PENETRATING THE INDUSTRIAL MARKET: A CASE STUDY

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Adoption of the marketing concept has not come easily in industrial markets. Sales efforts and product orientation appears to receive an inordinate amount of attention even in highly mature, saturated markets. Resistance to marketing can encourage new competitors possessing technology and marketing skills to invade these once stagnant market segments. This paper identifies one firm's attempt to thwart such invasion by developing and implementing sound marketing strategy.

Introduction

Nearly all markets eventually experience change in character, composition, etc. As forces within and outside a market challenge the nature and scope of competition, evolution results. Today's market leaders may become tomorrow's followers. Market share may become a tug-of-war between competitors. Vendors who once practiced a customer-passive management philosophy are forced to become more active in their attempt to better comprehend and satisfy demand. Vendors jockey for market position and make an attempt to practice marketing instead of sales management.

The forces that impact a market and cause the sales-to-marketing transition are often external participants (competitors) possessing new technology. The struggle to gain relative advantage is focused upon a variety of strategies. For example, some firms depend on their marketing expertise for success. These firms understand the benefits associated with proven marketing techniques and use a customer-active orientation in order to extract market share away from traditional market participants. Alternatively, some firms depend upon technological superiority or expertise to penetrate a mature market. Relative advantage can be realized through market-wide affirmation to new technology. A once stagnant market can suddenly become quite active in relationship with the infusion and subsequent adoption of "new" technology. Finally, the most successful firm understands that the greatest relative advantage can be realized by balancing both marketing and technology. Such firms blend their product and customer capability in order to advance their position in the market.

The purpose of this paper is to describe the efforts of one firm that has attempted to assess market potential and consumer perception of a new technological development. This firm is striving to gain a fundamental understanding of the demand for a new product concept--the "multiple operation concept." This proposed product concept is essentially a small, lathe-type numerical-control machine tool whose primary objective is to minimize the cost of converting raw stock into finished product while maintaining or improving accuracy (precision). This product concept can be easily compared with the latest state-of-the-art technology--the "cell" concept of lathe-robot-mill. The lathe-robot-mill machining cell product requires a design of various machines. Alternatively, the multiple operation concept (MOC) is a single machine concept (see **Figure A** and **B**).

Scope of the Research

To understand the potential demand and market characteristics of the MOC market, a two-phased study was conducted. Phase I was an exploratory effort to establish general parameters or conditions for subsequent, more structured investigation. Emphasis was placed upon general market exploration since it was assumed that no particular market segment could be labeled adoption-certain candidates. Furthermore, the basic objective of Phase I was to provide market-related parameters thereby allowing the researchers to probe select market niches without preconceived notion of market adoption rate.

The insight generated by this phase provided support for a more detailed, comprehensive investigation of select target market segments. As a result, Phase II required a refinement of the original product concept. Product and market refinement/enhancement is essential because successful diffusion of any technology demands a precise market entry strategy and product to ensure comprehensive, systematic adoption. In fact, the rate of adoption is directly related to early entry strategy. By comparison, a "pull" strategy is superior to a "push" strategy. This implies that more successful market penetration will result when selective marketing is utilized thereby linking users (innovators/early adopters) with producers. It is very important to have early users "pull" the product into the marketplace and then thereby serve as propagators or role models in continued penetration of larger, more technology-resistant segments (e.g. late majority, laggards).

The diffusion scenario for machine tools is similar to that for any other technology/product/service. As depicted in **Figure C**, this comprehensive process is actually a planned process of steps or stages. The process is directly impacted by market facilitators and their endorsement/rejection of the technology.

Inasmuch, Phase II therefore focused upon market facilitators or risk takers who serve as early adopters. The result of Phase I identified these facilitators as large job contract shops and large manufacturers (>50 employees). The data generated by Phase II will support the development of purposeful "pull" strategy for market introduction of the MOC.

Methodology

The methodology chosen for Phase I centered around 20 in-depth interviews with potential customers of the MOC concept. While it was unknown whether these participants characterized the entire machine-tool market, it was hoped the information/insights generated by these intensive interviews would offer response similarity and provide for a general "picture" of interest and demand for the MOC within the entire machine-tool market.

Participant firms were selected according to the following criteria: size of firm, firm status (customer vs. non-customer), and type of firm (job shop or manufacturer). It was assumed these criteria would greatly influence the adoption/rejection probability of the product concept. Present customers of the sponsoring firm (MOC developer) were substantially relied upon because of their product knowledge, geographic location, and willingness to participate. At no time were the participants aware of the sponsor. Anonymity ensured objectivity in response. And, because of the properietary nature of the MOC, the name of the concept developer and sponsoring firms will remain anonymous throughout this report.

