

CRAIG VAUGHN

INNOVATION AND R&D

A balanced package of research and development is a key component in the success of companies

INNOVATION IS THE KEY TO THE future success of companies in the chemical industry. While innovation is expected of other parts of organizations, it is a critical component of all R&D activities. Some companies rely on R&D for growth via new product introduction; others use R&D to stimulate incremental improvements. Some companies conduct no R&D and view it as an unnecessary expense. Understanding all the roles of R&D and recognizing the value in each role are key to properly supporting and enhancing innovation in organizations.

The first major role of R&D is the development of fundamental knowledge or “enabling technologies” (nanotechnology, computational chemistry, etc.). These technologies could have a major impact on the competitive landscape but their applicability or absolute value is still unknown. Since the purpose of this research is exploratory in nature, funding for these projects is often provided without the expectation of immediate financial return. This funding frequently comes from the corporate level because these technologies cut across business units or product lines. The business and the R&D community agree that this research is important. However, this work usually only accounts for a fraction of the R&D budget. Companies are increasingly using university collaborations to augment their long-range research efforts.

Knowledge-building activities are often the first activities cut during lean times.

The second important function of R&D is to provide support to manufacturing, customers, and business management. R&D organizations are often the repositories of technical know-how. As such, R&D can be an invaluable resource to plants. The value of R&D can be demonstrated when plant production problems are solved quickly or avoided. R&D functions to evaluate competitive technology threats and opportunities, which allows

business management to make decisions with greater confidence. By pointing out technology strengths and weaknesses or forecasting technology trends, new business opportunities can be created. Technical service for customers is also an important but underrecognized R&D function. The work in this second role tends to be sporadic and is often done in conjunction with project work.

The third major function of R&D is to develop and implement new technology. While the first role is considered strategic and the second is considered necessary, the third role is often considered discretionary.



R&D MANAGEMENT Picking the right projects for technology development is critical, says Vaughn (standing) shown talking with (from left) research assistants Alak Bhattacharyya and Wayne Schammel and research associate Bob Snyder Sr.

Usually, this role is viewed as an investment, requiring an acceptable return. Picking the right projects to work on is a critical role of business and R&D management. This task is made difficult by misapplication of project valuation metrics and inaccurate estimates of technical and market risk. Since short-term projects have less technical risk and are easier to value, they are usually favored. While short-term research is important, long-range research (if properly supported) has the potential to make a much bigger impact.

All of the R&D roles are interrelated. Project work (technology development and implementation) provides an outlet for the fundamental knowledge gained in the long-term research programs. The knowledge and experience gained in pursuit of project work are critical to the manufacturing or business management support role. When organizations attempt to eliminate one of the roles, all of the roles are diminished. R&D organizations that concentrate on technical service without doing project work lose their ability to apply new technology to the problems of the day. Technical service, in the absence of project work, degenerates into a series of quick fixes. In short, it is less innovative, which leads to missed opportunities and loss of competitiveness.

Business and technology strategies often determine the relative effort placed in each of the R&D roles. Drug companies tend to focus on knowledge building, and commodity chemical companies tend to emphasize technical service activities. The challenge is to maintain some level of activity in all of the roles.

Getting the right balance of the different R&D roles is critical to the success of organizations. This balance requires an understanding and appreciation of all of the different roles. Senior management must have the foresight to fund knowledge-building research. Businesses must properly support both long- and short-term project work and realize that such project work is critical to the maintenance of an effective and innovative manufacturing support network.

Organizations that maintain meaningful activity in all of the various R&D roles will be best positioned to recognize and act

on new opportunities. If innovation is truly the key to the future, balanced R&D organizations can secure the future competitiveness of chemical enterprises.

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