

MS Access Database Designed
For Community Service Office

By

Juan P Ojeda Pedraza

A Senior Project submitted
in partial fulfillment
per the requirements of a
Bachelors Degree of Science in Industrial Engineering

California Polytechnic State University,
San Luis Obispo

Graded By: _____ Date Submitted: _____

Checked By: _____ Approved By: _____

Table of Contents

List of Tables & Figures	3
Abstract	4
Introduction	5
Background	7
Literature Review	7
Design.....	12
Microsoft Access Database	12
Defining Requirements	12
Designed Features	14
Unique Aspects of the Design	20
Microsoft SharePoint Server	21
Defining Requirements	22
Implementation Plan	23
Methodology.....	25
Initial State Value Stream Map	25
Time Studies.....	26
Pareto Chart of Errors	27
Results.....	29
Time Savings.....	29
Reduction in Errors	30
MS SharePoint.....	30
Conclusion.....	32
References	33
Appendix I: Database User's Manual.....	35
Appendix II: Unique Code	50
Appendix III: Time Study Sheets	51

List of Tables & Figures

Figure 1: Main Control Form.....	14
Figure 2: Worker Information Controls	15
Figure 3: Hour Controls.....	15
Figure 4: Individual Worker Information Profile.....	16
Figure 5: Individual Worker Hour Report	17
Figure 6: Bi-Weekly Report Requested by County Court Office	18
Figure 7: Search Options.....	19
Figure 8: Example of Populating Textboxes.....	20
Figure 9: Code for saving worker information based on search method used	21
Figure 10: SharePoint Implementation Plan Work Breakdown Structure	23
Figure 11: Initial State Value Stream Map	26
Figure 12: Worker Info Entry Time Study Sheet	27
Figure 13: Generating Reports Time Study Sheet.....	27
Figure 14: Pareto Chart of Errors	28
Figure 15: Time sheet for new data entry method.....	29
Figure 16: Time sheet for creating reports using database.....	29
Table 1: Error Resolution Duration	28
Table 2: Report Costs	30
Table 3: MS SharePoint Costs	31

Abstract

The purpose of this senior project is to reduce the number of data entry errors in the community service worker system at the EcoSLO office. EcoSLO is a community service office located in San Luis Obispo, CA that seeks to better the environment through various events and programs such as recycling projects and environmental clean-up projects. Currently the EcoSLO office uses Microsoft Excel to store and keep track of community service workers. A Microsoft Access database will be designed to help minimize data entry errors and to make it easier to generate reports that must be submitted to the San Luis Obispo County Court. This senior project also includes a proposal for using Microsoft SharePoint, a web-based collaborative enterprise software platform.

Introduction

EcoSLO is a community service office in San Luis Obispo, CA that seeks to better the environment through various events and programs such as recycling projects and environmental clean-up projects. Their mission statement states that they are striving to support and create resilient, healthy natural systems and lifestyles in San Luis Obispo County. They hope to accomplish this through representation at local community events where they promote, support, and demonstrate responsible practices.



In addition to organizing environmental restoration projects, EcoSLO is partnered with the San Luis Obispo County Court to help people work off traffic violations and misdemeanors through community service.

This non-profit organization is in need of a system that could maintain membership information and keep track of volunteer hours and other statistics. As of now, the EcoSLO office operates under a paper system and some use of Microsoft Excel. The problems facing the office include data entry errors and lack of standardized practices. There are mainly three types of workers that handle data entry; the main office manager, who is the most experienced with collaborating with the County Court, an office assistant who is somewhat familiar with the entry and reporting process, and the occasional volunteer who helps with clerical work at the office and is least familiar with the system. It would be worthwhile to incorporate some fail-proof standard practices so that more than one single person is capable of managing the data entry and create the reports submitted to the County Court.

A literature review was performed to examine pertinent information as it relates to providing a solution for EcoSLO. Topics reviewed include; MS Access database system design, the security features available for MS Access, the file sharing capabilities of MS SharePoint, the human-computer interface, and human resource approach to change in the workplace.

The solution approach will be to design an intuitive, easy to use MS Access database while incorporating the knowledge gained from courses taken from the Industrial & Manufacturing Department. The material reviewed in the literature review will serve as supplementary reference material that will aid in the creation of a user friendly interface as

well as provide reasons for incorporating a file sharing system like MS SharePoint. Frequent client meetings will be utilized to clarify the system requirements and definition of the current system state.

