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Research Service**

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Government Printing, Publications, and Digital Information Management: Issues and Challenges

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Specialist in American National Government

Updated November 8, 2017

Congressional Research Service

7-....

www.crs.gov

R45014

Summary

In the past half-century, in government and beyond, information creation, distribution, retention, and preservation activities have transitioned from a tangible, paper-based process to digital processes managed through computerized information technologies. Information is created as a digital object which then may be rendered as a text, image, or video file. Those files are then distributed through a myriad of outlets ranging from particular software applications and websites to social media platforms. The material may be produced in tangible, printed form, but typically remains in digital formats.

The Government Publishing Office (GPO) is a legislative branch agency that serves all three branches of the national government as a centralized resource for gathering, cataloging, producing, providing, authenticating, and preserving published information. The agency is overseen by the Joint Committee on Printing (JCP), which in 1895 was charged with overseeing and regulating U.S. government printing. GPO operates on the basis of a number of statutory authorities first granted in the 19th and 20th centuries that presume the existence of government information in an ink-on-paper format, because no other format existed when those authorities were enacted. GPO's activities include the Federal Depository Library Program (FDLP), which provides permanent public access to published federal government information, and which last received legislative consideration in 1962.

In light of the governance and technological changes of the past four decades, a relevant question for Congress might arise: To what extent can decades-old authorities and work patterns meet the challenges of digital government information? For example, the widespread availability of government information in digital form has led some to question whether paper versions of some publications might be eliminated in favor of digital versions, but others note that paper versions are still required for a variety of reasons. Another area of concern focuses on questions about the capacity of current information dissemination authorities to enable the provision of digital government information in an effective and efficient manner. With regard to information retention, the emergence of a predominantly digital FDLP may raise questions about the capacity of GPO to manage the program given its existing statutory authorities.

These questions are further complicated by the lack of a stable, robust set of digital information resources and management practices like those that were in place when Congress last considered current government information policies. The 1895 printing act was arguably an expression of the state-of-the-art standard of printing technology and provided a foundation which supported government information distribution for more than a century. By contrast, in the fourth or fifth decade of transitioning from the tangible written word to ubiquitous digital creation and distribution, the way ahead is not as clear, due in part to a lack of widely understood and accepted standards for managing digital information.

This report examines three areas related to the production, distribution, retention, and management of government information in a primarily digital environment. These areas include

- the Joint Committee on Printing;
- the Federal Depository Library Program; and
- government information management in the future.

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Overview

In a representative democracy, publicly available information about government activity is seen by many as a vital resource to inform the public, and to ensure accountability and transparency of government action. In the past half-century, in government and beyond, information creation, distribution, retention, and preservation activities have transitioned from a tangible, paper-based process to digital processes managed through computerized information technologies.

Information, whether a newspaper, government communication, or congressional bill, is created as a word processing document, spreadsheet, database, or other digital object which then may be rendered as a text, image, or video file. Those files are then distributed through a myriad of outlets ranging from particular software applications and websites to social media platforms. The material may be produced in tangible, printed form, but typically remains in digital formats.

Government printing and publishing authorities, generally codified in some chapters of Title 44 of the *United States Code* (*U.S. Code* or *U.S.C.*), specify the production, dissemination, retention, and availability of government information by or through the Government Publishing Office (GPO).¹ GPO is a legislative branch agency that serves all three branches of the federal government as a centralized resource for gathering, cataloging, producing, providing, authenticating, and preserving published information. The agency's activities are funded through three sources: appropriations, income from executive and judicial branch agencies that pay GPO for information management and distribution services, and sales of products to nongovernmental entities and the general public. GPO's appropriation is included in the annual legislative branch appropriations bill.² The bill primarily funds two GPO accounts: Congressional Publishing, and Public Information Programs of the Superintendent of Documents. On occasion, Congress has made further appropriations to the Government Publishing Office Business Operations Revolving Fund.³ Congress allocates a substantial proportion of the funds appropriated to GPO to Congressional Publishing, which funds the production and dissemination of congressional documents.

Established in 1861 as the Government Printing Office, GPO was renamed in 2014. Congress has passed measures making substantial changes to the legislative branch agency's operations on three occasions since its establishment.⁴ In 1895, Congress codified the role of the Joint

¹ This report focuses on government information products intended by current statutory arrangements to pass through GPO for production and distribution in tangible and digital formats. Many of the digital transition issues discussed in this report also affect other types of government information including, but not limited to federal and presidential records or materials made public through the Freedom of Information Act (FOIA). For further information in those domains, see CRS Report R43165, *Retaining and Preserving Federal Records in a Digital Environment: Background and Issues for Congress*; CRS Report R41933, *The Freedom of Information Act (FOIA): Background, Legislation, and Policy Issues*; and CRS Report R40238, *The Presidential Records Act: Background and Recent Issues for Congress*.

² See CRS Report R44899, *Legislative Branch: FY2018 Appropriations*, for current details of GPO funding.

³ Congress appropriated \$1 million to establish the GPO revolving fund in 1953.

⁴ Congress has made other changes to GPO operations, including changing the agency's name and some adjustments to the distribution of the *Congressional Record*, in 2014. More fulsome congressional consideration of GPO operations was undertaken in 1979 and 1998, but no legislation was enacted. In 1979, companion measures were introduced in the House and Senate to change the leadership of GPO by creating a board that would have been charged with overall management responsibility for the agency, including the appointment of the Public Printer, and labor-management relations. In 1998, S. 2298 (105th Congress), the Wendell H. Ford Government Publications Reform Act of 1998 would have replaced the Public Printer with an administrator given broad authority to manage the creation and dissemination of government's publications and to enhance permanent public access to those publications. The bill would have transferred various functions of the Joint Committee on Printing (JCP) to other entities in part in response to a Supreme Court ruling in *Immigration and Naturalization Service v. Chadha* (462 U.S. 919, (1983)), related to concerns about a

Committee on Printing (JCP), originally established in 1846, to oversee qualifications of “journeymen, apprentices, laborers, and other persons necessary for the work” at GPO along with establishing a number of other technical and administrative oversight responsibilities.⁵ The 1895 measure also established printing formats for congressional bills, hearings, and documents, and the *Congressional Record* that are still in use today. In 1962, Congress created the Federal Depository Library Program (FDLP) within GPO to provide permanent public access to published federal government information.⁶ In 1993, GPO was directed to maintain an electronic directory of federal digital information, and to provide online access to the *Congressional Record*, and the *Federal Register*.⁷

GPO continues to operate on the basis of a number of statutory authorities first granted in the 19th and 20th centuries that presume the existence of government information in an ink-on-paper format, because no other format existed when those authorities were enacted. The current version of the *U.S. Code* available online⁸ mentions current JCP authorities in 60 sections; 37 of those sections were originally enacted a century or more ago. Similarly, GPO is subject to 129 *Code* sections in Title 44, of which 105 were first enacted during or prior to 1917.⁹ As a consequence, the law makes reference to the trades that were necessary to make printed products in the 19th century, but is silent on the contemporary corps of software engineers, data entry technicians, website designers, and librarians whose efforts support the creation and distribution of much of the digital material that comprises government information. Current law also contains detailed requirements for distribution of paper copies of a variety of documents, including bills under consideration throughout the legislative process and other congressional materials,¹⁰ but little detail on the specifics of digital collection, distribution, retention, or preservation. In addition, the current business model under which GPO operates is arguably over-reliant on printing as a means of generating income, and there are no explicit provisions to meet the costs of upgrading technological infrastructure upon which electronic collection, distribution, and preservation rely.

