ADVANCED PRINTING TECHNOLOGY ASSESSMENT

CONCEPT OF OPERATIONS

U.S. GOVERNMENT PRINTING OFFICE

KEEPING AMERICA INFORMED

UNITED STATES GOVERNMENT PRINTING OFFICE (GPO)

JULY 21, 2009

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TABLE OF CONTENTS

1.0 SCOPE

1.1 Identification

This document is the Concept of Operations (Conops) for the Advanced Printing Technology Assessment (APTA) project at the United States Government Printing Office. The sections below identify the proposed system, provide an overview of the document, describe the approach used to generate the document, and provide a brief overview of the system.

1.2 Document Overview

The DPTA Conops serves as a vehicle to communicate the high-level system characteristics of the envisioned system to users, developers and other stakeholders.

This document contains the following sections:

- **Section 1** – Describes the approach used to develop this document
- **Section 2** – Lists the documentation that was used as a basis to create the document
- **Section 3** – A detailed description of current situation or the existing system in need of modification or replacement
- **Section 4** – Justification for the change and a description of the nature of the change
- **Section 5** – Description of the proposed system or solution
- **Section 6** – Description of operational scenarios
- **Section 7** – Summary of the operational and organizational impacts
- **Section 8** – An summary analysis of the proposed system

The intended audience for this document is the management and staff of the Office of the Public Printer, the management and staff of the Office of the Chief Information Officer (CIO), and industry leaders of printing technology.

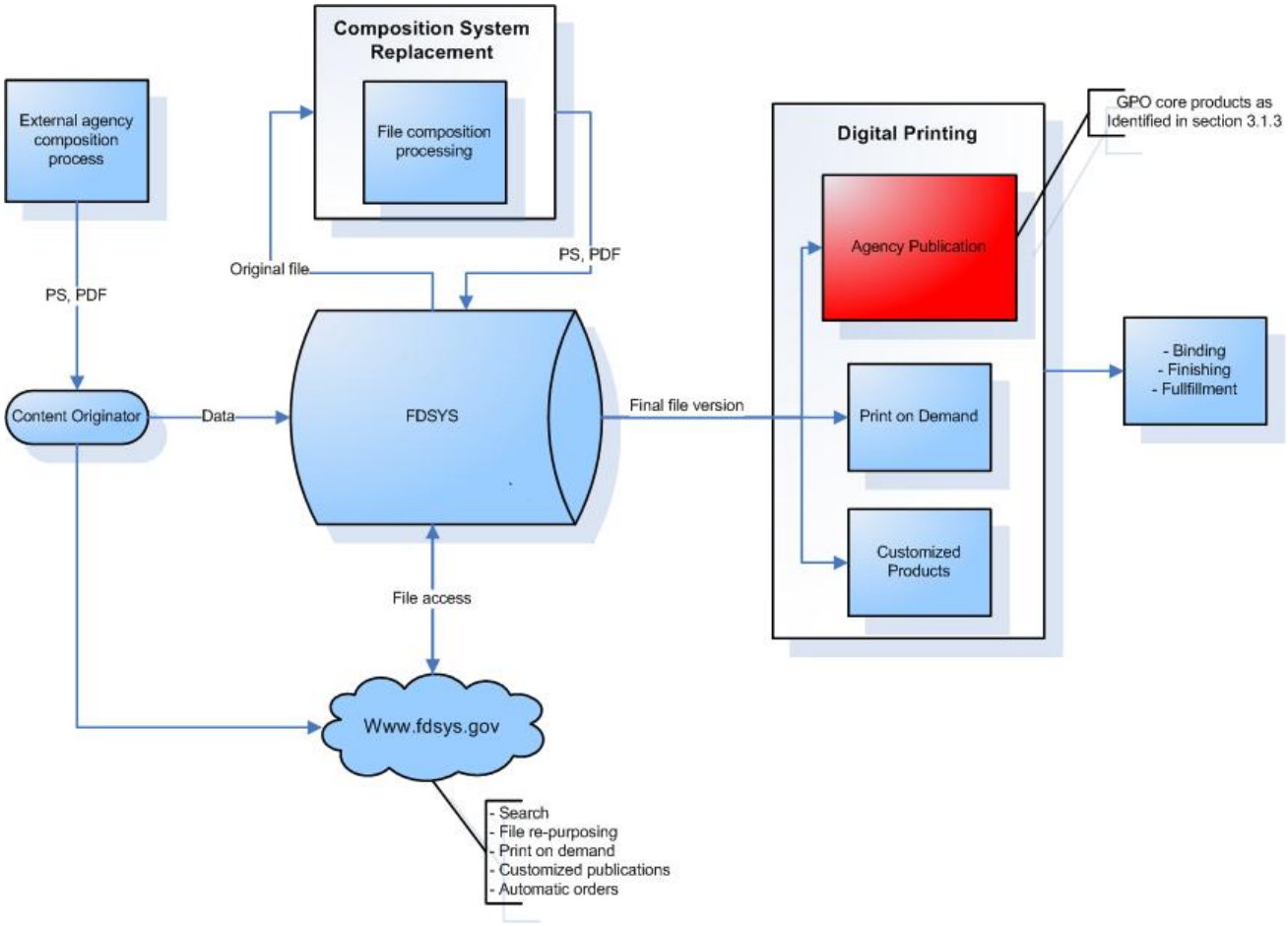
1.3 System Overview

Content will be submitted by customer agencies to the Government Printing Office using GPO's Federal Digital System (FDsys, Appendix A). FDsys will store data files where GPO production departments can access them and prepare them for printing using GPO's Composition System Replacement (CSR).

Once the file has been typeset, the finalized PDF versions will be stored in FDsys. The final PDF version will be made available to GPO customers for file repurposing via www.gpo.gov/fdsys. Customers will have the opportunity to search for publications, customize documents and initiate Print on Demand orders through FDsys' web-to-print interface.

Once these requests have been saved, Plant Operations will retrieve the files and distribute them to one of three production streams: (1) Agency Publications, (2) Print on Demand (POD) or (3) Customized Products. The Agency Publications to be produced using the proposed system are identified in section 3.1.3 and are addressed as GPO's "core products" in this document.

The Concept of Operations focuses on the "Advanced Printing Operations" section of the high-level context diagram below:



2.0 REFERENCED DOCUMENTS

Documentation used to support the Advanced Print Technology Assessment Conops is described in sections 2.1.

2.1 GPO Documentation

United States Government Printing Office. Concept of Operations for the Future Digital System V2.0. 16 May 2005. http://www.gpo.gov/pdfs/fdsys-info/FDsys_ConOps_v2.0.pdf.

United States Government Printing Office. Composition System Replacement Conops V1.1. 18 April 2008. http://www.gpo.gov/pdfs/vendors/CSRConOpsv1.1.pdf.

