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2010 CENSUS PLANNING MEMORANDA SERIES

No. 180

MEMORANDUM FOR   The Distribution List

From: Arnold Jackson *[signed]*
     Acting Chief, Decennial Management Division

Subject: 2010 Decennial Applicant, Personnel, and Payroll System (DAPPS) Assessment Report

Attached is the 2010 Decennial Applicant, Personnel, and Payroll System (DAPPS) Assessment Report. The Quality Process for the 2010 Census Test Evaluations, Experiments, and Assessments was applied to the methodology development and review process. The report is sound and appropriate for completeness and accuracy.

If you have questions about this report, please contact Karen Seebold at (301) 763-9340.

Attachment

2010 Decennial Applicant, Personnel, and Payroll System (DAPPS) Assessment

U.S. Census Bureau standards and quality process procedures were applied throughout the creation of this report.

Final Report

Karen Seebold, Field Infrastructure
Decennial Management Division

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Executive Summary

The Decennial Applicant, Personnel, and Payroll System (DAPPS) is a commercial off-the-shelf software from Oracle/Peoplesoft. It was customized to meet unique decennial requirements and interfaces with internal and other Federal agencies' administrative systems. The DAPPS is a fully integrated system that focused on the following areas: recruitment, personnel data, time and attendance, and payroll. The system was developed by the U.S. Census Bureau to support the administrative work in the local and regional field offices established to manage the data collection operations associated with the 2010 Census.

The original plan for the DAPPS infrastructure supporting the 2010 Census was to be hosted under the Field Data Collection Automation contract; however, to minimize risks, the Census Bureau decided in the summer of 2008 to take ownership of the Field Data Collection Automation hosting requirement and move it to the Census Bureau infrastructure that went live on October 2, 2008. A location change was made to avert possible schedule delays that may have resulted from the contractor not being able to obtain a full certification and accreditation from IT Security for the data center. The new plan was to host the DAPPS system within the Census Bureau's Bowie Computer Center using the Field Data Collection Automation hardware. The DAPPS team created an aggressive three-month schedule to transition, implement, test, and roll-out the new DAPPS infrastructure needed to support the 2010 Census by October 1, 2008. The DAPPS team in collaboration with the Decennial Systems and Processing Office, LAN Technology Support Office, Information Systems Support & Review Office, and the Telecommunications Office successfully placed DAPPS in production on schedule.

During the Address Canvassing operation, daily time and expense data were captured on the hand held devices used by the field staff and transmitted to the Early Local Census Offices for processing. After the Address Canvassing operation was completed in June 2009, all temporary field staff used the paper form D-308, Daily Pay and Work Record, to submit their hours and expenses. DAPPS employees received their initial paycheck eleven days after the close of the pay period in which they were hired and every seven days thereafter.

The DAPPS supported the processing and data capture of approximately 3.9 million job applicants ; supported the hiring of 857,374 employees; and supported a peak payroll of 585,729 employees in one week. On May 4, 2010, the DAPPS supported over 8,000 concurrent users who performed the necessary administrative functions to facilitate the hiring, training, and payroll of the temporary workforce needed to conduct the Nonresponse Followup operation.

The total life cycle costs for developing the DAPPS through the decade was $52.2 million.

1. Introduction

1.1 Scope

This report addresses the effectiveness, goals, timeliness, and cost of the 2010 Decennial Applicant, Personnel, and Payroll System (DAPPS).

The purpose of this assessment is to document the results of developing and implementing a fully integrated applicant, personnel, and payroll system used to hire and pay field/office temporary (non-benefit earning) decennial staff in the Local Census Offices (LCOs).

1.2 Intended Audience

The report is for Census Bureau program managers and staff responsible for overseeing the 2010 Census as well as those planning the 2020 Census.

2. Background

2.1 Program Description

The Decennial Applicant, Personnel, and Payroll System (DAPPS) is a fully integrated system that focuses on the following areas: recruitment, personnel data, time and attendance, and payroll. The system was developed by the U.S. Census Bureau to support the administrative work in the local and regional field offices which were established to manage the data collection operations associated with the 2010 Census. DAPPS stores applicant data, processes personnel actions and daily time and expenses records, and computes weekly payroll for the temporary (non-benefit earning) decennial workforce. DAPPS interfaces with internal and external administrative systems and generates management reports.

2.1.1 Census 2000 – Pre-Appointment Administrative Management System/Automated Decennial Administrative Management System

In 1996, the Administrative Management Systems Division (AMSD) and the Field Division (FLD) developed the Pre-Appointment Management System/Automated Decennial Administrative Management System (PAMS/ADAMS). We purchased the PeopleSoft's Federal HRMS Version 5.20 and Commercial Payroll Version 5.12 and we upgraded to PeopleTools Version 7.0. PAMS/ADAMS was an integrated application that was modified to comply with decennial census specific requirements. PAMS/ADAMS fully complied with all rules and regulations for applicant, payroll, and personnel processing as defined by the Office of Personnel Management (OPM).

The success of PAMS/ADAMS for Census 2000 established a new level of applicant, personnel, and payroll processing that ensured the timely payment of employees working on census operations. From March 1997 through the end of December 2001, all payroll deadlines were met. According to the "Census 2000 Pre-Appointment Management System/Automated Decennial Administrative Management System" assessment report, at peak, the system supported a database of over three million applicants and a payroll of over 520,000 employees in a single week. System contingencies and backup ensured that software, hardware, and telecommunications were available and operational so that deadlines were met. In case of human error, we used an alternate pay program which interfaced to PAMS/ADAMS.

2.1.2   2010 Census – Decennial Applicant Personnel Payroll System (DAPPS)

In December 2001, the Census Bureau implemented a new application to support the applicant, personnel, and payroll processing for the 2004 Census Test. The new application was enhanced and upgraded throughout the decade to support the 2010 Census. DAPPS is a commercial off-the-shelf software from Oracle/PeopleSoft. It was customized to meet unique census requirements and interfaces with other Federal agencies' administrative systems.

DAPPS uses state-of-the-art internet architecture technology to maximize information management. Its server-centric architectural design allows end users access to the applications via an internet web browser. The following diagram illustrates the architecture involved in the deployed DAPPS architecture of the 2010 Census. In addition to this, the DAPPS database was sized to handle approximately 600,000 employees at peak employment levels in the 494 LCOs.