In order to increase participation in Phase II research, respondents were contacted prior to receiving a copy of the research questionnaire. This procedure was implemented in order to increase the traditionally low response rate associated with mail questionnaires. Normally, the response rate for self-administered mail questionnaires is no greater than 18-20%. The premailing phone contact increased the actual response rate to a respectable 34% (104 total respondents. 37 job contract shops with average size of 90 employees: 67 manufacturers with average size of 785 employees).

A self-administered questionnaire serves as the primary information-gathering technique. The self-administering format increases response objectivity and offers greater savings and reliability than alternate forms of data collection. Each respondent received a detailed description/explanation of the MOC (see Appendix A) along with a letter outlining the research objective(s) associated with Phase II.

A semantic differential scaling technique was utilized for many of the questions. These scaled responses formed the basis for the respondent's perception regarding product- and market-related questions. To analyze the data, the BMDP statistical software package was used. Basic routines were employed to compute the frequency, percentage, and cumulative percentage, etc. for each distinct question or variable.

Before discussing the information generated in Phase II, a general overview of the various segments composing the user-market of the machine-tool products is helpful.

Job Contract Shops

Traditionally, job contract shops can be defined as "passive" market participants. They are often only order-taking establishments which prosper by offering a specialized, high-quality product at a relatively low price. Simply, job shops do an adequate job at a lower cost than if manufactured in-house. Normally, job-contract shops have lower overhead rates. In the highly competitive machine market the job shop is perpetually coerced to maintain low overhead and high quality. Job shops are often seeking new ways to more efficiently and effectively machine a part and turn a profit. This often requires the assessment and adoption of a new technology. Unfortunately, job-contract shops may feel threatened by the extreme costs and sophistication often associated with advanced technology.

Smaller job shops (<50 employees) are large in number and might be considered as primary candidates to adopt new technology. However, while these candidates are large in number they usually possess a unique character which precludes them as market adopters or primary market candidates. Specifically, smaller job-contract shops are technology laggards and are highly conservative, change resistant, and extremely sensitive to cash-flow and capital funding.

Alternatively, larger job shops appear to be much more reasonable in philosophy regarding the management of technological change. Specifically, they are often more educated regarding product application, benefits, etc. Probably more than any market segment, they live by a rather simple "bottom line" philosophy -- lower overhead leads to increased ROI which ultimately leads to continued competition. This philosophy makes this particular segment a primary candidate for the successful marketing and adoption of the multiple operation concept.

Manufacturers

Another important segment consists of manufacturing firms. This market segment performs a wide range of machine-tool activities ranging from specialized engineering (low volume customization) to mass production of standard parts/equipment. This segment is often in the mainstream of technology and is more responsive to technological change.

During Phase I, a very interesting perception surfaced during conversions with large manufacturers. It appears that many manufacturers sense their in-house capability may be greatly enhanced with advanced technology.

The units of analysis in Phase II consisted of medium and large job contract shops and large manufacturers (>50 employees). The insights generated in Phase I suggested that these segments formed the primary market for the adoption of the multiple operation concept.

Discussion of the Research Findings
Phase I: An Exploratory Investigation

In order to foster a general discussion with participants selected for Phase I, each was given an opportunity to read a detailed explanation of the MOC. In addition, a series of product application and adoption questions along with general market-related questions provided the discussion parameters for exploratory interviews. The interviews normally lasted up to three hours and included intense product and market-related questioning.

After reviewing responses provided in Phase I, the researchers became aware of several prevalent concerns addressed by nearly all respondents. It was apparent that certain possible market segments do not consider the MOC to possess any value. Coincidently, there appears to be much general confusion and skepticism regarding the reliability and availability of the MOC technology. Certain market segments (smaller establishments) expressed concern with the utility of the MOC. Type of establishment is a definite segmenting variable for the MOC.

Also in Phase I, a very interesting perception surfaced during conversations with large manufacturers. It appears that a growing number of manufacturers sense their own in-house capability can be greatly enhanced through the adoption of new technology. Many respondents stated that the new machine tool technology can increase in-house production capability and overall machining expertise/control and thereby reduce dependency on job-contract shops. New technology can often reduce the manufacturer's overhead rate and thereby make him more competitive with the job shop counterpart. This is viewed as a tremendous benefit by the manufacturer.