United States Government Printing Office. Quality Assurance Through Attributes Program: GPO Publication 310.1. August 2002.GPO. http://www.gpo.gov/pdfs/vendors/qatap.pdf

3.0 THE CURRENT SYSTEM OR SITUATION

3.1 Background

Throughout its history, GPO has been organized to carry out its mission in a traditional printing craft setting with its emphasis on extensive capital investments in heavy metal equipment operated in a large factory environment. In general, the Government Printing Office dedicates its in-house printing equipment to produce overnight newspapers for Congress and The Office of the Federal Register. GPO uses three conventional web offset presses to produce these overnight publications. These three web presses are referred to as the double unit web presses in this document.

GPO uses a different set of web presses to produce the remaining core products listed in section 3.1.3. Some of these products, such as the Hearings and Reports, are also produced overnight. The web presses dedicated to these publications are referred to as the single unit presses in this document. Finally, GPO uses a Harris V-15D web press to print some Bills and Calendars. Combined, a total of 7 web presses are used to produce the core products.

Some digital printing equipment is utilized at the Government Printing Office. GPO operates a digital print center that primarily uses Xerox equipment. These toner based printers are used for short runs, specifically for Bills and Reports (see section 3.3.4). Total capacity is limited and no personalization functionality is present.

GPO's current web presses are designed to yield maximum efficiency when printing 20,000 or more copies. Press runs have decreased linearly over the past decade where currently none of GPO's core products average quantities over 8,000 copies. These short runs have caused high paper waste percentages as make ready quantities can be nearly as high as the required delivery amounts.

3.1.1 Objectives

GPO's objective is to produce and deliver congressional and federal agency publications in a timely, cost effective manner while maintaining acceptable quality levels set forth by Congress and federal agencies in conjunction with standards established by the Quality Assurance Through Attributes Program (QATAP).

3.1.2 Scope

This document will focus on GPO's core products and the web offset presses used to produce these publications.

3.1.3 Core Products

- Congressional Record
- Congressional Record Index
- Federal Register
- Federal Register Index
- Senate Calendar
- House Calendar
- Bills

- Economic Indicators
- Hearings
- Senate Reports
- House Reports
- Code of Federal Regulations (CFR)
- List of CFR sections affected (LSA)

3.1.4 Web Offset Presses

- Three 25 x 38" Hantscho Single Unit Web
- Three 35 x 50" Hantscho Double Unit Web
- Harris V-15D Single Unit Web

3.2 Description of the Constraints of the Current System

GPO's press division operates in a historically effective environment that has become less and less efficient during the past decade. GPO's conventional web offset equipment has served GPO's customer needs for the past three decades. However, with the advent of the Internet and the accessibility of electronic files, print volumes have decreased. Shorter press runs have caused GPO's production waste percentage to increase dramatically as Plant Operations continues to use high print volume optimized web presses for book publication.

Some of the constraints of the current system may include:

- GPO's conventional web presses are designed to run minimum quantities of 20,000 plus copies; none of the core products average quantities that exceed 8,000 copies
- Due to short press runs, make-ready paper usage can equal as much as half the allocated paper to plan a job; this can lead to production paper waste percentages as high as 80 -90% for Bills and Calendar jobs
- Roll changes on web presses to produce less than full signatures can require substantial configuration and setup times
- Hantscho is no longer in business, so all replacement parts for the printing units (cylinders, gears, etc.) must be custom fabricated by either the GPO machine shop, or by contracted vendor
- While GPO does operate some digital printing equipment, Print on Demand opportunities are restricted due to a lack of Bindery solutions as well as limited throughput
- While the single unit web presses are run during all three production shifts, the double unit web presses are only fully utilized on the third shift
- Fixed cutoffs on the web presses generate high trim waste for Bills and Calendar press runs
- GPO must run three production shifts using current equipment even though 1st shift may only utilize one double unit press during production

3.3 Description of the Current System or Situation

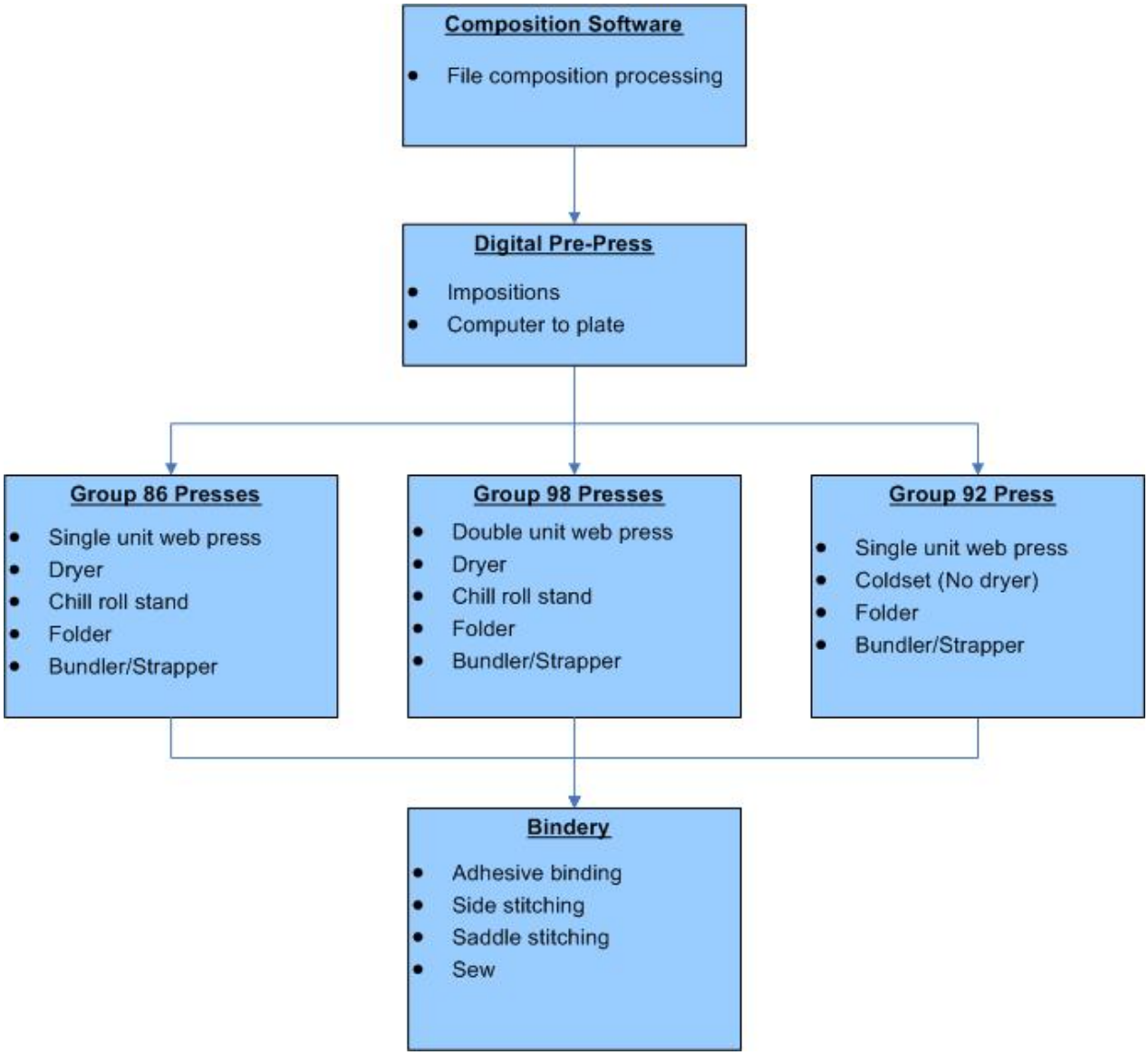
Agency and Congressional content is received by GPO both electronically and by hardcopy manuscript. For GPO's core products, Agency and Congressional content arrives at various times throughout all three production shifts. Once the file composition process is completed, the

PDF or Postscript versions will be sent through GPO's computer to plate process (CTP). Printing plates are delivered to the pressroom as they become available.