Figure 1: PeopleSoft Internet Application Server

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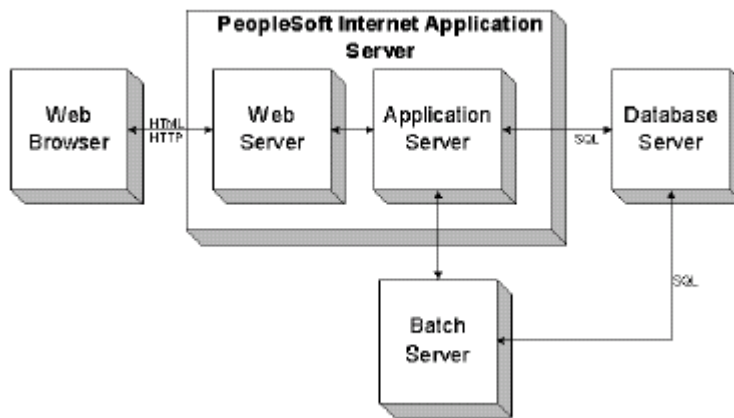
DAPPS integrates the Human Resource Management (HRM) module with the Time and Labor (T&L) and North America Payroll modules. DAPPS provides an automated system that supports:

- processing of temporary 2010 Decennial Census applicant data,
- processing of personnel actions and payroll,
- providing reports and data, and
- maintaining employment history.

The DAPPS also provides employment and payroll data through a number of internal and external interfaces. The original plan for the DAPPS infrastructure for the 2010 Census was to be hosted under the Field Data Collection Automation (FDCA) contract; however, to minimize risks, the Census Bureau decided in the summer of 2008 to take ownership of the FDCA hosting requirement and move it to the Census Bureau infrastructure that went live on October 2, 2008.

2.2   DAPPS Major Components

The DAPPS application has four major components: Recruiting, Personnel Data, Time and Labor, and Payroll.

2.2.1   Recruiting-Applicant Data

DAPPS electronically stores applicant biographical data, selection aid results, language capabilities, and other employment related criteria. These elements include:

- entering applicant data
- processing/correcting applicant information
- submitting applicant name check information to the CHEC System for a criminal history search
- receiving criminal history results
- electronically geocoding applications using an interface with the Master Address File/Topologically Integrated Geographic Encoding and Reference System (MAF/TIGER)
- processing changed non-status related applicant information
- processing applicant inquiries
- processing applicant selection criteria
- generating selection certificates
- selecting applicants (reference check, interview)
- processing updates to applicant status
- scheduling training sessions, and
- generating recruiting reports.

2.2.2 Personnel Data

DAPPS electronically stores and maintains personnel data, such as hiring, rehiring, tracking employment history, converting employees to new positions/pay rates, and terminating Census Bureau employment. These elements include:

- personnel actions and corrections
- retroactive adjustments
- data element changes
- status code changes
- notification of personnel actions
- tax exemption data
- direct deposit information
- management reports

2.2.3 Time and Labor

DAPPS stores employee time and expense reimbursements daily that are keyed directly into the system. The time of day and hours worked are captured and edited. The system also processes reclaims and retroactive mileage reimbursements.

Additionally, the DAPPS stores time and expense data by various means (e.g., electronically transmitted from a hand-held computer or through direct keying from paper input). Hours are computed and premium pay entitlements are determined. These elements include:

- batching payroll records
- reconciling weekly payroll totals for an employee
- auditing payroll records
- editing weekly pay period totals
- extracting and loading time and expense data to create pay sheets
- accumulating time and expense data submitted before and after the weekly payroll submission deadlines
- comparing totals from the Extract and Load process to the Control of Hours process

2.2.3 Payroll

For the Payroll component, DAPPS calculates gross pay, deductions, net pay, and employer contributions for each employee on a weekly pay period basis. Payroll data were keyed on a daily basis in the LCOs. At the end of each pay period, daily payroll totals are combined to create a single weekly total of hours.

Payroll processing begins after the Regional Census Center (RCC) has received confirmation from all LCOs that calculation of pay and reimbursements has begun.

Varying tax laws, locality pay distribution, cost of living adjustments, and overtime pay limits add complexity to the processing. Employee pay is calculated using federal, state, and local tax guidelines. Employee-specified tax withholdings, garnishments, other deductions, direct deposits, and retroactive pay capability also exist within the system. Quarterly balances of employee earnings and tax withholding are maintained. Payroll data are transmitted to: (l) the Department of the Treasury for creating paper checks or Electronic Fund Transfer (EFT) payments for direct deposit; (2) the National Processing Center for creating employee earnings statements; and (3) to the Census Bureau's General Ledger in the Commerce Business System. All or some of the payroll data may require interface to a number of external systems (e.g., the Federal Reserve Bank and the Social Security Administration).

After the Address Canvassing operation was completed in June 2009, all temporary field staff used the paper form D-308, Daily Pay and Work Record, to submit their hours and expenses. Employees submitted their D-308s daily to their supervisor for review and approval. Office clerks keyed the information directly into DAPPS. A weekly payroll file was then transmitted to the Regional Census Center for the pay compute process; this process created the required documentation that was sent to the Department of the Treasury. The Department of the Treasury processed the payroll request and generated the employee's salary payment. DAPPS employees received their initial paycheck eleven days after the close of the pay period in which they were hired and every seven days thereafter.

Figure 2 below details the life cycle of an employee through the DAPPS system. The life cycle's time period is from the time of application to the receipt of an employee's first paycheck.

Figure 2: DAPPS Employee Lifecycle Chart

Applicant to Employee Lifecycle

DAPPS

Applicants complete all application forms.	Applications are entered in DAPPS.	Applicant data is forwarded to CHEC. (24 to 48 hours)	Namechecks are requested and reviewed. Applicant status is forwarded to DAPPS.
		Applicant data is forwarded to the automated geocoding system. (24 hours)	Returns codeable and uncodeable applicants.

Selection certificates are created for available, geocoded applicants.	Available applicants are selected for a position.	Applicants go to training.	Applicants are fingerprinted and data forwarded to FBI.	Completed folders are returned the 1st or 2nd day of training to Local Census Office for review and keying.
			Applicants review their application data, provide tax withholding info, and update address changes.	

Employee data is forwarded to E-Verify to determine employment eligibility and SSN validity.	On a daily basis, employees work, record their time on D-308 (E-308 during Ad Can), and submit time for supervisor approval.	D-308 forms are approved and forwarded to Local Census Office for processing.	Employees receive their 1st pay check 11 days after the close of the pay period (Saturday).
We have 24 hours to process personnel packets to produce an SF-50 hire action.			

3. Methodology

3.1 Methods

The following questions will be answered using results from debriefing sessions, lessons learned reports and other methods.

