Records and Print Management in Higher Education

In the following report, Hanover identifies best practices for environmentally-sustainable and cost-effective records and print management across higher education institutions. In particular, we examine strategies employed by colleges and universities to store and print information as they move toward more efficient, less paper-intensive routines and environments, highlighting cost savings where possible.
Introduction

In the following report, Hanover identifies best practices for environmentally sustainable and cost-effective records management and print management across higher education institutions. In particular, we examine strategies employed by public and private colleges and universities to store and print information as they move toward more efficient, less paper-intensive routines and environments.

We begin this report by presenting best practices in the area of records management, which we discovered by examining university websites, scholarly literature, market research, and group listservs relating to Chief Information Officer (CIO) and records management issues. We discuss strategies employed by colleges and universities in the areas of records policy, forms management, and electronic records management, presenting our findings both thematically and via brief institution profiles. Our discussion of electronic records management section comprises separate sections on enterprise content management systems (ECMs), document imaging/management systems, and digital mailrooms. Where possible, we highlight cost savings as a result of these various records management strategies at profiled institutions.

In the next section, we identify a variety of print management strategies employed by institutions of higher education. The strategies include the use of variable data printing, eBook readers, multi-function device printers, and student print management. We also provide several brief profiles of institutions that engage in print reduction outreach, highlighting their practical recommendations for limiting print use. We conclude by presenting several successful student print systems and print management programs, along with the cost-savings they yielded.

Key Findings

After an exhaustive online scan of current literature on and discussion of best practices in records and print management, we identified a number of strategies employed by institutions to better store and print information. In an effort to increase efficiency and reduce paper use, many higher education institutions have implemented electronic records management systems. These systems have allowed higher education institutions to improve sustainability by facilitating:

- streamlined forms management;
- document imaging/management systems;
- outsourcing to digital mailrooms; and
- enterprise content management systems.

Higher education institutions utilize a variety of print management strategies to reduce the use of paper and streamline the printing process, including:
variable data printing;
• use of eBook readers;
• replacement of individual desktop printers with multi-function device (MFD) printers;
• establishment of new procurement and service models; and
• student print quotas.

Our examination of university policies and practices suggests that universities do not appear to utilize budgets or allocations to restrict faculty or staff printing. However, many universities do limit faculty and staff printing in public computer labs, establishing costs if faculty or staff exceed their print quotas.¹

Finally, several universities promote highly practical print management techniques through print reduction education. Common strategies promoted include:

• duplex printing;
• reducing default margin settings;
• placing documents such as bills, large reports, and course catalogs online;
• eliminating print agendas for meetings;
• reducing font size, leading, and graphic elements to condense documents;
• using change-tracking, commenting, and collaborative software features to reduce editing process print-outs.

In order to encourage the adoption of print reduction practices, it is recommended that users be “trained with an education and awareness program” or be “assisted by user friendly software that helps inform them” of the most sustainable options.²

¹ “About STC Printing Allotments at IUB.” Indiana University, Bloomington. http://kb.iu.edu/data/aouh.html
Records Management

Introduction

The authors of a 2008 Educause report on IT offices at colleges and universities in the state of Maryland identified an array of sustainable IT strategies, which they organized according to two factors: implementation difficulty and impact. A number of strategies employed by these departments relate directly or indirectly to print and records management:

High Difficulty/High Impact

- “online business practices”
- “digital imaging”
- “outsource student email”
- “proper disposal procedures”
- “education/awareness”

High Difficulty/Low Impact

- “print management for faculty/staff”
- “intranet for document collaboration”

Low Difficulty/High Impact

- “recycled paper”
- “print management for students”
- “online collaborative communications”
- “reduce hardcopy reports”

Low Difficulty/Low Impact

- “electronic reserves”
- “engaging students to promote cultural change”

To this extent, print and records management represents a considerable step in institution-wide sustainability and other efforts. In a listserv discussion on “paperless initiatives” by university CIOs, for example, IT consultant Daniel Updegrove draws the connection between print and records management, demonstrating the larger context in which these practices are situated:

Total cost of paper use extends beyond paper and printing to storage (in how many different places?), retrieval (time and difficulty of finding something in hard copy), transaction costs (i.e., the cost to capture two inked signatures on a piece of paper?), and risk (what if paper falls into the wrong hands or the admin building burns?)...Total cost of “paperless” extends beyond software and hardware to business process reengineering, training, potential loss of functionality and/or development of local workarounds and shadow systems, and risk (disaster/need for backup, electronic break-ins, greater ease of discovery in litigation, format/media obsolescence).  

Given the value of records management for college and university operations as a whole, in the following section, we explore a number of issue areas and provide examples of implementation of:

- Records Policies
- Forms Management
- Recycling
- Electronic Records Management
  - Enterprise Content Management (ECM)
  - Document Imaging & Management
  - Digital Mailrooms

Records Policies

According to an article published in the American Records Management Association’s Information Management magazine, organizations going through downsizing can employ a general set of “simple initiatives” to “reduce the volume of stored information and their associated costs and risks.”

- “Ensure non-records are removed from active storage as expediently as possible (e.g., drafts, notes, scraps of paper, and other non-business related documents and communications).”

- “Work to reduce unnecessary duplication of records. To illustrate, sending an e-mail with a 1 MB attachment to 100 people adds 100 MB of electronically stored information (ESI) to the organization. Storing that same 1 MB record in a central server or document management program and sharing a link to access it would eliminate the need for extra storage space.”

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 “Utilize document management or enterprise content management systems to implement or expand automated disposition of expired electronic records to help streamline disposition.”

 “Analyze and update current policies and procedures. Periodically reviewing retention schedules is essential to effective records management, but conduct an analysis now to determine whether the retention schedule can be refined further by weeding out obsolete classifications or reducing the number of classifications by combining record series.”

 “Develop user-friendly RIM [Records Information Management] guides (think whitepaper for RIM policy and procedures) to enhance adherence to retention requirements. Classification and disposition checklists, flow charts, intranet links, and other user-friendly compliance tools are all inexpensive ways to help organizations reduce the volume of stored records.”