With the widespread use of digital technologies and availability of government information in digital form, some have argued that eliminating paper versions of some publications, including the *Federal Register*, *Congressional Record*, and other congressional documents, and relying

unicameral legislative veto, and discussed in greater detail below.

⁵ 44 U.S.C. 305. The statute sets a minimum rate of pay for journeymen printers, pressmen, and bookbinders employed at GPO “at the rate of 90 cents an hour for the time actually employed.”

⁶ 44 U.S.C. Ch. 19.

⁷ 44 U.S.C. Ch. 41.

⁸ See <http://uscode.house.gov/>.

⁹ The earliest authority affecting GPO is 44 U.S.C. 1908, first enacted in 1813, which requires a copy of the public journals of the Senate and of the House of Representatives, and of the documents published under the orders of the two chambers, respectively, to be transmitted for the use of the American Antiquarian Society of Massachusetts.

¹⁰ All bills and resolutions are printed at least once. Versions of measures that are considered in one chamber are authorized to be printed when introduced or submitted, when reported to the chamber, and upon passage or adoption by the chamber. Under typical circumstances of consideration, bills and resolutions considered and passed by both chambers may be printed in seven different versions reflecting congressional action. Some measures considered by both chambers may require fewer printings, while others require more. See 44 U.S.C. 701, 706, 713, 720, 721, and 728.

instead on electronic versions,¹¹ could result in cost and other resource savings.¹² These statements are difficult to verify, due in part to a lack of reliable cost models for enduring digital information management systems. On the printing side, some savings have resulted by reducing the number of printed copies, or by implementing newer production processes. Nevertheless, GPO notes that for the foreseeable future, “some tangible print will continue to be required because of official use, archival purposes, authenticity, specific industry requirements, and segments of the population that either have limited or no access to digital formats, though its use will continue to decline.”¹³

Others have raised broader questions about the capacity of Title 44 and other information dissemination authorities to enable the provision of government information in an effective and efficient manner. In 1994, for example, what was then designated as the General Accounting Office (GAO)¹⁴ stated that

“for all practical purposes, the framework of laws and regulations used to manage many aspects of government publishing has become outdated” and that “[t]he additional technological changes that are expected will only exacerbate this situation.”¹⁵

In 2013, the National Academy of Public Administration (NAPA), noted that “GPO’s statute is outdated and precedes current technology.”¹⁶ In 2017, in testimony before the Committee on House Administration (CHA), Davita Vance-Cooks, who then served as the Director of GPO, suggested that 44 U.S.C. Ch. 19, governing the operations of FDLIP, “has been eclipsed in some areas by technology, which today provides for more flexibility and innovation in meeting the public’s needs for access to Government information.”¹⁷

In light of the technological changes of the past four decades, a relevant question for Congress might arise: To what extent can these 19th century authorities and work patterns meet the challenges of ubiquitous digital creation of government information? This question is further complicated by the lack of a stable, robust set of digital information resources and management

¹¹ See, e.g., H.R. 195, Federal Register Printing Savings Act of 2017. As passed by the House on May 17, 2017, the bill would bar GPO from providing a printed copy of the *Federal Register* without charge to Members or any other office of the United States unless the Member or office requests a printed copy of a specific issue, or during that year or the previous year, the Member or office requested a subscription to printed copies of the *Federal Register* for that year. H.R. 195 was ordered to be reported without amendment favorably by the Senate Committee on Homeland Security and Governmental Affairs on July 26, 2017. No further action has been taken at the time of this writing.

¹² Some of the technological transformations GPO has adopted have also incorporated changes that may provide environmental benefits. Since at least 2000, GPO and its contractors have used paper that meets federal recycled paper requirements, and all GPO printing inks have been vegetable-oil-based instead of petroleum-based. In 2009, Representative Nancy Pelosi, then Speaker of the House, announced that the daily edition of the *Congressional Record* would be printed on 100% recycled paper. See U.S. Government Printing Office, *Annual Report, Fiscal Year 2000*, Washington, DC, 2001, p. 2; and U.S. Congress, House, Speaker of the House, “Pelosi: Congressional Record Now Printed on 100 Percent Recycled Paper,” press release, October 2, 2009.

¹³ GPO, *Budget Justification, Fiscal Year 2018*, Washington, DC, March 15, 2017, p. A2, at https://www.gpo.gov/docs/default-source/congressional-relations-pdf-files/budget-submission/budget_justification_2018.pdf?sfvrsn=cb826d3d_0.

¹⁴ GAO is now the Government Accountability Office.

¹⁵ U.S. General Accounting Office, *Government Printing: Legal and Regulatory Framework is Outdated for New Technological Environment*, GAO/NSAID094-157, April 15, 1994, p. 2, <https://www.gao.gov/assets/220/219439.pdf>.

¹⁶ National Academy of Public Administration, *Rebooting the Government Printing Office: Keeping America Informed in the Digital Age*, Washington, DC, January 2013, p. 30, <https://www.napawash.org/wp-content/uploads/2013/02/GPO-Final.pdf>.

¹⁷ Davita Vance-Cooks, “Remarks before the Committee on House Administration,” hearing on Transforming GPO for the 21st Century and Beyond: Part 2, July 18, 2017, <https://docs.house.gov/meetings/ha/ha00/20170718/106258/hhrg-115-ha00-wstate-vance-cooksd-20170718.pdf>.

practices like those that were in place when Congress last considered current government information policies.

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Joint Committee on Printing

JCP was established by Congress in 1846 to oversee the management of private printers who competed to provide printing and publishing services to the government.¹⁸ With the creation of GPO in 1861, JCP was charged with overseeing and regulating government printing in all three branches of the national government, and overseeing the new agency in its efforts to provide government-wide printing services.¹⁹

As assigned by Congress, JCP's statutory duties with regard to the management of GPO were (and remain) granular. Some of those responsibilities include overseeing GPO finances, facilities, and staffing for the various printing and other industrial trades necessary to produce printed works when those authorities were conferred in the 19th century. In statute, JCP is the final authority on wage setting for GPO staff, assessing the quality of paper GPO would purchase, and determining which work GPO might produce within the agency or by contract with outside vendors.

The joint committee's authority to oversee and enforce statutory authorities that mandate government printing through GPO was essentially unchallenged for more than a century. This began to change in the 1980s and 1990s following a 1983 Supreme Court decision in *Immigration and Naturalization Service v. Chadha*.²⁰ The Court ruled unconstitutional a one-chamber veto because it deviated from the constitutionally specified lawmaking process of bicameral consideration and presentation of legislation by Congress to the President for his consideration. Soon thereafter, a number of executive branch entities, including the Department of Justice (DOJ), Department of Defense (DOD), and the Office of Management and Budget (OMB), began to question JCP's regulatory and statutory authority on the basis of *Chadha* and enduring concerns about the separation of powers. Of particular interest to those agencies was the requirement specified in 44 U.S.C. 501 that all printing, binding, and blank-book work for every government entity other than the Supreme Court is to be done at GPO. DOJ's Office of Legal Counsel (OLC) concluded that many of JCP's authorities, particularly provisions mandating the joint committee's prior approval before an executive agency could have materials printed outside of GPO, were invalidated by *Chadha*, and that executive agencies were able to procure printing services from providers other than GPO.²¹

¹⁸ 9 Stat. 113.