The objectives of this Senior Project are to:

- Reduce the number of errors in data entry
- Save time in adding, editing, and reporting membership information
- Facilitate the ease of sharing information between management
- Draw on the education gained from Industrial Engineering courses taken

Expected Deliverables

- Database system to client capable of data management and reporting membership profiles
- Recommendations for incorporating MS SharePoint
- A user's manual on how to use the database system

The main tasks required to complete this project are to

- Design MS Access database system per client specifications
- Cost Analysis for use of MS SharePoint
- Write a clear and helpful user's manual

The following report contains background information to bring the reader up to speed on database system design, user interface systems, human factors associated with change (or new system) management, and some of the security features of MS Access and MS SharePoint. The rest of the report outlines the methods taken to design the database system, the features and functions of the database system, the quantifiable results generated from incorporating the system at the EcoSLO office, and finally a discussion on the project and conclusions reached.

Background

The following literature review contains information on topics pertaining to this senior project. The intention of this paper is to provide background information for the design of a MS Access database system for EcoSLO, a local community service office in San Luis Obispo, CA. This paper reviews some of the literature that specifies the; importance of proper database design and some methods by which to achieve a proper database, techniques to incorporate in an effective user interface system, the functions and usefulness of incorporating Microsoft SharePoint, tips on how to successfully implement a database system, and training methods for new systems. The client at EcoSLO has also asked for some sort of security system for the database.

Literature Review

An intuitive database system is a valuable tool for many businesses. The ease of use of the system itself can make the day to day operations of the business operate smoothly; a poorly designed database system can introduce issues that waste more time than it saves. The effectiveness of a properly designed database system relies heavily on the controls of the system as well as the interface by which data is manipulated. But first and foremost, the database must be designed to accurately store, update, and retrieve data. Not everything can be attributed to human error; the database itself must be designed to function correctly. Once a properly functioning database system is established and the interface system is finely tuned for ease of use, it is worthwhile to explore collaborative software that allows for sharing of information. There exist a myriad of such software ranging from complex and feature rich ERP systems to basic IT management software. But for the purposes of a small business the use of Microsoft SharePoint will suffice. It would also be worthwhile to consider the implications of implementing a database system in an office that has never had such a system before. Also, there exist several personnel management techniques that may be helpful in making a smooth transition into a new system.

A good database system will be designed for users of varying experience. It should be easy enough for the novice to operate and open enough in functionality for the expert to

manipulate. Malcolm Atkinson et al. define various mandatory characteristics required of an object-oriented programming database in *The Object-Oriented Database System Manifesto*. According to Atkinson, an object-oriented database should; be able to support complex objects built from simpler ones, support object identity (defined entities without assigned values), have a simple way of querying data, and insure harmonious coexistence among users working simultaneously on the database. It is understood that MS Access satisfies these and therefore qualifies as an appropriate object-oriented database.

In *The Structural Model for Database Design* Gio Wiederhold and Ramez El-Masri outline 12 distinct steps that are carried out in the database design process; first, identify the user of the system and define the restrictions of the database to the relatable data. Second, describe the logical data requirements of the user. The third step is to represent these data requirements using entity-relation diagrams. Next, the database model is analyzed. There are several intermittent steps where submodels are defined and the users further quantify their needs. The database model is then reviewed and cleared of major problems. Next the model and submodels go through new design iterations if required. And finally the database is verified and validated against the specifications of the user.

In *Database Design for Mere Mortals*, Michael Hernandez gives his version of the objectives and benefits of good database design. In order to design a good, sound database structure the designer must; incorporate properly and efficiently designed tables, impose data integrity at multiple levels (field, table, and relationship levels), support data retrieval both at the pre-designed level as well as the ad hoc queries proposed by the user, design the database to be in line with the rules of the business (i.e. providing valid and relevant information to the organization), and finally design the database to be open to future improvements. The designer will benefit from closely adhering to these guidelines offered by Hernandez. The benefits of following these guidelines include ease of maintaining and modifying the database structure and ease of information retrieval (Hernandez, 2003). These rules and guidelines offer helpful tips to incorporate in database design ranging from the simple to the complex.

Ergonomic design can be applied to the interface of the database system. In his book, *Human-Computer Interface Design Guidelines*, C. Marlin Brown states that priority judgments will be required when designing an interface between a computer system and the user (1999). Brown admits that any general “guidelines” will have to be considered and applied based on

hardware and software constraints but that there are no cure-all design methods that are applied to all situations. The designer should draw on common sense and their experience to design a practical interface system. It is always a good idea to keep the purposes, constraints, and intended users of the system in mind when designing. There are also several human factors that must be taken into consideration; such as the ease of readability, the appropriate color choice, lighting and contrast to reduce eyestrain, and others.