 “While it will not reduce the overall volume of an organization’s records, developing legal hold policies that preserve a defensible, yet more targeted, scope of relevant documents and ESI can reduce the volume of records subject to the legal hold and result in significant cost savings.”

University of Missouri

The University of Missouri’s Records Management program, which serves a four-campus system, sets out to “ensure the university retains the necessary information to meet legal, financial, administrative, research, and historical needs and to provide efficient forms management” in the “most cost-effective manner.” According to the program website, the university “accomplishes its mission” by employing the following guidelines:

 “Helping to create records that are necessary for the efficient and successful operation of the University”
 “Saving records and information that are necessary for the continued operation of the University”
 “Creating no more records than are necessary”
 “Retaining no more records than are necessary”
 “Retrieving stored records when they are needed”
 “Establishing effective filing systems”
 “Operating an efficient cost-effective Records Center”
 “Operating an efficient and cost-effective Forms Management Program”

7 Ibid.
“Provide records disaster planning and prevention consulting services”

In its 2006 Annual Report, the Records Management program discusses how the migration of department documents to a centralized records center saved the university between $261,750 and $1,135,000.

The number of boxes received for storage increased by 17 percent to 10,470. These boxes represent the equivalent of 1,745 4-drawer file cabinets and 12,215 square feet of office floor space. The cost avoidance by eliminating the purchase of file cabinets to hold that volume of records would be between $261,750 and $1,135,000, depending on the type of file cabinets purchased, plus the additional savings of 12,215 square feet of floor space. 

**Indiana University**

Following the university’s implementation of an electronic records management system, Indiana University’s chief archivist crafted a set of lessons learned. In particular, he provided the following tips for building “record keeping functionality” into an enterprise-wide system:

- Automate records management functions to the greatest extent possible
- Design systems so that the capture of records and metadata occur within the context of an automated workflow or business process engine
- Whenever possible, build recordkeeping functionality into enterprise-wide applications rather than into individual applications

**Forms Management**

According to the Texas State Archives Commission, “a large percentage of any agency’s administrative staff time is spent reading, completing, processing, transferring, referring to, and filing forms created or received by the agency.” The commission further notes that “the cost of processing and handling forms has been estimated at twenty times the cost of paper and printing.”

**University of Michigan**

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11 Ibid.
The University of Michigan Health System outsourced its forms management process to RR Donnelly, a print services firm. The university’s procurement office identified a number of key benefits to its two-year contract with the company:\textsuperscript{12}

- “contract pricing protected”
- “better way to identify forms”
- “detailed invoice and complete usage data”
- “desktop printing of select forms through print on demand”
- “15 to 18 percent cost savings”
- “central repository for all UMHS forms”
- “content and version control compliance”
- “UPS ground shipping included in price”

\textit{Cincinnati State University}

In 2005, Cincinnati State University developed eForms, its own custom electronic forms application, giving “non-technical folks” the ability to “turn virtually any paper-based form into an electronic form.”\textsuperscript{13} According to the university’s CIO, negative attitudes toward the application have “virtually been eliminated,” as form owners can easily enter the system, determine a form’s stage in the work-flow, and see “who has ‘signed’ off on it so far.”\textsuperscript{14} Furthermore, the large number of features developed for eForms means that “ITS is now out of the ‘game’ of building custom forms.”\textsuperscript{15} These features include:\textsuperscript{16}

- “a customizable work-flow for approvals and processing”
- forms that are “centrally located and searchable”
- “security that “can be applied to each form,” as set by the “form owner”
- “archiving and retrieving”
- a standardized “Cincinnati State look and feel”

The university’s CIO highlights eForms’ “enormous impact” on the Cincinnati State University campus, noting that, to date, the university has “191 eForms in ‘production’” and over “69,000 [eForms] submitted and archived through the system.”\textsuperscript{17}

\textbf{Recycling}

\textsuperscript{14} Ibid.
\textsuperscript{15} Ibid.
\textsuperscript{16} Ibid.
\textsuperscript{17} Ibid.
Several university records management programs take part in sustainable recycling practices. In 2006, Virginia Tech’s Records Management Services “sent nearly 30 tons of outdated records to Montgomery County recycling.”\(^8\) As part of its sustainable purchasing initiative, the University of Pittsburgh notes its contract with records contractors who employ environmentally sustainable practices. One contracted supplier, Business Records Management, handles the University’s offsite records archiving and destruction, recycles ALL media once it’s been destroyed - paper, tape, film and plastic. Nothing goes to a landfill. Recycled materials include x-ray film, magnetic video and audio tape, computer diskettes, data cartridges and reels, transparencies and motion picture film. Paper is shredded, not incinerated.\(^9\)

The University of Pittsburgh’s records storage contractor, Penn Record Systems, states its commitment to “environmental sustainability, which is the impetus behind its “green” initiative to minimize the ecological impact of manufacturing processes.”\(^20\) Furthermore, the university procurement office describes its ordering and invoice process, PantherBuy, as “paperless.”\(^21\)

**Electronic Records Management**

Many universities have launched systems for electronic records management, which can be defined as the “entire process by which an organization creates, classifies, controls, and authorizes access to electronic records.”\(^22\)

In its 2009 *MarketScope for Records Management*, Gartner - an IT research and advisory company - recommends that organizations consider several factors in the acquisition of electronic records management systems.\(^23\)

- “Identify the specific business objectives for their records management initiative and select the right vendor, as a records management program requires a long-term commitment and the product needs to be compatible with the organization’s content management strategy.”
- “Assess the records management product’s capabilities to integrate and extend records retention policy into other content repositories, e-mail systems, and other information management tools.”

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\(^8\) “Sustainability Initiatives Highlights.” Virginia Tech Facilities Services. www.facilities.vt.edu/sustainability/initiatives.as


\(^20\) Ibid., 15.

