Modeling the Failure of Productivity Improvement Programs

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This paper develops a simple model of a manufacturing firm in which a successful productivity improvement program is implemented. The model is used to show how a successful improvement program can fail to significantly improve a firm's financial performance. It is argued that the potential rates of improvement in the firm's capabilities can differ substantially based on the intrinsic complexity of those processes. The spread of improvement skills and commitment to the effort is modeled as a diffusion process among employees in a given area. The allocation of resources to support that commitment is represented as a dynamic adjustment process. The formulation, with the assumption of locally rational decision rules, results in differential rates of improvement in the capacity and demand generating areas of the firm. If excess capacity results, interactions with traditional accounting, pricing, and human resource policies can create unanticipated side effects that result in sub-standard performance or failure of the program. Policies for mitigating these problems are discussed and analyzed.

Related Work:

The Improvement Paradox: Three Essays on Process Improvement Initiatives

Ph.D. Dissertation
MIT Sloan School of Management
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Abstract

The dissertation includes the paper described above, and two additional essays:

Agency Problems in Process Improvement Efforts

In this paper I study the problem faced by a firm that tries to induce its workforce to reveal information leading to productivity improvements when those improvements may lead to lay-offs or 'downsizing'. The analysis begins with a discussion of the conditions under which productivity improvements are likely to lead to lay-offs. I then develop a model in which the firm attempts to extract productivity improving information from its workforce by providing monetary incentives for such revelations. The impact of different contractual and institutional assumptions on the firm's ability to implement such programs is investigated. There are two main results of the analysis. First, the employees' ability to collude or participate in binding side agreements – to write contracts with each other or to join a union – is a critical determinant of the firm's cost of implementing new programs. Second, the program's perceived impact on the firm's survival strongly influences the firm's cost and the ability of employees to profitably collude. These results allow me to explain the differing experiences of firms that use such programs, and to generate some insight into the effect that a firm's financial health has on its ability to implement programs like TQM.

A Tale of Two Improvement Efforts: Towards a Theory of Process Improvement and Redesign

The purpose of this paper is to lay the foundation for a theory of process improvement and redesign that accounts for both the physical *and* the behavioral components of the environment in which improvement is taking place. The main tools for theory development are intensive case study research, the development of stock/flow and feedback diagrams, and the analysis of existing literature. The results from two intensive case analyses of process improvement efforts with a major US manufacturing company are reported. The main thrust of the argument is that, contrary to the popular conception, TQM and re-engineering are complementary activities, and a more general improvement and redesign methodology can be developed using precepts from each theory. TQM offers an organizational structure and decision making methodology, and re-engineering provides a tool for challenging the dominant mental models that guide the organization.