Table 1: Assessment Questions and Sources

Question Number	Question	Data Sources
1	What was the total cost of implementing DAPPS, through the decade, for the 2010 Census?	Financial Management Reports
2	How many Full-time Employees/Contractors did the Census Bureau employ to customize and support the DAPPS application for the 2010 Census?	Financial Management Reports
3	Was the hardware infrastructure sufficient to support the load and performance for processing the recruiting, personnel, time and expenses and ultimately payroll activities as well as reports?	DAPPS Performance Remedy Tickets
4	Was DAPPS implemented according to the schedule?	DMD Master Activities Schedule
5	What were the major successes for DAPPS during the 2010 Census?	Debriefings
6	What was the workload the DAPPS supported?	DAPPS 2010 Census Workload
7	Was DAPPS Continuity of Operations Planning/Disaster Recovery contingency plan executed? If so, when? If used, did it work as expected?	DAPPS Disaster Recovery Test
8	Were there any problems/crashes or changes to DAPPS that impacted the ability to complete payroll, recruitment, selection, or administrative activities? If so, when, what, and why? How long were the delays?	Unplanned Outages Report
9	Were Federal-mandated reporting requirements met?	2010 Census Tax Payments and Filings for Federal and State Final Report

10	Did the FDCA E-308 (electronic payroll form used with hand-held computers) improve time and cost collection and reporting during Address Canvassing?	DAPPS – 2010 Census Payroll System Final Report
11	How did DAPPS interface with other agency interfaces?	DAPPS Interface Table
12	Did the DAPPS interface meet with the Department of Homeland Security E-Verify System requirements and automate clerical processing?	E-Verify MOU Census
		Employer Web Service V19-VIS 2.0
13	Were there any major problems or changes to E-Verify that impacted DAPPS? If so when, what, why, and how was it addressed?	E-Verify Update – New Form I-9
14	Was the Decennial Operations Technical Support (DOTS) Help Desk support timely in its response to handling DAPPS issues/remedy tickets?	Help Desk Performance Statistics and Debriefings
15	How many travel reimbursement requests were processed?	Query by DAPPS Technical Team
16	How many change requests were processed?	DAPPS Change Requests Log
17	Did the on-site DAPPS-AMSD IT/Tech provide sufficient resolution of technical problems to meet the weekly payroll requirements? What was the call volume to the DOTS-DAPPS Help Desk and rollover of tickets to the DAPPS-AMSD IT/Tech Help Desk?	Debriefing and Remedy Tickets
18	Did a single web-based DAPPS database in 2010 as opposed to twelve databases in 2000 improve processing capability?	Debriefing of DAPPS technical team

3.2 Quality Assurance Procedures

The information in this report was compiled and reviewed by the Project Manager and Quality Assurance Reviewers based upon the *Handbook for the Quality Process for the 2008 Dress Rehearsal Assessments and the 2010 Census Evaluations, Experiments, Assessments, and Quality Profiles.*

4. Limitations

This assessment does not cover the functional support staff responsibilities and costs for developing functional requirements, processing manuals, training, and completion of administrative reviews to ensure recordkeeping requirements were met.

5. Results

The following questions were previously approved via the Decennial Applicant, Personnel and Payroll System Study Plan. The methods and source documents listed in section 3 of this report were used to answer the questions and provide insight and analysis for each subject matter.

5.1 What was the total cost of implementing DAPPS, through the decade, for the 2010 Census?

The total life-cycle costs for developing the DAPPs through the decade was $52.2 million. The table below shows the delineation of costs:

Table 2: System Life-Cycle Costs

Estimated Total Life-Cycle Cost	**Software/Hardware Costs; Telecommunication Costs; Contractor/Government Costs; Security Assessment, Accreditation & Continuous Monitoring Costs; other costs.**	**$84.0 Million**
FY 2001 – 2002	Initial Implementation and Deployment, including Software Purchases	$4.2 Million
FY 2003 – 2007	Operation Support, Enhancements/Upgrades, Additional Software Licenses, IT Refresh	$14.3 Million
FY 2008 – 2011	Operation Support, Enhancements/Upgrades, IT Refresh, Mandated Initiatives	$33.7 Million
Actual Total Life-Cycle Cost		**$ 52.2 Million**

Source**:** Financial Management Reports

5.2 How many Full-time Employees/Contractors were employed to customize and support the DAPPS application for the 2010 Census?

Table 3: DAPPS Technical Support

Level of Effort	Government Staff	Contractors	Total
Initial Implementation	11	18	29
Post-Implementation (Census Test & 2008 Dress Rehearsal)	8	9	17
2010 Census	10	12	22

Source: AMSD-AMSB Position Descriptions and Staffing Documents

For the 2010 Census, the number of employees and contractors could have been higher, but because the DAPPS team had a core group that was experienced with PeopleSoft software and Census Bureau requirements from Census 2000, the subsequent 2004 and 2006 Census Tests and the 2008 Dress Rehearsal (DR), the team was able to handle the exceptionally high workload. The DAPPS team also had a very low turnover of staff.

5.3 Was the hardware infrastructure sufficient to support the load and performance for processing the recruiting, personnel, time and expenses and ultimately payroll activities as well as reports?

Yes, the infrastructure was sufficient to support all DAPPS activities and processing requirements but only after the DAPPS team completed a hardware technology refresh in March 2010. To better accommodate the processing for the high number of reports, the DAPPS team reconfigured the web servers and dedicated four of the twelve web servers to batch processing.

5.4 Was DAPPS implemented according to the schedule?

DAPPS was implemented according to the 2010 Census Master Activities Schedule. DAPPS was available to support all field operations including the 2004 Census Test, the 2006 Census Test, the 2008 DR, and the 2010 Census. In 2008, DAPPS went live on the FDCA servers in the Decennial Systems and Processing Office's General Support System.

5.5 What were the major successes for DAPPS during the 2010 Census?

The major successes for DAPPS are described in the following particular accomplishments.

- **Fingerprinting Initiative (February 2008 through September 2010)**

  The 2008 DR and 2010 Census Fingerprint Initiative Project was a critical and major enhancement for the DAPPS application and established a new interface with the CHEC application. The project started in the first quarter of FY 2008 and was completed on-time to support the testing that was conducted in the two 2008 Dress Rehearsal sites during May and June of 2009. However, major enhancements were made to the interface based on new requirements from within AMSD, other divisions within the Census Bureau, other agencies, and also from lessons learned. The DAPPS Fingerprint Initiative team worked with the CHEC staff and FLD Division to jointly define the requirements then design the DAPPS enhancements and updates to the DAPPS - CHEC interface. The initial effort was accomplished while the DAPPS team was:

  - implementing tax updates for year-end processing,
  - generating of W-2 data files,
  - implementing enhancements to the E-308, and
  - interfacing with the FDCA systems.