\(^21\) Ibid., 9.


document archives and file stores, as well as its search and legal discovery capabilities.”

- “Consider records management products with capabilities to support multiple content types and media — physical records, which may be in distributed record centers; electronic documents, which may reside in multiple repositories; and e-mail, which may exist in both the e-mail system and e-mail archives.”

- “Consider the records management product’s certification under country- and regional-level standards such as Department of Defense (DoD) Directive 5015.2-STD, Model Requirements for the Management of Electronic Records (MoReq) and Victorian Electronic Records Strategy (VERS).”

Regarding the integration of enterprise content management systems and records management applications, Gartner points out the trend toward records management products being “increasingly integrated into the organization’s content management infrastructure as a service” and not as “stand-alone departmental records management systems.”24 Specifically, Gartner notes:

Many enterprises have yet to standardize on a single ECM platform, and will typically have multiple content repositories. Gartner research and surveys have consistently shown that over 60% of organizations have six or more content repositories. Thus, the ability of records management products to extend their reach through federation to other content management repositories, archives and applications — as well as supporting compliance and discovery — is essential.25

Gartner presents the leading electronic records management venders and products for 2009, rating them on such criteria as product/service capabilities, offering strategy, market understanding, marketing execution, business model, and overall viability. In its evaluation, Gartner considers the degree to which these products follow industry standards, presented in the following table:26

<table>
<thead>
<tr>
<th>Product</th>
<th>Rating</th>
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<tbody>
<tr>
<td>Autonomy Records Management</td>
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<td>CA Records Manager</td>
<td>Strong Positive</td>
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<tr>
<td>EMC Documentum Records Manager</td>
<td>Strong Positive</td>
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<tr>
<td>HP Trim</td>
<td>Positive</td>
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<tr>
<td>IBM FileNet Records Manager</td>
<td>Strong Positive</td>
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<tr>
<td>Iron Mountain Accutrac</td>
<td>Caution</td>
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24 Ibid.
25 Ibid.
26 Interestingly, Microsoft Sharepoint is excluded because it is not DoD 5015.2-STD certified. However, Gartner expects that “upcoming release of SharePoint 2010 will be certified in the future for DoD 5015.2-STD and will provide more comprehensive records management functionality.”
Enterprise Content Management (ECM)

ECM is defined as the “strategies, methods and tools used to capture, manage, store, preserve, and deliver content and documents related to organizational processes.” A number of higher education institutions have implemented ECM systems in order to reduce costs related to maintaining records and improve records security.

University of Wisconsin, Milwaukee

The University of Wisconsin, Milwaukee’s IT department implemented Xythos ECM, an enterprise-wide service delivery product, following a $1 million budget cut. Reflecting on the ECM initiation, the university’s CIO made several recommendations for “other organizations seeking to gain cost savings advantages from ECM,” such as:

- “take an aggregate from your constituents and leverage those services,” because “a majority of departments manage content in similar ways”
- “take the time to work through business processes with the goal of simplifying where it makes sense to do so”
- “help your customers to understand that consistency and doing things in common ways actually helps to foster creativity”
- “use the International Institute of Business Analysts (IIBA) requirements guidelines and then map requirements to potential vendor options”
- create a “rigorous requirements management process” to ensure that requirements are “done right from the beginning”

Fairfield University

Fairfield University deployed an ECM system in order to centralize and manage content across the university. Because its ECM system enabled the university to use a single standard server type and “shut down file servers and fold the services they provided into Xythos [ECM],” the university estimated that it could save $500,000 over a two-year period in “hardware related costs alone.” However, Fairfield University’s Director of Computing and Network Services cautions against hasty

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<tr>
<td>Laserfiche Record Management Edition</td>
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<td>Open Text Records Management</td>
<td>Strong Positive</td>
</tr>
<tr>
<td>Oracle Universal Records Management</td>
<td>Positive</td>
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</table>

Source: Gartner

29 Ibid., 7.
30 Ibid.
content migration, encouraging institutions to allocate “time in advance developing a common set of policies and templates to guide how data should be stored and shared with different types of users based upon identities and roles.” He warns against “the temptation to move the data and update access rights all together,” since a one-time offloading of “different server’s content into one centralized location” will not be possible without early-phase standardization.\(^{31}\)

**Santa Barbara City College**

By investing in an ECM, and “streamlining inefficient client processes,” Santa Barbara City College has been able to save an estimated $160,000 annually.\(^{32}\) With a “variety of scanners and multi-function printers,” the college uses Xythos ECM to scan, search, classify, and deliver documents and reports. Furthermore, the new ECM helped the college to:

- manage and standardize the “paper intensive” accreditation process\(^{33}\)
- reduce the number of IT helpdesk calls
- devote less staff time to system maintenance
- streamline admission and financial aid office workflow
- eliminate the need to transcribe handwritten staff notes for official documentation
- move “paper submission forms and processes online”\(^{34}\)

The college’s Vice President of IT also discusses how Xythos ECM helped to reduce the use of paper at staff meetings:

Instead of distributing printed meeting agendas and supplemental documents, meeting information is created in desktop applications and then shared via the built-in email capabilities of Xythos. Meeting participants can read the information online or, then print it at their own discretion. Committee members use projectors to share content during meetings, which is more environmentally correct...While Bishop cannot report the specific cost savings resulting from print reduction, he did mention that SBCC had saved enough money to purchase 52-inch displays for about ten of their class and conference rooms.\(^{35}\)

**Document Imaging & Management**

Many institutions have implemented document management systems in order to reduce the proliferation of paperwork. In conjunction with well-defined records

\(^{31}\) Ibid., 10.
\(^{32}\) Ibid., 11.
\(^{33}\) Ibid.
\(^{34}\) Ibid., 13.
\(^{35}\) Ibid.
management policies, a document management system increases “efficiency, reduces labor and storage costs,” and improves “back-up and disaster recovery capability.”\(^\text{36}\) According to a print and document technology review conducted by Wyse Technology in 2007, records managers should scan “paper documents so that they are accessible online” and install “good document management systems so that they can be easily retrieved.”

