LINE EXTENSION: PROVIDING INVENTORY MANAGEMENT BARCODING PRODUCTS AND SERVICES TO THE WOOD PRODUCTS INDUSTRY

A TEACHING CASE STUDY

by

Richard P. Vlosky

UPC Bar Code

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OREGON STATE UNIVERSITY

COLLEGE OF FORESTRY

Department of Wood
Science & Engineering

The Forest Research Laboratory of Oregon State University, established by the Oregon Legislature, conducts research leading to sustainable forest yields, innovative and efficient use of forest products, and responsible stewardship of Oregon's resources. Its scientists conduct this research in laboratories and forests administered by the University and cooperating agencies and industries throughout Oregon. Research results are made available to potential users through the University's educational programs and through Laboratory publications such as this, which are directed as appropriate to forest landowners and managers, manufacturers and users of forest products, leaders of government and industry, the scientific community, the conservation community, and the general public.

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TABLE OF CONTENTS

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In this case, the student is a senior partner in Corporate Planning Group (CPG), a strategy-consulting firm. The principals of National Systems, Inc. (the company) have retained CPG to develop a 5-year strategic marketing program to (1) strengthen current markets and (2) develop new markets for the company's line of bar-coding products and services. The objectives for the student are to (1) evaluate the current market dynamics in the context of the position National Systems, Inc. occupies and (2) develop a strategic perspective on how the company can best take advantage of new market opportunities.

INTRODUCTION

Over the past decade, there has been a structural shift in demand sectors for some major wood products categories. The repair-and-remodel, end-use segment has become a significant market for wood products relative to the once-dominant single-family housing segment. The de-emphasis of single-family housing starts is expected to continue as baby boomers spend most of their 'shelter income' on trading up to homes within the existing housing stock, rather than on the purchase of new homes. Repurchases of existing homes generally result in some degree of upgrading or remodeling. Over 34 million existing homes changed ownership from 1995 to 2000 (personal communication, National Association of Home Builders, Washington, DC 2002).

The shift from new housing to the repair-and-remodel segment has been increasingly important for many primary wood products, such as hardwood-appearance boards, softwood lumber, plywood, oriented strand board, waferboard, medium-density fiberboard and particleboard. Wood products going to the repair-and-remodel segment are typically sold through home center retailers,

3

lumber yards, and hardware stores to do-it-yourself, buy-it-yourself, and small contractor customers. Home center chains in particular have achieved recent prominence in conveying wood products to consumers, and this has altered historical wood products distribution patterns. Manufacturers, distributors, wholesalers, and other suppliers are facing an evolving customer base with a new set of rules and requirements (Vlosky and Smith 1993).

In response to the changes in the customer base, retailers have made changes in the way products are displayed and marketed. Specifically, large home center chains are requiring wood products suppliers to place labels containing a UPC (universal product code) bar code that can be used with POS scanning devices on each piece of lumber, plywood, and other products.

WHAT IS A BAR CODE?

A UPC bar code symbol is composed of a series of bars and spaces that translate into numeric information that can be scanned or read by a scanning device and translated into meaningful business information. There is no one industrial standard for bar codes; instead, there are several different bar code standards that serve different uses, industries, or geographic needs. Since 1973, the Uniform Product Code (UPC), regulated by the Uniform Code Council [an industry organization located in Dayton, Ohio (Uniform Code Council 1991)] has provided a standard bar code used by most retail stores. The European Article

UPC Bar Code

0	95043	10406	8
System Character	Manufacturer Number	Product Number	Check Didgit

Figure 1. UPC bar code.

Numbering system (EAN), developed by Joe Woodland (the inventor of the first bar-code system) allows for an extra pair of digits and is becoming widely used. POSTNET is the standard bar code used in the United States for ZIP codes in bulk mailing.

The first digit on the left is the system character that designates the industry to which the product is going (Figure 1). The first set of five digits is the manufacturer's number, which is assigned to a manufacturer by the Uniform Code Council (UCC). The UCC assigns numbers for every industry, including the wood products industry, for a one-time fee based on company revenues. The second set of five digits is the product number. This is assigned by the manufacturers and is communicated to their buyers. Every single stock-keeping unit (SKU) that a supplier sells to a home center or other scanning customer must have a separate and distinct UPC five-digit product number. The last digit is called the check digit, which is an arithmetic calculation of the previous eleven digits that confirms to the scanning device that the scan has been successful. By adopting the use of UPC bar codes, communication is improved between suppliers and their customers regarding the products that are bought and sold. In addition, neither party needs to change its present product or SKU numbering system. UPC is simply the link or translator that allows trading partners to do business in a common language.