  The enhancements coincided with other significant events that included the ELCO/LCO conversion, the E-Verify implementation, and the supporting of production issues during the Address Canvassing operation.

- **FDCA Transition (October 2008)**

  The DAPPS host location changed from the Harris Corporation data center to the Census Bureau's Bowie Computer Center (BCC), which used FDCA hardware. The location change averted possible schedule delays in obtaining full certification and accreditation from IT Security within the data center. The DAPPS team created an aggressive three-month schedule to transition, implement, test, and roll-out the new DAPPS infrastructure needed to support the 2010 Census by October 1, 2008. The DAPPS team in collaboration with the Decennial Systems and Processing Office (DSPO), LAN Technology Support Office (LTSO), Information Systems Support & Review Office (ISSRO), and the Telecommunications Office (TCO) successfully placed DAPPS in production on schedule. The major tasks for this achievement included the completion of:

  1. DAPPS hardware and operating system installation and configuration for the DAPPS Production and Development environments at the BCC.
  2. Oracle database and PeopleSoft installation and configuration for the DAPPS Production and Development environments at the BCC.
  3. DAPPS interface reconfiguration and testing within the new infrastructure. This included the reconfiguration of the DAPPS – FDCA data streaming which tested the FDCA/DAPPS increment 3b/4 and validated the interface through using the new DAPPS infrastructure.
  4. DAPPS regression, integration, and user acceptance testing using the new infrastructure.

5. Interface Control Documents (ICD) and Interconnection Security Agreements (ISA) for DAPPS internal/external interfaces.
6. Security documentation required for the DAPPS security recertification.

- **ELCO/LCO Conversion (February 2009)**

  The conversion of Local Census Office (LCO) codes to Early opening Local Census Office (ELCO) codes and vice versa between DAPPS and FDCA was a critical system change for the 2010 Census. This change impacted the beginning of the Address Canvassing operation and other operations that followed. The implementation of this change involved converting LCO Codes to ELCO codes when the applicant, record of training, and employee data were passed to the FDCA system and vice versa when FDCA passed E-308 data to DAPPS to support the Address Canvassing and Group Quarters Validation operations as well as the Census Coverage Measurement (CCM) operations until all the ELCOs were converted to Local Census Offices (LCOs) from October 1, 2009 through December 31, 2009. The timeframe to implement this change was very short and came very late into the schedule of 2010 Census operations.

- **Implementation of the DAPPS – E-Verify Interface (March 2009)**

  The implementation of the DAPPS - E-Verify interface was a critical system change for the 2010 Census that impacted the beginning of the AC as well as the operations that followed. E-Verify provides verification of employment eligibility for new hires and validates Social Security Numbers (SSNs) against the Social Security Administrations (SSA) SSN data file. Changes were made to DAPPS and an automated interface was established to the E-Verify Internet-based system operated by the U.S. Citizenship and Immigration Services in partnership with the SSA. The DAPPS automatically transmitted the Form I-9 employee data to the E-Verify system. The E-Verify System electronically compared the Form I-9 employee data to the data in the SSA and the Department of Homeland Security immigration databases. Within seconds, E-Verify returned the verification results. Without this automated interface, the data would have to be manually entered into the E-Verify system.

- **American Recovery and Reinvestment Act (May 2009)**

  The U.S. Office of Personnel Management required agencies funding new hires with appropriations granted by the American Recovery and Reinvestment Act (ARRA) to document the legal authority on the SF-50A Notice of Personnel Action. DAPPS was updated to include the new appointing authority on the form.

  The ARRA funding was allocated to seven different project codes and task codes associated with a decennial field operation. The DAPPS was changed to assign the costs associated with these hires to specific project and task codes for accounting and reporting purposes.

- **Employee Notification System (ENS) Interface (February 2010)**

  The DAPPS to ENS interface was a very late requirement for the 2010 Census. The data were required for managers to be able to quickly contact the DAPPS temporary employees for work or emergency related reasons. The Interconnection Security Agreement was not signed until December 2009. The data requirements, data security, and transmission details were not finalized until shortly before the interface went live in February 2010. The DAPPS team was able to produce the data file and deliver it to the Census Bureau's Human Resource Division server on schedule, and continued the weekly file delivery.

- **DAPPS Security Enhancements/User Account Management (2010)**

  In response to new Census Bureau IT security policies and procedures and NIST SP800-53 recommended security controls, the DAPPS team implemented several feature and functionality updates to DAPPS security controls and user account administration and management. The highlights of the DAPPS security enhancements are summarized as follows:

  1. A change to the login page required that all users must accept the terms of the DAPPS Rules of Behavior to be able to access DAPPS.
  2. DAPPS was modified to ensure that users can have only one account profile.
  3. Role-based templates were created to simply the process for managers to assign and semi-annually review the templates for the users. The templates ensured that users would be provided with only the permissions they required to perform their jobs. To accommodate the majority of DAPPS users in the RCCs and LCOs, three basic types of templates were created: clerk, supervisor, and manager.
  4. To ensure that DAPPS accounts were created only for valid Census Bureau employees, accounts could only be created by first selecting the users whose information was obtained by importing the account data from the Census Bureau Lightweight Directory Access Protocol (LDAP) tree.

- **DAPPS Infrastructure Technology Refresh (March 2010)**

  The DAPPS team determined after a series of system load tests were performed that the DAPPS would not be able to adequately support the high processing loads expected during the NRFU operation. Using the information gathered during the decennial applications load testing, the DAPPS team prepared an innovative and comprehensive plan for upgrading the system. Some of the major tasks are summarized:

  1. Purchased new servers and storage area network (SAN) at the end of January.
  2. Re-architected the application processes.
  3. Split the interactive and batch processing for DAPPS onto separate servers.
  4. Reconfigured how the F5 load balancers and encryption worked with the DAPPS web servers.

5. Developed an innovative way to dynamically reallocate hardware resources to critical processing without impacting the users.

The DAPPS team had to work on an aggressive schedule because the hardware vendor was not able to deliver the new hardware until mid-February. With only six weeks before the start of heavy NRFU processing, the DAPPS team worked with the various Census Bureau IT support teams to deploy, configure and test three DAPPS environments including: Beta Test, Disaster Recovery, and DAPPS Production.

