Cutting Waste Seamlessly

Bob Reynolds
Director of Communications
University of Arkansas Cooperative Extension Service
Little Rock, Arkansas

Eugene Thomas
Interim Print Shop Manager
University of Arkansas Cooperative Extension Service
Little Rock, Arkansas

Abstract

University of Arkansas Cooperative Extension Service
Print-On-Demand

Situation: *The University of Arkansas Cooperative Extension Service traditionally has written, designed, printed and warehoused hundreds of "fact sheets."*

Problems: *Fact sheets had been printed on offset presses for decades. This required authors to order a given quantity at the time of printing.*

Several titles continued to be warehoused beyond relevancy, contained outdated information and reflected previous design standards.

The process wasted paper, employee time and warehouse space.

Objectives: *To reduce waste.*

To assure the timeliness of fact sheet content.

To bring about change in a way that appeared seamless for users.

Strategies: *Information Technology (IT) rewrote the on-line ordering program:*
- *Orders for fact sheets that were warehoused would continue to be directed to the warehouse.*
- *Orders for fact sheets that were prepared for print-on-demand would be directed to the Print Media Center.*

The Print Media Center provided 48 hour turn-around on print-on-demand fact sheets to assure a continued quality of service.

A system was established by Communications section so that authors could make content changes to update information in fact sheets.

Results: *County faculty are unaware that the fact sheets they order are printed only as needed.*

Waste has been curtailed.

Warehouse space has been freed.

Service has been improved.

The content of fact sheets is timely.

Introduction of the Organization

The University of Arkansas Cooperative Extension Service delivers research-based information to individuals, organizations and communities in each of the seventy-five counties in Arkansas. Locally delivered instruction is conducted by content specialists and county faulty in agriculture and agriculture-related practices, community and leadership development, public policy issues, environmental practices, family consumer science, nutrition, early childhood development and money management, and it serves more than 100,000 youth in Arkansas through its 4-H chapters.

As part of Extension's comprehensive educational program taught in non-traditional settings, content specialists author two to twelve-page fact sheets and other printed material, most of which is made available at no cost to clientele statewide through the seventy-five local county offices and through Extension's web site.

Statement of the Problem

Extension's fact sheets had been printed for decades on offset presses. Offset printing, due to set up costs, required a rather sizeable volume or run to be cost effective on a per-copy basis. As a result, Extension content specialists, who authored fact sheets, had been required to estimate the number of copies of each title to be printed based on assumed needs, interests and budgeted dollars available. Printing runs varied typically from 1,000 to 5,000 fact sheets and occasionally reached as high as 10,000. This procedure, dictated by offset technology and tradition, resulted in several hundred titles being warehoused for extended periods, even beyond relevancy in a number of cases. The procedure limited the ability to track the use of titles, and it drove the system for fact sheet revisions based on

quantities available in the warehouse rather than on changes in data, knowledge or style. On the occasions when new data were great enough to require major revisions, old copies were discarded and new fact sheets printed.

As a result, the process wasted paper, warehouse space and employee time. It also resulted in shortages of popular titles, with a time lag for restocking those particular titles. The procedure, once in place, did call for revisions once the quantity on hand reached a base level; however, the time between rewrite, redesign and reprinting, particularly when a given title was especially popular left Extension with shortages. When they occurred, county faculty were forced to photocopy fact sheets, wasting time and frequently resulting in poor-quality copies.

Extension had updated its ordering system from paper orders to an electronic listing and orders using the intranet. As each county office ordered a given fact sheet, the electronic ordering system maintained a record of quantity on hand so that county agents knew whether or not there was enough quantity of any given title. When the order was placed at the county or state level, it was directed electronically to the warehouse where the order was filled and shipped.

Design

The introduction of digital technology in printing in recent years provided Extension with a new opportunity for seeking solutions to the limitations inherent in printing fact sheets using offset presses. By moving the printing of fact sheets from offset presses to a digital print engine, Extension would potentially print fact sheets only as they were ordered, and in doing so, eliminate waste, free prime warehouse space and open the possibilities of changing fact sheet content as needed and on a quick turnaround that did not disrupt printing and distribution. While a fact sheet produced using print-on-

demand technology might cost a few pennies more than a fact sheet printed on offset press, the benefits potentially outweighed the cost.