According to the authors of the 2007 Wyse review, the “top ten Electronic Document Records Management (EDRM) systems” are:\(^\text{37}\)

- Captaris
- DocuWare
- EMC
- IBM FileNet
- Hummingbird
- Interwoven
- Open Text
- ScanPoint
- Softlinx
- Tokairo

**Dickinson College**

Dickinson College’s admissions office implemented a document imaging system, Nolijweb, in order to reduce paper use and improve the efficiency of its application process. Admissions counselors mentioned several key inefficiencies prior to the implementation of Nolijweb:\(^\text{38}\)

- “Missing applicant files and filing delays”
- “Recruitment Plus missing items out of synch”
- “Counseling staff filing instead of reviewing applicant materials”

Following the implementation, Dickinson College saw the following improvements:\(^\text{39}\)

- “Reduced paper consumption by approximately 40,000 pages”
- “Increased data entry and review efficiency.” While each paper application takes ten minutes to enter and review, electronic submissions require less than one minutes.


\(^\text{37}\) Ibid.


\(^\text{39}\) Ibid.
“Developed integration with Common App Online,” through which “over 65% of applications and supplement forms are submitted.”

Cincinnati State University

Cincinnati State University implemented Perceptive Software’s ImageNow imaging software to “‘attach’ paper images” to student records in its Datatel Colleague System. According to the university’s CIO, this software has gone a “long way to get off-site storage cleared up” for the university.40

University of Tennessee, Martin

The University of Tennessee, Martin’s “admissions, records, and financial aid offices use Xtender, an “imaging and document management suite specifically designed for higher education that launches documents and content directly from [SunGard’s] Banner Student Information System,”41 “for everything from records attached to Banner to meeting minutes.”42 According to the university’s CIO, the Xtender implementation was intended “to reduce paper, but the main goal was to provide better access.” The university expects the following results from its implementation of a document imaging system:43

- “the reduction of physical space used for file cabinets and storage”
- “reduction in duplication of documents”
- “standardize the scanners being used”
- “documents will be easier to locate”
- “reduce the amount of paper”
- “documents will be accessible to those that need them”
- “documents will be preserved in case of fire, flood, tornado”
- “enterprise solution with centrally managed software and backups”
- “more secure, since not open on the desk”
- “save time in retrieving documents”
- “better service to customers”

Other Examples

In a discussion on “Digital Document Management on the Cheap” on the Educause CIO listserv, several universities mentioned effective alternatives to expensive,
proprietary document management software. Wartburg College’s former Director of Academic Computing, for example, discussed the use of simple PDFs in his Enterprise Resource Planning (ERP) software:

At my previous post, our ERP client software allowed links (URLs) to PDF documents on local file servers. For example, Admissions personnel would scan documents to PDFs and paste URLs in the corresponding student’s record. We also adopted a standard document naming convention. The end result was rapid, convenient access to documents normally retrieved from filing cabinets…We also scanned all student health records in a similar fashion and embedded links into the ERP client software.44

Roanoke College uses Integrated Imaging’s “cost-effective solution for scanning and database storage.” Roanoke’s VP of IT notes that the company’s “document type, indexing, and database (MS SQL) is generic,” which facilitates “migration to other solutions if necessary.” He also mentions how to save on scanning and indexing:

I would caution against scanning without indexing from the start as the project will grow quickly once it is introduced. Back filling indexing can be time consuming. Finally, finding a company which will work with you on the physical scanning is helpful as although much can be accomplished in house with student assistants large volumes and old formats, microfiche, are handled effectively by outsourcing.45

Cornell University developed Fedora (Flexible Extensible Digital Object Repository Architecture), an open-source digital asset management service that provides “environment upon which applications can be built to manage a wide variety of digital objects” and supports “virtually any digital format,” including scanned images, PDF documents, graphic formats, and standard file types.46

**Digital Mailrooms**

As Gerry Santelli, VP of Business Development for Databank IMX, another digital mailroom provider, describes his company’s business model:

> Our digital mailroom operations allow us to receive the applicant’s paperwork at one of our full-service scanning centers, open the mail, sort, scan, index and move the electronic documents into the school’s line-of-

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business software, student information system, or workflow and document management systems.\footnote{Forestweb. “Document conversion services company DataBank showcases paperless admissions, financial aid applications at NACAC educators.” http://my.forestweb.com/iiFeed/view.cfm?id=1876557696&lid=9695}


Furthermore Northeastern University and St. John’s University outsource the document imaging and paper-handling process of their financial aid and admissions offices to Databank IMX. Northeastern University’s partnership with Databank IMX means that online forms now “automate input from the applicant, while all paper-based applications and credential documents are sent to a post office box managed by DataBank IMX for Northeastern.”\footnote{“Success Story: Northeastern University.” Databank IMX. http://www.databankimx.com/press-release/northeastern.pdf} 50 For St. John’s University, DataBank IMX consistently meets the institution’s “desired turnaround time of 72 hours,” “even during peak processing periods.”\footnote{“St. John’s University Found its Solution with Databank IMX.” Databank IMX. http://www.databankimx.com/st-johns.html} 51 The implementation of DataBank IMX, along with improved business processing, “made it possible for the University to send out acceptance letters before Christmas for the first time in St. John’s history.”\footnote{Ibid.} 52 Following these results, the university also decided to contract Databank IMB to process “all Financial Aid documents.”\footnote{Ibid.} 53
Print Management

Introduction

In “Energy Efficient Printing and Imaging in Further and Higher Education” JISCO (Joint Information Services Committee) - an advisory committee supporting information technology research for higher education in the U.K. - reviewed best practices for print management and document imaging. The authors present the following ways to reduce print use:\(^{54}\)