The information provided by Phase I interviews aided in the research focus for Phase II. Phase I findings suggested that the optimal target market for introducing the MOC was larger job-contract shops and manufacturers (>50 employees). Because these organizations possess greater resources as well as a keener ability to assess the utility of new technology, they were singled out as high probability candidates for the MOC adoption.

To promote the adoption of the MOC product concept, it was important to identify innovators/early adopters. Phase I results established that the large job shops and manufacturers represented the innovator/early adopter category while smaller job shops and manufacturers comprise the late majority and laggards of the market (See **Figure C**). More importantly, Phase I helped determine product/technology characteristics/features that are in high demand. This preliminary information helped design Phase II of this comprehensive research effort.

Prior to designing/implementing costly market-related introductory strategy, the proposed market segements needed to be explored further. The proposed adoption market needed to be statistically sampled in order to ensure reliability/validity of the preliminary findings of Phase I. It would have been dangerous to overgeneralize Phase I information. Therefore, Phase II--a more systematic and detailed sample of these two target segments of larger establishments--served a critical role.

Phase II: A Random Sample of the Target Market

As already stated, Phase II is an intensive, systematic assessment of the primary target market-large job shops and manufacturers. The information from the 104 respondents provided several interesting insights which can greatly assist in the development of a market introductory strategy. The following is a general discussion of key findings generated from Phase II.

First, it is interesting to note that there was clear support for the MOC by the large manufacturers versus the large job contract shops. Manufacturers' strong endorsement stems from their growing interest in technology in general and their desire to control any and all manufacturing functions whenever possible. These are definitely the "trend setters" for technology.

Comparatively, while both groups of respondents expressed interest in increased accuracy and understood the sometimes necessary tradeoff of higher initial purchase price vs. increased machine accuracy, the job contract shops did not completely believe the implied capability of the MOC. The job contract shop generally portrayed skepticism in the MOC's configuration--a complex, one-machine system. They wanted more detailed performance information as well as vendor assurances to support the standards proposed by the MOC. It came down to a simple belief in the reputation of the vendor. This is essentially a marketing-related problem and not necessarily a technology-related problem. Product performance perception and adoption can be changed through sound marketing strategy. All parties are concerned with machine accuracy. Everyone is interested in not only increasing production capacity but also technical capacity. Increased technical capacity allows the machine user to do more difficult work. However, the job-shop segment will require a special marketing effort in order to reduce and eliminate the mild adoption resistance expressed in Phase II.

Another important question in Phase II required the respondents to assess his ability to predict machine tool needs--to forecast his own machine-tool purchases in the next 3-5 years. The responses indicated that both segments are cautiously optimistic regarding their ability to successfully forecast demand. Such caution can be attributed to the perceived volatility within the machine-tool industry during the past few years. All respondents explained how the machine-tool market has undergone much turbulence during the last five years. Much foreign competition has

flooded the once technology-stale market with low priced, highly sophisticated hardware. Japanese and European machine-tool companies have turned the market upside down with the constant stream of new technology. Most respondents expect this trend to continue. While large manufacturers view this positively, large job shops express concern with too much "progress."

A follow-up question asked the respondents to predict the rate of technological change relative to machine tools for the next 3 to 5 years (a normal planning period). While both segments perceived a continued pattern of technology infusion, job shops perceived a slightly greater infusion rate than manufacturers. This may be a direct reflection of the job shop environment. That is, job shops not only have to compete among themselves, they must also maintain a rellative advantage over manufacturers that may attempt to do more machine work in-house. Job shop respondents sense the potential threat and view it with increasing alarm.

The final question in Phase II requested the respondent to carefully consider his own adoption decision regarding the MOC. A specific timetable for planned adoption was provided and ranged from "adoption within the next year" to "never consider for adoption." Based on prior adoption research, many respondents will avoid the extreme response and select a conservatively safe period (i.e. 5 years). The responses, as indicated below, portray a highly favorable perceptual adoption rate for the MOC.

