Designing and Implementing a New Nursery Computer Program at George 0. White State Nursery, Missouri Department of Conservation

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Abstract: The most recent computer program upgrade for the nursery was completed in 1992. it was time for a change. Technology changes at a rapid pace, and a 12-year-old program could use improvement. The nursery program went through a total overhaul. This paper outlines steps taken to complete this process.

Keywords: computer program, Microsoft® Access, shipping, inventory management, financial management

Computer Program History

We began entering orders at the George 0. White State Nursery, Licking, MO in 1984. Orders were entered at the nursery and data transferred to Jefferson City, MO, fur processing. From 1984 to 1991, all reporting, forms printing, and revenue collection were completed in Jefferson City.

In October 1992, a new computer program was implemented at the nursery. This was a custom program written in-house by our Information and Technology section, a programming team consisting of three programmers and one designer. This new program was written in COBOL and ran on an IBM AS/400 platform. It enabled the nursery to enter the orders, print and mail the billing cards, print shipping tags, collect revenue, and generate all necessary reports onsite. This system was used until October 2004 when a new computer program was implemented. As the Information and Technology section phased out the use of AS/400 computers in the department, they wanted the nursery system to be a server-based program using Microsoft Access. They used much of what we were doing on the AS/400 computers and incorporated it into the program we are using now.

Identifying the Needs of the Operation

The first step in creating a new computer program is to identify the needs of your operation. For our operation, the needs included: 1) processing 12,000+ orders annually and maintaining a transaction history of each order; 2) managing inventory', both estimated and actual; 3) managing financial functions; 4) shipping 50,000 packages, using two common carriers and customer pickup; and 5) the hardware necessary to make this happen.

Processing and Transaction History

We process 12,000+ orders annually. We need to be able to look at the order and see what transactions have been completed, including when an order was shipped, paid, cancelled, and so on. One vast improvement in the new system is the ability to leave text notes on the order in the computer. Previously, we attached hand-written notes to each order we changed, which created quite a filing problem. We usually change something on approximately one-fourth of our orders.

Inventory Management

We operate using an estimated and actual inventory, and sell using an estimated field inventory. However, when we are creating shipping tags, we use an inventory based on what we have actually graded. We needed the ability to look at both inventories at the same time, and the computer program needed both inventories to create billing cards and shipping tags.

Financial Functions

Our new system needs to provide the ability to manage the financial functions necessary for our operation. We accept payment by check, money order, credit card, cash, and wire transfer, and the system must maintain a history of financial transactions by date and type for auditing purposes. It needs to provide the reports necessary to transfer funds from our bank to the Office of the State Treasurer in Jefferson City.

Shipping

The new system must be able to handle our shipping needs. We process around 50,000 packages annually, and the computer program uses certain parameters to determine what will be in the package. These parameters include tree size, physical inventory availability, and payment status. Packages are either shipped or picked up by our customers. We use both United Parcel Service (UPS) and the U.S. Postal Service (USPS) for shipping. The system must be able to interface with the Pitney Bowes Shipping system to transfer addressing information. The program determines which carrier will be used based on parameters we have set up in the system (table 1).

We worked with our local post office to work out a better rate for shipping. The computer sorts our tags by bulk mail center (BMC) zones, and we process those packages by zone. The packages are loaded into mailing containers (provided by the post office) and labeled for those zones. The USPS provides transportation for those containers. Once the trees leave the nursery, they are handled very few times, and the loading time for the USPS truck is minimal.

We have contract pricing for our UPS shipping, and they have waived the special handling fee for open packages. We get a contract discount based on volume and use the hundred weight shipping for our larger orders. Loading trucks for UPS shipping can be very time consuming, and once the packages leave here, they are handled many times before they reach their destination.

Hardware

The hardware needs of the operation are very important. We needed high volume printers with the ability to print quickly on a variety of paper types. We previously used an impact printer which could handle any type of form. When we went to the new system, we were provided with two laser printers. They were fast enough, they just don't necessarily like the forms.

Establish a Timeline

When starting this process, a timeline needs to be established. We decided to have the program implemented in the fall of 2004, which seemed reasonable. Although all aspects of the program should have been done before the season started, we made the mistake of allowing certain parts to be unfinished with the promise that they would be ready when needed. This, unfortunately, caused major problems at our busiest time of the year.

Test! Test! and Retest! ⎯⎯⎯⎯⎯

When the program is ready to implement, make sure you TEST it again and again. We tested each and every step through the process, including all possible scenarios and for all potential problems. Then we tested with what we considered a large volume of data, using several hundred customer orders. What we eventually discovered was that it should have been with several thousand orders. We found later that Access cannot handle a high volume of transactions happening at the same time.

Identify and Fix Problems ⎯⎯⎯⎯

When a problem is found, get it fixed immediately. Make sure you have the problems resolved to your satisfaction, not that of the programmer. DO NOT COMPROMISE. Make sure the program is what you want.

Anticipate Problems ⎯⎯⎯⎯⎯

No matter how much you test, there will be problems. When they do happen, make sure that your programming team understands the severity of the problems resolves the issues quickly. We encountered a major problem when we tried to create shipping tags for our first major shipping date. We had tested the shipping program with several hundred orders and it seemed to work fine. However, when

Table 1—Criteria to determine package shipping method.

United States Postal Service	United Parcel Service
1) Rural address (n-State only)	1) Urban address and out-of-State rural address
2) No more than 10 packages to one address	2) Rural address with more than 10 packages

several thousand orders were in the system, the program couldn't handle all the steps necessary to generate shipping tags. It was then decided that Access could not handle the load, and the program was transferred to a SQL-server. This happened during our shipping season! We had two Information Technology (IT) employees here at the nursery for 3 days fixing a problem, after they had already spent two all-night sessions in our headquarters working on the problem.

Happy Ending

There can be a happy ending! With a few adjustments to be made, we have a computer system that is going to be very usable. We are fortunate that we have staff in our agency up to the task of completing a program like this. We were able to write this program in-house and not have to go to a private vendor. When something goes wrong, we know who to contact.

More Information

When completed, this program will be available to any association members at no cost. If any one would like more information about the new program, please feel free to contact the nursery. I can send you a print-out of the screens we use and answer any questions you have about the program.