Plates are assigned to the single or double unit web presses based on the production schedule and product/equipment match. GPO's Hantscho web presses use heat set inks and print on newsprint and white offset paper. Once printed, the paper is fed through a dryer where the ink solvents are evaporated and transported to a thermal oxidizer. After drying, the paper is fed through a chill roll stand to harden the ink resin and then enters the in-line folders. Signatures are created and then strapped into bundles. The bundles are weighed to obtain an accurate count of required signatures before being transported to the bindery where they are compiled into books and bound using adhesive binding or side/saddle stitching and then trimmed to finished size. Delivery times for each publication can be found in section 3.3.2.

The current-state documentation is based on a high level reference model depicted in 3.3.4.

3.3.1 Context Diagram



3.3.2 Specifications – Core Products

Publication	Frequency	Trim Size	Average Quantity	Average Page Count	Substrate	Paper Weight	Binding Options
Congressional Record	Daily	8.25 x 11"	4,160	200	Newsprint	28	Adhesive binding if >128 pages. Side or saddle stitch if <128 pages
Congressional Record Index	2 per month	8.25 x 11"	3,767	150 -460	Newsprint	28	Adhesive binding
Federal Register	Daily	8.25 x 11"	6,904	300	Newsprint	28	Adhesive binding if >128 pages. Side or saddle stitch if <128 pages
Federal Register Index	Monthly	8.25 x 11"	7,194	48 - 160	White Offset	50	Saddle or Adhesive binding if 132 pages
Senate Calendar	Daily	7.375 x 11"	1,040	88 -104	White Offset	40	Saddle stitch
House Calendar	Daily	7.375 x 11"	1,277 - 2,078	160 -200	White Offset	40	Saddle or side stitch
Bills	Daily (up to 50/per day)	7.375 x 11"	250 -800	66 - 1,000 plus	White Offset	40	Saddle/side stitch or adhesive binding with wraparound
Economic Indicators	Monthly	7.875 x 10.25"	3,000	40	White Offset	40	Saddle Stitch
Hearings	Daily (up to 5/per day)	5.875 x 9.125"	300 - 850	12 - 2,000 plus	White Offset or MF Offset	40 or 35	Saddle, side, or adhesive binding with cover
Senate Reports	Daily (up to 5/per day)	5.875 x 9.125"		14 - 1,000 plus	White Offset or MF Offset	40 or 35	Saddle, side, or adhesive binding with cover
House Reports	Daily (up to 5/per day)	5.875 x 9.125"	1,400	14 - 1,000 plus	White Offset or MF Offset	40 or 35	Saddle, side, or adhesive binding with cover
CFR	210 per year	5.875 x 9.125"	6,900	700	White Offset	40	Adhesive binding with cover
LSA	Monthly	5.875 x 9.125"	6,900	200	White Offset	50	Saddle or adhesive binding with cover

3.3.3 Specifications – Web Presses

Manufacturer	Acquired	Max Press Sheet	Pages	Inks	Speed (IPH)
Hantscho Single Web	1979	25 x 38	32	Black text only	14,000 - 18,000
Hantscho Single Web	1979	25 x 38	32	Black text only	14,000 - 18,000
Hantscho Single Web	1979	25 x 38	32	Black text only	14,000 - 18,000
Hantscho Double Web	1995	35 x 50	64	Black text only	14,000 - 18,000
Hantscho Double Web	1995	35 x 50	64	Black text only	14,000 - 18,000
Hantscho Double Web	1997	35 x 50	64	Black text only	14,000 - 18,000
Harris Single Web	1986	22 ¾ x 36	16	Black text only	14,000 - 18,000

3.3.4 Production Scheduling

GPO produces seven overnight publications that require critical production scheduling in order to meet their firm deadlines:

Publication	Frequency	Print-ready File Completion	Delivery Deadline
Congressional Record	Daily	12:00 AM - 7:00 AM	7:30 AM
Federal Register	Daily	8:00 PM - 12:00 AM	9:00 AM
Senate Calendar	Daily	12:00 AM	7:30 AM
House Calendar	Daily	12:00 AM	7:30 AM
Bills	Daily (up to 50/per day)	7:00 PM - 2:00 AM	7:30 AM
Senate Reports	Daily (up to 5/per day)	7:00 PM - 2:00 AM	7:30 AM
House Reports	Daily (up to 5/per day)	7:00 PM - 2:00 AM	7:30 AM

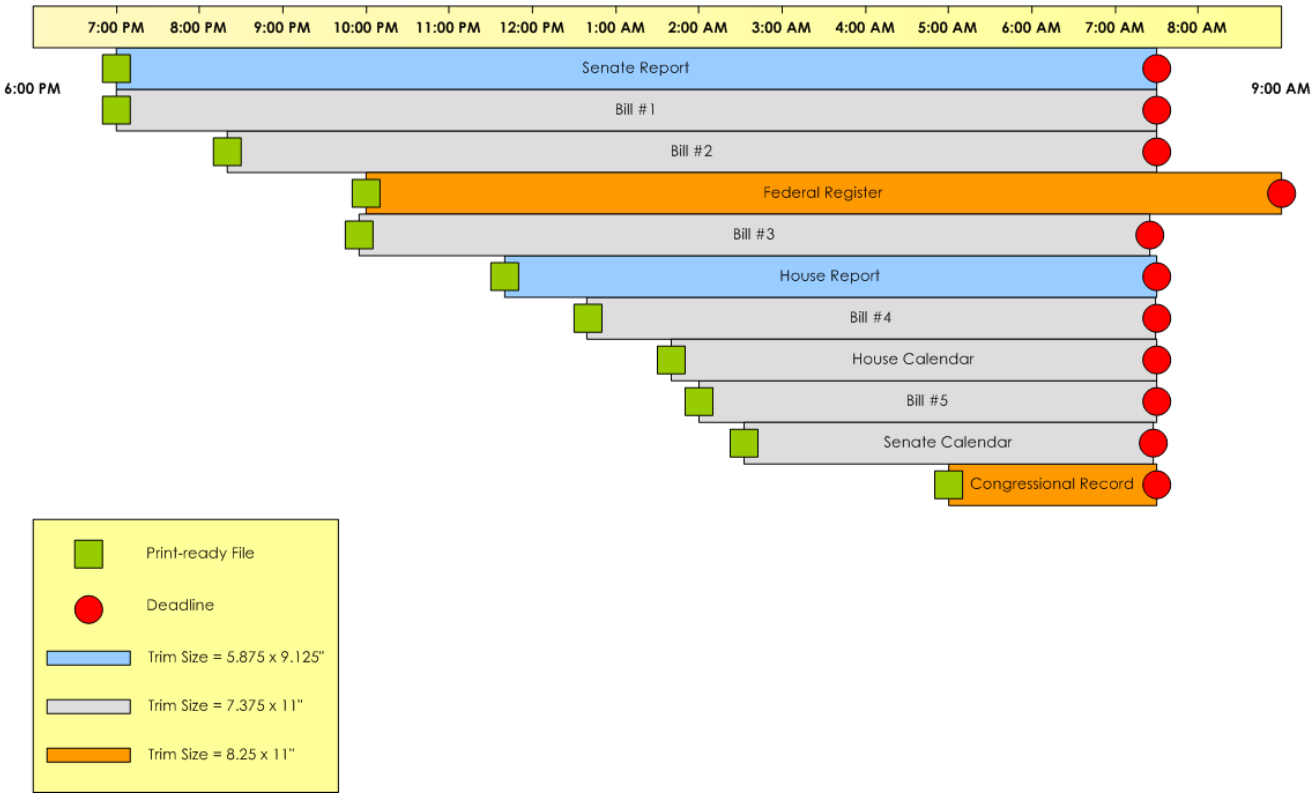
The Congressional Record is the most difficult publication to produce during this production window because content arrives throughout the night. Many times the final PDF file is not ready until 7:00 AM. Because of this time crunch, print-ready files are created as the content arrives and Plant Operations will begin printing signatures on the web presses immediately. Once the final press run is complete, the signatures printed from throughout the shift will be assembled to create the final publication.

