

**INFORMATION SYSTEMS PLANNING REPORT  
WHOLESALE DISTRIBUTION SECTOR**

**NOVEMBER 1986**

# THE HISTORY OF THE CITY OF BOSTON

BY  
JOHN H. COLEMAN

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INFORMATION SYSTEMS PLANNING REPORT  
WHOLESALE DISTRIBUTION SECTOR

CONTENTS

	<u>Page</u>
I MAJOR ISSUES .....	III-WH-1
A. Driving Forces	III-WH-1
B. Issues and Objectives	III-WH-2
C. Impact of Technology	III-WH-5
II NEW APPLICATIONS .....	III-WH-11
III BUDGET ANALYSIS .....	III-WH-17

the 1990s, the number of people in the world who are under 15 years of age is expected to increase from 1.1 billion to 1.5 billion.

As a result of the increase in the number of children, the number of children in the world who are under 5 years of age is expected to increase from 1.1 billion to 1.5 billion. This increase is expected to be particularly significant in the developing countries.

The increase in the number of children is expected to have a significant impact on the world's population. The number of children in the world is expected to increase from 1.1 billion to 1.5 billion, which is a 40% increase.

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WHOLESALE DISTRIBUTION SECTOR

EXHIBITS

		<u>Page</u>
I	-1 Wholesale Distribution--Driving Forces	III-WH-3
	-2 Wholesale Distribution--Issues and Objectives	III-WH-6
	-3 Wholesale Distribution--Impact of Technology	III-WH-9
II	-1 Wholesale Distribution--New Applications	III-WH-12
	-2 Sources of New Applications	III-WH-14
	-3 Allocation of Programming Staff	III-WH-15
III	-1 Wholesale Distribution--Change in Budget, 1986-1987	III-WH-18
	-2 Wholesale Distribution--1986 Budget Distribution	III-WH-19



## I MAJOR ISSUES

### A. DRIVING FORCES

- Profit margins in the wholesale distribution industry are quite low--typically 2-3%--so pressure to improve efficiency is strong.
  - The cost of storing inventory can approach 40% of its value. Minimizing unused stock is, therefore, central to maximizing profits.
  - Order processing involves large volumes of cumbersome paperwork and presents many opportunities for human error. Minimizing this paperwork is also essential to maximizing profits.
- Grocery distributors represent a large percentage (20-30%) of the wholesale distribution industry. The current state of the agricultural economy forces grocery distributors to find ways to cut expenses and boost revenue.
- Computer applications in the wholesale and retail sectors are becoming more and more interdependent as technology advances. Inventory control applications make use of results from sales forecasting applications which, in turn, rely on information gathered at the point-of-sale.
- New technology in retail drives parallel developments in the wholesale sector and vice versa. To take full advantage of information provided by point-of-





sale terminals and to remain competitive, wholesalers will have to implement demand forecasting and other applications requiring sales information.

- Most independent wholesale operations are small businesses competing for a market niche. The wholesalers who thrive will not necessarily be those offering the lowest prices. Rather, they will be those offering a comprehensive line of services. These services may include acting as automation consultants and as suppliers of hardware and software to retail establishments.
- Exhibit I-1 summarizes the driving forces for the wholesale distribution sector.

#### B. ISSUES AND OBJECTIVES

- Offering consulting services and installing automation for retail will become the responsibility of wholesale distributors. This will present a challenge as well as an opportunity for distributors.
  - Distributors within large chains have the financial backing of the entire chain, giving them the flexibility to initiate new services at a short-term loss, leading eventually to long-term gains.
  - Independent distributors have to compete with chain stores, so they require the same services from their independent wholesalers as chain stores require from their distributors. This puts a squeeze on independent wholesalers whose low profit margins make it difficult to take the risks and short-term losses associated with initiating new services or lines of business. If wholesalers can afford the short-term losses, offering automation consulting and installation will boost profits and enhance competitive position.



EXHIBIT I-1

**WHOLESALE DISTRIBUTION  
DRIVING FORCES**

- **Low Profit Margins**
- **Economic Pressures**
- **Technology Trends**
- **Competitive Pressures**



- Distributors depend on communication with manufacturers and retailers. Traditionally, order processing has relied on paperwork, but electronic data interchange (EDI) and electronic mail are quickly gaining favor. The primary use of EDI in wholesale distribution is to enter orders from retailers directly into computers, thus reducing paperwork and avoiding redundant data entry.
  
- Compatibility and standards are major issues in wholesale distribution because of the interdependence of retail systems and wholesale systems and because of the importance of communications to this sector.
  - Computers for analysis and forecasting should connect with computers for inventory control, and, ideally, both should connect point-of-sale terminals and computers on retail premises.
  