The redesign of the DAPPS architecture will provide personnel/payroll support for future census tests and the 2020 Census, if it is kept up to date and enhanced throughout the decade.

- **NRFU Shipping (May 2010)**

  As a contingency for Paper Based Operations to support the shipping of enumerator questionnaire forms, the DAPPS team volunteered to build a shipping application. Once the DAPPS team received Census Bureau management approval, the team developed, tested, and deployed the NRFU Shipping application in three days. Though the application was not part of the DAPPS system, it is included in this discussion because it was a significant achievement for the DAPPS team. From May 22, 2010 through June 05, 2010, the field offices used the application to scan, ship, and track over 27.5 million completed questionnaires (92,785 boxes. The application was developed on the Oracle PeopleSoft platform and was based on DAPPS architecture. The application was hosted on the DAPPS Beta Test servers.

5.6 What was the workload the DAPPS supported?

The DAPPS supported the processing and data capture of approximately 3.9 million job applicants ; supported the hiring of 857,374 employees; and supported a peak payroll of 585,729 employees in one week. On May 4, 2010, the DAPPS supported over 8,000 concurrent users who performed the necessary administrative functions to facilitate the hiring, training, and payroll of the temporary Nonresponse Followup workforce.

5.7 Was DAPPS Continuity of Operations Planning/Disaster Recovery contingency plan executed? If so, when? If used, did it work as expected?

The DAPPS Disaster Recovery Test was done to exercise the failover procedures in the event of a DAPPS outage between the Bowie Computer Center (primary) and Census Bureau's servers in Suitland, MD. The purpose of this test was to confirm that critical procedures for IT failover/failback for DAPPS were available in the event where the DAPPS production system becomes unavailable for a significant period of time and contingency strategies are enacted.

On April 9, 2010, the contingency response teams for DAPPS performed a live failover of the production of the DAPPS application training instance. The failover exercise and

data validation were successfully performed within approximately two hours.   No additional troubleshooting was necessary. Field user testing was conducted and successfully completed on April 10, 2010.

Failback to the production environment occurred on April 18, 2010 during a DAPPS maintenance window.   The failback from the Continuity of Operations Plan (COOP) environment to the production environment was successful. However, an unexpected error message resulted when performing the Data Guard A to B switchover commands. After unsuccessful troubleshooting, a decision to restore the training instance to the production environment using the latest backup was performed. The restoration process was successful, and the training instance in production was accessible to field users before the end of the maintenance window.

5.8   Were there any problems/crashes or changes to DAPPS that impacted the ability to complete payroll, recruitment, selection, or administrative activities? If so, when, what, and why? How long were the delays?

When payroll increased for the Address Canvassing operation, the DAPPS processing started to slow down. Processes that normally took 20 minutes were taking as long as six hours. The issue was resolved with a series of hardware upgrades and tuning the process that included indexing the database to increase performance of the system.

We had outages through March 2010 until we replaced the production infrastructure in its entirety. These outages were due to the poor architecture design and hardware infrastructure provided under the FDCA contract. This was resolved by performing load testing during and after the Address Canvassing operation. The outages did not impact our ability to complete payroll processing on schedule.

In addition, the Census Bureau modified the existing payroll processing schedule to a staggered closing to reduce the load on the system to ensure all regions were not running some of the longer processes at the same time. The schedule was modified to allow for four RCCs to complete the payroll process in the RCC on Tuesday, four on Wednesday and the last four on Thursday each week.

5.9   Were Federally-mandated reporting requirements met?

Yes, all federally mandated reporting requirements were met. In accordance with federal requirements, all individuals who may legally work in the United States – either U.S. citizens or foreign citizens – must meet employment eligibility requirements and have the necessary authorization. Employee data were transmitted (via interface between DAPPS and the Department of Homeland Security's E-Verify System) to verify the employees' eligibility for employment when the hire action was performed in the DAPPS. In addition, the Federal Office of Child Support Enforcement (OCSE) required the Census Bureau to report new hires within 30 days following the end of each quarter. Each Regional Census Center also filed and paid the Federal, State and Local Taxing Authorities, as required. The

Census Bureau also submitted monthly Federal Civilian Employment Reports to the Office of Personnel Management, as required.

5.10 Did the FDCA E-308 (electronic daily payroll form completed on the hand-held computers) improve time and cost collection and reporting during Address Canvassing?
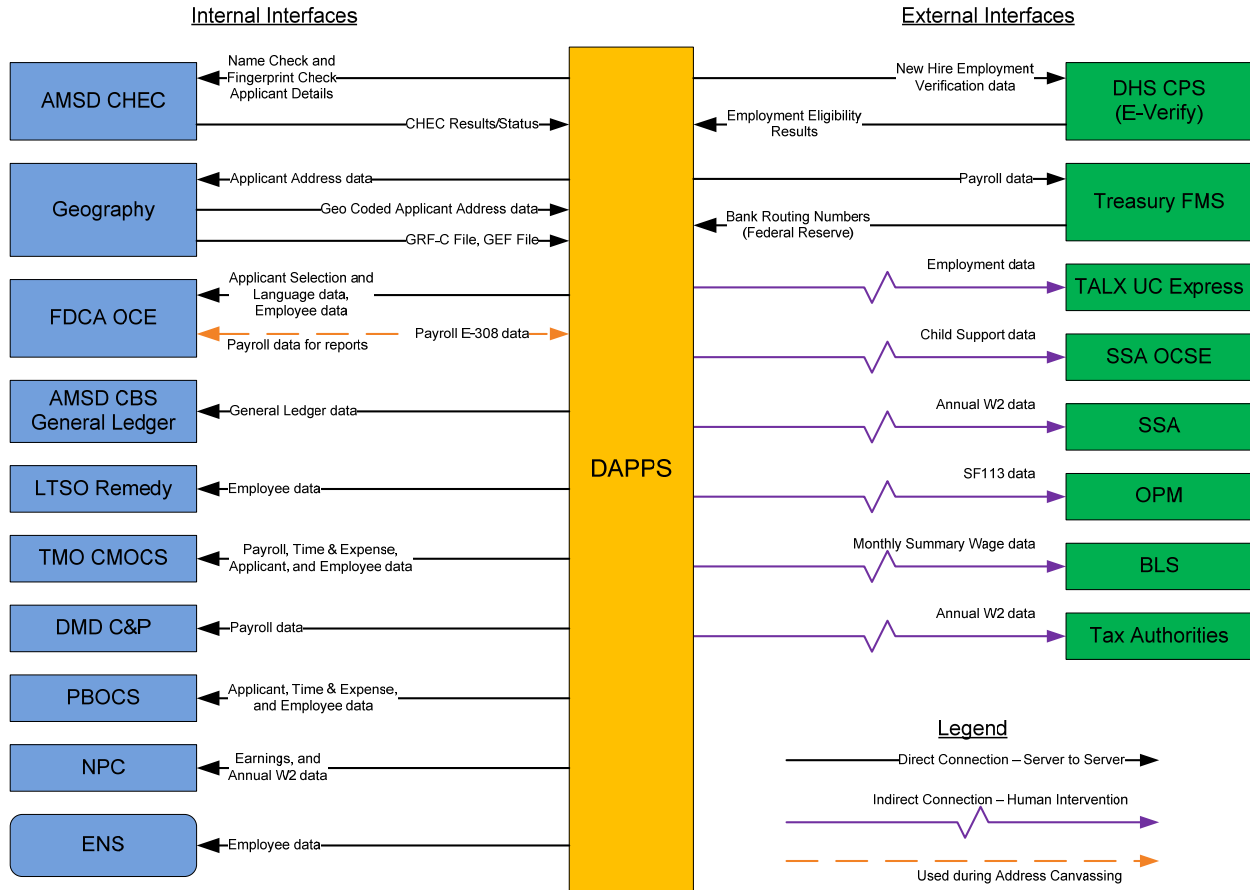
The FDCA E-308 method of capturing Time and Expense (T&E) information did improve time and cost collection and reporting during the Address Canvassing operation. The DAPPS system received the T&E information on a daily basis for the purposes of calculating cost and progress and all T&E was transmitted with an electronic signature. DAPPS also provided access to all T&E information submitted on the paper form D-308, Daily Pay and Work Record, to augment the E-308 T&E information maintained in FDCA.