For Bills and Reports, multiple publications are printed per night. However, not every publication will be produced on GPO web presses. GPO does operate a Digital Print Center equipped with toner based Xerox printers. The cutoffs for these publications are:

- **Bills:** In general, publications with page counts equal to 24 pages or less are printed using Xerox printers. However, time sensitive Bills with page counts of 13 or greater will be printed using GPO web presses
- **Senate and House Reports:** In general, publications with page counts equal to 12 or less are printed using Xerox printers

All Bills and Reports whose page counts exceed these cutoffs are printed on GPO's web presses. The diagram in 3.3.5 illustrates a typical 3rd shift web press production schedule for daily overnight publications. Note: the deadline for the overnight publications includes binding and finishing operations.

3.3.5 Web Press Production Schedule (deadline includes Bindery operations)



3.3.6 Daily Throughput

The advanced print technology solution must ultimately fulfill GPO's production requirements referenced in section 3.3.2. The chart below shows an average press run for each of the publications used in the web press production scheduling scenario:

Publication	Average Quantity	Average Page Count	Total Images
Congressional Record	4,160	200	832,000
Federal Register	6,904	300	2,071,200
Senate Calendar	1,040	104	108,160
House Calendar	2,078	200	415,600
Bill #1	500	150	75,000
Bill #2	500	150	75,000
Bill #3	500	150	75,000
Bill #4	500	150	75,000
Bill #5	500	1,000	500,000
Senate Reports	1,000	128	128,000
House Reports	1,400	128	179,200
			4,534,160

For this example, the total number of pages or images required during this production scenario would be a total of 4,534,160 images.

3.3.7 Raster Image Processing (RIP) times

- **Double unit web presses:** Ten minutes for the first plate and five minutes for each additional plate
- **Single unit web presses:** Ten minutes for the first plate and two minutes for each additional plate
- **Harris single web press:** Ten minutes for the first plate and two minutes for each additional plate

3.4 Modes of Operation for the Current System or Situation

GPO operates three production shifts at its main headquarters in Washington, DC. These three shifts are responsible for producing all Congressional and Federal agency publications inside GPO's production facility. Because the printing, folding and packing functions are all in-line operations, each press requires between four and six employees for production. In general, the 3rd shift produces the highest volume of work. When Congress is not in session, 3rd shift will experience increased idle time. Typically, 1st and 2nd shifts will experience routine down time because overnight publications are predominantly printed during the 3rd shift operation.

- **All shifts**
  - **Single unit web presses:** Four workers per press
  - **Double unit web presses:** Six workers per press
  - **Single unit Harris web press:** Two workers on press

3.5 User Classes and Other Involved Personnel

The following are personnel/users that are involved in the offset web printing process. An explanation as to their role(s) in the process is included for each:

3.5.1 Hantscho Double Unit Web Offset Presses

- **Head pressperson (Head operator):** Responsible for overall finished product and press operation. Duties include registration, mounting plates and monitoring the weight count.
- **2nd web offset pressperson:** Responsible for maintaining color, density and pagination as well as mounting and removing printing plates.
- **Offset pressperson:** Responsible for roll splicing, roll mounting, assembles spindle and inflatable bladder and tracks roll paper usage.
- **Packer (2):** Sets belt tension, operates the stacker, operates strapping machine and programs robotic arm.
- **Roll tender:** Operates forklift, transports web paper rolls, strips roll waste, assists in inserting the spindle and inflating the bladder and responsible for disposing partial paper rolls.

3.5.2 Hantscho Single Unit Web Offset Press

- **Head pressperson (Head operator):** Responsible for overall finished product and press operation. Duties include registration, mounting plates and monitoring the weight count.
- **2nd web offset pressperson:** Responsible for maintaining color, density, pagination, mounting and removing printing plates, roll splicing, roll mounting and tracks roll paper usage.

- **Packer:** Sets belt tension, operates the stacker, operates strapping machine and programs robotic arm.
- **Roll tender:** Operates forklift, transports web paper rolls, strips roll waste, assists in inserting the spindle and inflating the bladder and responsible for disposing partial paper rolls.

3.5.3 Harris V-15D Single Web

- **Head pressperson (Head operator):** Responsible for overall finished product and press operation. Duties include registration, mounting plates and monitoring the weight count.
- **Roll tender:** Operates forklift, transports web paper rolls, strips roll waste, inserts and inflates roll spindle, disposes of partial paper rolls and operates the stacker and strapping machines.

3.5.4 Training

All personnel that work on GPO's single and double web presses require specific levels of training. Although GPO offers an internal apprenticeship program, outside hires can meet requirements with experience equivalents.