  - EDI is still a young technology, and standards have not yet been set. Although it is already useful, its ability to facilitate order processing and improve efficiency will increase significantly when and if standards are developed.
  
  - One unfavorable effect of hardware and software standardization is that it will weaken the hold distributors have on their customers. Without standards, switching wholesalers involves enormous operational changes since it can involve changing computer systems. If standards are imposed, retailers will be far more willing to switch suppliers for other reasons.
  
- A related issue is that of software integration. Connectable computers cannot provide maximum efficiency unless the software on one node can communicate with the software on others. In order to avoid duplicating data entry, it is important that data collected for one purpose can be used for other purposes. IS managers are confronting this issue early in the implementation of automation for distribution because so many applications in this sector rely on data from a single source—point-of-sale.



- The job of sorting and analyzing the overabundant data from the point-of-sale will fall to white collar workers. Their productivity must increase to keep up with data capture techniques. White collar workers must also learn to choose judiciously which data to analyze and which to discard.
- Exhibit I-2 summarizes the primary issues and objectives addressed by the IS respondents for this sector.

### C. IMPACT OF TECHNOLOGY

- Nondurable goods wholesalers have a lead over durable goods wholesalers in the sophistication of their automated systems.
  - Durable goods include bulky or irregularly shaped items like building materials and clothing. These items do not lend themselves well to laser scanning or to other electronic data capture techniques.
  - Nondurable goods, on the other hand, are generally small, uniformly packaged items which lend themselves nicely to laser scanning. Bar codes can be included in label design, and items are small enough that checkers can easily pass them over a scanner.
- Methods for electronically identifying durable goods are currently being studied and developed, but a clear-cut "best answer" has not emerged. Present possibilities include the following:
  - Kimball tags. Price tags double as small keypunch cards. Each card carries a product code which is associated with product identity, price, color, and other information held in central computers.

*[The text on this page is extremely faint and illegible. It appears to be a list or a series of entries, possibly containing names and dates, but the specific details cannot be discerned.]*



EXHIBIT I-2

**WHOLESALE DISTRIBUTION  
ISSUES AND OBJECTIVES**

- **Implementation of EDI**
- **Integration and Connectivity**
- **White Collar Productivity**



- Magnetic stripes. Information magnetically encoded on price tags identifies products.
  - Optical character recognition. Electronic readers are capable of identifying numbers printed on price tags. Equipment for this method is currently very expensive.
  - Bar code scanning. This method will be very useful when portable or hand-held scanners become available, but scanners are currently not portable.
- 
- Point-of-sale (POS) technology, including bar coding and laser scanning, makes sales data readily available to applications such as sales forecasting and precision inventory control.
  - While EDI is still in its infancy, it will be used extensively in the next five years to transfer business documents over networks. In wholesale, EDI will be particularly useful for reducing the plethora of paperwork now required for order processing.
  - Automation of wholesale distribution has traditionally included applications to facilitate inventory management and vehicle scheduling, but little beyond these. Inventory management and vehicle scheduling are still the most important aspects of automation, but they are quickly advancing in sophistication, and there is a strong emphasis on integration of all applications.
  - American distribution organizations and software companies have adopted the Japanese "just-in-time" inventory replenishment strategy and have used variations of it to develop software packages for Distribution Resource Planning (DRP).
  - Advanced software technology will yield increased program efficiency by integrating large packages using one data base for a number of applications



and by storing only one version of a procedure that is used many times in different contexts. This is particularly relevant to wholesaling since many different tasks rely on one set of data.

- Exhibit I-3 summarizes the impact of four major areas of technology on the wholesale sector.



EXHIBIT I-3

**WHOLESALE DISTRIBUTION  
IMPACT OF TECHNOLOGY**

<b>TECHNOLOGY</b>	<b>COMMENTS</b>
<b>POS</b>	<b>Large Potential for Data Capture</b>
<b>EDI</b>	<b>Streamlines Order Processing</b>
<b>Inventory Control</b>	<b>Cuts Storage Costs</b>
<b>Software Integration</b>	<b>Makes More Efficient Use of Data</b>









## II NEW APPLICATIONS

- Electronic Document Interchange (EDI) will eliminate much of the paperwork associated with order processing. The EDI market is still small but will grow at an average annual rate of over 100% for the next five years. EDI lends itself nicely to order processing tasks and may well reduce the cost of order processing by as much as 70%.
- New Distribution Resource Planning (DRP) programs automate storage and retrieval and utilize sales forecasts to determine the size and frequency of replenishments. DRP reduces storage and inventory costs by keeping excess inventory to an absolute minimum.
- Vehicle loading and scheduling programs interact with DRP to coordinate deliveries and pickups.
- In addition to EDI, DRP, and vehicle scheduling, survey respondents listed sales forecasting and bar code technology among new applications.
- Exhibit II-1 summarizes the new applications wholesalers will be implementing in 1987.
- Over 60% of all new applications being implemented in the next year are being developed in-house by internal staff.