A bar-code reader is used to read the code. The reader uses a laser beam that is sensitive to the reflections from the line and space thickness and variation. The reader translates the reflected light into digital data that are transferred to a computer for immediate action or storage.

Bar codes and readers are most often seen in supermarkets and retail stores, but many
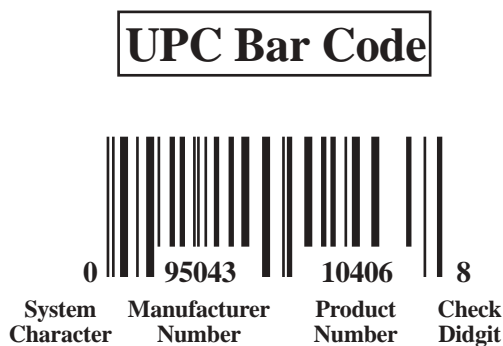
different uses have been found for them. They are also used to take inventory in retail stores, to check out books from a library, to track manufacturing and shipping movement, to sign in on a job, to identify hospital patients, and to tabulate the results of direct mail marketing returns. Very small bar codes have been used to tag honey bees used in research. Bar-code readers may be attached to a computer (as they often are in retail store settings) or separate and portable, in which case they store the data they read until it can be fed into a computer.

WHY DO RETAILERS REQUIRE BAR CODES?

Manufacturers, distribution intermediaries, and retailers use inventory management systems based on bar-code scanning for many reasons, all intended to increase profitability and competitiveness. Retailers have moved to UPC point-of-sale (POS) scanning for similar reasons. These reasons include accuracy of keying in prices and product data, inventory control, communication between buyer and seller, and improved data for corporate logistics research.

ACCURACY OF KEYING IN PRICES AND PRODUCT DATA

Errors of keying in prices and product data at the cash register are reduced nearly 100% by scanning UPC bar codes. Studies show that at the cash register there occurs approximately one error in every 350 manual key strokes versus one error in every 3 million scans of a bar code (Clemson University 1993). Checkout line throughput is also improved, with customers passing through the checkout line significantly faster when scanning, rather than keying in, information

is used (Bar Tech International Coding Systems, Inc. 1993). Scanning home centers have a distinct competitive advantage through greater sales and increased customer satisfaction.

INVENTORY CONTROL AND MANAGEMENT

Inventory control is another major cost-saving result of adapting bar-code technology. As a product is scanned at the register, the inventory of that product can be electronically tracked at the manufacturer level. In addition, as products are scanned, a computer can detect when inventory reaches a minimum threshold and electronically transmit a purchase order to the supplier's computer by electronic data interchange.

The application of bar-code technology for managing and controlling the flow of inventory through the product pipeline and for managing internal inventories is well established. Bar codes are also used at the unit or package level as part of computer-based inventory systems or for transmitting shipping information to customers. The UCC 128 and the Interleaved 2 of 5 codes are the most prevalent bar codes for unit management and inventory for the retail industry and its suppliers (Figures 2 and 3). UCC 128 and Interleaved 2 of 5 bar codes allow information to be imbedded in the bar code, including shipper, manufacturing location, date of shipment and carton or unit contents. The applicability of bar code technology for inventory tracking and control exists for any company in any industry independent of UPC bar code piece labeling requirements.

A primary use of bar codes for internal inventory management is with work-in-process inventories. These inventories can assist wood-products producers with recovery rate
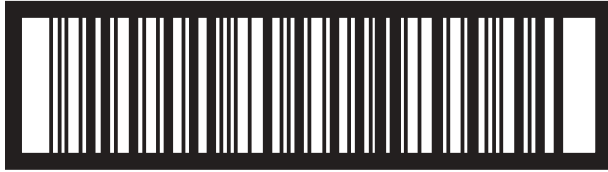
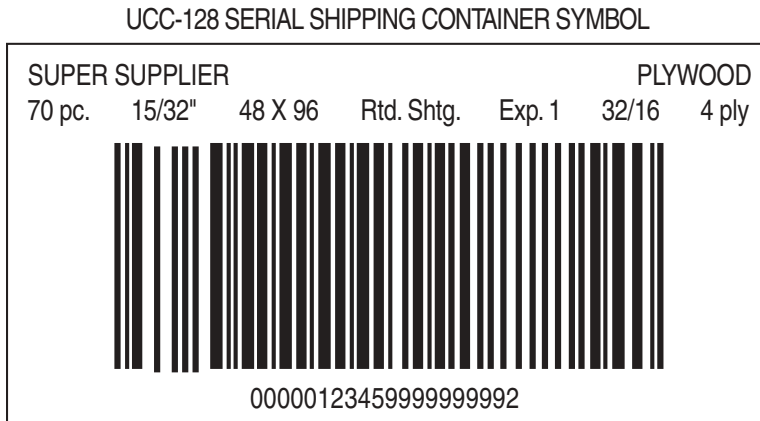Figure 2. Interleaved 2-of-5 inventory bar code.