- Send “faxes electronically by exploiting the scan to email function on MFDs”
- Do not print “short drafts or emails”
- “Consolidate multiple printers/copiers and other equipment into a smaller number of volume devices, many of which are likely to be MFDs”\(^ {55}\)
- “Optimize document formatting and toner usage”
- Utilize “sustainable procurement standards, such as Energy Star”\(^ {56}\)
- Select vendors who can deliver “good environmental performance,” and “provide information and support”\(^ {57}\)
- When selecting a vendor, consider “takeback schemes for packaging; end of life schemes which do not involve additional customer payments; availability of relevant software options (e.g. toner optimization); and accurate information on energy usage”
- Buy “recycled and/or lighter weight paper”\(^ {58}\)
- Use duplex printing
- Avoid “double-spacing, large margins, small amounts of orphaned text and unnecessary white space in documents to be printed”
- Utilize print preview
- Print in draft mode
- Use “scrap (copied on one side only) paper for draft copies whenever possible”\(^ {59}\)

A 2007 “Review of Technology” conducted by Wyse Technology, upon which may of JISC’s findings were based, recommends additional sustainable print management practices, such as:

- Using “a software bridge that sits between the university network and the Copier/Printer (MFD)” and “allows users to utilise the copier to scan

\(^ {55}\) Ibid., 21.
\(^ {56}\) Ibid., 21.
\(^ {57}\) Ibid., 20.
\(^ {58}\) Ibid., 22.
\(^ {59}\) Ibid., 23.
documents to a number of different places and in a number of different formats.”

- “Network Print Management” and MFD fleet management
- Print tracking and copy auditing solutions
- PDF tools, which “have become an integral part of most organizations document management planning,” supplanting “the need for expensive meta tagging in archived documentation”

Regarding this last recommendation, the authors justify the preference for PDF tools among institutions:

The use of a PDF tool by staff and students on campus is essential if a “portable” document is to be created that can be printed, published or distributed in the most effective manner. If a central print unit is the most effective place to produce a document on campus, then the only way that faithful reproduction can be assured is via the use of PDF. This ability to create and reproduce PDFs is essential to continued usage and success of any university Print Unit.

According to the Wyse review, any print management system needs to be able to achieve the following:

- “Act as a one-stop management for network printing and photocopying”
- “Minimize waste and control usage”
- “Monitor and recover printing costs”
- “Work in a cashless campus”
- “Reduce day-to-day administration”
- “Track and report asset total costs of ownership”

The authors of the Wyse review conclude by listing the necessary capabilities of an “enterprise wide print management and cost recovery system.” These include:

- “Control of printing resources and costs across the enterprise”
- “Accurate page counting”
- “Support for a wide range of printers”
- “Support to HE [Higher Education] range of MFD suppliers without exception”
- “Devolved management of resources”

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61 Ibid., 15.
62 Ibid., 26.
63 Ibid., 14.
64 Ibid., 18.
65 Ibid., 26.
“A comprehensive, fault-tolerant audit trail”
“Flexible charging strategies”
“Customizable web-based viewing of audit trail and printer status”
“Automated crediting options via card, cash deposit stations or web based payments”

It is worth mentioning the consequences of conflating “pages” with “cost.” As IT consultant Daniel Updegrove warns: “High-volume printing tends to have low per-page costs; unilaterally removing an application of high-volume printing may result in proliferation and use of local printers, often with much higher per-page costs.”

In the same way, “an initiative that reduces the University’s (visible and budgeted) paper use may shift print costs to students in their residences and faculty/staff at home”

In light of these recommended strategies in print management, in the remainder of this report we explore higher education institutions’ practices in:

- Variable Data Printing
- eBook Readers
- Multi-Function Device Printers
- Procurement Models
- Print Reduction Education & Outreach
- Student Print Management

**Variable Data Printing**

In an effort to cut printing expenses, a number of universities promote the use of variable data printing, an on-demand format that allows departments to “tap purchase-history databases to design, create and print entirely personalized catalogs.” Variable data printing helps universities to better customize mailings, integrate print and other media, and change text, image, and design elements “without stopping or slowing down the printing process.” The University of Iowa highlights the format as a major cost-cutting opportunity, citing its use for fundraising letters and credit-card applications. Oregon State University’s mail office notes the following applications for variable data printing:

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67 Ibid.

68 ‘Dead-tree Medium’ No Longer: For Many Marketers, Print Outperforms Digital.” Knowledge@Wharton. http://knowledge.wharton.upenn.edu/articlepdf/1919.pdf?CFID=14613437&CFTOKEN=17815783&sessionid=a83of83a33eb8f7a45535973121623196d


• Transactional or Statement Printing
  o Accounts Receivable Bills
  o W-2’s
• Basic Mail Merge
  o Letters
  o Postcards
  o Flyers
• Marketing Applications
  o Informational brochures
  o Newsletters
  o Donor letters
  o Catalogues

**eBook Readers**

With low manufacturing costs and low power consumption, eBook reading devices have “a potential for decreasing environmental impact” compared to paper-based products. In 2009, Princeton University equipped students and faculty in several courses with new Amazon Kindles as part of a campus-wide “sustainability initiative to conserve paper.” According to one Princeton administrator, the Kindle would reduce the use of paper by obviating the need to print e-reserves.

The University of the Pacific’s CIO notes the successful paper-saving potential of Kindles among administrators. In regards to a previous posting, the CIO at the university writes:

> Dan’s note reminds me that at Pacific I gave Kindles to the Provost and all the Deans and other members of the Provost’s council. For almost a year, paper agendas and discussion documents were not printed, but sent to a LISTSERV that blasted them to the individual Kindles wirelessly at no cost.

**Multi-Function Device Printers**

Many institutions have decreased the number of individual desktop printers, opting instead to purchase a smaller number of multi-function device (MFD) printers that combine printing, scanning, copying, faxing, and even email functions into one machine.

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Kent State University

Following a “60-day pilot phase with three departments of varying size,” Kent State University consolidated its printing equipment, relocated devices based on usage, and replaced “many single-function devices with fewer multifunctional machines.” According to the university’s Director of Procurement, these recommendations, which would significantly “reduce dependence on inkjet and laser jet printing,” could “amount to hundreds of thousands of dollars” in savings.