The sensory processing limitations of the brain should be considered. The ability to detect contrast is necessary to detect and recognize shapes (Wickens, 2004). The brightness level of a character or shape also affects how easily the brain can process visual input. In the case of reading printed words, the letters should not be too fine in order to guarantee readability. Fine print and very narrow stroke widths are dangerous choices. Because of certain asymmetries in the visual processing system, dark text on lighter backgrounds offers higher contrast sensitivity than light on dark (Wickens, 2004). Wickens also mentions that color deficits (i.e. color blindness) are yet another human factor to consider. A color coded system serves little efficiencies if the user cannot discern between them! Incorporating the right level of contrast, colors, and print widths in title screens and dialogue boxes will be a benefit to the user of the system.

The appropriate representation of numbers and codes will also make the human-system interface easier. For instance a phone number listed as 8374957788 would take longer to process than one listed as (837) 495-7788. And a product code listed as FJE 749 is easier to remember than F7J4E9. This is because the human mind is better at remembering strings of data if they are grouped into manageable and predictable chunks. George Miller gave us Miller's Law that says that most human short term memory is limited to 7 plus or minus 2 "chunks" of data. This should not impose any issues for simple database data entry.

Common sense must also be considered. A system that behaves based on a prediction and gives the desired outcome would be beneficial to a user that has forgotten, or never encountered, the procedure (Brown, 1999). A system that will behave as expected will be much more accepted by the user. The consistency in the commands accepted by the system will allow

for a learned experience with the interface. If the system has consistent interaction rules for every transaction, the user will utilize logical rationale for dealing with the system.

In the human-computer interface relationship, the role of the human is to control, monitor, make decisions, and respond to unexpected events. The purpose of the computer is to store and recall data, process information using pre-specified procedures, and to present options with supporting information to the user. The benefits of a good interface design include; reduced errors, reduced training, increased efficiency, and improved productivity due to design consistency (Brown, 1999). A properly designed system will offer all of this.

IT management systems are used in industries to share information. Information facilitates the decision making process and will help in aligning the company's priorities and goals. Microsoft SharePoint is a tool developed by Microsoft Co. that allows users to share information between computers. It is a business collaboration platform that can be employed within the intranet of a business but also be shared outside the enterprise (i.e. the internet) so that employees, customers, and business partners can work with the platform (Microsoft SharePoint Evaluation Guide, 2010). Within this unified infrastructure, SharePoint has the capability of having an Access applications published on SharePoint. In the newest released version of MS Access, you can publish a database to Access Services on SharePoint – and then use the database in a browser [3]. Employees can collectively share this database, look up and add records. This is especially useful for collaboration within a workplace.

Several careful steps can be taken to successfully implement a new system into a company. Robert Paton and James McCalman offer their intervention strategy model (ISM) in their book *Change Management: A Guide to Effective Implementation*. For the ISM, three process areas are reviewed; 1) The physical process constituting the operational system, 2) the communications process handling the transfer of information between systems/departments/users, and 3) the monitoring process maintaining system stability. Review of these processes will help the manager determine the level of autonomy that exist (or is capable) in the system. The ISM model resembles the DMAIC methodology implemented by industrial engineers in the sense that first the problem must be clearly defined then measurements must be taken. The gathered data is then analyzed and the best alternatives are

chosen and implemented. The final step is to monitor the changes and ensure that the employees are adhering to the new system. This final step can be accomplished by taking employee surveys and being open about criticisms or comments. A more quantitative measurement could be to monitor error rates and throughput values. The manager will do well to keep the employees informed and well educated on the introduction of a new system.

Incorporating some of the security options MS Access has will add to a satisfactory database system for EcoSLO. First and foremost, in order to utilize the special queries, VBA codes, and macros, the user must enable this content by selecting “Enable Content” from the Security Warnings message bar that appears when a database file is opened and has this content. MS Access 2007 allows for password encryption where the file can only be opened after the user enters the password [7]. Before encrypting, the database must first be opened exclusively. This can be done by selecting “Open Exclusively” from the Open dialogue box. You can also save a backup file for the database which would allow you to retrieve an older version of your file. To secure the programming code of a database, the user can save the file under the format .accde. The .accde format will protect reports, forms, and modules, but not tables and queries. For sending a secure file, MS Access has a “package and sign” feature [14]. This feature allows the user to apply a digital signature to their file and then send it to a colleague. The colleague can then extract the file and safely open it knowing that the signature is from a trusted source. These security features will be helpful to an office looking to incorporate a MS Access database.