Figure 3. UCC 128 bar code.

calculations and can be used to establish "real time" finished and rough inventory tracking and control, which is applicable for any wood product or building materials supplier.

COMMUNICATION

Communication between buyer and seller is also enhanced. UPC bar code symbols comprise a common language that describes product definitions electronically. Stern and El-Ansary (1992) state that the UPC bar code is an example of a specialized language designed to reduce the amount of "noise" in a message. Noise is described as information overloads in a communication system resulting from an abundance of detailed information being transmitted. Noise leads to misunderstandings, as information exceeds the processing capacity of the recipient (Stern and EI-Ansary 1992).

ADVERTISING

Scanning of UPC bar codes may be a useful advertising tool. Computer-generated POS data can determine whether an advertising campaign is effective for any SKU at the product, store, regional, or corporate level.

MARKETING RESEARCH DATA

Improved data for consumer market research result from real-time data availability captured at POS scanning terminals. Information derived from POS scanning can be used for tracking, modeling, and experimentation (Stern and EI-Ansary 1992).

REVENUE AND PROFITS

Direct revenue and margin improvement because cash register checkout employees are not miskeying product prices. It has been estimated that the home center industry historically has lost up to 25% of gross revenue generated from the sale of lumber and other wood products annually because of miskeying product information at the cash register or consumers purposely or inadvertently misleading cash register employees (personal communication, Michael Modansky, 1988).

BAR CODING IN THE WOOD PRODUCTS INDUSTRY

While UPC bar codes have been commonplace in the grocery industry, where POS scanning has been firmly established for decades, this is a relatively new trend in the home center industry, evolving over the past 10 years. Many home center companies currently have POS capabilities and require barcoded wood products. This includes the larg-

est companies in the industry, Home Depot and Lowe's, which together account for 35% of the U.S. market share (National Home Channel News 2002). Many other home center chains are expected to follow suit in the near term in order to retain a relatively competitive position within their industry.

Because the requirement to bar code wood products is being explicitly used as a criteron in vendor selection, wood products suppliers are accelerating their efforts to implement UPC bar coding technology in order to service this customer base. In addition, the economic return from such products is often significant. For example, in 1990, lumber contributed $599/square foot of sales area annually, the highest for any merchandise category in the home center industry (Directory of Home Center Operators & Hardware Chains 1991).

Wood products typically comprise more store square footage than other product groups. These realities increase the strategic importance for POS scanning home centers to have UPC bar code labels on all wood products. According to an industry study of the top 50 home center retailers in 1990, 80% had POS scanning capabilities or planned to have them in the next 5 years (Widman Management 1990). This will create considerable pressure for suppliers to have UPC-labeling capabilities in the near term.

There are some unique challenges to labeling wood products. For example, complications arise when attaching a bar-code label to the end of a piece of lumber that is green, rough, or both or that will be treated with preservatives. Moreover, ensuring that labels will remain attached in harsh climatic conditions (from subfreezing winters to sweltering summer temperatures in boxcars) from mill to POS represents additional difficulties. Affixing labels to wood products is quite different from affixing a label to glass or other clean, smooth surfaces. As a result, new label adhesives have been developed specifically for the wood products industry.

BAR CODING TECHNOLOGY: NATIONAL SYSTEMS, INC.

National Systems, Inc., was incorporated in July 1998 by Louis Johnson and Edward Wilson to develop an in-line labeling system utilizing bar codes for the lumber product industry. Johnson, a successful well-established lumber broker in Pittsburgh, Pennsylvania, owns 51% of the shares issued, with Wilson owning 49%. Management has a varied background, specifically concentrated in the lumber product industry, engineering, computerized bar coding, and marketing.