- **Head pressperson (Head operator):** Four year apprenticeship or equivalent plus one year minimum experience
- **2nd web offset pressperson:** Four year apprenticeship or equivalent plus one year minimum experience
- **Offset pressperson:** Four year apprenticeship or equivalent
- **Packer (2):** Four week training
- **Roll tender:** Four week training

3.6 Description of Support Environment

GPO web presses are maintained internally by agency personnel. Press division employees are responsible for routine maintenance on production machinery. GPO also utilizes its in-house electricians, machinists and plumbers for various inspection, maintenance and repairs. Required maintenance responsibilities for the web offset presses are:

- **Press division**
  - General cleaning
  - Greasing
  - Spindles
  - Rollers
  - Folders
  - Cylinders
- **Electricians**
  - Wiring issues
  - Timing issues
  - Relay troubleshooting

- **Machinists**
  - Bearing replacement
  - Cylinder rebuild
  - Gear replacement
  - Sharpens tucker blades
  - Maintains jaws
  - Maintains slitter
- **Plumbers**
  - Dryer maintenance
  - Chill roll maintenance
  - Duct work
  - Ink transportation system
  - Valves
  - Maintains thermal oxidizer

4.0 JUSTIFICATION FOR AND THE NATURE OF CHANGES

4.1 Justification for Changes

GPO seeks to move from a high-speed, high-volume, large-batch size, and low-cost printing operation to a high-volume, small-batch size, and low-cost operation. Several factors drive the desire to replace the current web presses used for in-plant operations. These include GPO's desire to leverage advanced printing technology to modernize its printing plant and provide the most cost effective and flexible print solutions available to its customers.

Traditional web presses have fulfilled Congressional and Federal Agency needs for the past four decades but they have become less efficient as print volumes have grown shorter. GPO web presses are designed for press runs of minimum 20,000 copies in order to reach desired efficiency. Since the mid 1980s, GPO has witnessed a decrease in publication quantities where currently not a single core GPO product averages more than 8,000 copies. This decrease in quantity has led to an increase in the production paper waste percentage.

In addition, GPO's current web presses offer no flexible printing solutions. While GPO does contain some digital printing equipment, it wishes to increase its capacity for variable data printing and Print on Demand orders. A solution utilizing an advanced printing solution should provide GPO with the means to better meet the needs of Congressional and Federal Agency customers and FDsys end users. New printing systems utilizing advanced printing technology should provide the same high-speed and high-volume printing capabilities as the current web press system while allowing for cost-effective solutions for short to medium press runs.

4.2 Description of Desired Changes

The new advanced print technology will enable GPO's Production Department to interface with FDsys and CSR. It will support the production of GPO's core products while providing minimal make ready waste and offer increased POD capabilities for government publications as well as customized versions of federal documents.

4.2.1 Proposed System Capabilities

To meet strategic objectives, the advanced printing technology solution will need to:

- Perform high speed printing with throughput capable of meeting GPO production requirements. (See 3.3.2)
- Produce multiple publications simultaneously within a constrained production window
- Maintain acceptable offset printing quality standards equal to or greater than levels 3 through 5 for text printing and levels 3 and 4 for covers as defined in the Quality Assurance Through Attributes Program (QATAP)
- Focused on black and white printing with the potential for process color printing capabilities
- Provide solution for in-line, near-line or off-line finishing equipment configuration to include folding, side wire and saddle stitching, trimming and adhesive binding
- Produce complete government publications while minimizing production paper waste
- Provide POD and high speed variable data printing options
- Contain robust print engine with RIP times acceptable for quick turnarounds

- Alleviate scheduling issues by reducing set up and configuration downtime
- Accept a variety of substrates including but not limited to:
    - Newsprint
    - White offset
    - Recycled (up to 100%)

4.2.2 Proposed System Interfaces

The system must interface with the following external applications and systems:

- GPO's Federal Digital System (FDsys)
- Composition Software Program
- Commercial finishing and binding equipment (in-line, near-line or off-line)

4.2.3 Personnel Changes

The advanced technology solution will require personnel to be trained to fit the proposed system. All listed personnel will be affected by the proposed technology solution:

- Head pressperson (Head operator)
- 2nd web offset pressperson
- Offset pressperson
- Packer
- Roll tender
- Plate makers
- Bindery personnel

4.2.4 Operational Changes

Migrating GPO's production model from a high-volume, large-batch size, low-cost printing operation to a high-volume, small-batch size, low-cost printing operation might require significant operation changes. However, these changes will not be identified until the print technology is completely understood and selected for use at GPO. Updates to the Conops will be made as required.

4.2.5 Support Changes

Migrating GPO's production model from a high-volume, large-batch size, low-cost printing operation to a high-volume, small-batch size, low-cost printing operation might require significant support changes. However, these changes will not be identified until the print technology is completely understood and selected for use at GPO. Updates to the Conops will be made as required.

4.3 Priorities among Changes

Priorities among changes to the operational and support structure of GPO will be identified until the print technology is completely understood and selected for use at GPO. Updates to the Conops will be made as required.

4.4 Changes Considered but not Included

See Section 8.3 Alternatives and Tradeoffs for a summary of alternatives to Advanced Print Technology Solution and changes considered.

4.5 Assumptions

- Congress and Federal Agencies seek low-cost efficient print solutions for their needs
- The demand for file repurposing to create customized publications is present and will continue to grow in future print markets
- Government publication print quantities will continue to decrease
- The proposed advanced print solution will interface with FDsys and CSR
- Congress and Federal Agencies will have confidence in GPO's proposed solution and embrace GPO's technical advancements
- An advanced print solution may require extensive training and opportunities for Plant Operations employees
- An advanced print solution will require external support for training and maintenance

4.6 Adverse Effects

The risks of not proceeding with an advanced print technology solution include:

- Inability to fulfill agency mission efficiently
- Inability to implement industry technical advancements and best practices
- Continued lack of support for obsolete machinery
- Non compliance with GPO's Go Green initiatives for conservation
- Lose work to competing private industry whose technological advancements have postured themselves as legitimate competition
- Mechanical breakdowns that severely impact GPO's workflow
- GPO will not be positioned to provide adequate services to customers

5.0 CONCEPTS FOR THE PROPOSED TECHNOLOGY

5.1 Background

The motivation of this project is to transform GPO's overnight newspaper operation from a long-run size, conventional web offset press workflow to a dynamic, flexible system by choosing the best printing technology solution available. This solution will provide high-speed, high-volume, small-batch variable data printing and reduce production paper waste incurred by short run government publications.

5.1.1 Objectives

The objective of the proposed advanced print technology incorporated into a print solution will be to continue to deliver Congressional and Federal Agency publications in a timely manner, but at a lower cost. The new system will also be capable of providing print solutions for customers who will use FDsys functionality to customize orders through the web interface.

