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A Monopoly Strategy Developing a New Version of Information Product or Why Microsoft Products Do Not Become Much Better

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Abstract

The paper attempts at explaining some of market strategies of monopolies in information product markets. A special case is considered where a particular information product, supplied by a monopoly, has captured a limited market share, or where the overall market is limited by a particular number of users. The only way for the supplier to keep this market share, and to continue extracting revenue, is to eventually offer a new version of the information product. The customers then accept the new version only if it has some new quality characteristics they are prepared to pay for. Using a theoretical model, we derive some conclusions why the incentives of monopolies to contribute to the quality of their new versions of information products are limited.

Key words

Information product, Quality, Price, Cost, Monopoly

INTRODUCTION

In the early years of information age, when the role of information in the modern marketplace became obvious, its seeming availability enormously increased euphoria and ungrounded expectations of dramatic changes in economy structures. A common argument was that better information about products and competitors, available to everybody due to information technology advances inevitably should lead to more competitive and effective markets. This would be a reason for lower production costs, lower prices for buyers, wider variety of products, and better quality. Such a simplistic view was soon shattered by reality, which showed much more complicated relationships between information available to market players and market behavior. Perfectly available information technology does not automatically mean perfectly available information, and does not mean perfect competition in the markets utilising information technology.

It becomes clear that the traditional approach to economic analysis does not adequately describe the phenomenon of information good markets, or information component of tangible good markets. Firstly, the specific characteristics of information products make traditional cost/price based competition ineffective and prompt market players, aiming at staying competitive, for non-traditional innovative decision making.¹ Secondly, both empirical observations and recent theoretical analysis lead to a conclusion that these markets are unlikely to be perfectly competitive (Varian, 2001). As long as information products are concerned, we are looking at monopolistic competition in usually highly concentrated markets. In order to keep their market share, and continue extracting revenue, suppliers have to periodically issue updated versions of their products with improved or new features targeting existing as well as new customers.

In this paper, we discuss some specifics of managerial decisions concerning expenditure on version updates, product quality, volume of sales, and prices as conditions for successful market strategy.

We consider a highly concentrated market of information product, which is typical to information product industry. Microsoft is the most striking instance, though not a unique one. Other examples are, for instance: pre-Microsoft word processor and spreadsheet markets, airline reservations systems; etc. (Varian, 1993, Applegate, 1999)

¹ Discussion of product characteristics and possible strategies can be found in (Kazakevitch & Torlina 2001, Varian 1993, 2001, Bakos 1998)

Given that a high market share or even the whole market has been already captured, the monopolist has a limited number of options to continue extracting revenue:

- Sales to new customers. New customers can be recruited predominantly from the existing customers of competitor's ("established product market") or predominantly from the customers new to this product category ("new product market"). This option is limited if the market share is high and market is not expanding quickly; and/or
- Developing a new product or an updated, improved version of existing product.

In the case of monopolistic competition in information markets, traditional models do not include all appropriate variables significantly reducing an explanatory outcome. In particular, the quality of the product is considered as exogenous and decided upon outside the model. In our recent paper (Torlina & Kazakevitch, 2001) we assume that multiple sources of value embedded in the product, including both tangible and intangible components, are reflected in the product quality; and that product quality affects market price determination through demand and supply equilibration.

In this paper, we consider possible strategies towards issuing updates to existing products of companies, like Microsoft, occupying a considerable market share. A theoretical analysis is undertaken, to show that such companies are not interested in achieving the highest possible quality of new versions. They would rather commit to relatively inexpensive investments in improvements that allow recovering additional costs of developing new version and include as much novelty as customers would agree to pay for. Improvements are targeted first of all at fixing obvious bugs of previous version, cosmetic changes in user interface, features allowing easy learning, better marketing of the product, and better compatibility with newer hardware.

THE STRUCTURE OF THE MODEL AND ANALYTICAL RESULTS

We consider a special case where the information product is supplied by a monopoly. The monopoly has captured a particular market share and the overall number of users is limited. For simplicity, we restrict our consideration to a one-product company. The only way for such a company to keep its market share, and to continue extracting revenue, is to eventually offer a new version of the information product.

The quality of updated product is a complex matter and may include product content and functionality, user interface, ease of learning, warranty, service and support provided, and many other things. For the purpose of this model, "quality" is the *perceived quality*, which may include both real improvement as well as a successful marketing component. The latter one may also appear to be a marketing hype. We assume the simplest case where all the quality characteristics of an information product, produced by a monopoly, can be aggregated into the scalar quality characteristic q . We also assume that quality variable q depends upon the cost of the production C of the original copy of a new version:

$$q = q(C) \quad (1)$$

where

$$\frac{dq(C)}{dC} > 0; C \in C \subset \mathbf{R}^+ \quad (2)$$

and

$$\frac{d^2q(C)}{dC^2} > 0; C \in C \subset \mathbf{R}^+ \quad (3)$$

Condition (2) means that any additional expenditure on the new version contributes to its quality. However, condition (3) specifies that each next dollar spent brings less of quality increment than the previous one. In other words, each further increment in quality is more expensive than the previous one.

The demand y for information products is measured in the quantity of copies. The key assumption is that the costs C associated with the first copy of the product is the actual total cost of production of the first and any further number of copies:

$$C = C(y) = \text{const} \quad (4)$$

or, in other words, marginal cost is equal to zero.