Since its inception, the company has successfully developed and marketed three major products: the in-line printer/applicator (the N-100); the hand-held bar code applicator (the N-150); and a turnkey printing station (the N-200), as well as the controlling software systems. In addition, the company has established distributorship arrangements for a complete line of bar-code products in order to provide turnkey systems and services for bar coding in the forest products industry. With significant success with the wood products customer base, the company has evolved to a point where the principals are prepared to expand into other bar-code-oriented applications in the forest products sector.

OPERATIONS AND MARKETING

The company has developed a line of products designed to apply bar codes to wood products at either the manufacturing or distribution level, thus allowing the forest prod-

ucts industry to respond to the increasing demand from their retail customers for bar-coded products. Operations are conducted from an office and plant facility in Pittsburgh. The company currently employs 10 people.

HISTORY AND DIRECTION

- July 1998–Louis Johnson, President of Johnson Lumber Company identified a demand for bar-coded wood products, and decided to investigate how to bar-code the production of his Pittsburgh lumber mill. When he found that no one was making bar-coding equipment for the lumber industry, he started discussing ways to accomplish this with business associates. This led to a business partnership with Ed Wilson to build a production in-line UPC bar-code labeling system. As the design evolved, it was decided to utilize the expertise being developed in the start-up of a new company called National Systems, Inc.

- December 1998–The company was incorporated for the purpose of becoming a manufacturer and systems integrator for bar coding in the forest products industry.

- February 1999–The first in-line bar-coding installation in the wood products industry was completed at Johnson Lumber Company.

- March 1999–National Systems, Inc. exhibited its equipment at the Spring Wood Show in Atlanta, Georgia. Response to the company's concept and products was resoundingly favorable. The first system sale was made at the show.

- July 2000–The company moved the operations base from the Johnson Lumber Company to leased premises in Pittsburgh.

Maria Burney, an MBA graduate from Pennsylvania State University, was hired as general manager.

MANAGEMENT

Johnson and Wilson have assembled a team that has the combination of skills necessary to be a success in the industry. Collectively, they have practical knowledge of wood-oriented industrial production, as well as experience in design and implementation of bar-coding systems, computer programming and hardware design, and mechanical design and fabrication. The management team has come up with a combination of products and services that are in strong demand in the market place. Long-term success will require a continued commitment to R&D, marketing a durable and reliable product, and responsive service to keep the equipment as trouble-free as possible.

DESCRIPTION OF CURRENT PRODUCTS

The company's current line of products is designed to apply bar codes to wood products at the mill or wholesale level. This allows the forest products industry to respond to pressure for bar coding from retailers. The company also has made sure their products are compatible with management information and data interchange systems that can be tied into the bar-coding function. The product line includes the following.

N-100 Bar Code Label Printer/Applicator Package

This equipment is designed for in-line bar-code labeling of forest products. It comes with the hardware and software necessary to read data about the product (dimensions, species, grade, date produced, corporate information, etc.), print this information in

bar-code format on a self-adhesive label, and apply the label to each individual piece of lumber as it proceeds down the production line. The N-100 consists of a computerized processing unit to read and arrange the data and prepare printing instructions, a printer to make the label, a hot glue system to prepare the piece for labeling, and an applicator system to put the label on the passing piece of lumber.

N-150 Hand-Held Label Applicator

The N-150 is a hand-held label applicator designed specifically for bar-code labels and the forest products industry. It applies preprinted labels from a roll, as opposed to the printer/applicator N-100, which prints a label for each individual piece of lumber. The N-150 resembles a very large staple gun with a feed for the preprinted labels. The present model is electric, using 110-volt current, but a battery-operated model is in the works for use in remote areas.

N-200 Turnkey Printing Package

The heart of the N-200 system is a high-speed label printer that allows customers to print their own labels in-house. The printer is supplied complete by Ricah Label Printing Systems, a Japanese firm with American headquarters in Texas. National Systems can program the printer to handle customer requirements and can also design and implement an interface to the customer's management information systems, using a custom designed software package.

THE CURRENT MARKET SPACE

National has the experience, abilities, and drive to enable them to sustain an edge in the wood products industry, which will continue to be a challenging, but growing, market. However, the principals wish to blaze

new trails in the bar-coding industry with expanded applications.