¹⁹ 12 Stat. 177.

²⁰ *Immigration and Naturalization Service v. Chadha*, 462 U.S. 919 (1983).

²¹ Theodore B. Olson, Memorandum for William H. Taft, IV, Deputy Secretary of Defense: Effect of *INS v. Chadha* on 44 U.S.C. 501, "Public Printing and Documents," Office of Legal Counsel, Department of Justice, Washington, DC, March 2, 1984, <https://www.justice.gov/olc/page/file/936121/download>; Theodore B. Olson, Constitutionality of Proposed Regulations of Joint Committee on Printing: Memorandum Opinion for the Counsel to the Director, Office of

With executive agencies free, from the perspective of DOJ and OMB, to fulfill their printing services elsewhere, the production and distribution of government information—meant to be collected, produced, and distributed through GPO and made publicly available—departed to some extent from the policies specified in various chapters of Title 44 of the *U.S. Code*. Among other consequences, the increase in agency-controlled printing and publishing resulted in an unknown number of “fugitive” government documents and publications that have not been identified or published in GPO’s Federal Digital System (FDSys), govinfo,²² or the collections of FDLP participants, and may not be readily available to policymakers or the general public.

In light of governance and operational challenges to the joint committee’s activities, in 1995 Congress began a process to eliminate staffing and funding for JCP, with the joint committee last receiving an appropriation for its activities in FY1999. According to searches of a variety of databases,²³ JCP has held organizational meetings for every Congress since the 104th Congress in 1995, and published details of those meetings for the 108th and 113th-115th Congresses. The committee also published the proceedings of one hearing it held in 1997. In practice, some of the functions related to government information management for which JCP is responsible appear to be executed by the Committee on House Administration (CHA), or the Senate Rules and Administration Committee (SRA), from which JCP draws its membership.²⁴

In this context, questions have been raised by congressional and other observers related to the efficiency and effectiveness of JCP, and whether or not its responsibilities might formally be performed by other entities.²⁵ One option could be to maintain existing practices, as they appear to have addressed GPO management and oversight concerns that can be publicly identified. Another option might be to assess the joint committee’s authorities to identify those which may have been rendered impracticable due to separation of powers concerns expressed by the executive branch, or obsolete, following the implementation of newer GPO procurement or other more modern business practices, or due to technological or practical changes in printing and publishing. In light of such an assessment, one option might be to terminate JCP and formally reassign its responsibilities to CHA, SRA, GPO, or other government entities as appropriate.

Management and Budget, Office of Legal Counsel, Department of Justice, Washington, DC, April 11, 1984, <https://www.justice.gov/file/23606/download>; and Walter Dellinger, Involvement of the Government Printing Office in Executive Branch Printing and Duplicating: Memorandum Opinion for the General Counsel General Services Administration, Washington, DC, May 31, 1996, <https://www.justice.gov/file/20026/download>. The positions taken on the OLC memoranda were clarified and reiterated during the George W. Bush Administration in 2002. See Mitchell E. Daniels, M-02-07, Memorandum for Heads of Executive Departments and Agencies: Procurement of Printing and Duplicating through the Government Printing Office, Executive Office of the President, Office of Management and Budget, Washington, DC, May 3, 2002, <https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/omb/pubpress/2002-26.pdf>.

²² GPO currently serves digital forms of government information through the Federal Digital System (FDSys), <https://www.gpo.gov/fdsys/>. In the future, FDSys is to be replaced by govinfo, <https://www.govinfo.gov/>, which is in beta testing. See <https://www.govinfo.gov/about>.

²³ (name redacted), Senior Research Librarian in the Government and Finance Division, conducted the searches discussed in this section.

²⁴ 44 U.S.C. 101.

²⁵ For example, in the 104th Congress, Representative Jennifer Dunn introduced H.R. 1024, “To improve the dissemination of information and printing procedures of the Government,” which would have eliminated JCP and transferred its functions to CHA and SRA. A similar proposal was suggested by Senate Members of the Joint Committee on the Organization of Congress in 1993, but no legislation was introduced. See U.S. Congress, Joint Committee on the Organization of Congress, *Final Report of the Senate Members of the Joint Committee on the Organization of Congress*, 103rd Cong., 1993 (Washington: GPO, 1993), pp. 10-11. See also Gabriel Kahn, “Thomas, Joint Committee on Printing’s New Chairman Wants to Abolish His Own Panel,” *Roll Call*, February 23, 1995.

Federal Depository Library Program (FDLP)

Congress established FDLP to provide free public access to federal government information. The program's origins date to 1813, when Congress authorized the printing and distribution of additional copies of the Journals of the House and Senate, and other documents the chambers ordered printed.²⁶ At various times, the program was expanded to include federal executive branch publications. FDLP is administered under the provisions of Chapter 19 of Title 44 of the *U.S. Code* by GPO, under the direction of the Superintendent of Documents (SUDOCs), who is appointed by the Director of GPO. The current structure of the FDLP program was established in 1962.²⁷

Under the law, FDLP libraries receive from SUDOCs tangible copies of new and revised government publications authorized for distribution to depository libraries, and are required to retain them in either printed or micro facsimile form. Depository libraries—which include state, public and private academic, municipal, and federal libraries—are required to make tangible FDLP content available for use by the general public. In support of that effort, depository libraries provide resources to manage collection development, cataloging, bibliographic control, adequate physical facilities, collection security and maintenance, and staffing.²⁸ Neither statute nor current GPO guidance specifies how depository libraries must deploy those resources in support of FDLP. Ownership of publications provided by SUDOCs to depository libraries remains with the U.S. Government.²⁹ Observers note that distributing publications to depository libraries has the effects of long-term preservation of federal government information in widely dispersed settings, and providing free, local access to that information. The costs of providing preservation and access are also widely distributed.³⁰

Depository libraries fall into one of two statutory categories related to the materials they may receive. Under 44 U.S.C. 1912, not more than two depository libraries may be designated as regional depository libraries (hereinafter, regionals) in each state and Puerto Rico. Regional libraries are required to retain tangible government publications permanently, with some exceptions.³¹ The FDLP currently has 46 regional libraries.³² Five states have two regional

²⁶ Resolution For The Printing and Distribution of an Additional Number of the Journals of Congress, and of the Documents Published Under Their Order, 13th Congress, December 13, 1813, 3 Stat. 140. A history of FDLP through the late 20th century is available in Sheila M. McGarr, "Snapshots of the Federal Depository Library Program," GPO, August 22, 2000, http://www.access.gpo.gov/su_docs/fdlp/history/snapshot.html.

²⁷ 44 U.S.C. Chapter 19.

