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A computer feasibility study covering the automation of Thermal Security Products

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A COMPUTER FEASIBILITY STUDY COVERING

THE AUTOMATION OF

THERMAL SECURITY PRODUCTS

prepared for
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and
Eleanor P. Godfrey

ACCY 499H

by

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To the reader:

This report is prepared for use by William Cummings, Eleanor Godfrey, and other interested third parties. It presents the findings and alternatives of a study for and recommendation to Thermal Security Products.

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DESCRIPTION OF TSP

Thermal Security Products is a manufacturing firm which produces steel replacement doors, thermal windows, and rolling shutters. The doors are purchased as blanks and then modified to order. This includes putting in windows, peepsites, dead bolts or decorative handles as well as painting or staining the doors. The windows are purchased complete, stored in the warehouse, and installed as ordered. The rolling shutters start out as raw

materials: The poly vinyl chloride slats and covers are measured, cut, and assembled at TSP. Each one is custom made for an exact fit.

GENERAL GOALS OF TSP

At TSP, all clerical, accounting, production planning, and inventory control is currently performed manually. TSP wants to expedits these procedures with a computer system.

The factory has been operating for eleven months and currently has approximately 500 transactions per month producing revenue of $141,500. As the summer season approaches and the company becomes established, much growth is expected. A three-year forecast shows a potential of 3000 transactions per month and revenue of $850,000. TSP wants a computer system that will handle current processing requirements and also accommodate anticipated volume levels and new applications. It must be economically feasible and not require extensive computer expertise for daily use.

SPECIFIC NEEDS AND OBJECTIVES

Production Control

1. To provide a daily production schedule that will insure completion of orders corresponding to promised delivery dates.

2. To provide a cutting schedule for rolling shutter orders that will reduce mismeasurements, miscalculations, and resulting excess scrap.

3. To provide printed tags to keep the individual pieces of each shutter order together and accounted for prior to assembly.

Inventory Control and Order Verification

1. To keep a running total of all inventoried items. This is a straight inventory for windows. For doors, it inc~ludes the blanks and optional additions. Rolling shutter inventory will be raw materials.

2. To be notified when any item in inventory, not allocated to a particular order, drops below a specified reorder point.

3. To be able to verify sufficient inventory for a prospective order and estimate a delivery date.

Accounting

1. To acquire and install a computerized accounting system that will eliminate the need for a manual system and will operate according to Generally Accepted Accounting Principles.

2. To provide sufficient audit trails and controls to allow for adequate verifiability and internal control.

3. To provide for more timely billings to customers and payments of invoices; to take advantage of purchase discounts available.

Office and Management

1. To maintain records that reflect the most recent data.

2. To provide better quality correspondence through word processing and mailing lists.

3. To maintain records of customer complaints and service calls due to factory malfunction.

4. To provide the ability to identify revenue sources by product line and determine profitability.

Miscellaneous Objectives

1. To acquire a computer system that is easy to use.

2. To acquire a computer system that will accommodate present and forecasted needs.

LIMITATIONS

The amount of money budgeted for this acquisition seems to eliminate the option of purchasing a minicomputer. However, the cost of a minicomputer system is included here for comparison purposes.

Three different hardware configurations were developed and compared on a cost basis to determine the most feasible alternative. Any of these configurations will meet the specifications of TSP. The acquisition costs of each, however, are quite different.

TSP indicated a desire to incur as many costs as necessary initially so that continuing operating costs will be kept to a minimum.

HARDWARE ALTERNATIVES

Although the focus of this study is on software, it is difficult, if not impossible to recommend a software package without first determining what type of hardware will be necessary.

The following general requirements have been determined for TSP:

1. 2 keyboard terminals

2. 1 dual function dot-matrix printer which has both high speed and near letter quality printing abilities

3. 1 hard disk storage system

These requirements can be fulfilled by any of the three
hardware configurations described below.

A Multi-User Minicomputer

This is a 16-bit multi-user, multitasking minicomputer which
will support up to 16 terminals. Many operations can be run
concurrently. This computer would require special site prepara-
tion because room temperature and humidity must be controlled.

For TSP, this configuration consists of a centralized
minicomputer with two keyboard terminals. One terminal will be
placed in the administrative office. The other will be used in
the factory production manager's office. Both terminals will be
on-line, allowing for direct data input and immediate processing.

A Multi-User Microcomputer

An 8-bit multi-user, multitasking microcumputer will support
up to 5 terminals with one printer. Separate applications can be
run at once. This is a desk top computer that does not require
special atmospheric controls.

