends (e.g., new product development). Furthermore, we see organizations going the next step—to require specific analyses and outputs at each stage. This facilitates the automated routines (factor three). But, even more importantly, it familiarizes users with data-based technology analyses. The manager who gets the prescribed FTA

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