²⁸ The FDLP program description is based on Government Printing Office, Office of the Superintendent of Documents, *Legal Requirements & Program Regulations of the Federal Depository Library Program*, Washington, DC, June 2011, <http://permanent.access.gpo.gov/gpo9182/legal-requirements-guidance2011.pdf>, and other sources as noted.

²⁹ For background on the 1962 law and its early implementation, see U.S. Congress, Senate Committee on Rules and Administration, Subcommittee on the Library, *Revising the Laws Relating to Depository Libraries*, committee print, 87th Cong., 2nd sess. (Washington: GPO, 1962); and Carper W. Buckley, "Implementation of the Federal Depository Library Act of 1962," *Library Trends*, July 1966, pp. 27-36.

³⁰ James A. Jacobs, James R. Jacobs, and Shinjoung Yeo, "Government Information in the Digital Age: The Once and Future Federal Depository Library Program," *The Journal of Academic Librarianship*, vol. 31, no. 3 (May 2005), p. 199.

³¹ Exceptions include superseded publications, or unbound publications that are issued later in bound form, which may be discarded as authorized by SUDOCs.

³² A directory of FDLP institutions is available at <http://catalog.gpo.gov/fdldir/FDLPdir.jsp>.

libraries;³³ seven regionals serve more than one state, territory, or the District of Columbia;³⁴ and two states have no designated regional library.³⁵ Arrangements allowing multistate regional libraries do not appear to be sanctioned in 44 U.S.C. Chapter 19, but according to GPO, some multistate agreements date to the years following the passage of the 1962 FDLP program revisions.³⁶

Selective depository libraries (hereinafter, selectives) are partially defined in Title 44,³⁷ and include all FDLP participants that are not regional libraries. Whereas regionals receive all FDLP tangible content provided by GPO, selectives may choose among classes of documents made available.³⁸ Selective libraries that are served by a regional library may dispose of tangible government documents after retaining them for five years, subject to certain conditions. Those selective libraries that are not served by a regional library are required to retain government publications permanently, subject to the same limitations placed on regional libraries.³⁹ There are approximately 1,100 selective libraries in the FDLP.⁴⁰ **Table 1** provides the number of depository libraries by decade since 1962. As shown in **Figure 1**, the number of libraries participating in the FDLP has declined since the mid-1990s.

³³ Alabama, Louisiana, North Dakota, Texas, and Wisconsin each have two regional libraries.

³⁴ The Maryland regional serves Maryland, Delaware, and the District of Columbia; the Connecticut regional serves Connecticut and Rhode Island; the Florida regional serves Florida, Puerto Rico, and the U.S. Virgin Islands; the Hawaii regional serves American Samoa, Guam, and Micronesia; the Maine regional serves Maine, New Hampshire, and Vermont; the Minnesota regional serves Minnesota, Michigan, and South Dakota; and the Washington regional serves Washington and Alaska.

³⁵ No regional library is identified for Nevada or Wyoming in the FDLP directory.

³⁶ In a draft report to JCP, available on the FDLP website, GPO states that “As early as 1966 the University of Maine became the regional depository library for New Hampshire and Vermont, with the support and approval of their Senators. The first shared regionals at the University of North Dakota and North Dakota State University were designated by their Senators in 1968.” “Regional Depository Libraries in the 21st Century: A Time for Change?,” 2008, available at <https://www.fdlp.gov/file-repository/about-the-fdlp/regional-depositories/regional-depository-libraries-in-the-21st-century-a-final-report-to-the-jcp/54-regional-depository-libraries-in-the-21st-century-a-time-for-change/file>.

³⁷ Depository collections are housed in a variety of types of libraries, including college and university libraries; public libraries; law school libraries; court libraries; state libraries; special libraries; research libraries; tribal college libraries; and libraries within federal executive departments, service academies, and independent agencies. See 44 U.S.C. 1906, 1907, 1915, and 1916.

³⁸ See Government Printing Office, Superintendent of Documents, *List of Classes of United States Government Publications Available for Selection by Depository Libraries*, Washington, DC, November, 2015, <https://www.fdlp.gov/file-repository/collection-management/list-of-classes/2682-list-of-classes-print-version-revised-11-2015>. Classes organize government information by the issuing agency.

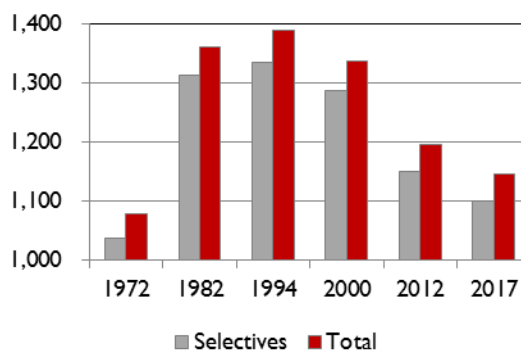
³⁹ 44 U.S.C. 1911, 1912.

⁴⁰ A directory of FDLP institutions is available at <https://catalog.gpo.gov/fdlpdir/FDLPdir.jsp>.

**Table I. FDLP Libraries, Select Years
1962-2017**

Year	Regionals	Selectives	Total
1962	—	—	603
1972	41	1,037	1,078
1982	49	1,313	1,362
1994	53	1,336	1,389
2000	51	1,287	1,338
2012	47	1,150	1,197
2017	46	1,100	1,146

Source: JCP, 1962, 1972, 1982, 1994; GPO, 2000; and CRS calculations, 2012, 2017. A breakdown of regional and selective libraries was not available for 1962; 1994 was the earliest data were available in the 1990s. Selective libraries choose among classes of documents made available by GPO for retention.

**Figure I. Change in FDLP Libraries,
Select Years 1972-2017**

Authorities governing FDLP are based on a paper-based information creation and distribution environment.⁴¹ The FDLP tangible collection, which incorporates materials dating to 1813, is estimated to contain approximately 2.3 million items. As much as one-third of the tangible collection,⁴² including most items created prior to 1976, is not catalogued. Most depository libraries do not have a full complement of depository materials because they joined the program at various times after 1813, and are not required to acquire materials retrospectively or retroactively in the event of collection loss. Some tangible government publications are still distributed to depository libraries but in decreasing quantities. During FY2011, for example, GPO distributed approximately 2 million copies of 10,200 individual tangible items to depository libraries.⁴³ During FY2016, 989,826 copies of 4,502 items were provided.⁴⁴

Under current GPO guidance, every FDLP participant is required to provide the “FDLP Basic Collection,” which is composed of a variety of government information collections, including the *Budget of the United States Government*, the Catalog of Federal Domestic Assistance, and the daily edition of the *Congressional Record*, among other resources.⁴⁵ The resources may be served to users in tangible or digital formats as available.

In response to demand from users and some FDLP participants, GPO in 2014 announced changes to focus on the provision of access to online resources by selectives. A “mostly online depository” is a selective that emphasizes selection and provision of access to online depository resources, while providing access to a few resources in tangible formats. An “all online depository” is a

⁴¹ For example, depository libraries must have collections of at least 10,000 books other than government publications. 44 U.S.C. 1909; and GPO, SUDOCs, *Legal Requirements & Program Regulations of the Federal Depository Library Program*, <http://permanent.access.gpo.gov/gpo9182/legal-requirements-guidance2011.pdf>.