Extension's communications director, print media center manager and IT director examined literature provided by vendors, analyzed the potential volume that could be moved from offset to print-on-demand, explored how counties might place orders for fact sheets and how billing might be handled and contacted one university within the Land-Grant System that had recently started using print-on-demand. Several questions were posed to the Land-Grant University:

- Was there a cost increase or savings and if so, what was it?
- Did print-on-demand free warehouse space?
- What machine was leased or purchased? Why?
- What impact did the technology have on staffing and personnel costs?
- Had print-on-demand affected turnaround? If so, how?
- What system or procedures were used to order fact sheets?
- What were the digital system's limitations?
- What were its benefits?
- What was the digital print machine's repair record?
- How did the equipment impact your overall internet use and availability?
- What difficulties did you face in implementing the new system?

At the time, there were no comparable systems in Arkansas, so Extension was limited as to its ability to visit sites and explore first hand the use of the digital technology in a printing environment.

The Land-Grant University that had implemented print-on-demand had initiated an on-line ordering system that apparently worked for that particular state, but it was determined that the approach

would not work well in Arkansas because it required extensive alterations in how employees ordered publications. It was decided that UofA Extension would transition to print-on-demand in a way that was seamless for county agents and specialists so that the procedure for submitting content or ordering fact sheets would not change. UofA Extension's investigation and planning continued for approximately one and a half years and decisions were delayed because of funding. The planning eventually involved the communications director, the IT director, the print media center manager, a programmer, the facilities manager, the business office director and the director of Extension.

During planning and investigation, it was determined that Xerox offered the only hardware and software package that came close to meeting Extension's extensive print-on-demand needs. As a result, the communications director, IT director and print media center manager traveled to Dallas, Texas to further investigate the digital print machines and software packages provided by the vendor. Though Xerox could provide the digital hardware and software necessary for print-on-demand, it did not provide software that would adequately address Extension's specific needs regarding the electronic ordering of fact sheets in counties statewide. This was not fully understood during planning, and it would impact implementation.

During planning, it was decided to partner with the University of Arkansas for Medical Sciences in negotiating for two machines, one housed at Extension and one at UAMS. The machines would be connected electronically so that both machines were available in meeting multiple, tight deadlines. The theory was that Xerox would offer more competitive prices in the lease agreement if two machines were leased under the University of Arkansas System.

Since the Xerox machine would replace two older and smaller analogue print machines located in Extension's print media center, several technical issues needed to be addressed:

- Footprint size and configuration within the available space.
- Weight load rating of the concrete slab that would carry the machine.
- Power source requirements.
- Internet and telecommunications wiring, connections and hardware and software requirements.
- Capacity for electronic storage of fact sheets.
- Potential downtime for repairs as Extension moved from two machines to one.
- Interface between the print engine's computers and Extension's server.

Finally, there was one drawback that became apparent if Extension moved the publication of fact sheets from the offset press to a print-on-demand machine. Extension's fact sheets are printed in two colors, one black and the second a spot color for design and style purposes. When fact sheets were printed on a two-color offset press, both the second color and black ink were applied during a single pass. The cost for leasing a digital print machine that printed two to four-color was cost prohibitive at approximately 35 cents per click whereas the cost per click for a black and white digital print machine was somewhere in the neighborhood of 3.5 cents or less. It was decided that spot color would be applied to a shell, using a one-color offset press and then stored on pallets in the print media center. When an order for a fact sheet title was placed, the black and white ink that printed the copy would be applied to a given shell.

Implementation

Extension leased a Xerox Docutech 6180, which has the capacity of printing up to 180 one-sided standard-size pages per minute. The piece of equipment leased also has the capability of collating, folding, trimming, stapling and printing directly from electronic versions of fact sheets at a slower rate than 180 impressions per minute.

Extension had met extensively with Xerox personnel and planned for the delivery and installation. Because the two machines leased by Extension and UAMS were the first in Arkansas, the local sales and service representatives lacked experience. This would eventually require Xerox to send in expertise from other states and greatly delayed full installation and implementation. When the facilities manager for Extension requested information on power needs for the 6180 during the planning phase, he was informed that the needs were identical to the analogue equipment that was being replaced. When the 6180 arrived, it became apparent that the power needs were greater. As a result, Extension contracted with UAMS electricians to upgrade the power going into the print media center for the 6180 at a cost that was not anticipated.

At the UofA Extension Service, telephone services and internet services fall under the domain of the IT Section. The IT technician in charge of technical support, placed telephone and network connections.