Hood College

In 2009, the IT Department at Hood College decided that it would “no longer pay for individual printers.” According to the college’s CTO, “individual printers became the responsibility of the department.” Even though the department still pays for the maintenance of individual printers, the printers’ “cost factor has gradually caused them to not be replaced” upon failure.

University of Tennessee, Martin

The University of Tennessee, Martin’s CIO discussed strategies for print-function consolidation:

We moved away from individual printers to MFD’s a few years ago by showing the cost per page and by creating a special 5 year purchase plan for departments to buy MFD’s. We do not prohibit individual printers, we just explain the cost.

Villanova University

Villanova University anticipated that its “Copier/MFP Replacement Program,” which would “replace Minolta copiers with Cannon Multi Function Print devices” could save the university up to 30% per year, based on new contractual agreements.

University of Texas, Austin

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75 “Pilot Phase of Print Management Initiative Comes to a Close.” Kent State University. http://einside.kent.edu/?type=art&id=91561
76 Ibid.
78 Ibid.

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The University of Texas, Austin, “rightsized” its printing fleet by selecting “a single vendor who provided a solution to consolidate 100+ pieces of office equipment down to 24 multi-function devices for the CFO Organization.” This rightsizing project led to a “40% reduction in print output costs in terms of equipment purchases, leases, maintenance and supplies.”\(^{81}\) The single-vendor option further reduced service costs, as it permitted:\(^{82}\)

all departments on campus to participate and to pool volume on an annual basis. This will reduce costs because many of the University’s copier agreements are based on a set amount of monthly copy minimums, even if actual usage is significantly less. Additionally, any month in which the minimum volume is exceeded results in monthly overage charges. By participating in the rightsizing program, all volume is pooled on an annual basis.

**Procurement Models**

*Duke University*

Duke University initiated a centralized print management program to allow the university to “benefit from consolidating contracts and volume buying from experienced print buyers as well as improve service, track savings, and monitors quality.”\(^{83}\) The program, which mandates that print projects “costing more than $2,500” be “bid and coordinated by the Print Management Team,” manages the following processes for the university:\(^{84}\)

- “Commercial and specialty printing services (offset and digital)”
- “Print specification development and review for cost effective printing”
- “Mail addressing services of completed printed projects”
- “Developing contracts for magazines, newsletters and other repeat publications”
- Graphic design referrals
- Coordinating “mail addressing services on projects without printing as part of the project”


\(^{82}\) Ibid.


\(^{84}\) Ibid.
Kennesaw State University

In 2004, Kennesaw State University improved its print management business model, redrafting its service agreements and meeting the following goals, as set by the business model task force: 85

- “Impose clear operating standards on the vendors
- “Ensure that the latest technology was in place throughout the term of the contract”
- The new print management system “was to be online, enabling immediate activating or termination of users”
- “Total portability,” whereby “copy/print access could be from any PC and used at any device on the network and charged to any valid administrative department code”
- “Students or personal use accounts would also be available at every device on the network”
- “Reports would be provided that allowed any department to know who had made what copies (number and type) at what devices and when”
- “Paper would be purchased” at “state contract rates, but deployed by the vendor”
- “Only models in current production and currently supported by the manufacturer could be deployed”
- “Penalties if strict 98% equipment uptime performance” and “2 hour problem response times” were not maintained

According to the university, “reduction in expense (which to date has never been more than $68,000 in a month versus $100,000 per months for similar usage under the old contract)” spurred by the new model “has been significant.” 86 In addition, the university identified a number of favorable results: 87

- “Functionality (faxing, color, and scanning) has been increased across campus”
- “Faculty and staff can have their own personal use declining balance account just like students”
- “Costs to users were either maintained at the old levels or reduced (none were increased) despite the increased services offered. In many instances, existing fax machines and their phone lines were disposed of, increasing savings.”
- “Paper costs were reduced from approximately $0.04 per page to the state contracted rate of less than $0.01 per page (a significant savings when usage is over 20 million images per annum)”

86 Ibid., 11.
87 Ibid., 2.
Villanova University

As part of its 2004 campus-wide print program, Villanova University created a “revised consumable model” to enable “the best possible pricing for all ink, toner, and paper supplies.” Through a single-channel and a more “efficient and expedient methodology for the attainment” of supplies, the university estimated that it could save “between 5% and 7% annually” on consumables, which “translates to savings of $7,500 to $10,000 per year.”

Furthermore, the university implemented a printer acquisition program, which reduced the “variety of printers on campus by establishing a standard set of devices,” and sent “all hardcopy acquisition requests through a single channel.” The university anticipated the following results:

By limiting the variety of printing devices, UNIT is seeking to save 5% of its’ current expenditure on printer support. On average, Villanova acquired 159 new printers a year for the last three years, at an average cost of $117,000 per year. By reducing the total number of hardcopy devices in the University’s install base and establishing a formalized refresh program, the anticipated savings could well exceed 20%.

Print Reduction Education & Outreach

In order to diminish opposition to print reduction initiatives, the authors of Wyse’s 2007 “Review of Technology” offer the following tips:

- “It is usually best to be honest if cost savings are the main reason for change, as pretending otherwise is likely to create cynicism.”
- “Providing information on the environmental impacts of multiple devices, or paper usage, can help to soften the blow.”
- “Consolidation and print management can make printing more convenient as it can be done from a greater number of locations.”