⁴² A more precise estimate cannot be established, because no entity has been charged with maintaining a complete list of materials distributed since the establishment of the program.

⁴³ Government Publishing Office, *Budget Justification, Fiscal Year 2013*, January 25, 2012, p. F2, http://gpo.gov/pdfs/congressional/Budget_Justification_FY2013.pdf.

⁴⁴ Government Printing Office, *Budget Justification, Fiscal Year 2018*, March 15, 2017, p. E2, https://www.gpo.gov/docs/default-source/congressional-relations-pdf-files/budget-submission/budget_justification_2018.pdf?sfvrsn=cb826d3d_0.

⁴⁵ See GPO, “FDLP Basic Collection,” at <https://www.fdlp.gov/requirements-guidance/collections-and-databases/1442-basic-collection> for a full list of required collections.

selective that does not intend to select or add any tangible depository resources. Under GPO guidance, current selective depository libraries with tangible holdings may transition to become all online over time by choosing not to receive any tangible format items and by removing all tangible depository publications in the library's collection.⁴⁶

The emergence of a predominantly digital FDLP may raise questions about the capacity of GPO to manage the program given its existing statutory authorities. Whereas GPO is the central point of distribution for tangible, printed FDLP materials, its responsibilities are potentially more diverse, and may be less explicitly specified, regarding its distribution of digital information. In some instances, GPO carries out activities to distribute digital information that are similar to its actions regarding print materials. In others, GPO provides access to digital content that it does not produce or control.⁴⁷ SUDOCS has archiving and permanent retention authorities for tangible materials, which are exercised by the distribution of materials to depository libraries. At the same time, those authorities do not envision digital creation and distribution of government publications. GPO appears to have some authority to manage digital FDLP materials and other aspects of the program, subject to congressional approval.⁴⁸ At the same time, explicit digital distribution authorities⁴⁹ that provide for online access to publications, including core legislative and regulatory products, do not directly address GPO's retention and preservation responsibilities for digital information.

FDLP Modernization

In June 2017, Davita Vance-Cooks, then Director of GPO,⁵⁰ charged the Depository Library Council (DLC), a GPO advisory committee,⁵¹ with making recommendations to her for changes in Title 44 related to FDLP, with particular emphasis on Chapter 19, and potential revisions that could provide depository libraries with "more flexibility."⁵² In testimony before the Committee on House Administration (CHA), Director Vance-Cooks suggested that 44 U.S.C. Ch. 19, governing the operations of FDLP, "has been eclipsed in some areas by technology, which today provides for more flexibility and innovation in meeting the public's needs for access to Government information."⁵³ DLC presented its recommendations to Director Vance-Cooks and

⁴⁶ GPO states that the transition to become all online would take five years for current depositories due to the five-year publication retention requirement for some selectives. See GPO, "All or Mostly Online Federal Depository Libraries," at <https://www.fdlp.gov/requirements-guidance/guidance/2124-all-or-mostly-online-federal-depository-libraries>.

⁴⁷ Beyond the FDLP program, some government information is provided by an agency directly, and that material may not be cataloged for inclusion in FDLP or other centralized government information resources. See, for example, Ed Metz, "Capturing Military Information on the Web and Elsewhere," *Online*, September-October 2004, pp. 35-39.

⁴⁸ 44 U.S.C. Ch. 19.

⁴⁹ 44 U.S.C. Ch. 41.

⁵⁰ Ms. Vance-Cooks resignation as GPO Director was announced on November 1, 2017. See GPO, "GPO Director Davita Vance-Cooks Departs Federal Service," at <https://www.gpo.gov/who-we-are/news-media/news-and-press-releases/gpo-director-davita-vance-cooks-departs-federal-service>.

⁵¹ The Depository Library Council to the Director, U.S. Government Publishing Office (DLC), serves as an advisory committee to the Director and SUDOCS on issues related to FDLP. See GPO, "Depository Library Council" at <https://www.fdlp.gov/about-the-fdlp/depository-library-council>.

⁵² GPO, "Title 44 Modernization: Contribute Your Ideas," at <https://www.fdlp.gov/news-and-events/3030-title-44-modernization-contribute-your-ideas>. Also, see Lisa Peet, "GPO Requests Recommendations to Update Federal Deposit Library Rules," *Library Journal*, August 24, 2017, http://lj.libraryjournal.com/2017/08/legislation/gpo-requests-recommendations-to-update-federal-deposit-library-rules/#_.

⁵³ Davita Vance-Cooks "Remarks before the Committee on House Administration," hearing on "Transforming GPO for the 21st Century and Beyond: Part 2," July 18, 2017, at <https://docs.house.gov/meetings/ha/ha00/20170718/106258/>

the depository library community in September and October 2017, respectively, which included the following:

- Amend and combine existing definitions of government publication⁵⁴ and public information intended to be made available to the public⁵⁵ to include government information in all formats, allowing those formats be incorporated into FDLP.
- Require legislative, executive, and judicial branch agencies to deposit authenticated electronic publications with GPO for inclusion in FDLP.
- Make authenticated digital copies of government publications a format which a regional depository library may hold.
- Give GPO grant-making and contracting authority, to work with depository libraries to enhance access to government publications.⁵⁶
- Affirm that the public shall have no-fee access to electronic government information.
- Incorporate provisions ensuring that the public may use federal electronic information resources with an expectation of privacy.

In addition, DLC made several recommendations related to detailed FDLP qualifications and operations, including changes to the process by which selectives choose materials and formats they receive from GPO; amending requirements based on tangible holdings to a standard that a participating library have physical or electronic collections sufficient to demonstrate organizational capacity; changes to the manner in which some selectives might dispose of some government documents; and expanded authorities for regional depositories to share their collections and services across state lines, subject to the approval of Senators in the involved states.⁵⁷

hhr-115-ha00-wstate-vance-cooksd-20170718.pdf.

⁵⁴ Numerous observers have identified and called for changes to different definitions of government information. 44 U.S.C. 1901 defines a government publication for purposes of FDLP as “informational matter which is published as an individual document at Government expense, or as required by law.” Some observers note that this definition does not capture all information produced by the national government, particularly in digital formats. By contrast, 44 U.S.C. 4104 defines “Federal electronic information” as “Federal public information stored electronically,” for purposes of mandating the electronic distribution of the *Congressional Record*, *Federal Register*, and other products. See, generally, Letter from Michael A Keller, University Librarian, Stanford University, to Chairman Gregg Harper, Members of the Committee on House Administration, and Davita Vance-Cooks, August 4, 2017, <https://freegovinfo.info/wp-content/uploads/2017/08/Keller-CHA-t44revision-final-170803.pdf>; Letter from Robert E. Fox, President, Association of Southeastern Research Libraries, to Davita Vance-Cooks, Director, GPO, August 30, 2017, https://www.aserl.org/wp-content/uploads/2017/08/2017_08_ASERL_Title_44-letter_Vance-Cooks.pdf; and Letter from Greg Lambert, President American Association of Law Libraries, to Karen Russ, Chair, DLC, August 30, 2017, <https://www.aallnet.org/Documents/Government-Relations/Formal-Statements/2017/lt083017.pdf>.

