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## HP CE Technology Transfer

Looking at the new product generation process, often there is a long chain of activities involved, starting from basic research and proceeding to applied research, technology development, new product development, and finally, manufacturing. Later, while the product is being marketed, an improved and enhanced series of products will be generated in an R&D process sometimes referred to as current product engineering. Throughout this sequence of steps, knowledge, experience and competence are being built up, hopefully in a continuous, smooth, unidirectional way. However, since many people and different organizations are involved, losses, frictions, and interfacing issues associated with the transfer of know-how will occur and must be resolved or at least kept to a minimal negative impact.

Unlike the typical situation of 20 years ago, when the same group of people carried out the entire new product generation process all the way from research to manufacturing through many sequential steps, the scenarios of today's new product research and development projects have changed considerably. Given the complexity and breadth of most of HP's products, not only the analytical products, there is no way of making all of the key components entirely within HP. Instead, many things have to be acquired from external parties in various stages of development, be it fundamental research results, patented technology, methods, processes, or other know-how. In many situations even complete products or system components come from outside sources.

In our case of adding CE to the LPA (liquid phase analysis) product line, certainly we did look at the alternatives of acquisitions or external R&D collaborations, but before the final decision was made to take advantage of the accomplishments of an HP Laboratories research project and transfer technology and know-how from there to the Waldbronn Analytical Division and plunge into new product development, we had been thinking about mechanisms of technology transfer in general, and tried to reflect our conclusions in the organizational structure of our R&D function.

Generally, R&D divides its forces into activities of current product support and enhancement, development of next-generation products, and investigations, which include new products, new technology, key components, and fundamental research. The size of each of these segments depends on the business situation,

which may change quickly. There is always a temptation to sacrifice the long-term investigations for short-term, market-driven problems or opportunities.

To stabilize the long-term, high-risk, but strategically important projects against the pressure of the tactical projects, we decided to divide the R&D function into two units: a smaller unit focusing on development, acquisition, and transfer of new techniques and generic components and a larger unit focusing on current and next-generation product development. The structure of the technology unit reflects the major technical and functional areas of the product line and therefore this unit has a few resident engineers and scientists who are specialists and experts in those categories. A larger number of members are set up in transient project teams and remain in the technology unit only during acquisition or investigation phases. We then transfer the project together with the transient team into the product development environment. This model should ensure minimal loss of know-how in the transfer from the investigation phase to the lab engineering phase and still keep a stable base of technical expertise and competence beyond one particular project cycle. In addition, it helps synchronize projects of different time scales and keeps the rules of the project life cycle flexible enough to adapt to new product design as well as to current product engineering.

The HP CE project was the first technology transfer project to be completed under this organizational structure and following these rules. The technology transfer from HP Laboratories to the Waldbronn Analytical Division yielded a very successful product. We have transferred technology from HP Laboratories before, but this transfer in particular went smoothly and pleasantly, I tend to believe, because of the new organizational model, but as much because of the enthusiasm, the dedication, and the support of the engineers and managers involved on both ends, including our marketing, manufacturing, and business people.

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