This configuration is similar to that above. The two key-
board terminals will be placed in the respective offices. Because
this is an 8-bit machine, it will not process as quickly as the
minicomputer, but its speed is near that of a 16-bit microcomputer
and is sufficient for TSP's needs.

Since there are six input/output ports, additional keyboard
terminals or printers can be added. Also, this system can be
networked with other multi-user microcomputers.

Two Single-User Microcomputers

This configuration links together two identical desk top
single-user microcomputers using local area network technology.

The microcomputer placed in the administrative office will operate with a hard disk storage system. The microcomputer in the factory office will operate via a 5¼ inch floppy disk.

The networking technology will allow all data to be available to either terminal. Additional single-user microcomputers can be added to the network.

COST COMPARISON

The following price quotations are estimates from Chicago-area vendors. They are based on general specifications provided and were used mainly to determine what type of hardware to acquire so that corresponding software could be evaluated accordingly.

A multi-user minicomputer

Central processing unit for 16 users	$20,300
2 keyboard terminals @ $1,500	3,000
Line printer (175 LPM)	3,450
Total Cost	$26,750

A multi-user microcomputer

Central processing unit for up to 5 users with hard disk storage	$14,500
2 keyboard terminals	(included)
Dual-speed dot-matrix printer (190 cps/145 cps)	2,140
Total Cost	$16,640

Two single-user microcomputers

2 single-user central processing units with hard disk storage	$13,376
2 keyboard terminals	(included)
Dual-speed dot-matrix printer (190 cps/145 cps)	2,140
Network software	3,000
Total Cost	$18,516
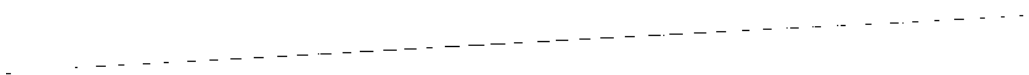
GENERAL SOFTWARE COMPONENTS

Major Software Needs

Software is a collection of programs, routines, and subroutines that instructs the computer what to do with inputted data. Current and future activities at TSP indicate that four software packages are needed: a production control/cutting schedule package, an accounting package including inventory control features, a data base management system, and a word processing package. These four packages are the foundation of the computer system and will enable TSP to achieve the goals set forth. As the firm continues to grow and administrative employees become familiar with the computer system, additional applications can be added. Software packages have been evaluated using selected criteria. Special emphasis was placed on the evaluation of accounting packages and five specific packages are ranked.

Production Control/Cutting Schedule

The basic function of this package is to take a given set of window measurements and calculate the number and size of components needed to manufacture a rolling shutter to fit that window. Each shutter is constructed for an exact fit; therefore, each order must be calculated individually. The program consists of a complicated formula broken into steps which account for the many variables involved.

This package is top priority. However, because this is a very firm-specific formula, a program has not been developed and marketed that will perform this function. A specially written program is required. It must also interface with the accounting

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package to prevent double entry of data. In evaluating accounting packages, the manufacturer's willingness to cooperate along these lines was considered.

Accounting

TSP is currently operating under an accrual basis accounting system. Records are kept manually; customers are billed as orders are completed and delivered. Bills are paid as they come due. A physical count of inventory is periodically taken. This operation is inefficient. A proposed accounting package will be able to consolidate these activities, produce statements monthly, and produce a cash forecast on demand. It will also interface the journals with the general ledger. Payroll functions are not necessary at the present, but will be added in the future.

Data Base Management

A data base is a collection of stored numbers, records, and other information. To access this information, special software is required. The data base management system is an intermediary between the stored data and an application program or between stored data and the user. It "knows" the physical arrangement of the data and can add or retrieve requested data. TSP can use this to maintain customer lists, service data, maintenance information, and revenue sources.

Word Processing

Word processing was developed as a means for raising office productivity. It allows for ease in writing and editing through its ability to manipulate words, sentences, and paragraphs for memos, letters, or reports. In addition to the basic text

editing features, a word processing package for TSP should include a mailing list program. This would allow for easy correspondence with primary dealer customers.

RECOMMENDATIONS

Hardware

Recommendation I: TSP should install one multi-user microcomputer.

This allows for the two terminals presently needed, and can easily adapt to more if company growth justifies additional workstations. The processing speed is sufficient for TSP's use and this alternative eliminates the need for purchasing networking software in addition to program software.

Software

Recommendation II: TSP should acquire CertiFLEX accounting software.