5.11 How did DAPPS interface with other agency interfaces?

DAPPS had twelve automated system-to-system interfaces and six interfaces that required human intervention. Ten of the automated interfaces were internal to the Census Bureau, and two of the automated interfaces were to systems at external agencies. The following diagram shows the direction of data flow between DAPPS and the interfaced systems.

For tax reporting, the DAPPS staff copied the W-2 data onto Computer Disks (CDs) for each region. FLD Division mailed the CDs to each Regional Census Center to provide the tax data to the state and local tax authorities.

Figure 3: DAPPS Interfaces

Internal Interfaces   External Interfaces

AMSD CHEC
- Name Check and Fingerprint Check
- Applicant Details
- CHEC Results/Status

Geography
- Applicant Address data
- Geo Coded Applicant Address data
- GRF-C File, GEF File

FDCA OCE
- Applicant Selection and Language data, Employee data
- Payroll E-308 data
- Payroll data for reports

AMSD CBS General Ledger
- General Ledger data

LTSO Remedy
- Employee data

TMO CMOCS
- Payroll, Time & Expense, Applicant, and Employee data

DMD C&P
- Payroll data

PBOCS
- Applicant, Time & Expense, and Employee data

NPC
- Earnings, and Annual W2 data

ENS
- Employee data

DAPPS

DHS CPS (E-Verify)
- New Hire Employment Verification data
- Employment Eligibility Results

Treasury FMS
- Payroll data
- Bank Routing Numbers (Federal Reserve)

TALX UC Express
- Employment data

SSA OCSE
- Child Support data

SSA
- Annual W2 data

OPM
- SF113 data

BLS
- Monthly Summary Wage data

Tax Authorities
- Annual W2 data

Legend
- Direct Connection – Server to Server
- Indirect Connection – Human Intervention
- Used during Address Canvassing

5.12 Did the DAPPS interface meet the Department of Homeland Security E-Verify system requirements and automate clerical processing?

Changes to the DAPPS application were made to meet all applicable requirements in the *Interface Control Document for Customer Processing System (CPS) E-Verify Web Services Access Method, Version 17*. The DAPPS – E-Verify system interface went live in March 2009. The DAPPS development team continued to make updates as Department of Homeland Security released new versions of the ICD. By December 2011, DAPPS will have been updated to be compliant up to version 23 of the ICD.

The E-Verify interface did automate some of the clerical processing in that the interface used the applicant data that were entered initially during the hiring process to send to the E-Verify system so that the clerks did not have to enter the data a second time. This reduced the number of clerks that had to be hired.

5.13 Were there any major problems or changes to E-Verify that impacted DAPPS? If so when, what, why, and how was it addressed?

DAPPS did not encounter any major problems with the E-Verify interface. After the March 2009 go-live, DHS did make changes to E-Verify that impacted DAPPS. Twenty-seven change requests have been implemented in DAPPS to accommodate new requirements by either new releases of E-Verify or by enhancements to support FLD operations. One of the major changes to E-Verify was caused by revisions made to the Form I-9. A change request was created to change the I-9 codes in the DAPPS recruiting module. All the E-Verify changes were handled in the same manner as with all other DAPPS changes. The STAT Configuration Management System was used to record the new or modified requirements and then to control the change through the various stages of development, test, and release to production. However, DHS required an additional step in that any changes that were made to the E-Verify interface had to be tested with the DHS E-Verify test site. In coordination with the DHS testing team, tests had to be performed by sending sample data through the interface. DHS had to acknowledge that all the testing steps had been performed and that the Census Bureau had passed the Certification Test.

5.14 Was the Decennial Operations Technical Support (DOTS) Help Desk support timely in its response to handling DAPPS issues/remedy tickets?

Overall, the DOTS Help Desk was timely in handling DAPPS issues and responding to users. A review of the Remedy tickets will not reveal the extent of how fast or how slow the response was because the DOTS Help Desk also supported the other decennial systems at the Census Bureau.

Most of the delays in closing the tickets could be attributed to the help desk's primary mission of taking calls and communicating with their customers. Thus the secondary priority of updating and closing out the tickets would only be done when time permitted.

Based on the volume of tickets during Address Canvassing, the DAPPS team estimated that a high strain would be placed on the resources needed to assist the DOTS Help Desk and DAPPS users. Therefore, a DAPPS Help Desk was created to provide additional user support and serve as a buffer between the technical staff and the DOTS Help Desk and DAPPS users. The DAPPS Help Desk also provided extended weekday hours and weekend support. The DAPPS Help Desk further ensured the timeliness of the tickets being completed for the DAPPS users.

5.15 How many travel reimbursement requests were processed?

At total of 96,472 per diem requests were processed in the DAPPS during the 2010 Census as shown in Figure 4 below.