5.1.2 Scope

The scope will include core products as identified by Plant Operations as well as any product chosen for POD orders:

5.1.3 Core Products

GPO core products are listed in sections 3.1.3 and 3.3.2

5.1.4 POD Orders

- Any publication offered for on-line purchasing

5.2 Operational Policies and Constraints

The proposed advanced print technology incorporated into a print solution will support GPO operational policies as well as future changes to policy. Some of the constraints of the proposed system are:

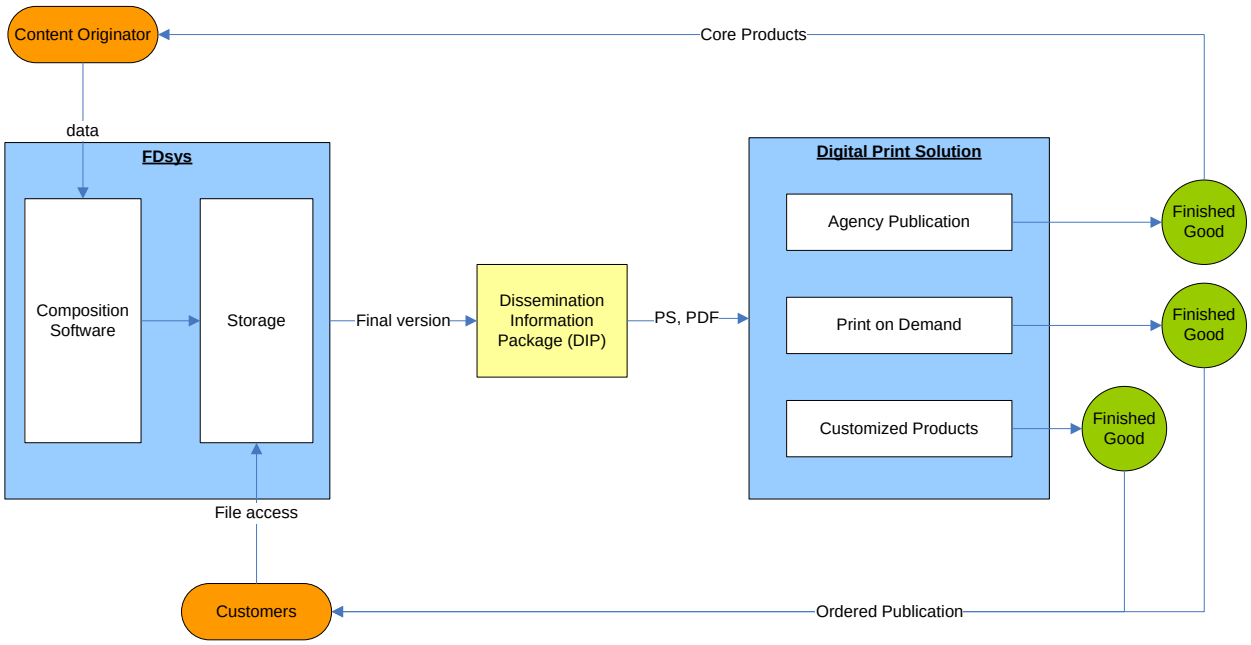
- The printing system utilizing the print technology solution must support FDsys
- The system will be implemented within current funding and resource allocations
- Users of the proposed system will need extensive training
- Physical space for the eventual printing equipment using this technology will need to be allocated
- A climate controlled storage area may be required to stage substrates used in the eventual print system
- The Composition Software Replacement program may not be integrated before a new print solution is implemented.
- FDsys customization, automatic ordering, file repurposing and POD functionality may not be available before a new print solution is implemented

5.3 Description of the Proposed Technology

The proposed advanced print technology incorporated into a print solution will interface with the Federal Digital System (FDsys). Content will be submitted from government agencies into FDsys where the composition engine will process input data to output content in various formats. The files will be stored in FDsys and disseminated to plant operations for hardcopy production. GPO's core publications will receive PDF and postscript files for production.

The new printing solution will produce complete hardcopy publications which will be delivered to the content originator (Congress, Office of the Federal Register). Final electronic versions of these and other publications will be stored and archived in FDsys where customers can access them via web interface through www.gpo.gov/fdsys. These files can be ordered for hardcopy POD or made available for file re-purposing and customization to be printed in-house using GPO's new print solution.

This process is illustrated in the following diagram:



5.4 Modes of Operation

The proposed advanced print technology incorporated into a print solution would require a three shift operation at GPO's main facility located in Washington, DC.

- **1st shift:** 7:30 am – 4:00 pm
- **2nd shift:** 3:30 pm – 12:00 am
- **3rd shift:** 11:30 pm – 8:00 am

5.5 User Classes and Other Involved Personnel

The classes of users who will interact with the proposed advanced print technology incorporated into a print solution will not be defined until the technology has been selected and user class defined per specification of the equipment. The DPTA Conops will be updated as required.

5.6 Description of Support Environment

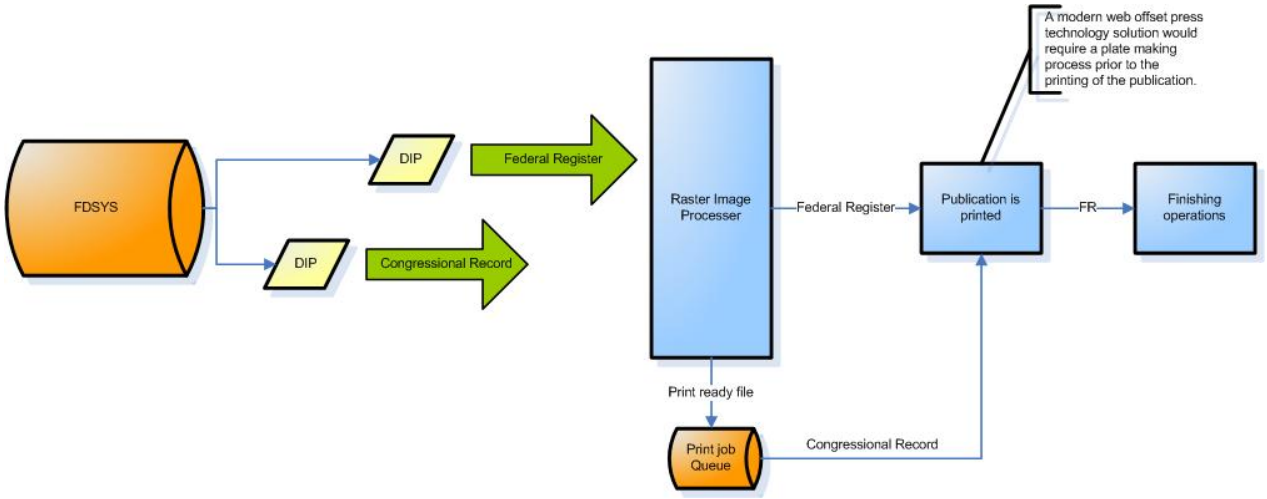
The proposed advanced print technology incorporated into a print solution will require continuous support. The exact support environment will not be determined until the technology has been selected and support structure identified. The DPTA Conops will be updated as required.

6.0 OPERATIONAL SCENARIOS

The following sections describe the basic operational scenarios of the proposed advanced print technology incorporated into a print solution and presents diagrams that are intended to illustrate the capabilities required of the desired technology. The technology is based on a continuous feed model and assumes support from ancillary bindery equipment.