²Here and below, the differentiability of functions within continuous intervals of independent variables is assumed by default.

We assume that demand conventionally negatively depends upon the price (p). It also positively depends upon the quality variable q . Therefore, the demand for the IT product, as viewed by a monopoly, can be represented as a function:

$$y = y(p, q(C)) \quad (5)$$

or its inverse

$$p = p(y, q(C)), \quad (6)$$

with

$$\frac{\partial p(y, q)}{\partial q} > 0; q \in \mathbf{Q} \subset \mathbf{R}^+ \text{ and } \frac{\partial p(y, q)}{\partial y} < 0; y \in \mathbf{Y} \subset \mathbf{R}^+ \quad (7)$$

However the willingness of the market to accept a higher price diminishes with each next increment in quality:

$$\frac{\partial^2 p(y, q)}{\partial q^2} < 0; q \in \mathbf{Q} \subset \mathbf{R}^+ \quad (8)$$

Even though, a non-conventional demand and cost functions are assumed, we can consider the conventional monopoly's profit maximization problem as:

$$\Pi = yp(y, q(C)) - C \rightarrow \max, \quad (9)$$

The first order equilibrium conditions for (9) appear to be different to the standard model:

$$y \frac{\partial p(y, q(C))}{\partial y} + p(y, q(C)) = 0; \quad (10)$$

$$y \frac{\partial p(y, q(C))}{\partial q} \frac{dq(C)}{dC} - 1 = 0 \quad (11)$$

Condition (10) is equivalent to the condition $\frac{dy}{y} = -\frac{dp}{p}$. It means that, at zero marginal costs there is no optimal scale of production, which would maximise profit. Meanwhile, due to the decreasing demand, increase in the volume of sales requires and allows for a proportional decrease in price.

Condition (11) or

$$y \frac{\partial p}{\partial q} = \frac{dC}{dq} \quad (11')$$

means that there is an optimal combination of the cost of the first copy, price and the volume of sales, which says by itself about a limited incentive for expenditure for quality.

The case of fixed output ($y=y^*$), however, appears to be especially interesting. This case corresponds, for example, to the situation where a monopoly attempts to convince all the customers to buy a new version of its product. At a fixed output (Figure 1), the price as a function of quality, due to (7) and (8), is represented by a convex upward curve. In contrary, the cost as a function of quality, due to (2) and (3), is represented as a convex downward curve. Therefore, in the general case, (Figure 1A) the quality is feasible within the interval $q_1 < q < q_2$. Outside of this interval, the price, at which all the customers accept the new version, appears to be below the cost of the first copy. Therefore, a better quality, beyond q_2 is infeasible. Figure 1B corresponds to an extreme case, where the customers accept any quality improvement at a price corresponding to such an improvement. However, as in the case A, the quality is limited by q_2 . Figure 1C demonstrates the opposite extreme where neither quality improvement is affordable by the company due to prices acceptable by the customers lower than costs. Thus, a new version is not feasible.

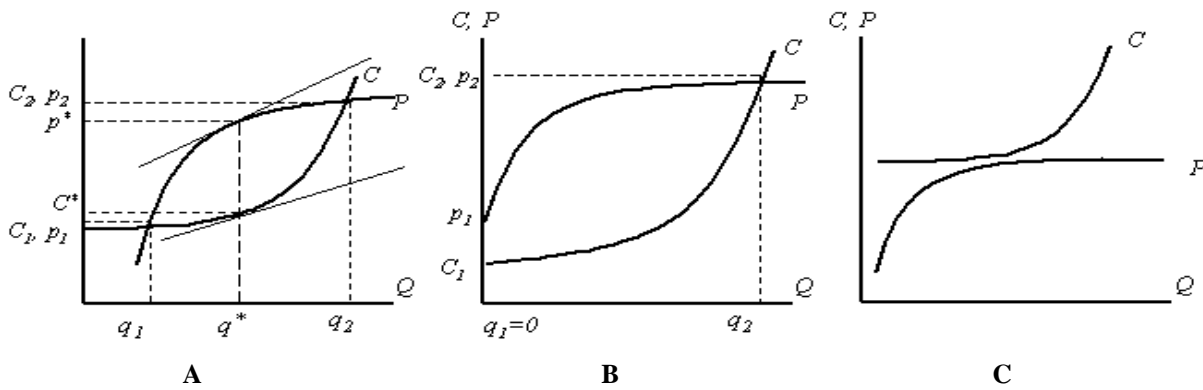


Figure 1: The quality-price-cost relationship at a constant volume of sale.

Condition (11') corresponds to an optimal quality q^* and corresponding optimal price p^* and optimal expenditure for the first copy C^* , that specifies further the economic restrictions of a quality of information product supplied by a monopoly.

CONCLUSION

The paper gives some insight into the optimal strategy of a monopoly producing an information product. The traditional theoretical approach to the economic analysis of the monopoly market has been modified to include specific characteristics of information products. In particular, factor quality is included as an endogenous variable. This enables a theoretical analysis of the strategies of a monopoly facing a limited market and attempting to maintain its cash flow by introducing a new version of its information product. The customers accept the new version only if it has some new quality characteristics which they are prepared to pay for. Using a theoretical model, we show the economic constraints, the company faces, on the quality of the information product. The existence of such constraints can be used to explain the limitations of the quality of software products supplied by monopolists. In particular, this partially explains the phenomenon of Microsoft building financial success on products, continuously generating customer's complaints.

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