CertiFLEX is an easy to use, menu-oriented accounting software package. It is fully integrated meaning it interfaces the subsidiary journals with the general ledger. The package was designed by Certified Public Accountants, so it conforms with Generally Accepted Accounting Principles and provides a good audit trail. Customer statements, sales reports, and agings may be printed at any time, not only at the end of the month. The activity or balance in individual accounts may also be printed.

CertiFLEX is willing to modify their programs to fit any particulars of their customer's firm. CertiFLEX will also design a custom program for production, or assist in integrating a program presented by TSP with their module system.

Recommendation III: TSP should acquire D-base 3 as the Data Base Management System.

D-base 3 is the upgraded version of D-base 2, a data base system frequently used in business. The DBMS is relatively powerful, flexible, and easy to use. It allows data to be entered, sorted, manipulated, and extracted as wanted. The files of this DBMS can also be accessed with compatible word processing or spreadsheet packages.

Recommendation IV: TSP should acquire WORDSTAR along with CORRECTSTAR and MAILMERGE as the word processing software package.

WORDSTAR is a popular processing package because of its advanced editing capabilities. It is completely menu driven which makes it easy to use. CORRECTSTAR is a dictionary program which checks for correct spelling phonetically. MAILMERGE provides an automated mailing list for more efficient correspond- ence with customers.

APPENDIX

The information in this appendix is the rationale behind the choice of accounting software. The criteria below were used to evaluate and compare several software packages. The values in parenthesis represent the value assigned when the software meets that criterion. The five top rankings packages are listed following the criteria with their respective scores.

Vendor Support

1. What kind(s) of aid(s) are available from the vendor at the time of installation?

   1A. Assistance in setting the system up?

       a) Yes (2)   b) No (0)

   1B. Training sessions or seminar?

       a) Yes (2)   b) No (0)

   1C. 24-hour phone consultation?

       a) Yes (1)   b) No (0)

   1D. Regular hours phone consultation

       a) Yes (1)   b) No (0)

2. Does the software vendor allow testing of the package with your data?

       a) Yes (2)   b) No (0)

3. Is the vendor knowledgeable in general business practices?

       a) Yes (4)   b) Somewhat (2)   c) No (0)

4. How many user references is the vendor able to supply?

   a) More than two   (4)

   b) Two   (3)

   c) One   (2)

   d) None   (0)

Manufacturer Support

5. What kind(s) of aid(s) are available from the manufacturer at the time of installation?

   a) Assistance in setting the system up   (4)

   b) Training sessions or seminar   (3)

   c) 24-hour phone consultation   (2)

   d) Regular hours phone consultation   (1)

   e) None   (0)

6. Does the manufacturer provide a toll free service phone number?

   a) Yes (2)   b) No (0)

7. How much assistance does the manufacturer provide in modifying its own package?

   a) Writes programs needed   (4)

   b) Modifies own programs   (3)

   c) Assists in modification   (2)

   d) Will not modify   (0)

Documentation

8. Which of the following does the documentation explain?

   a) Hard copy of the source code to assist in modification and instructions to access the code.   (5)

b) Descriptions of safeguards built into
the program to prevent complete loss
of data   (4)

c) How to proceed in case of abnormal
terminations and system lock-ups   (3)

d) Descriptions of each error condition   (2)

e) How to perform all the routine
operations   (1)

f) How to start and terminate the program (0)

9. The documentation is:

a) Easy to read and provides step by step
instructions   (4)

b) Easy to read, but does not provide
step by step details   (3)

c) Hard to read   (2)

d) Not understandable   (0)

<u>General</u>

10. In what language is the software written?

a) COBOL or FORTRAN   (4)

b) BASIC   (3)

c) PASCAL or PL 1   (2)

d) Other   (1)

11. Is the software available in modules?

a) Yes (2)   b) No (0)

12. Is the software capable of handling the
transaction volume expected within 3 years?

a) Yes (4)   b) No (0)

Evaluation For

Accounting Software Packages

Software Package	Question Number																Total Score	Cost
	1A	1B	1C	1D	2	3	4	5	6	7	8	9	10	11	12			
CertiFLEX	2	0	0	1	2	2	3	3	2	4	5	3	3	2	4	36	$2,750
Dow Jones	0	0	1	1	0	4	3	3	2	3	4	3	3	2	4	33	$2,250
BPI	0	0	0	1	0	4	4	2	2	4	4	3	3	2	4	33	N/A
Peachtree	0	0	0	1	0	4	4	2	2	3	3	3	3	2	4	31	$2,380
Great Plaines Hardisk	0	0	0	1	0	4	4	2	2	3	3	3	2	2	4	30	$2,380