6.1 Scenario – Agency Publication

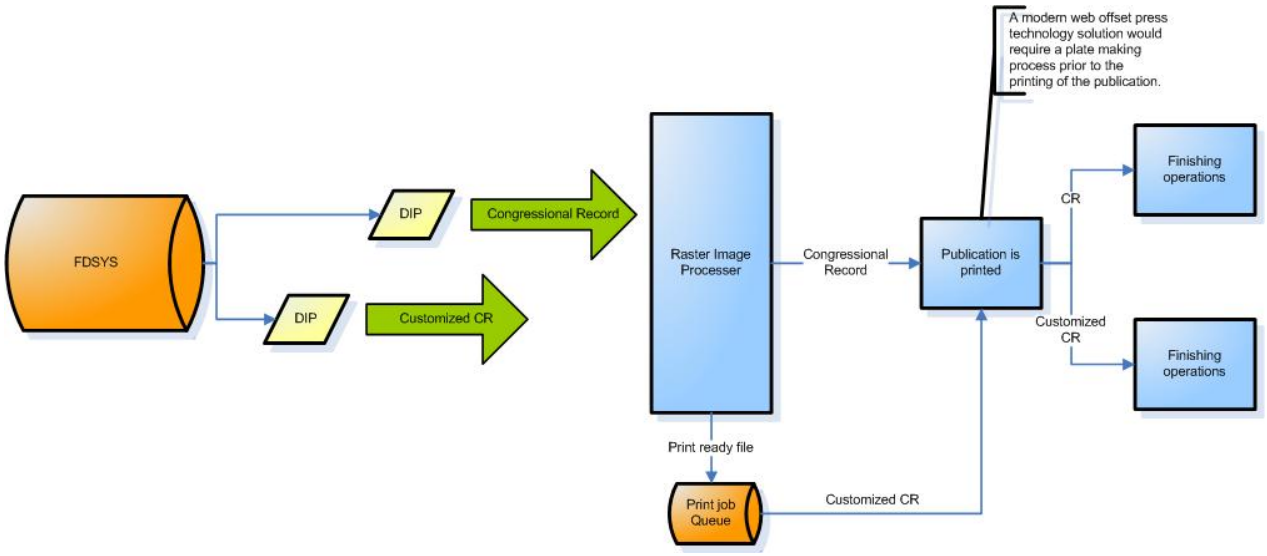
- FDsys generates the dissemination information package (DIP)
- Plant Operations receives the DIP/production-ready file and routes the Federal Register (FR) PDF or postscript file to the raster image Processor (RIP)
- Once the RIP is complete, the Federal Register print ready file is sent to the printing unit.
- As the Federal Register is being printed, the next DIP/production-ready file is received which contains the Congressional Record (CR) PDF or postscript file
- The Congressional Record file is sent to the RIP and then stored in the print queue
- After the Federal Register print run is complete, the publications are bound and trimmed
- The Congressional Record print ready file is sent to the printing unit



6.2 Scenario – Agency or Congressional Publication + Customized Product

- FDsys generates the dissemination information package (DIP)
- Plant Operations receives the DIP/production-ready file and routes the Congressional Record (CR) PDF or postscript file to the raster image processor (RIP)
- Once the RIP is complete, the Congressional Record print ready file is sent to the printing unit

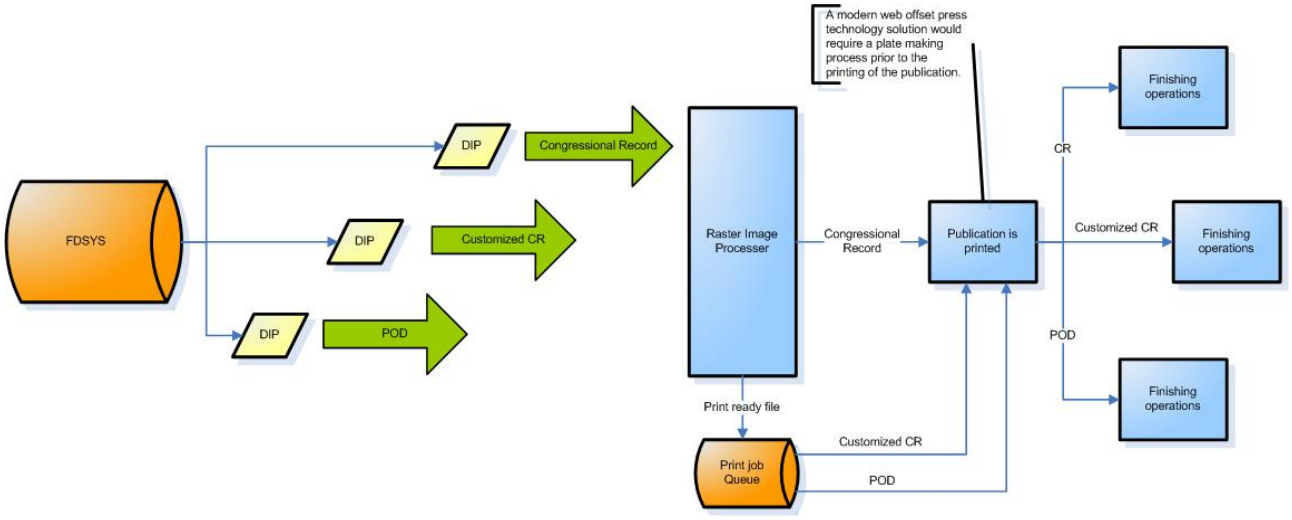
- As the Congressional Record is being printed, the next DIP/production-ready file is received which contains a customized Congressional Record order
    - Customized order example – a customer requests a copy of the Congressional Record that only includes pages which contain information on "educational programs." Instead of a full CR publication containing 200 pages, her customized copy only contains six. (*different finishing operation may be required)
- During the CR print run, the customized Congressional Record print ready file is sent to the printing unit and enters the production stream



6.3 Scenario – Agency or Congressional Publication + Customized Product + Print on Demand (POD)

- FDsys generates the dissemination information package (DIP)
- Plant Operations receives the DIP/production-ready file and routes the Congressional Record (CR) PDF or postscript file to the raster image processor (RIP)
- Once the RIP is complete, the Congressional Record print ready file is sent to the printing unit
- As the Congressional Record is being printed, the next DIP/production-ready file is received which contains a customized Congressional Record order
- The customized CR file is sent to the RIP; after processing the print ready file is stored in the print queue
- FDsys generates a DIP which contains a print on demand order (POD)
    - POD order example – a customer requests a copy of the "Emergency Response to Terrorism, 2008." The PDF file is stored in FDsys and is searchable to GPO customers. (*different finishing operation may be required)

- The POD file is sent to the RIP; after processing, the print ready file is stored in the print queue
- During the Congressional Record print run, the customized Congressional Record print ready file and the POD order file are sent to the printing unit and enter the production stream



7.0 SUMMARY OF IMPACTS

The implementation of the proposed advanced print technology incorporated into a print solution will have a wide ranging impact on both GPO and its customers. The subsections below identify potential operational, organizational and development impacts that should be considered as GPO develops its plans.

7.1 Operational Impacts

Possible operational impacts may include:

- New interfaces with primary or alternate computer operating centers
- Changes in processes and procedures
- Changes in operational budget
- Changes in operational risks

7.2 Organizational Impacts

Possible organizational impacts may include:

- Modification of roles and responsibilities of production personnel
- Training personnel to obtain required skill sets
- Operation and maintenance
- Increased development of education and increased training for GPO staff
- Reduced need for engineering support from in-house personnel

7.3 Impacts during Development

Possible impacts during development may include:

- Articulation of business rules and other controls needed for operational implementation
- Development of training plans
- Involvement in studies, meetings and discussion prior to award of the contract
- Parallel operation of test systems without disruption current plant operation processes

8.0 ANALYSIS OF THE PROPOSED TECHNOLOGY

This section provides an analysis of the benefits, limitations, advantages, disadvantages and alternatives and trade-offs considered for the proposed advanced print technology incorporated into a print solution.