⁵⁵ 44 U.S.C. 3502(3)(B)(12) defines “public information” as any information, regardless of form or format, that an agency discloses, disseminates, or makes available to the public. This definition is used in relation to the Paperwork Reduction Act, 44 U.S.C. Ch. 35, which is administered by the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget (OMB), and appears to be beyond the scope of authorities and responsibilities assigned to GPO.

⁵⁶ DLC states that potential cooperative activities could include the digitization, preservation, or cataloging of federal government publications.

⁵⁷ James Shaw, for the DLC, “Recommendations for revisions to Title 44 U.S. Code Chapter 19,” Memorandum to Davita Vance-Cooks, September 25, 2017, at <https://www.fdlp.gov/file-repository/outreach/events/depository-library-council-dlc-meetings/2017-meeting-proceedings/2017-dlc-meeting-and-fdl-conference/2929-dlc-recommendations-to-gpo-director-for-revisions-to-title-44-u-s-code-chapter-19/file>; and GPO, Depository Library Council, “Title 44 Reform,” October 16, 2017, at <https://www.fdlp.gov/file-repository/outreach/events/depository-library-council-dlc->

FDLP Issues for Congress

The possible concerns related to managing the FDLP program in an environment in which tangible and digital materials coexist are varied. On the tangible side, some participating depositories note that the enduring challenges of tangible collections that have grown out of the available space include storage, cataloging, and access.⁵⁸ Digital resources raise questions regarding the security, authentication,⁵⁹ custody, and long-term preservation of digital materials. Other areas of possible concern include the management and digitization of tangible materials,⁶⁰ permanent retention and preservation of digital content,⁶¹ and costs associated with these activities. These concerns may be addressed in their own right, or in the context of user demand for FDLP information, for which there is no uniform metric over time, or comparatively among current FDLP institutions.

FDLP Tangible Collection

Systematic estimates of the usage of tangible FDLP materials are not readily available. This is due in part to the highly decentralized manner in which materials are stored and accessed, differences in the ways depository libraries might track collection use, and the lack of requirements to develop and maintain utilization metrics. There are some suggestions that parts of the collection might be underutilized, due to the lack of cataloging information for much of the collection distributed prior to 1976, when GPO began creating cataloging information.⁶² Others suggest that some materials that are cataloged and available receive little engagement because users prefer digital formats.⁶³ On the other hand, it has been suggested that some tangible items that had not been used were more frequently accessed when made available online.⁶⁴ In the

meetings/2017-meeting-proceedings/2017-dlc-meeting-and-fdl-conference/2986-title-title-44-reform-slides/file.

⁵⁸ CRS Report 97-71, *Access to Government Information in the United States: A Primer*; testimony of Celina McDonald, Government Documents & Criminology Librarian, University of Maryland, before the Committee on House Administration hearing, “Transforming GPO for the 21st Century and Beyond: Part 3 – Federal Depository Library Program,” September 26, 2017, at <https://docs.house.gov/meetings/HA/HA00/20170926/106425/HHRG-115-HA00-Wstate-McDonaldC-20170926.pdf>; and Joseph A. Hurley, “Enhancing Access to Printed Government Documents,” in *Government Information Management in the 21st Century: International Perspectives*, Peggy Garvin, ed. (Sussex, United Kingdom: Ashgate, 2011), pp. 61-93.

⁵⁹ Timothy L. Coggins and Sarah G. Holterhoff, “Authenticating Digital Government Information,” in *Government Information Management in the 21st Century: International Perspectives*, Peggy Garvin, ed. (Sussex, United Kingdom: Ashgate, 2011), pp. 133-156.

⁶⁰ Joseph A. Hurley, “Enhancing Access to Printed Government Documents,” in *Government Information Management in the 21st Century: International Perspectives*, Peggy Garvin, ed. (Sussex, United Kingdom: Ashgate, 2011), pp. 61-93.

⁶¹ Shannon Kupfer and Aaron O’Donovan, “Digitization and Digital Preservation of Government Information,” in *Government Information Management in the 21st Century: International Perspectives*, Peggy Garvin, ed. (Sussex, United Kingdom: Ashgate, 2011), pp. 39-54.

⁶² Judith C. Russell, “Challenges and Opportunities for Federal Depository Libraries in the Digital Age,” *Against the Grain* (November 2010), pp. 32-26, http://www.against-the-grain.com/TOCFiles/v22-5/fea_russell_v22-5.pdf.

⁶³ See testimony of Celina McDonald, Government Documents & Criminology Librarian, University of Maryland, before the Committee on House Administration hearing, “Transforming GPO for the 21st Century and Beyond: Part 3 – Federal Depository Library Program,” September 26, 2017, at <https://docs.house.gov/meetings/HA/HA00/20170926/106425/HHRG-115-HA00-Wstate-McDonaldC-20170926.pdf>. A government documents librarian noted in 2012 that in his library, one person had checked out pieces of the U.S. Serial Set in the past 10 years. Paul Belloni, Regenstien Library, University of Chicago, “Serial Set Concerns Follow-up,” posted to GOVDOC-L Listerv, February 14, 2012, <http://lists.psu.edu/cgi-bin/wa?A2=ind1202B&L=GOVDOC-L&T=0&F=&S=&P=27593>.

⁶⁴ Discussion with Suzanne Sears, Assistant Dean for Public Services, University of North Texas Libraries, December

absence of any systematic inquiry, it cannot be determined whether the perceived lack of utilization is the result of minimal demand, lack of catalogue information for some materials in the FDLP collection, inadequate communication of the collection's availability, or other, unidentified reasons.

Some depository libraries see opportunities to digitize tangible FDLP collections to ensure their preservation and to make them more available to users.⁶⁵ Such efforts might provide broader access to the public, assuming that technological infrastructure is in place to ensure sufficient user access to the Internet. Provision of digital government information in digital form could reduce the costs of maintaining a tangible collection, or provide the opportunity to reduce the number of copies of tangible government publications held by depository libraries through consolidation of collections. On the other hand, there is no consensus on what constitutes a sufficient number of paper copies. Further, it is possible that the costs of ongoing maintenance and technology upgrades necessary to support digitized materials could be higher than the current costs to maintain tangible collections.

Any effort to digitize or reduce the number of tangible copies appears to be beyond the scope of authorities granted to SUDOCs or depository libraries under current law. Nevertheless, the question of how to retain and preserve government information contained in tangible form alone, and to provide access to that information to all who wish to see it, raises a number of questions. At the outset, these questions may lead in two directions: one related to the retention and preservation of tangible materials in their original form, the second focused on efforts to transition tangibles to digital formats.

Tangible Retention

Questions related to the retention and preservation of materials in tangible formats arise with regard to the following: preservation of decaying tangibles; establishing how many complete, tangible copies may be necessary to ensure permanent retention of records of government activities; and access for the general public when digital materials do not meet user needs. With regard to preservation, it would be necessary to have a more fully cataloged FDLP collection to be able to determine the scope of preservation requirements.

There is little consensus on questions about the number of tangible copies to be retained permanently. Some studies note the opportunities to consolidate collections to free up storage

7, 2011.