**Figure 4: Number of Per Diem Requests per Pay Period**
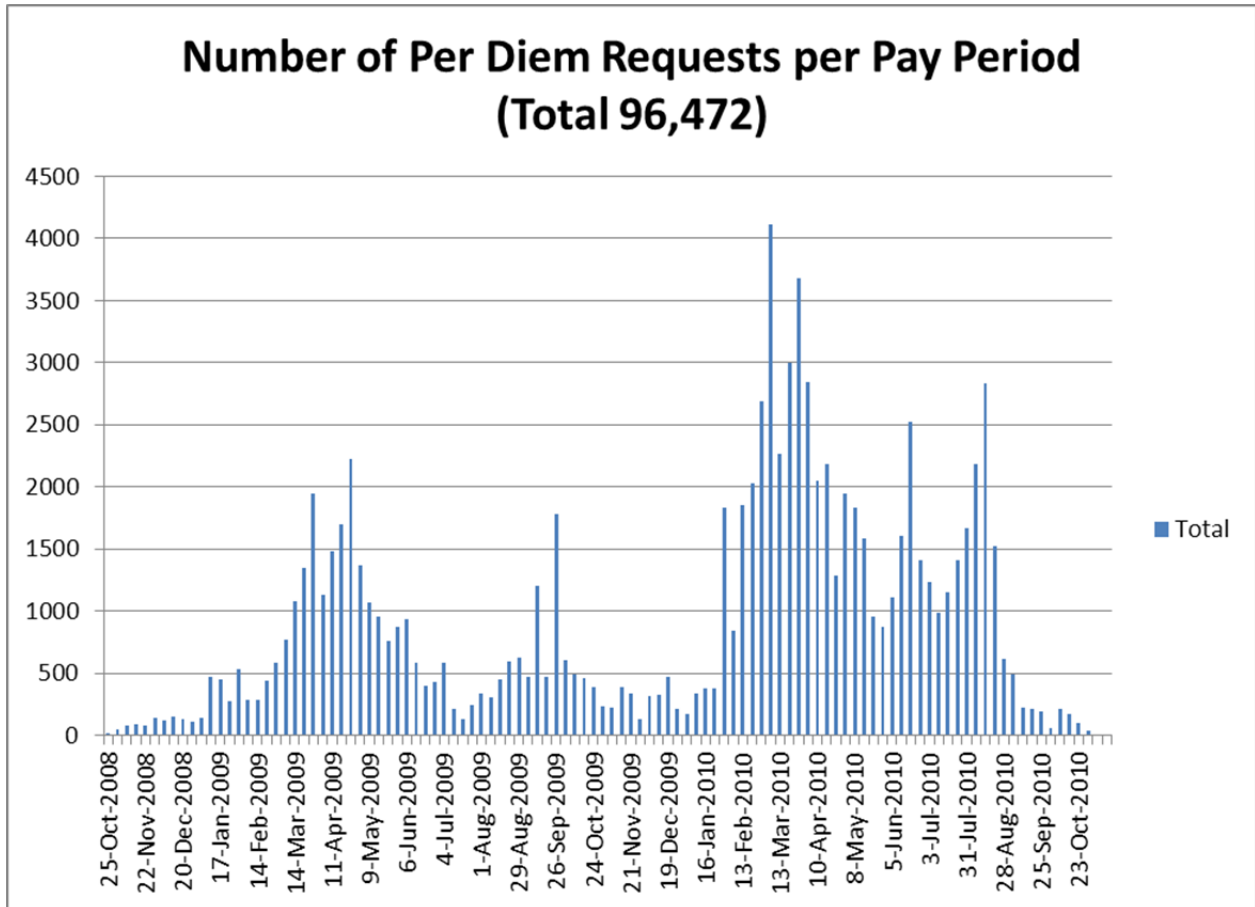
Source: DAPPS

5.16 How many change requests were processed?

From July 1, 2007 to July 1, 2011, approximately 2,221 change requests were implemented in DAPPS production. All change requests for DAPPS are entered in the Stat configuration management application. Using an export of the data from Stat, the Figure 5 below shows how many change requests of various types were made to the DAPPS. There were 1,147 change requests for the DAPPS application modules (Human Resources, Payroll, Recruitment, and Time & Labor). There were 124 change requests for other system related changes such as, system configuration, operating system administration, database administration, and security configuration. Also, there were 950 changes made for the purpose of correcting or updating DAPPS data.

Figure 5: Total Change Requests Implemented in DAPPS Production
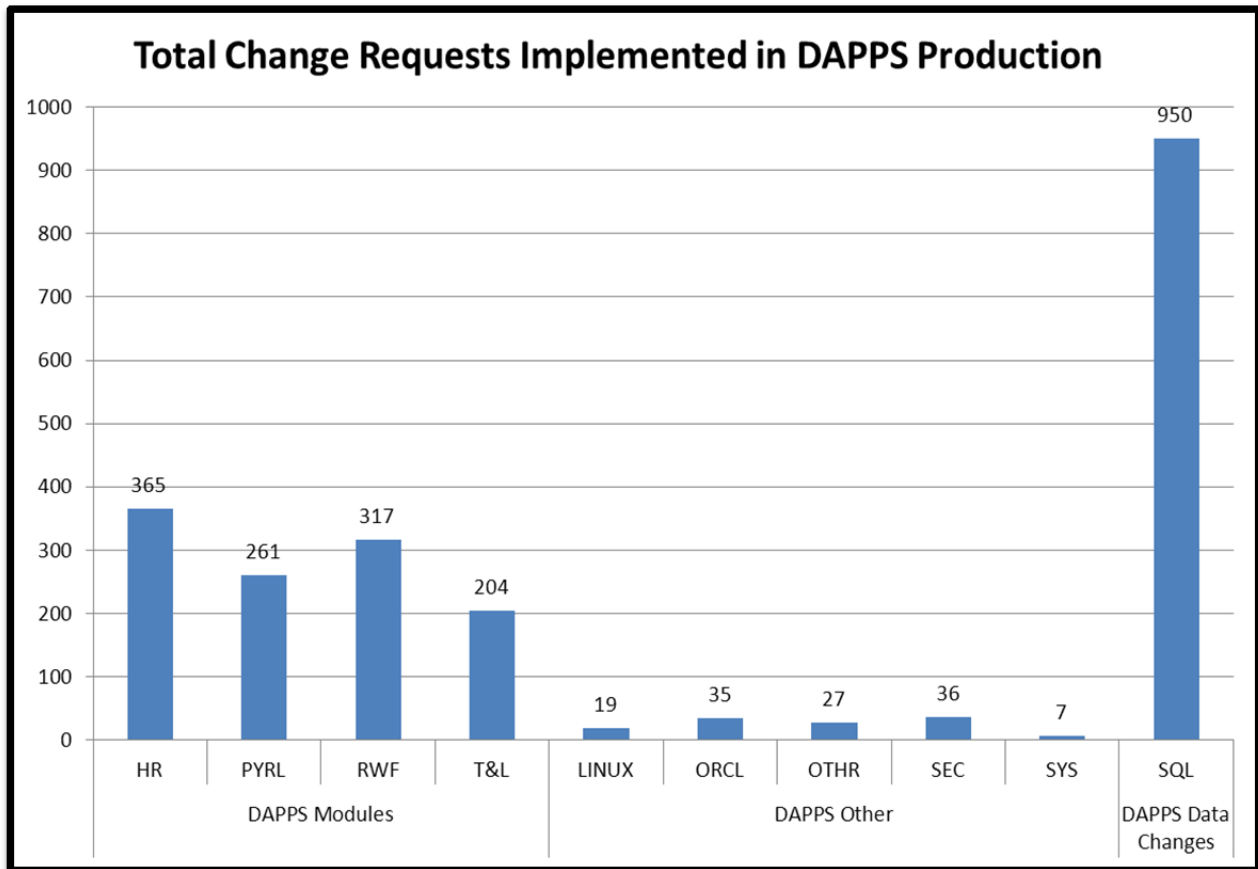
Source: STAT Configuration Management System