The material researched in this literature review is considered applicable for this project’s purposes. Overall, the research indicates that proper database design rules serve as the foundation for the database system. The limitations and preferences of the human mind should also be considered in the aesthetics as well as the functionality of the database. And the utilization of an IT sharing system would be beneficial to a small office. For this project proper database design principles as presented by Dr. Tao Yang and various supplementary materials will be implemented. Full use of the security features in MS Access will be encompassed. The guidelines for an effective human-computer interface system will be kept in mind. And the implementation of Microsoft SharePoint will be recommended.

Design

This chapter discusses the design of the database including defining the requirements, the initial concept of the design, and the unique aspects of the design. The requirements and implementation plan for Microsoft SharePoint are also discussed.

Microsoft Access Database

To solve the data entry problems encountered by the EcoSLO office and to make creating reports easier, a Microsoft Access database was designed specifically for their needs. Using the knowledge gained from IME 312 and various reference materials, an Access Database was created for the EcoSLO office. A complete user's manual was created for the EcoSLO office personnel. This manual can be found in Appendix I.

Defining Requirements

The initial meeting with EcoSLO management revealed the desired functionality of the database system. Desired features for data entry essentially mirrored those for the current Excel system in place but with the need for a more user-friendly and failure-proof. The EcoSLO office desired a quicker and simpler way to generate reports [15].

EcoSLO management presented the following list of desired functions and outputs:

General

- Provide for adding, changing, deleting workers
- Provide for recording info about new workers
- Add date last modified
- Payment Amt & Service Agency (45 chars)
- Default DPO to Traffic if case starts with T
- Default DPO to Bench if case starts with M
- Default enrolled date to current date
- Default area code to 805
- Payment flag to N; change to Y if payment = \$50
- Add flag for court papers received

- Add memo field for comment
- Add pull down menu for Service Agency; Set this up as separate table with name, address, phone, contact, hours & memo field describing work

Provide form for update of hours worked; Every time new hours (current hours) entered, update the hours to date and remaining hours fields by Adding to the Hours to date field and then subtracting Hours to date from Total Hours Required

Reports

Create report for sending to the court (see spreadsheet). They prefer this be in a PDF format. The report lists activity for a date range (usually 1-15, 16-30), so prompt for a beginning & ending date & pick up all records modified within that period.

Create report to provide summary totals by date range of:

- Number of workers registered for period
- Number of cases completed for period
- Number of cases continued for period
- Total funds received for period

Create report of workers with no current hours and enroll date is more than 30 days ago.

Create report of workers with past due court due dates.

Create report showing total hours worked for date range by agency.

Create detail report by worker (prompt for worker name) showing all information (e.g. name, address, phone, notes, etc & activity reported by date (1 line for each date reported).

Security

I would like security on the system so I can get into everything – tables, forms, queries, reports, etc. I would like to be able to allow others access only to view and others to update records.

This list of functions was adhered to to the best of my abilities. I sought assistance from Dr. Tao Yang in the areas unfamiliar to me (i.e. the security features of Access) and produced the following database.

Designed Features

Figure 1 shows them main control form for all the controls within the database system.

The image displays a software interface titled 'Main Control Form' with a purple background. It is organized into four horizontal sections, each with a colored header and a white button area:

- Worker Controls** (orange header): Contains three buttons: 'Add a Worker' (green text), 'Edit Worker Info' (black text), and 'Delete a Worker' (red text).
- Hour Controls** (green header): Contains two buttons: 'Enter Hrs Req' (black text) and 'Update Worker Hrs' (red text).
- Report Controls** (yellow header): Contains three buttons: 'Individual Worker Info Report' (green text), 'Individual Worker Hours Report' (black text), and 'Multiple Worker Hours Report' (black text).
- Search History** (red header): Contains one button: 'Search Options' (black text).

Figure 1: Main Control Form

The worker controls (Figure 2) are for adding, editing, and deleting worker information from the system.

The image displays three overlapping screenshots of a web application interface for managing worker information. The top-left window is titled 'Add a Worker' and contains fields for Date_Enrolled (5/2/2013), Case_Number, DPO, Last_Name, First_Name, Email, Location, Service_Agency, and a Notes section. It includes 'Add New Worker' and 'Clear Form' buttons. The top-right window is titled 'Update Worker Information' and features a search box with Case_Number, Last_Name, and First_Name, along with buttons for 'Search By Last Name' and 'Search By First Name'. It also has fields for Last_Name, First_Name, DPO, Date_Enrolled, Location, Service_Agency, Payment, and Notes, with a 'Clear' button. The bottom window is titled 'Delete a Worker' and has a similar search box and fields for Case_Number, Last_Name, First_Name, DPO, Location, Service_Agency, Payment, and Date_Enrolled.

