

ON-LINE MARKETING INFORMATION
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E.S.B. EXIDE INDUSTRIAL BATTERIES

BACKGROUND

Exide Industrial Battery is a division of ESB Ray-O-Vac which is a wholly owned subsidiary of INCO Corporation of Canada. ESB was founded in 1888 to supply batteries to Philadelphia Electric. The Industrial Battery Division has its headquarters in Horsham, Pa., just outside Philadelphia, and manufacturing plants located in Sumter, S.C., Richmond, KY. and Raleigh, N.C..

The primary products we manufacture include industrial batteries for lift trucks and uninterrupted power supplies with batteries for large computer installations and process control industry where backup power is required. In Raleigh, we manufacture the chargers for batteries and uninterrupted power supplies. The products are sold by our own sales force from 18 locations in the U.S. There are 34 Service Centers where the field inventory is kept.

In the past five years, there have been major changes in this Division. New products have been introduced and an old plant was closed in Philadelphia. Essentially, the Division has been undergoing change and revitalization.

One of the areas identified as requiring substantial change was in the development of new operations and systems at the Division. The old systems were primarily oriented toward accounting applications and were run in batch mode resulting in data that tended to be rather stale - showing what happened, rather than allowing anticipation of problems and opportunities.

Division Management decided that large benefits would be realized in the development of a Marketing Information System. A task force of users was then formed to define the detail system requirements. All major functional areas of the Company participated in this task force. Their efforts gave birth to a system we call Direct Order Entry System or "DOES". "DOES" encompasses the ESB-Exide Data Collection and Order Management System. It was the intent of Management to improve the order process from closing of the sale to customer delivery. The by-product of "DOES" is improved information flow to management as well as reduction in administrative costs.

The end product of the task force was a designed requirement document which delineated all the elements a Marketing Information System should contain. This document was written by the Systems Department and extensively reviewed by the user task force.

It was determined that in-house expertise was insufficient for the installation of a major on-line order entry system. Both software and hardware proposals were solicited from outside vendors. The proposal was sent to about 12 vendors which included software and hardware combinations such as DEC, Data General, Hewlett-Packard, and Corporate Computer Center - the latter consisting of NCR and Data General. The major determinant in the selection of HP as the vendor was the availability of the high level languages COBOL, RPG, FORTRAN, and their IMAGE data base software.

The design and development phase began in June 1976 with delivery of the CX System to the software house for development. The project was scheduled for completion by the end of 1976. However, the project began slowly due to changes in personnel at the software house, and because of changes that we were making. After several setbacks, the project finally took off in November, 1976, and the system was delivered to our Horsham location in August, 1977.

Within two weeks of the system's delivery, we began entering orders on the system and started printing our invoices for a small segment of our business. Within a couple of months, it became obvious that the CX could not handle the workload nor could it perform all the functions we desired of the system. An upgrade was made to the Series II in February, 1978.

We currently have the HP-3000 Series II with 512 k memory, (1) HP7905 15 megabyte disk, (1) HP7920, 50 megabyte disk and (1) 47 megabyte disk. There are 14 on-line order entry and inquiry terminals, 4 terminals for system development and one on-line terminal printer. We also have a 600 line per minute printer and a card reader. This upgrade improved the CRT response time to an acceptable level.

SCOPE

Marketing Information System "DOES" controls the order from initial receipt to final invoicing of the product.

1. The order entry covers three distinct products and meets the order entry needs of multiple market places. It can be as simple as entering a catalog number or as complex as actually designing the final configuration of a total battery installation.
2. Reservations can be made against batteries and chargers located in one of the 34 Service Centers or in transit to the Service Centers. The salesmen can inquire of product availability at the plants in transit, and at all the service stations, by calling the Customer Service Center in Horsham.
3. Assignments of firm customer orders are made against stock orders that are being produced at our plants. This is not an automatic function. An operator has to review the CRT display and then select the order she wants assigned

based on its need date and availability.