-would adopt within the next year....
  22% Man. 21% Job Shop
-would adopt within the next 3 years.
  32% Man. 37% Job Shop
-would adopt within the next 5 years.
  40% Man. 38% Job Shop
-would never consider for adoption...
  6% Man. 4% Job Shop

These favorable results seem to paint a rather bright picture for the MOC. The two market niches represented by large manufacturers and job contract shops form the basis for early adoption of the MOC. This is a relatively substantial group (54% of large manufacturers, 58% of large job contract shops) and is not similar to the normal 12-15% represented in most diffusion models/scenarios. Such a substantial portion of technology adopters can greatly moderate the overall diffusion process or rate. At best, it represents a substantial clientele--ready, willing, and able to adopt. At worst, it reflects a substanatial % of highprobability purchasers in a market that is "technology active" and possibly pro-adoption. In any case, this situation presents a challenge not only to technology advocates but also marketing experts.

Summary of Major Findings

-Substantial ready-made market segments that are technology-friendly yet somewhat skeptical of any new technology.
-Restructuring of machine-tool market due to invasion by foreign competitors.
-Change in machine-tool producer management philosophy from product orientation. Implementation of traditional marketing techniques.
-Increasing market volatility due to recent intense competition of machine-tool manufacturers as well as changing needs of users of machine-tool products.
-Sponsoring agency frequently cited as a highly reliable, reputable organization--overall favorable competitive image.

Proposed Marketing Strategy

All new technology is subjected to the diffusion process. Due to the important role market facilitators play in the diffusion of any technology, it is important to consider the nature and scope of their role. For instance, the timing associated with technology development and introduction is critical to the long-term success for the product. Delaying the introduction of a technology such as the multiple operation concept may be tantamount to diffusion suicide. A substantial percentage of both segments is calling for the MOC within a relatively short period of time. Any delay by the sponsoring agency and technology developer might invite competition to enter the market with their own version. A delay in product of more than 3 years may significantly distort the diffusion of the MOC for the developing agency and thereby dilute potential ROI.

If introduction of the MOC can be accomplished within a period of 2 or fewer years, a "bond" might be formed between the firm and many early adopters/advocates and thereby enhance subsequent adoption throughout the entire market. For instance, the firm may select a group of product development and refinement (e.g. prototyping, test-marketing). This practice is becoming common throughout industrial markets. Such cooperation can help "pull" the product through introduction and growth into large, more profitable market segments (e.g. late adopters, early majority).

Finally a major information effort must accompany the marketing of the MOC. As evidenced in this project, confusion and skepticism are closely associated with MOC. Marketing must be able to resolve this concern by concentrating on the reliability and vendor. If the firm already has a strong reputation regarding quality, service, and value, diffusion can be enhanced through marketing effort. The general image of the vendor plays a significant role in the adoption process. Firm reputation can serve as a primary stepping stone for successful marketing. The keys to market penetration and successful diffusion rest with perceived reliability (reputation), promotion, and customer cooperation. The active marketer must be "pro" customer and realize the benefits associated with this new, more demanding role.

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Product Concept Description

"Multiple Operation Concept"

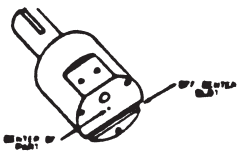
This proposed product will be a small lathe-type numerical control machine for parts 6 inches in diameter by 6 inches long or smaller. It will be able to more completely machine parts that require turning and milling. What distinguishes this product from present lathes with mill/drill attachments is the ability to move an additional axis in order to do off-axis work (see Figure A). Specifically, this product would be a "family" of machines starting with a simple 2-axis lathe as the low-end entry. By adding attachments, this machine could readily be enhanced (expanded) on the shop floor. For example, the simple 2-axis lathe could be expanded by adding mill and drill capability. Furthermore, this machine can also be expanded to include off-axis milling capability, part handling and/or unattended operation capability.

Another proposed feature of this machine concept is its ability to automatically set up. This feature would allow automated trial cuts to be performed on the first part without an operator being present. Subsequent machining of parts can be automatically monitored and adjusted. This "automatic set-up" feature may also reduce the need for a part programmer.

The primary objective of this multiple operation concept is to minimize the cost of converting raw stock into finished product while retaining or improving accuracy.

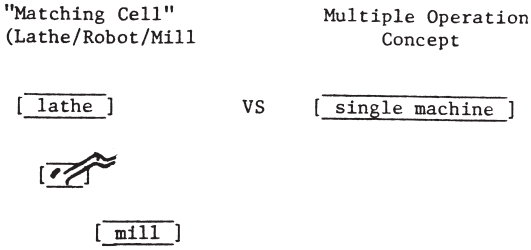
(Figure A)

Typical Part Machined by Multiple Operation Concept



(Figure B)

Comparison - Cell Concept vs. Single Machine (Multiple Operation Concept)



(Figure C)