⁶⁵ In 2012, for example, the Association of Southeastern Research Libraries (ASERL) approved an implementation plan for the management and disposition of federal depository library collections in its member libraries. The implementation plan was a step in ASERL's efforts to develop what it called a "Collaborative Federal Depository Program." See ASERL, "Collaborative Federal Depository Program (CFDP): ASERL's Plan for Managing FDLP Collections in the Southeast," at <http://www.aserl.org/programs/gov-doc/>. In its implementation plan, the group asserted "that the best means of providing broad public access to these collections is through online access to digital and digitized copies. Management of the tangible collections should include efforts to support or participate in initiatives to create a comprehensive, authentic digital collection in the public domain." ASERL argues that its plan would complement efforts to manage the tangible collections held by depository libraries in its member institutions. The ASERL plan also makes efforts to define what constitutes a comprehensive FDLP tangible collection; establish two such comprehensive collections; and establish "centers of excellence," FDLP regional libraries that would focus on cataloging, inventorying, and acquiring publications in an effort to establish a comprehensive collection of agency-specific materials. See ASERL, *Implementation Plan: Southeast Region Guidelines for Management and Disposition of Federal Depository Library Collections*, April 12, 2012, p. 1, at https://www.aserl.org/wp-content/uploads/2012/07/FINAL_ASERL_FDLP_GUIDELINES_Revised_07-2012.pdf.

space, and potentially reduce costs, while still ensuring that library users' needs are met.⁶⁶ Others cite a lack of data to demonstrate how many copies might be needed to meet those needs.⁶⁷ Another proposal calls for the creation by GPO of two national retrospective collections, to be housed separately in secure facilities.⁶⁸ One study focusing on the number of copies of scholarly journals that must be retained in print form concluded that accurate, analyzable data were not readily available, which might leave decisionmakers "to make best-guess estimates anyway" in determining the appropriate number of permanent retention tangible copies.⁶⁹

Tangible Digitization

A number of questions related to the retention and preservation of digitized materials are similar to issues that arise in the consideration of born digital materials. Questions specifically related to digitized tangibles arise in the following areas:

- the costs of digitizing tangible collections;
- the authenticity and ownership of digitized versions of tangible publications;
- the disposition of original publications that are digitized;
- the extent to which the costs of these efforts represent a resource savings or increase in comparison to current FDLP practices or a redistribution among FDLP participants; and
- whether these efforts change the extent and nature of public access to government information.

In addition to the technical and procedural aspects, any discussion of tangible materials would likely involve consideration of the costs of activities necessary to preserve them in their original manifestations, or to ensure their access through cataloging or digitization. Estimates of the cost of such efforts across the FDLP program do not appear to have been developed.

Access to Digital Government Information

Unlike tangible collections, digital government information is not physically provided to depository libraries, but is provided through the Internet by GPO and its content partners to depository libraries and directly to users with Internet access. The information itself is contained on a server and in any backup facility that may be utilized. For depository libraries, this may raise concerns related to their collection development practices. If digital access is assured, it may be possible to reduce tangible collections. On the other hand, if digital access is not robust, it may be necessary for depository libraries to support access to digital materials while maintaining tangible collections. Potential users may or may not benefit from digital delivery arrangements if their Internet access is not sufficient to access resource intensive, authenticated materials served through FDSys and govinfo. Another set of concerns may focus on the availability of information

⁶⁶ Emily Stambaugh, "Heading West: Circling the Wagons to Ensure Preservation and Access," *Against the Grain* (November 2010), pp. 18-22, at http://www.cdlib.org/news/publications/heading_west.pdf.

⁶⁷ Julia Gammon and Edward T. O'Neill, *OhioLINK—OCLC Collection and Circulation Analysis Project 2011*, OhioLINK Collection Building Task Force, Dublin, OH, September 2011, p. 8, <http://www.oclc.org/research/publications/library/2011/2011-06.pdf>.

⁶⁸ Patrick Ragains, "Fixing the Federal Depository Library Program," *American Libraries*, April 16, 2010, <http://americanlibrariesmagazine.org/features/04162010/fixing-federal-depository-library-program>.

⁶⁹ Candace Arai Yano, Zuo-Jun Max Shen, and Stephen Chan, "Optimizing The Number Of Copies For Print Preservation Of Research Journals," *International Journal of Production Research*, Vol. 51, Issue 23-24, August, 2013, at <http://www.tandfonline.com/doi/full/10.1080/00207543.2013.827810>.

that is not physically present in depository libraries. Other concerns may arise if available search resources do not yield the information a user seeks.

Costs of FDLP and Other Government Information Distribution Programs

Depository libraries appear largely to have borne the costs of the FDLP program since its establishment. There is no mechanism in 44 U.S.C., Chapter 19, to fund depository costs of managing materials, staff, and physical plant needs, and providing public access. In an era characterized by dwindling resources, particularly in state and local governments and public libraries, the costs of maintaining FDLP tangible collections, which, according to GPO, remain the property of the U.S. Government, have become prohibitive to some depository libraries.

The emergence of digital delivery has had cost implications for information providers. Whereas the costs of tangible support rest largely with depository libraries, the costs of providing digital materials, including storage of digital materials, Web development, maintenance, and upgrades, fall on GPO for FDSys and govinfo and other entities that provide FDLP content. In its FY2018 budget request, GPO stated that it “has continued to invest in the IT infrastructure supporting GPO’s digital information system.”⁷⁰ Over time, the costs of digital delivery could require increased commitment of GPO resources from its revolving fund or additional appropriations for GPO and other federal content providers; the absence of those resources could lead agencies to reevaluate service levels in a hybrid system of tangible and digital delivery. These costs may continue to increase as more digital information is created, and older data, software, and hardware must be upgraded to ensure ongoing digital availability, retention, and long-term preservation. There is no publicly available estimate of what those costs might be over time.

Government Information Management in the Future

The manner in which Congress has addressed government printing and publishing practices in the past might offer ideas for how it could oversee government information creation, distribution, and retention moving forward. This does not necessarily mean that legislatively enacting a new information management process, if undertaken, could be achieved in the same manner as past efforts.

By the time of the enactment of the Printing Act of 1895, the written word, whether on cave walls or papyrus, or from the mechanical printing press, had been a robust communication technology for 4,000 years. It is possible to see primitive drawings and glyphs in the places humankind first appeared, or early examples of printing created with mechanical presses in their original forms. The handwritten and printed versions of *Journals* of the House and Senate dating to the First Congress in 1789 are readily available in tangible and digitized⁷¹ form.

The 1895 printing act was arguably an expression of the state-of-the-art standard of printing technology and provided a foundation which supported government information distribution for more than a century. This is due in part to the robust nature of some printed materials. Once created, many paper-based documents and records are preserved for centuries because the

⁷⁰ GPO, *Budget Justification, Fiscal Year 2018*, Washington, DC, March 15, 2017, https://www.gpo.gov/docs/default-source/congressional-relations-pdf-files/budget-submission/budget_justification_2018.pdf?sfvrsn=cb826d3d_0.

