

Introduction to Industrial Research and Development

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DESCRIPTION

Industrial research and development laboratories located at the company's headquarters; one chemical industry company even had two central laboratories there, each serving a different group of strategic business units. Eventually, the concept of central laboratories was abandoned almost entirely in favor of internationally dispersed R & D investment centers. Today, even one industry is home to some of the biggest global players.

The original centralization of research and development could be attributed to a wide range of factors, including the perceived need for a critical mass of researchers and the expectation of economies of scale, the high costs of communication and coordination between geographically dispersed units, the ease with which the research and development portfolio could be controlled, and the importance of proprietary information. Perhaps more importantly, firms found it advantageous to take public research institutions provided in their home markets. Product life cycles were long enough to allow for the transfer of new knowledge from these institutions into firms through the hiring of young researchers and sparingly utilizing research and development collaborations.

The goal of Business Process Model and Notation (BPMN) is to provide a general, human-understanding-oriented description of the business environment. Its intended audience is business analysts and process designers rather than software architects and engineers. Since BPMN is mathematically based on Petri Nets, it does have a basis for proving the correctness of process models. BPMN supports both the orchestration and execution of business processes.

Second, the term "internationalization" may refer to a variety of tasks, from the management's perspective, are of a quite diverse nature. To provide an example, internationalization of research and development may mean:

Employing foreign R & D professionals in a wholly domestic organization that may have its headquarters, Bringing in new technological knowledge from abroad, such as through

purchasing patents or licenses.

Participation in collaborative R & D projects with overseas partners that include a small amount of resource transfer.

The question of why a company might want to entertain more than one R & D laboratory at different locations should be addressed before attempting to address problems of internationalization, as the first problem would then appear as a generalization of the second. In addressing this question, we will focus on economic factors that may explain why a company might want to entertain more than one laboratory in a different country. We do not intend to take these factors into consideration unless they appear to be connected to economic standards.

Usually, the internal costs of producing the desired result from R & D need to be taken into consideration, as R & D results might require inputs from other R & D performing institutions outside the respective firm, transfer costs that arise from the knowledge exchange be taken into consideration, and in the extreme, infinite costs arise if certain input factors are not available in locations where laboratories are planned or exist.

There is evidence that lateral spillovers between R & D teams contribute to the results of R & D projects, and if R & D projects are related to one another, it could be argued that experts may produce synergism from an exchange of ideas that could grow as more experts are assembled in one place. Additionally, the response of one large laboratory to a fluctuating demand for its services may be more flexible than is expected from a number of smaller units that, in total, represent a comparable capacity. A major input factor for R & D is highly qualified human labour, but the quantity needed at the traditional laboratory site may not be available at the desired level of qualification. Transferring these factors from their current location to the laboratory may involve costs that are much higher than providing the more or less immobile experts with a more convenient location; this is particularly true in nations with a very heterogeneous level of regional development.

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