University of California

The University of California recommends that staff and faculty print “directly from your PC to high-volume copy machines in common areas.” The university notes that the cost of printing to a networked copier, as compared to a printer, is less than

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89 Ibid.
between $.045 to $.065 per sheet, based on the reduction in “maintenance costs, energy consumption, and toner cartridge purchases.”\textsuperscript{92} The university states that its policy on sustainable practices “commits the university to using office paper with a minimum of 30% post-consumer recycle content.”\textsuperscript{93}

The University of California, Davis recommends document reformatting in order to decrease printing output. The university bases its recommendation on research conducted by Pennsylvania State University:

In October 2001, a research team of the Penn State Green Destiny Council released a report on the ecological analysis of Mueller Laboratory, a biology building on the Penn State University Park campus. This policy paper, derived from the report, showed how PSU could save 72 acres of forest and over $120,000/year by reducing the default margin settings campus wide\textsuperscript{94}

\textit{Princeton University}

Princeton University’s “Printing Less at Princeton” webpage explains both “why you should help” and “how you can help” to eliminate paper waste. Through its “Printing Less” program, Princeton provides a set of practical ways to reduce paper use:\textsuperscript{95}

\begin{itemize}
\item “Always print double-sided, or ‘duplex’”
\item “Use the ‘Print Preview’ option in the File menu before you send your document to the printer”
\item Select the “Printer-friendly” version of each website printed
\item Constrain the “need to print everything” by “using a PDF manager to organize” documents
\item “Create your own PDF documents” if “if you don’t have an easy way to save something, or want to preserve how it would look on paper”
\item Decrease page margins
\item “Print less of a document by choosing to print only the selection”
\item “When printing from Excel, make sure to define the print area to avoid wasting paper”
\item Print and distribute Microsoft PowerPoint slides with “4 or 9 slides per page”
\item Use ‘n-up’ or ‘booklet’ style printing
\item Employ a “variety of web browser tools and extensions” to remove “space-hogging graphics” or advertisements before printing
\end{itemize}

\textsuperscript{92} Ibid., 2.
\textsuperscript{93} Ibid., 3.
\textsuperscript{94} “Reduce Printer and Paper Use.” UC Davis Environmental Stewardship and Sustainability. http://r4.ucdavis.edu/programs/printCenter/reducePrinting.php
Use Microsoft Word’s “built-in commenting, change tracking, and collaboration features” and Adobe Acrobat’s PDF highlighting and mark-up capabilities” to reduce editing and grading process print-outs

Organize “paper-less thoughts” with software such as “Microsoft OneNote, Evernote, Scrivener, Yojimbo, MindMeister, VoodooPad, SOHO Notes and DevonThink”

Distribute course readings and submit assignments electronically

Collaborate with “students and colleagues online” and publish material online using resources such as “Blackboard, SharePoint, and WebSpace”

Goucher University

Goucher University’s “Print Wisely” program, initiated in 2006, discourages “wasteful printing” on the part of faculty and students through a print quota system in public computer labs. In tandem with this program, the Student Government Association passed several resolutions to reduce paper consumption among the entire community, “firmly” requesting that:

- “all professors at Goucher College encourage and accept double-side printed papers” and
- “all of Goucher’s computers that are connected to a network printer be defaulted to double-sided printing’ college purchase 100% recycled paper when it is available”

University of Florida

The University of Florida offers a set of “alternatives” to current print practices. As an alternative to copying “50 copies of a 150-page double-sided annual report, all color,” staff can:

- Reduce report size “by as much as half without eliminating data” through improved design
- “Print a short executive summary – typically 6 to 8 pages, and place the remainder of the document online”
- “Place the entire document online, and send links by email to the recipients explaining UF’s commitment to the environment by converting to electronic delivery”

The university notes the cost of placing a “small blue bar” on “each page of a 100-page” report, stating: “that small blue bar changed the price-per-page from 2.6 to 39-

97 Ibid.
cents per copy. $39 with the bar - $2.60 without.”

The university recommends that staff could “design the cover in color to create a quality impression, and copy the remainder of the pages in black & white,” or “place the document online, where color is free!” Furthermore, the university offers three alternatives to relying upon “the Handy-dandy Desktop Printer.”

- “Good alternative: If you do need a hard copy, print out one copy – then photocopy the rest. Photocopies cost less than printouts.”
- “Better alternative: print and copy on both sides of the sheet, which essentially cuts paper usage in half.”
- “Best alternative: don’t make that hard copy! You may prefer to read a printed page, but stop before you push that button and whenever possible, read, file and distribute documents by email.”

The university also urges staff to “think before you ink,” asking that department staff consult with their “Green Team” captains and adhere to the following set of guidelines:

- “Consider using a ‘print on demand’ service so that copies are ordered as needed. This prevents extra copies from being printed that will not be used”
- “Encourage your faculty to consider adding a fee to cover copy costs when the distribution of printed materials for a class, for instance, is unavoidable”
- “Convert tenure and promotion packs from bundles of printed packets to online submissions”
- “Where practical, set print lab computers to default to double-sided printing”
- “Consider ways you can reduce your paper consumption like eliminating full-page agendas for group meetings”
- “Condense content to a summary document and refer readers to the web for more information”
- “Use a smaller font,” “reduce the width of the margins,” “decrease leading (the space between the lines of type),” and “reduce the number of photos/graphic elements or reduce the size of photos/graphics”

Mount Holyoke College

Mount Holyoke College outlines six ways in which the institution intends to “reduce printing” as part of its 2010 Budget initiative:

- “Eliminate the printed telephone directory”
- “Eliminate the printed course catalog”

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99 Ibid.
100 Ibid.
101 “Do Your Part...As A Staff Member.” University of Florida. http://ufcn.urel.ufl.edu/ink/staff.shtml
“Reduce the use of flyers & other printed announcements”
“Use in-house copying service for large jobs instead of using outside vendors”
“Set networked printers to default to print double-sided”
“Streamline mailing lists”

Similarly, IT Consultant Daniel Updegrove advises universities to experiment with eliminating outsized reports, by “ceasing production of “large, routine reports and seeing if anyone complains. Examples might be monthly phone bills and gift reports. Those few who need the information might be trained to print on demand”103

Student Print Management

In response to spiraling print volume and costs, many universities have adopted print management systems to monitor and limit student printing. Universities generally employ pay-to-print systems or student quota systems, utilizing print management software to coordinate print jobs, monitor student allotments, and track usage statistics. We identified several universities that state the cost-savings of various student print systems. In the table provided below, we present these student print systems, along with other successful print management programs.104