EXHIBIT II-1

WHOLESALE DISTRIBUTION  
NEW APPLICATIONS

- Electronic Document Interchange
- Inventory Control
- Order Processing
- Vehicle Scheduling
- Sales Forecasting
- Bar Coding



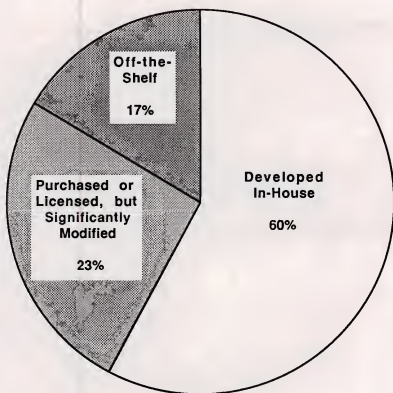
- Wholesalers will purchase but then customize approximately 23% of the applications they implement in the next 12 months (i.e., 23% of the new applications respondents mentioned will be developed outside, but modified in-house).
- They will buy and use approximately 17% of their new applications off-the-shelf with no modifications.
- Exhibit II-2 summarizes sources of new applications.
- Approximately 44% of in-house programming personnel will maintain and enhance existing systems. The other 56% will be developing new applications (see Exhibit II-3).





EXHIBIT II-2

SOURCES OF NEW APPLICATIONS

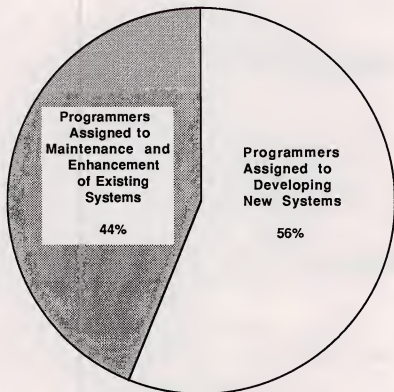


III-WH-14



EXHIBIT II-3

ALLOCATION OF PROGRAMMING STAFF



III-WH-15







### III BUDGET ANALYSIS

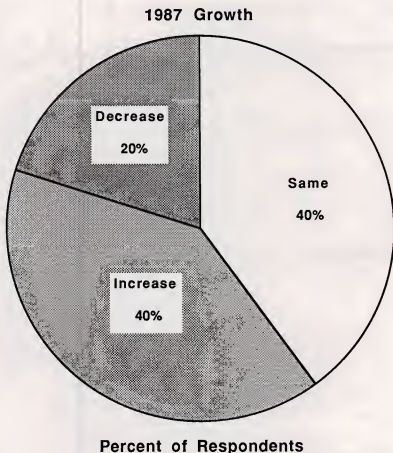
- Forty percent of the companies in this sector expect information systems budgets to increase in 1987, another 40% expect budgets to remain the same, and 20% expect decreases (see Exhibit III-1).
- The average budget growth expected for 1987 is 2.7%. In 1985, budget growth was 5.4%.
- Exhibit III-2 shows the distribution of expenses in wholesale distribution IS budgets.
- The three largest categories of 1986 budgets were personnel at 44.5%, hardware at 31.4%, and communications at 6.5%.
- The largest growth categories for 1987 are expected to be applications software and communications.
  - Applications software should increase nearly 13% in 1987. This is because of the ever-increasing emphasis on software integration. Many wholesalers are now purchasing modular software systems to which they may add new application modules as the need arises.
  - IS managers expect communications to grow 6% in 1987. This reflects increasing emphasis on using data from point-of-sale and the beginning of EDI use.





EXHIBIT III-1

**WHOLESALE DISTRIBUTION  
CHANGE IN BUDGET, 1986-1987**



III-WH-18



## EXHIBIT III-2

**WHOLESALE DISTRIBUTION  
1986 BUDGET DISTRIBUTION**

BUDGET CATEGORY	1986 I.S. BUDGET (Percent)	EXPECTED GROWTH
Personnel	44.5%	2.1%
Mainframe	18.4%	1.5%
Mini	4.4%	1.0%
Micro	7.5%	1.0%
Other Hardware	1.1%	3.9%
<b>Total Hardware</b>	<b>31.4%</b>	<b>1.4%</b>
Communications	6.5%	6.0%
PFS/SW Development	1.0%	0.0%
Applications Software	4.2%	12.7%
Systems Software	2.5%	1.4%
Hardware Maintenance	4.3%	4.4%
Software Maintenance	3.4%	0.0%
Other	2.2%	1.8%
<b>Total</b>	<b>100%</b>	<b>2.7%</b>



- Information systems budgets are approximately 0.7% of revenue in the wholesale distribution industry. This is close to the average for all industries.