8.1 Summary of Improvements

The proposed advanced print technology incorporated into a print solution may provide numerous benefits to GPO such as:

- Improved efficiency and processes
- Reduced production paper waste
- Improved equipment utilization
- Enhanced Print on Demand response
- Increased print solution portfolio for customers
- Reduced carbon footprint

8.2 Disadvantages and Limitations

Disadvantages and limitations related to the proposed advanced print technology incorporated into a print solution may include:

- Staff apprehension brought about by new responsibilities or changes to work processes
- Formidable training and retraining initiatives to obtain required skill sets
- High costs of proprietary maintenance, consumables and software
- Reliance upon proprietary maintenance, consumables and software
- Limited response time from vendor when maintenance is required
- Toner based digital printing solutions may be impacted by the USPS irradiation process for CFR and LSA publications
- Allocating work space to house print equipment, finishing equipment modifications and storage
- High acquisition and development costs

8.3 Alternatives and Trade-Offs Considered

An alternative to the proposed advanced print technology incorporated into a print solution would be to procure a modern offset web press with shaftless drive technology designed for short to medium run production. Advantages to this alternative may include:

- Users would not have to learn a new system or process
- Support environment would not be affected
- Required skill set exists at GPO
- Training and retraining would be limited
- No impact to downstream production processes

Disadvantages or limitations to this alternative may include:

- High acquisition costs
- Limited VDP or POD solutions to offer customers
- Limited reduction in production paper waste

9.0 ACRONYMS

Conops	Concept of Operations
FDsys	Federal Digital System
GUI	Graphical User Interface
PDF	Portable Document File
PS	Postscript File
APTA	Advanced Printing Technology Assessment Project
CSR	Composition System Replacement
POD	Print on Demand
QATAP	Quality Assurance through Attributes Program
CTP	Computer to Plate
SPF	Secure Production Facility
DIP	Dissemination Information Package
USPS	United States Postal Service
CFR	Code of Federal Regulations
LSA	List of Sections Affected

10.0 DICTIONARY

Print on Demand: A printing technology and business process in which new copies of a book (or other document) are not printed until an order has been received.

File Repurposing (customized publication): The leveraging of file content from different sources to create a new file with different intent.

Portable Document File (PDF): A file format created by Adobe Systems in 1993 for document exchange.

Postscript: A page description language developed by Adobe Systems.

Throughput: The amount of work performed in a given time period.

Raster Image Processing (RIP): A component used in a printing system which produces a raster image also known as a bitmap**.**

Batch Size: In printing terms this equates to a press run or single printing job.

Volume: The number of pages printed from multiple batches within a give time period.

Variable Data Printing (VDP): A form of on-demand printing in which elements such as text, graphics and images may be changed from one printed piece to the next, without stopping or slowing down the printing process and using information from a database or external file.

Make Ready: Refers to everything done on a press to prepare for the final print job.

Threshold: The starting point for a new process.

Core Products: Congressional Record, Congressional Record Index, Federal Register, Federal Register Index, Senate Calendar, House Calendar, Bills, Economic Indicators, Hearings, Senate Reports, House Reports, Code of Federal Regulations (CFR), and List of CFR Sections Affected (LSA).

Overnight Publications: Congressional Record, Federal Register, Senate Calendar, House Calendar, Bills, Senate Reports and House Reports.

Production Paper Waste: The sum of the planned paper waste and the unanticipated paper waste accumulated on a given job.

Composition System Replacement (CSR): A GPO project aimed at replacing its legacy composition system. The project will comprise the necessary technology and business practices to enable GPO to replace or integrate all existing discrete applications, utilities, and processes currently used by GPO and its users to compose and create files optimized for printing and access of select Congressional and Federal agency publications.

Dissemination Information Package (DIP): An information package that contains parts of all or one or more archival information packages, to be distributed to the FDsys user or consumer as requested, or to service providers to produce various outputs.

Federal Digital System (FDsys): GPO's comprehensive information lifecycle management system that manages information from all three branches of the U.S. Government and ensures that information is readily and permanently available for public access.

APPENDIX A. Federal Digital System

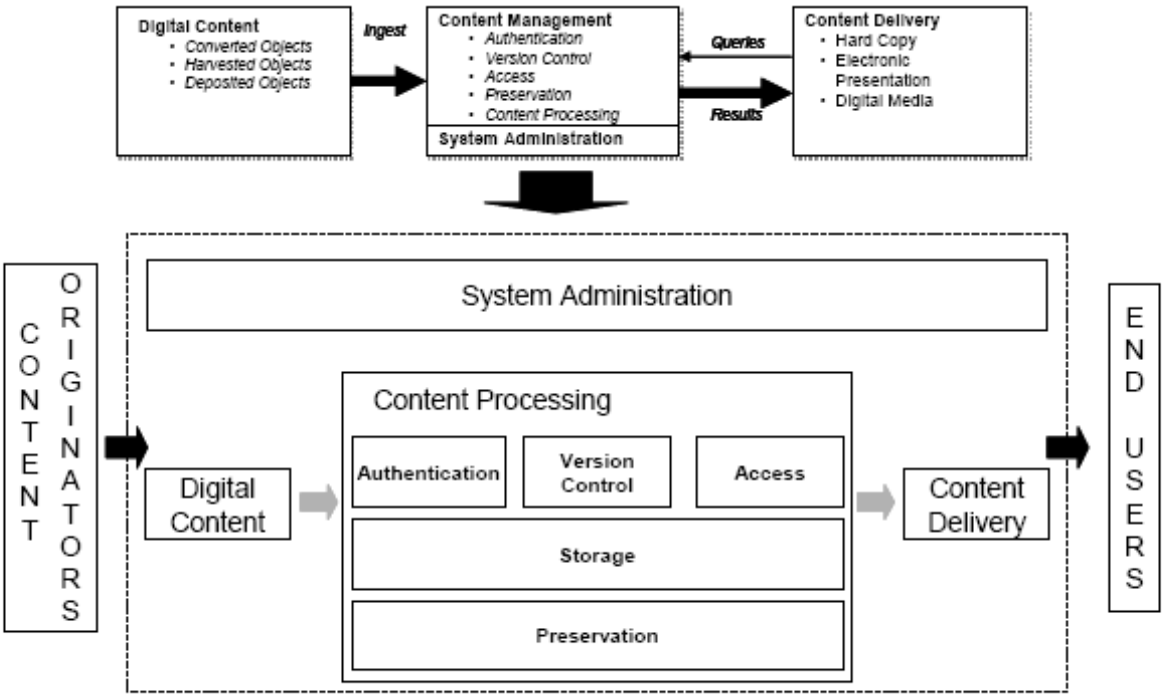


Figure 5-1. Reference Model