### Successful Print Management Programs

<table>
<thead>
<tr>
<th>Institution</th>
<th>Program/Product</th>
<th>Results</th>
</tr>
</thead>
</table>
| University of Rotterdam      | ❖ Installation of CentreWare Web, “a sophisticated software tool for remotely monitoring the status and usage of each device.”
                              | ❖ “Xerox opened and equipped two more service points at other university sites to spread the workload and improve response time.” | 10-15% savings105 |
| University of Texas, El Paso | Centralized Print Management                                                   | $125,000106     |

104 For other student print system surveys, see: http://www.stonesoup.org/Meetings/0805/CSG%20Print%20Survey%20March%202008.pdf and http://net.educause.edu/ir/library/excel/CSD5673.xls
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<tr>
<th>Institution</th>
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<th>Results</th>
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</thead>
<tbody>
<tr>
<td>University of Lincoln</td>
<td>Hewlett-Packard solution that streamlines printing and copying into one device</td>
<td>❖ Print volumes reduced by 25%</td>
</tr>
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<td></td>
<td>“into one device for both functions, one acquisition method based on cost per</td>
<td>❖ “At least £100,000 a year”</td>
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<tr>
<td></td>
<td>click, and one charging and authentication method for both copying and printing.”</td>
<td>jem 107</td>
</tr>
<tr>
<td>Kent University</td>
<td>Reduced “dependence on inkjet and laser jet printing in favor of the utilization</td>
<td>❖ “Departments can save from 23 to 50 percent” on printing costs</td>
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<td></td>
<td>of multifunction devices (MFDs)”</td>
<td>❖ John Flasco, Director, Procurement: “I feel the savings could amount to</td>
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<td></td>
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<td>hundreds of thousands of dollars.”</td>
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<tr>
<td>Clark University</td>
<td>Uniprint Print Management System</td>
<td>“Other campuses implementing Uniprint have seen waste reductions up to</td>
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<td>30% simply by holding jobs until the owner is there to retrieve them”</td>
</tr>
<tr>
<td>Mesa State College</td>
<td>GoPrint Print Management System</td>
<td>❖ “Our paper usage is down 60% from last year!” “</td>
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<tr>
<td></td>
<td></td>
<td>❖ “Many schools [using GoPrint] report a reduction in printing of 50% or</td>
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<tr>
<td></td>
<td></td>
<td>more.”</td>
</tr>
</tbody>
</table>

107 “Total print management from HP saves Lincoln University over £100,000 a year.” Hewlett Packard. www4.hp.com/cap/pdf/casestudies/lincoln_university_154kb.pdf
108 “Pilot Phase of Print Management Initiative Comes to a Close.” Kent State University. http://einside.kent.edu/?type=art&id=91561
109 “Printing Services.” Clark University. www.clarku.edu/offices/its/computerlabs/printingservices.cfm
110 “MavPrint.” Mesa State College. www.mesastate.edu/it/mavprint.htm
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<tr>
<td>University of Cincinnati</td>
<td>Uniprint Print Management System</td>
<td>- “Pages printed per year by college:</td>
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<td></td>
<td>- AIT&amp;L: 486,011: a 76% reduction</td>
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<td>- UCit: 871,590: a 56% reduction</td>
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<td>- University Libraries: 573,081: a 68% reduction”</td>
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<td></td>
<td>- “Annual Cost of consumables by college:</td>
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<td></td>
<td>- AIT&amp;L: $7,825: a 75% savings</td>
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<td>- UCit: $14,033: a 56% savings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- University Libraries: $9,227: a 68% savings”</td>
</tr>
<tr>
<td>Villanova University</td>
<td>“Revised Consumable Model to insure the best possible pricing for all ink, toner, and paper supplies.”</td>
<td>“$7,500 to $10,000 per year.”[111]</td>
</tr>
<tr>
<td>Villanova University</td>
<td>Print Reduction Program</td>
<td>“$30,000 savings annually.”[112]</td>
</tr>
<tr>
<td>Villanova University</td>
<td>The Printer Acquisition Program, “designed to reduce the University’s acquisition of network and desktop printers.”</td>
<td>“anticipated savings could well exceed 20%”[113]</td>
</tr>
<tr>
<td>Villanova University</td>
<td>Copier / MFP Replacement Program</td>
<td>“savings up to 30% from prior year, [2003]”[114]</td>
</tr>
<tr>
<td>Western State College of Colorado</td>
<td>Student Print Quotas</td>
<td>“nearly a half ton of paper—or 90,968 sheets—saved in just one semester”[115]</td>
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<tr>
<td>The College of New Jersey</td>
<td>Equitrac Print Management System</td>
<td>- 41% reduction in printer output</td>
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<td>- $17,000 savings “in the program’s first semester”</td>
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<td></td>
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<td>- “more than million fewer pages printed than the previous year”[116]</td>
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</table>

[113] Ibid.
[114] Ibid.
[115] Ibid.
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<tr>
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<tr>
<td>Furman College</td>
<td>Student Print Quotas</td>
<td>“Furman could see savings in excess of $20,000 per year in the libraries alone.”[118]</td>
</tr>
<tr>
<td>University of Texas, Austin</td>
<td>Single-Vendor Service Agreement, Printer Fleet “Rightsizing”</td>
<td>“40% reduction in print output costs in terms of equipment purchases, leases, maintenance and supplies”</td>
</tr>
<tr>
<td>Pennsylvania State University</td>
<td>Reduction in Standard Margin Settings</td>
<td>“over $120,000/year”*[119]</td>
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<tr>
<td>Kennesaw State University</td>
<td>New Printing Management Business Model</td>
<td>“The reduction in overall expense (which to date has never been more than $68,000 in a month versus $100,000 per month for similar usage under the old contract) has been significant.”[120]</td>
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</table>

Source: Hanover Research Council

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