⁷¹ The House Journal from 1992-2014 is available from govinfo at <https://www.govinfo.gov/app/collection/hjournal>. The Senate Journal from 2004-2014 is available in the “Featured Senate Publications” category for each Congress, at <https://www.govinfo.gov/collection/featured-senate-publications?path=/GPO/Featured%20Senate%20Publications>. The Library of Congress Century of Lawmaking site has the House Journal from 1789-1897 and the Senate Journal from 1789-1875 at <http://memory.loc.gov/ammem/amlaw/lwhj.html>.

materials used to create them do not readily deteriorate, assuming resilient materials and environmentally appropriate storage. The technologies supporting these activities, including writing, printing, bindery, and librarianship, are nonproprietary, and skilled practitioners of those crafts are well distributed across the world. In the event of deterioration, and depending on their value, among other variables, tangible materials may be preserved by applying a range of interventions that do not necessarily alter the information they provide.

By contrast, in the fourth or fifth decade of transitioning from the tangible written word to ubiquitous digital creation and distribution, the way ahead is not as clear. Consideration of the questions and challenges surrounding the permanent retention of digital information has occurred, but solutions that are widely accepted or implemented have not been identified.⁷² The questions are challenging, because less is known about the long-term, archival retention and preservation of digitized or born digital materials than about the preservation of information in paper or other tangible formats.⁷³ There are some similarities; as with preserving the “right” number of tangible copies of a given work for permanent retention, there is no widespread agreement about the number of manifestations of digital items that should be kept.⁷⁴ But there are also substantial differences in approaches necessary to preserve digital materials. Some born digital materials—such as databases, websites, and publications—may be dynamic, and their content more readily changed than tangible materials. This may raise questions about version control, or necessitate the development of strategies for identifying and capturing different versions of materials in their entirety for archival preservation.

Further, instead of a fixed standard as is available for tangible products, digital preservation relies on a combination of risk analysis, and differentiated preservation techniques dictated in part by the object or goals of the preservation effort.⁷⁵ Whereas a printed document or book sits on a shelf, digital production and retention relies on three interrelated factors for its creation: hardware, an operating system, and software applications. These separate but interdependent technologies and processes interact to create a “document,” whether it is printed or retained digitally. Over the past half century, all three items have evolved, with some early hardware such

⁷² Examples of consideration of the challenges of digital preservation include CENDI Digital Preservation Task Group, *Formats For Digital Preservation: A Review Of Alternatives And Issues*, March 1, 2007, http://www.cendi.gov/publications/CENDI_PresFormats_WhitePaper_03092007.pdf; David Talbot, “The Fading Memory of the State,” *Technology Review*, July 2005, pp. 44-49; Abby Smith, “Preservation in the Digital Age: What Is to Be Done?,” *American Libraries*, vol. 30, no. 3 (March 1999), pp. 36-39; John C. Mallinson, “Preserving Machine-Readable Archival Records for the Millennia,” *Archivaria*, vol. 22 (Summer 1986), pp. 147-152; Sue Gavrel, “Preserving Machine-Readable Archival Records: A Reply to John Mallinson,” *Archivaria*, vol. 22 (Summer 1986), pp. 153-155; Charles M. Dollar, “Appraising Machine-Readable Records,” *The American Archivist*, vol. 41, no. 4 (October 1978), pp. 423-430; and Kenneth Thibodeau, “Machine Readable Archives and Future History,” *Computers and the Humanities*, vol. 10, no. 2 (March-April 1976), pp. 89-92.

⁷³ Some efforts to develop digital preservation strategies and technologies include LOCKSS (Lots of Copies Keep Stuff Safe), <http://www.lockss.org/>; and ECHO DEPOSITORY: Exploring Collaborations to Harness Objects with a Digital Environment for Preservation, <http://www.digitalpreservation.gov/partners/echodep.html>.

⁷⁴ Mike Kastellec, “Practical Limits to the Scope of Digital Preservation,” *Information Technology and Libraries (Online)*, vol. 31, no. 2 (June 2012), at <https://search.proquest.com/docview/1022030090?pq-origsite=gscholar>.

⁷⁵ See, for example, Jean-François Blanchette, “A Material History of Bits,” *Journal of the American Society for Information Science and Technology*, vol. 62, no. 6 (June 2011), pp. 1042-1057; Simson Garfinkel and David Cox, “Finding and Archiving the Internet Footprint,” presented at First Digital Lives Research Conference: Personal Digital Archives for the 21st Century, London, February 10, 2009, <https://simson.net/clips/academic/2009.BL.InternetFootprint.pdf>; Caroline Arms and Carl Fleischhauer, “Digital Formats: Factors for Sustainability, Functionality, and Quality,” undated, https://memory.loc.gov/ammem/techdocs/digform/Formats_IST05_paper.pdf; and Library of Congress, *Recommended Formats Statement 2017-2018*, which “identifies hierarchies of the physical and technical characteristics of creative formats, both analog and digital, which will best meet the needs of all concerned, maximizing the chances for survival and continued accessibility of creative content well into the future,” <https://www.loc.gov/preservation/resources/rfs/RFS%202017-2018.pdf>.

as mainframe computers, or the non-networked personal computer; operating systems and programming languages, including DOS, or COBOL; and software, including WordStar word processing or Eudora email, having gone from ascendance to obsolescence. In some cases, changes to hardware, operating systems, or software have resulted in the loss of access to the digital output they were used to create.

Whenever there is a hardware, operating system, or software change, it is sometimes necessary to reformat the digital output so it can be accessed by successor systems. Some earlier digitally created materials can be retrieved from previous information technology appliances or storage media, but sometimes the newer technologies are unable to render them in their original forms. In addition to the retention challenges, this also may raise concerns about document authenticity as well as preservation, at least in the manner the term applies to tangible materials, or necessitate investigation of additional technological solutions.

As a consequence, as long as there is no stable digital equivalent to an information distribution model based on words on paper in an official format, any effort to establish standards for the production and retention of digital materials might run the risk of privileging a current standard (e.g., XML or the widespread use of PDF). A potential consequence of such an effort might be to limit the technologies that can be used only to those that conform to a standard enacted into law. This might be seen by some as replacing the current approach to printing and publication management in Title 44 with one that might reasonably be seen as unlikely to last for more than a century in the way the printing standards set in 1895 have. Further, locking in a standard might deny Congress, GPO, the rest of the United States Government, and American citizens the potential benefits of further digital innovation that might arise as newer, and potentially more enduring, technologies are established or demonstrated to support long-term retention of government information.

Instead of enacting fixed standards as it did in 1895, Congress could consider a process by which the potential adoption of newer technologies and approaches reflective of emerging information management practices might be specified in statute. An option to consider might be a manner of assessing the utility and effectiveness of current standards by which government information is produced, distributed, and retained as a way of identifying future needs. Current practices could also be assessed against the emergence of future technological refinement, expansion, or change related to government information. These technology and management assessment efforts could be accomplished by a government agency, or by an external panel of individuals who are experts in the fields related to producing, distributing, and preserving information in digital environments. If such an approach is chosen, and when a technology determination process is established, it could prove an enduring approach to facilitating the apparent need to regularly update and manage digital information technology processes, since it is unclear when or if they will reach a level of maturity that printing had by the end of the 19th century.

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Acknowledgments

(name redacted), Senior Research Librarian, provided substantial research support and coauthored some sections of this report. (name redacted), Senior Research Librarian, coauthored an earlier report on the Federal Depository Library Program from which some material in this report was taken. Raymond A. Williams gathered data that was incorporated into this report.

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