Chapter 10
A Performance Evaluation Framework for Innovation

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ABSTRACT

This chapter presents a framework for a conceptual evaluation of the performance of industrial product innovation activities. The framework promotes a holistic view of performance by considering three categories of activities: Planning, Implementation, and Sales and Delivery. Successful performance evaluation comes from acknowledging the fact that there are different objectives for each of the three activity categories. Moreover, performance may be expressed as a function of the performance of the Planning, the Implementation, and the Sales and Delivery activities. In this chapter the results of research involving seven large companies in Sweden, with the objective of improving the understanding of what is required to be successful when developing complex industrial products, are presented. Key factors for success as well as some general conclusions are discussed.

INTRODUCTION

Sustainable growth is often argued to be one of the most elusive goals a company faces (Christensen & Raynor, 2003); a high performing innovation process is a key aspect for achieving sustainable growth. One important ingredient in a high performing product innovation process is to be able to evaluate performance and use this information to decide on improvement actions (Davila, Epstein, & Shelton, 2006). Traditionally, performance improvements are achieved by focusing on and strengthening the processes that are easy to quantify in measurements e.g. the manufacturing process or the purchasing function. As a result there are plenty of performance measures related to, for example, the productivity of the operation process (Hill, 1993; Slack, Chambers, & Johnston, 2007). However, within innovation and product development there are no commonly accepted methods for evaluating performance,

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even though the total R&D spending in the 1000 largest companies in the world, in the year 2002, exceeded one quarter of a trillion dollars (Cooper, 2005). The stock market shows increasing interest in a firm's ability to be successful with innovation and product development, and measures such as the New Product Sales of Total Sales (Whitley, Parish, Dressler, & Nicholson, 1998) is one of the most commonly used measures for a company's product development process (Teresko, 2008). Still, being able to measure the outcome of the innovation process does not help an enterprise to improve or pinpoint where improvements need to be made in the process. Hence, it is important to differentiate between achieving high performance and performance evaluation. The ability to evaluate performance may influence performance, focus tends to be on what is evaluated, but it is only a first step in the quest for increased performance levels. An example which illustrates this point is when driving a car, there are several measures presented for the driver, e.g. a speed measurement showing current speed. However, a speed measurement does not imply that the car is able to travel at the speed the driver requires. On the other hand, it may assist the driver in understanding the car's capabilities; information that enables the driver to decide if a stronger engine is needed in order to reach the desired speed.

The difficult task of valuing promising ideas for new products in monetary terms has forced companies to view their spending on innovation and product development as a cost rather than an investment. Accounting rules require that investments in R&D are treated as a cost; even though the economic reality is that it is more of an investment (Hartmann, Myers, & Rosenbloom, 2006). This may explain why real time productivity measures related to innovation and product development are almost nonexistent. Research in the US reveals that only 52 percent of the total spending on product development is made on projects that are financially successful (Page, 1993). There are of course differences depending on market segment, type of product etc. Still, if a production site showed similar results it would not survive, at least not with the present management. Important to acknowledge is the fact that it is that 52 percent that will have to account for 100 percent of the R&D investment. An increase in the success rate of the product development process will therefore not only increase future revenues but also decrease the overall cost load, which directly affects a company's profit positively. An alternative is to increase the efficiency of the product development process and thereby be able to do more with less.

The research areas of performance evaluation, product development, and innovation are large and diverse. This research focuses on the development of complex industrial products, i.e. products that often include various technical capabilities like mechanics, electronics, and software. As a result these products are often developed in large organizations, often in a business-to-business context. Moreover, these products have long life-cycles and as a result the development activities are often incremental or evolutionary in their character rather than radical. The evolutionary character is the result of a technical complexity that has evolved over decades, by generations of engineers. This technical complexity also represents a large investment for an organization. An architecture or platform is therefore commonly used in these products, in order to decrease the time to market, share development cost, and increase the quality of the developed products.

In this research it is argued that in order to conceptually reason about performance in innovation and product development activities in large industrial companies, a holistic framework for performance evaluation is needed. In this chapter such a framework is presented starting by introducing our view on product innovation from the definitions of innovation and product development. With this in mind workshops, together with senior managers, with genuine experience in developing complex industrial systems within telecommunications,