Since incorporation in 1998, National Systems, Inc., has successfully developed and marketed products and services for applying UPC bar codes to individual pieces of wood products for POS scanning purchases of home center customers. Although the company has significant market share in the three targeted market segments (lumber manufacturers, panel manufacturers, and distribution intermediaries), over the next decade this business is expected to mature, with a decline in incremental market potential. Growth in the bar-code applications industry will be in integrating bar code technology to production, inventory management, transportation and logistics, and management information systems, both within companies and in forward and backward linkages in marketing channels.

Accordingly, National Systems' strategy builds on core competencies and current expertise in UPC bar coding to diversify into bar-code-based inventory management and control systems for the wood products industry. The current company structure and employee skills point to success in this industry. Specific attributes that can transition seamlessly from UPC bar coding to inventory systems are as follows:

- an intimate understanding of wood-oriented industrial production and inventory processes
- experience in bar coding systems design and implementation
- expertise in computer programming, hardware design and mechanical engineering
- expertise in systems development and integration.

Product/service categories can be broadly segmented into the following:

- software programs that are designed specifically for wood product industry applications and are compatible with existing systems currently being used by potential customers

- computer hardware, including PCs or workstations, printers and communication hardware (modem or network card and cables)

- bar-code-related equipment configured for the wood product industry, such as label/tag stock, label/tag printers, bar-code scanners, hand-held data capture devices, and bar-code applicators.

- technical consulting, including repair and maintenance services, specialized technical services and consulting.

CURRENT MARKET POSITION

As part of a startup strategy for the bar-code-based inventory management and control business unit, National has targeted the southern region of the United States, one of the two major regions (in addition to the western region) producing wood products. The primary reason for selecting this market is the company's present corporate location in Pittsburgh and proximity to the important southern wood products industry. Initially, lumber manufacturers and distribution intermediaries will be targeted customer segments, with expansion into additional segments and regions occurring beyond the current planning period.

Inventory-management based on bar-codes for wood product applications is an emerging industry. The wood products market segment, consisting of lumber manufacturers, panel manufacturers and distribution intermediaries, is currently serviced by 14 companies. Eight of the 14 hold approximately 83% market share, and the top three companies have over 50% of the total market. Although market share is concentrated with few companies, no single competitor has had definitive success in penetrating this product market for two reasons. First, wood products industry applications typically account for only a small component of sales and are considered to be an exploratory market for them, and, second, the lack of expertise in the nuances of the wood products industry has hampered overall market penetration.

The application of bar-code technology for managing and controlling the flow of inventory through the product pipeline and managing internal inventories for the wood products industry is not well established, typical of the wood products industry being a late adopter of technology in general. Only about 3.3% of the potential market in the targeted south U.S. market region has been penetrated, with 50 installations in 1998 out of a potential customer base of 1500 companies (Vlosky 1999). This indicates significant potential for exploiting this market.

By analyzing the industry structure, the market position could be identified as a niche market in the bar-code industry, i.e., marketing to a specialized customer segment.

INDUSTRY STRUCTURE

The bar-coding industry is composed of approximately 250 companies that supply diverse products and services to an equally diverse set of customers. Bar codes are widely used to track and monitor items such as groceries, library books, hospital patients, wild animals, and even children. The industry has existed for 25 years, and the technology has undergone continuous development and improvement. Large integrated companies are

positioned in multiple customer segments, while middle-sized and small companies tend to serve fewer market segments. National Systems, a "small" company, has developed the capability to serve a very specialized market.

NICHE MARKET

Special technology is required to attach bar-code labels to wood products, and/or to ensure that labels will remain attached in harsh climatic conditions. As a result, new label adhesives and application methods have been developed by National Systems and its competitors for the wood products industry.

CURRENT STRATEGIC ENVIRONMENT FOR NATIONAL SYSTEMS, INC.

PRODUCT-MARKET DEFINITION

NS defines its current market segment (Day et al. 1979; Alpert et al. 1984) as, "Wood products manufacturers and distributors that require UPC bar-code capabilities to satisfy their customers' demand for UPC bar coded wood products."

BENEFITS OFFERED

The company's products offer two major customer benefits: (1) allowing customers to satisfy increasing demand for bar-coded wood products by their customers (home center retailers); and (2) allowing customers to maintain market position or penetrate new markets.

CUSTOMER GROUPS

The customer group for the products and services offered are wood product manufacturers and distributors.