In order to avoid any disruption in filling orders for fact sheets, IT rewrote the program that was used to order on-line so that the quantity on hand triggered the program to direct the order to the print media center rather than the warehouse. In other words, if the quantity listed for the fact sheet was 999, that amount told the program to direct the order to the print media center's 6180 operator, who then downloaded the electronic version of the requested fact sheet and sent it to the digital print engine for immediate production. If the quantity shown was any number other than 999, that triggered the program to direct the order to the warehouse for fact sheets still stored in the warehouse.

As soon as the baseline quantity was reached that automatically triggered a revision, the revised fact sheet or any new fact sheet was automatically designed, saved and electronically stored for print-on-demand. Fact sheets that contained current, valid information and that were stored in the warehouse

would continue to be available through the warehouse until the supply was exhausted. If a fact sheet stored in the warehouse lacked the quantity to fulfill a complete order, that order would be filled partially by the warehouse and completed by the print media center through print-on-demand.

There were two exceptions to the procedure. If an author wanted a fact sheet printed in four color, the author would determine the quantity, the four-color fact sheet would be printed on the offset press and stored in the warehouse. If a grant paid for the printing of a fact sheet and if that grant required the funds to be spent during a time that would expire before the quantity was exhausted, it would be printed on the offset press and stored for distribution; however, once the grant-funded printing was depleted, subsequent orders would be fulfilled via print-on-demand.

Once print-on-demand was initiated, a press operator was reassigned as the operator of the 6180. A programmer continues to be involved, but only when an order requires each piece to be printed with information specific to each piece, such as a name and address, the programmer programs a field within the software used for print-on-demand that allows the machine to merge specific information per fact sheet during the printing process.

In order to expand use of the print-on-demand capabilities, workshops were provided secretaries on procedures for sending other printing jobs directly to the print-on-demand machine from their office computer. Specialists also received one-on-one instruction on how they can access print-on-demand from their office or home via computer.

After 18 months, the partnership with UAMS was dissolved and a new lease was negotiated with Xerox at a savings each month of approximately $8,000. The monthly lease is approximately $14,000 and the print media center prints approximately 4,000 to 5,000 fact sheets per month. In addition, numerous newsletters and other material have been shifted from offset press to print-on-demand in

order to provide personalized newsletters and pieces that are addressed as they are printed to take advantage of bulk mail rates, saving Extension a sizeable amount in postage. Software was made available on the intranet so that employees could take advantage of the 6180 by transmitting print jobs from their computers directly to the digital print engine. More than 500,000 impressions are made on the digital machine each month.

Benefits

Fact sheets are printed, with two exceptions already discussed, on a print-on-demand basis. This has ended waste and has freed space in the warehouse which in turn has contributed to Extension being able to cancel its lease on a second warehouse. The turnaround from revision, to design to being available for printing has been dramatically reduced. The use of digital printing continues to increase, because it also allows for the merging of information during the printing of each order so that each piece can be personalized. The most frequent use of this capability has resulted in an increase in requests for newsletters to be printed with the name and address of each recipient printed directly on the piece. This in turn has saved Extension a considerable amount in postage because it allows Extension to take greater advantage of bulk mail rates.

The decision to make the change from offset press to print-on-demand seamless has resulted in an easy transition for the customer. When asked if they have been using print-on-demand, county agents will tell you they have never used it, unaware that they have used it every time they order a new fact sheet.

The print media center manager has actively sought additional revenue by offering the service to other campuses within the University of Arkansas System and to state agencies in the Little Rock area.

As a result, the print media center has steadily increased its clientele base both for print-on-demand and offset printing.

Retrospect

The partnership with UAMS did not save money on the lease as anticipated. The need to use UAMS' machine as a backup never transpired. As a result, the need to continue the partnership dissipated and the partnership was ended by Extension.

The decision to make the change seamless has contributed tremendously to the success of the change from offset press to print-on-demand.

The cost of the machine has driven up costs for each fact sheet, but only by pennies, so it has not adversely affected the demand.

During planning it was decided that Extension would notify counties by e-mail of new fact sheet titles or of newly revised fact sheets. When this procedure for notification was followed, the demand for fact sheets dropped dramatically. The decision was then made to provide every county a copy of every fact sheet as soon as the fact sheet was available for print-on-demand. When this was done, the demand for fact sheets increased substantially.

The 6180 prints in black and white only. If the four-color print-on-demand costs were to become more reasonable, Extension would have a need to shift its four-color work from offset press to print-on-demand as well.