5.17 Did the on-site DAPPS-AMSD IT/Tech provide sufficient resolution of technical problems to meet the weekly payroll requirements? What was the call volume to the DOTS-DAPPS Help Desk and rollover of tickets to the DAPPS-AMSD IT/Tech Help Desk?

Yes, the on-site DAPPS-AMSD IT/Tech staff provided sufficient resolution of technical problems to meet the weekly payroll requirements. In June 2009, the DAPPS Call Center was established. From June 2009 through October 2010, the DOTS-DAPPS Help Desk received a total of 8,593 calls . The DAPPS-AMSD IT/Tech resolved 2,559 tickets. The remaining tickets were procedural problems that were resolved by the Field Division DAPPS support staff.

5.18 Did a single web-based DAPPS database in 2010 compared with twelve (12) databases in 2000 improve processing capability?

A single web-based DAPPS database that served all twelve regions provided many benefits over the system that was used for Census 2000 that had one database for each of the twelve regions. A summary of the benefits follows:

- Deploying the continual software changes to one database rather than twelve was less work and had less room for error. In Census 2000, the software migrators had problems with releasing the software changes accurately to all databases.
- For both developers and database administrators, researching issues in just one database was easier. There was no need to have to log in to the various databases to look for discrepancies.
- With one database, DAPPS employees could be transferred from one region to another.
- The annual Federal file for SSA had to be created only once as opposed to twelve times for separate databases.
- One database saved staff maintenance time for applying patches and upgrades for the application and database.
- Taking backups for one database required fewer IT resources and therefore cost less. Using one database eliminated any potential problems of having to schedule the backups for twelve databases.
- DAPPS users at headquarters were able to run reports for all the RCCs/LCOs at once. If there were twelve databases, one user for each RCC, then a user at headquarters would have had to run twelve reports and then merge the data from those twelve reports to get one report.

Resources and costs to maintain one database rather than twelve were lower because security-related activities only had to be done for one database. Government IT policies and procedures require that all databases be secured. The security activities that must be done for each database include implementing security controls, verifying the security controls as part of continuous monitoring, performing user account maintenance and semi-annual review and reauthorization, producing a security baseline, running Center for Internet Security benchmark scans, reviewing and saving audit logs, and regularly testing the recoverability of database backups. One database to review is also less work and time for auditors and Security Test and Evaluation staff.

6. Related Assessments

Recruiting and Hiring Program Assessment
Field Office Administration and Payroll Program Assessment

7. Lessons Learned, Conclusions & Recommendations

7.1 Lessons Learned

As a result of administrative debriefings, administrative review results, and input from DAPPS headquarters staff, the following is a listing of lessons learned:

1. Direct Deposit accuracy – audit required. During the 2010 Census operations, a number of data entry errors relating to direct deposit routing and account numbers

were made which caused delays in receiving salary payments for some employees.

2. The D-291, DAPPS Update Form, was not completed by operational staff correctly, delaying the timely updating of individual records.
3. To facilitate changes to the applicant/employee address, improve tracking to identify the user and date the address was last changed/updated.
4. Use DAPPS Verbatim Training for administrative staff   to ensure training is consistently delivered.
5. Tracking of Clerical Training and Competency - clerks in the office receive hands on training instead of verbatim training and their training is not tracked in the DAPPS. The LCOs need the ability to track the type of training an office clerk receives to facilitate work planning in the office.
6. Update DAPPS data entry screen to reflect employee ID and name on each screen. When making changes, the employee ID is only shown on the first data entry screen which requires the clerk to toggle back to the previous screen to verify an employee ID on the D-292 DAPPS Update Form.
7. Return of employee batch location – when closing out the LCO payroll process, if there is an error in the batch, the clerk must locate the employees' D-308 Daily Pay and Work Record within the batch to make corrections. The existing process does not identify the batch location of the D-308.
8. Payroll Closeout processing – for the 2010 Census, the RCC payroll closeout schedule was changed to allow four regions per day over a three-day period to complete payroll closeout activities on a flow basis and improve processing response time.

7.2   2020 Recommendations

As a result of administrative staff debriefings and discussions with DAPPS staff, the following 2020 recommendations were made:

1. Implement workflow in DAPPS to automate manual submission/review /approval processes.
2. Develop the ability to print W-2s, Wage and Tax Statement from DAPPS.
3. Establish Puerto Rico as its own company in DAPPS. Puerto Rico has separate tax reporting requirements from stateside.
4. Develop the capability for users to create their own Remedy tickets to facilitate troubleshooting/assistance.
5. Automate daily time and expense reporting.
6. Keep DAPPS for use in the 2020 Census and continue to enhance throughout the decade.
7. Implement an external on-boarding recruiting/applicant interface entry to capture applicant data.
8. Implement an electronic Official Personnel Folder consistent with government-wide record keeping implementation.
9. Develop and implement a self-service application to update employee addresses, tax exemptions, etc.

8. Acknowledgements

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9. References

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