SUBSTITUTION-IN-USE

Substitutes for company offerings are not alternative products; they are alternative offerings from competitors.

BUSINESS SECTOR PROSPECTS ANALYSIS

In order to understand the market National Systems competes in, the market potential and competitive situation including market growth rate and, in the context of the Directional Policy Matrix (DPM), market quality (Robinson et al. 1978; Figure 4) were examined. In principle, the DPM uses a composite measure to evaluate market attractiveness and market share. In using such a matrix, there is an assumption that resources are scarce and that there never will be, or should be, enough financial and other resources for the implementation of all the project ideas and opportunities that can be conceived in a successful, creative, and innova-

Market/Business Sector Attractiveness

The Company's Competitive Advantages/ Core Competencies	10	9	8	7	6	5	4	3	2	1
10 9 8 7 6	• Market leader • Maintain position					• Cash generation • Develop strategy for possible exit				
5 4 3 2 1	• Commit resources or • Exit					• Exit				

Figure 4. The directional policy matrix.

tive organization. Choices will always have to be made about investment priorities.

The matrix is constructed within two axes: the horizontal axis represents industry attractiveness, or the prospects for profitable operation in the sector concerned; the vertical axis indicates the company's existing competitive position in relation to other companies in the industry. The axes relate closely to Porter's models of competition (Porter 1979).

New possibilities can be evaluated initially along the vertical axis by considering their likely prospects for establishing competitive advantage.

Multi-dimensional measures, instead of a single factor, are probably appropriate for analysis because of the complexity of competitive and market environments.

Market Growth Rate

Although no exact figure exists for annual market growth rate, referential data exists that allow evaluation of market prospects. First, with respect to demand for UPC bar-coded wood products, overall adoption of this technology by home centers increased dramatically between 1992 and 1998. In general, across all supplier sectors, implementation of unit-level bar coding and POS scanning by home center respondents increased by 262% and 236%, respectively. With wood products suppliers, specifically, home center implementation increased 474% and 353% for unit-level bar-code scanning and POS scanning wood product merchandise, respectively. Respondents implemented unit level bar coding primarily to reduce data entry errors and to improve inventory management and control (Roadcap et al. 2000).

These study results reveal strong demand for UPC bar-coded wood products by home center retailers and considerable pressure for wood product suppliers to have UPC labeling capabilities. Based on this analysis, we believe that National Systems will face a market segment with excellent business prospects.

Competitive capability analysis

A review of the position of National Systems in relation to that of significant competitors in major submarkets was also made. Competitors identified as major players in National System's (NS) product-markets are Woben (W), Averton-Denton (AD) and Willton (WT) (Table 1).

Competitive Environment

The competitive position of National Systems is

Table 1. Competitive capability analysis.

	National Systems	Woben	Averton-Denton	Willton
Market share				
Lumber products	21.4%	28.6%	14.3%	7.1 %
Panel products	18.2%	68.2%	9.1%	4.5%
Distribution intermediaries	18.8%	22.2%	11.1%	7.7%
Hardware	Patented in-line applicator; best design in industry; lowest priced handheld applicator	Patented pre-print applicator		
Software	Programs developed in-house; compatible with customer systems	Purchased	Purchased	Purchased
Process economics	Manual	Automated	Automated	Automated
Sales & distribution	Local	National	National	Regional
Inputs of production costs	Lower than competitors			
Product R&D	Lower cost, faster reaction to the market			

strongly influenced by underlying economics and competitive forces beyond the control of participants in the industry. In addition to examining the industry structure, in accordance with Porter's theory of competitive forces (Porter 1979), we evaluated four additional competitive forces that shape the competition in this industry.

THREAT OF NEW ENTRANTS

There appears to be a low threat of new entrants for the following reasons:

- Bar-code applications for the wood products industry is a very small market relative to present competitor customer bases. The limited sales potential (relative to competitor current product-markets) is not appealing enough to attract many new entrants.

- Current companies have established themselves as competent suppliers in the close-knit wood products market.

- Start-up costs are high; experience curve effects in production and service also preclude new entrants.

- Lack of knowledge of wood product industry structure.

BARGAINING POWER OF NEW SUPPLIERS

Suppliers are likely to be powerful if

- the supplier's industry is dominated by a few firms

- the supplier's products have few substitutes

- the buyer is not an important customer to supplier

- the supplier's product is an important input to buyers' product

- the supplier's products are differentiated

- the supplier's products have high switching costs

- the supplier poses credible threat of forward integration.