4. Shipments are entered and invoices are requested each day. In addition, each order is checked on the CRT against the customer purchase orders.
5. Customers can call and make inquiries on the status of their orders. Multiple keys are used for simplifying the order search. Since this is the most frequently used function, we designed it two ways; one is part of the "DOES" system; the other is a stand-alone inquiry routine. Since "DOES" requires heavy overhead to run, we hope to reduce the resources required.
6. Each day operational reports such as invoices, acknowledgements and shipping documents are printed for mailing the next day. In addition, various documents are printed to control paper flow at the Division. We have reduced the number of internal copy order distributions from 48 to 12.
7. End of the week reports are prepared on gross profit regarding orders received, discount analysis and freight allowances given.
8. Monthly reports consist of a sales backlog. Future plans include a profit backlog.
9. The users are writing their own QUERY programs for on-line inquiry of backlogs, order assignments and the amount of business generated from a given customer. The QUERY is used to make ad-hoc reports for management. The only complaint is that they can't cross data sets.

DESIGN CONCEPT

The system is divided in two major parts; the on-line, which is available from 8:30 a.m. to 5:00 p.m. and the batch phase, which is run from 5:30 p.m. to about 8:00 p.m. We would not start the on-line function unless there has been a successful completion of the batch process the night before. This separation of functions insures that we do not have problems with cut-off dates.

There are three data bases on the system: Open Order, Product and Customer. The Open Order data base duplicates all the products and customer information for each order. The Customer data base, in addition to containing customer information, contains reservations and availability of orders at the plants. The product data base consists of all the product information and freight rate tables. These data bases were selected in order to prevent excessive contention on one data base due to the requirement of locking at the data base level. Therefore, there's no contention between entering orders and product availability inquiries.

The languages used are FORTRAN for the on-line application, COBOL to extract information from the data base and RPG to prepare various reports on the extracted program. A special screen monitor is used to control the writer and reach to and from CRT's, and to call application routines. Block mode (page) is used to transfer data from the screen to the computer at 2400 bd. All transactions that update the data bases are logged on a single transaction file. A special recovery program is used to rebuild the data base by applying the logged transactions to the most recent back-ups. The on-line module consists of 62 code segments. The largest is 6700 words, the average is 2000 words. The total size of the on-line module is 124k words. The data stack is approximately 8k words of which approximately 5.3k words are the global area (FORTRAN common).

Communication with the CRT's, updating of data bases, and editing of input data are centralized in three of the 62 segments of the "DOES" manipulation. As a result, more than 90% of the time required to process a transaction is spent in one of these three segments. Since we are dealing with a re-entrant (or code-sharing) system in the HP-3000, this allows a great deal of efficiency to be gained as these three segments tend to remain in memory. Thus, we have decreased the amount of memory we would normally require, and decreased the terminal response time.

The batch program consists of about 40 different programs and each program performs a specific function. No attempt was made to utilize one program for multiple functions. This concept has allowed us to make changes to extract and report with minimum impact on other programs.

SPECIAL FEATURES

1. Every night we notify 18 sales offices of the number of orders we have received from them, any reschedules and special shipments that are authorized on their location. The achieved objective was to reduce the incoming phone calls since all the information was available at the sales offices.
2. In addition, each of the CRT operators can transmit administrative messages to respective sales offices or a general message to all of the sales offices over the TWX network by utilizing a "DOES" function.
3. A special subroutine was written to estimate freight which is based on Ship to Zip Code, weight and FOB point. If the customer requests the freight invoice, we utilize this subroutine to prepare him an invoice at time of shipment.
4. Our field offices have the capability to TWX orders into a central TWX machine where a paper tape is generated for subsequent batch update of the data base.

COMMUNICATIONS

1. Every night we transmit shipping documents and bill of lading to Data Point to our plants using IBM 3780 protocol.
2. Every night a specially formatted file is transmitted using IBM 3780 protocol to Western Union Data Center in Virginia for distribution of daily newspaper over the Western Union TWX network.
3. The HP is also used for transmission of information to our IBM 148. The protocol used is 2780.

FUTURE PLANS

We are currently in a phase where we are building our data bases by order only. The next phase will be to utilize this information for management reports.

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BIOGRAPHY

George J. Neibergs is Manager, Information Systems for ESB-Exide in Horsham, Pa. Mr. Neibergs was formerly with Eaton Corporation as Materials Manager. Prior to this, he was with GTE Sylvania where he held various managerial positions in Manufacturing.

A graduate of Rensseler Polytechnic Institute, Mr. Neibergs holds a B.S. in Mechanical Engineering and a M.S. in Management Engineering.