Incentives to Share Knowledge

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Abstract

The knowledge required for decision making in a firm is distributed across various departments. In practice cross functional teams are used to integrate this distributed knowledge. Incentive schemes are of crucial importance to encourage departments to share knowledge. In this paper, we study different incentive schemes by means of a two stage model. In the first step departments have to choose between learning and sharing knowledge, in the second stage, they bargain about a new product feature. The outcome of the bargaining process in the second stage depends on the capabilities of the agents and their uncertainty about the opponent. The result of the second stage determines the agents’ payoffs which in turn influence the time allocation. In a simulation study, we investigate different incentive systems and show to which extent a firm has to reward the sharing of knowledge in order to reach its overall objectives. Furthermore, we are able to derive an analytical solution for the bargaining process under uncertainty and compute Nash equilibria for a discrete set of possible actions.

1. Introduction

The incentive system is an important parameter of an organizational structure [cf. [5]]. Traditionally, this aspect has been dealt with principal-agent models. These models frame the problem as one of incomplete information: the principal (e.g., firm owner) cannot perfectly monitor the actions of an agent (management, employee). The problem is solved through a profit-sharing scheme.

The aim of principal-agent models is to arrive at incentive compatibility. This requires, that the principal knows about the subject matter at least as much as the agent. Total Quality Management challenges this ”scientific management” view of knowledge distribution within the firm. It is a management method that tries to mobilize knowledge residing on all levels of the organization to improve products and processes. The premise of TQM is that the most valuable knowledge about the idiosyncracies of a production process or customer preferences is held by the employees actually dealing with them daily, i.e., shop floor workers and salesmen.

In contrast to principal agent models, the function of an incentive system in knowledge management is to foster the generation of knowledge through experimentation and reflection, and to share that knowledge as a prerequisite for building common models for groups searching processes. This is reflected in a number of TQM-methods: the seven tools of Kaizen are data gathering and model building methods used in quality circles. The House of Quality is a graphical model of the interactions between customer preferences, product and process specifications used as a road-map by multi-function product development teams.

Thus, when dealing with incentives in knowledge management, one has to give up the notion that the principal knows at least as much as the agent 1. For a one-to-one setting, models of this type are studied in [4]. He shows that a profit-sharing scheme can also be explained in a setting, where the principal can perfectly observe the agent’s actions but cannot judge their effect on his utility due to limited knowledge. In this paper, we will extend this view to a one-to-many setting: the principal has to provide incentives for a team of agents, each one having different knowledge the principal does not have. Following a stylized model of the House of Quality, the agents have to bargain over an interface specification between their systems (e.g., a technical characteristic of a product) that determines the quality of the result and the principals profit. The only other information the principal has besides the outcome is the knowledge explicated, in the form of e.g., a House of Quality model. Clearly, one could think about rewarding the whole team based on the team effort. However, as shown e.g. in [3], this often leads to a prisoner’s dilemma type of situation, where shirking is rational, especially if the team size increases so

1cf. [6] who assumes incomplete information on the agents’ preferences models a situation where the principal can obtain additional preference information. In contrast, we assume that the principal cannot observe the actions of the agents.