National Systems management believes that the company is in a position of relative power, as it fits all of the criteria listed above.

THREAT OF SUBSTITUTE PRODUCTS OR SERVICES

There are no foreseen threats of substitute products for UPC bar-coding in this product market. The threat comes from the possibility of competitors developing superior methods to print and apply bar codes to wood products. This threat is not considered pressing.

BARGAINING POWER OF CUSTOMERS

Currently low because of few qualified suppliers.

CRITICAL ISSUES

DEMAND ISSUES

It is likely that 75% of the product-market segment will implement a bar-coded inventory management system within the next 5 years.

This exceptional projected market growth indicates significant opportunities for National Systems to exploit the market and become a market leader. As discussed earlier, the current competitive environment is conducive to National Systems success with a low level of competitive rivalry because this product market is an insignificant component of competitors' portfolios.

Buyers demand systems specifically tailored to their situation and needs.

Our communications with current and prospective customers indicate that many wood products companies that use bar-coded inventory management systems are dissatisfied. These companies express problems with design and implementation. Thus, there is an enormous opportunity to enter this market with improved modular systems that can be easily tailored specifically to customer needs designed and built by a company that understands the wood products industry. A company capability analysis indicates that the three major competitors who hold over 50% of the market purchase the software used in their systems. This "off-the-shelf" software is not meeting customers' needs. National Systems has a distinct advantage of developing software in-house, giving it the capability of easily modifying applications to meet customer needs.

Managed growth

The overarching challenge for National is to manage corporate growth while maintaining high standards of service and product quality. Experience in the UPC-bar-coding business unit shows that National can expect to turn business away as demand for bar-code-based inventory solutions will exceed National's capacity.

DESIRED FUTURE POSITION

The company's marketing plan is designed to meet several major objectives. First, management wants to maintain a level of profitability that meets or exceeds the level currently enjoyed in the company's present markets for UPC bar-coded products and applications (10%–15%). The growth in the UPC segment, coupled with growth in the new business, will help position National in the long term as a purveyor of information based management systems. Management believes that National's current business has created a corporate infrastructure that lends itself to developing inventory management at a lower cost relative to a from-the-ground-up startup. They believe that current capital and staff can transition easily to the new venture.

STRATEGIC ADVANTAGES

National has three strategic advantages that will allow it to succeed in this product-market:

- intimate knowledge of the wood products industry and participation of management as members of the target industry

- a product offering of in-house developed modular software systems

- a unique approach to technical support. Because of the limited scope of the sales and technical field force, the company has developed an advanced 24-hour on-line network service that can respond to inquiry rapidly, as well as offer computer-based remote diagnostic services, technical support and regular maintenance. This is a key core competency that differentiates National's products from the competition.

SUMMARY

UPC bar coding in the wood products industry is a niche market in the bar-coding industry. Increasing home center demand for bar-coded wood products makes this product-market attractive. National Systems has significant advantages in technology and knowledge of the wood industry, but, to

maintain long-term success, the company requires a cohesive strategy to cope with the market environment and underlying competitive forces. Overall, despite small-scale economies, National Systems has significant competitive capabilities, especially in technology, to compete in this niche market.

At this juncture, National Systems requires an entry strategy for bar-code based inventory management solutions that builds on current competencies, expertise, and an understanding of the targeted product-market. The company believes it is well positioned to penetrate this market and stimulate demand for its product offering. Management believes that sustained growth and financial success will be attained if a successful plan can be developed and implemented.

QUESTIONS

1. How can National Systems leverage current products and services to enter the inventory management market?

2. How should National Systems configure systems (e.g.,"turnkey" systems or unbundled inventory modules)?

3. How should the company address the need for innovation in an environment where product life cycles can be compressed into a year or less for software based products?

4. What kind of pricing strategy should the company employ? Why?

5. The close-knit nature of the wood products industry will ensure rapid information dissemination about National System Inc. once its products and services are introduced. How should the company establish a communications and promotion program?

6. To meet customer demand for product support services, how can the company differentiate itself from the competition in this area?

7. What recommendations can you offer that will allow National to increase profits, grow the firm at a rational and sustained rate, and capture market share?

8. What would be a reasonable timetable for key pre-plan and first-year programmatic activities to launch the inventory management division?

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