Figure 2: Worker Information Controls

The hour controls (Figure 3) are for entering hours required of a worker and entering their progress. Calculations for service hours remaining are automatic. There are confirmation message boxes for the data entry person to verify fields before saving into the system.

The image shows two overlapping screenshots of a web application interface for managing worker hours. The left window is titled 'Enter Worker Hours Required' and includes a search box for Case_Number, Last_Name, and First_Name. It features fields for Date_Enrolled (5/2/2013), Hrs_to_Date (0.00), Due_Date, Current_Hrs (0.00), Total_Hrs_Req, and Hrs_Remaining. It has buttons for 'Enter Worker Hrs Required', 'Clear', and 'Back To Main Form'. The right window is titled 'Update Worker Hours' and has a similar search box and fields for Date_Enrolled, Hrs_to_Date (0.00), Due_Date, Current_Hrs (0.00), Total_Hrs_Req, Hrs_Remaining, and Status. It includes 'Update Hrs', 'Clear', and 'Back to Main Form' buttons.

Figure 3: Hour Controls

The report controls are for generating the different reports requested by the County Court office. The first (Figure 4) is a worker information profile for a single worker.

Individual Worker Information Profile

Case Number:

Last Name:

First Name:

Case_num_last:

Worker Information Profile

Environmental Center of
SAN LUIS OBISPO COUNTY

3438 Sacramento Drive, Suite A
San Luis Obispo, CA 93401

Office: (805) 944-1777
Fax: (805) 944-1873
info@ecsl.org
www.ecsl.org

Last Name: DOB:

First Name: Phone:

Case Num: Email:

Date Employed: Location:

Notes: Service Agency:

Date Last Modified: Payment:

9/11/2011 7:23:34 PM

Figure 4: Individual Worker Information Profile

The second report often requested by the court office is an hour report for a single worker. Figure 5 shows this report.

Individual Worker Hours Profile

Case_Number:

Last_Name: [Search By Last Name](#)

First_Name: [Search By First Name](#)

Case_num_last: [View Worker Hours Profile](#)

[Clear](#)

[Back to Main Form](#)

Individual Worker Hours Report

Case_Num: Date_Enrolled:

Last_Name: Date_Rate:

First_Name: Total_Hrs_Rate:

DPO: Hrs_To_Go:

Current_Hrs:

Hrs_Remaining:

Status:

5/1/2011 7:34:28 PM

Figure 5: Individual Worker Hour Report

The final report is the bi-weekly report submitted to the county court. This report (Figure 6) shows the current status of active community service workers. The workers are filtered based on their enrollment date. It takes two clicks of the mouse to select all the workers requested by the county office.

Multiple Worker Hours Report

Generate Hour Report for workers enrolled between [DATE 1] and [DATE 2]:

Date 1:

Date 2:

Worker Hours Report

3/31/2011 - 5/1/2011

DPO	Last_Name	First_Name	Case_Num	Date enrolled	Total Hrs Req	Hrs to date	Current Hrs	Hrs Remaining	Due Date	Status
Traffic	Smith	Doug	456567876567	4/11/2011	140	20	0	120	5/27/2011	
Traffic	Smith	Gary	5555555555	4/13/2011	200	60	0	140	6/30/2011	
Beach	Smith	Danny	9000001212	5/11/2011	100	10	5	90	4/30/2011	In Progress
Beach	Smith	Carol	9999999999	4/11/2011	75	20	0	55	6/1/2011	
	FIRST_TEST	FIRST_TEST	TEST_FIRST	5/19/2011	50	10	20	40	5/28/2011	
	TEST_ONE	TEST_ONE	TEST_ONE	4/10/2011	120	40	10	80	7/30/2011	In Progress
	TEST_TWO	TEST_TWO	TEST_TWO	4/19/2011	50	20	10	30	6/30/2011	In Progress
	TEST10	TEST10	TEST10	4/10/2011	200	20	20	180	4/30/2011	
	TEST99	TEST99	TEST99	4/19/2011	100	30	10	70	5/31/2011	
	0									

5/1/2011 7:37:17 PM

Figure 6: Bi-Weekly Report Requested by County Court Office

Several search options have been added (Figure 7). These include; searching by worker status, due date, enrollment date, service hours required, and service hours remaining. These search queries return the name and contact info of the workers under the specified criteria. At the request of EcoSLO management, I have also included an option to see the update history of entries on a worker's hours. This can be used to trace entries and research any discrepancies.

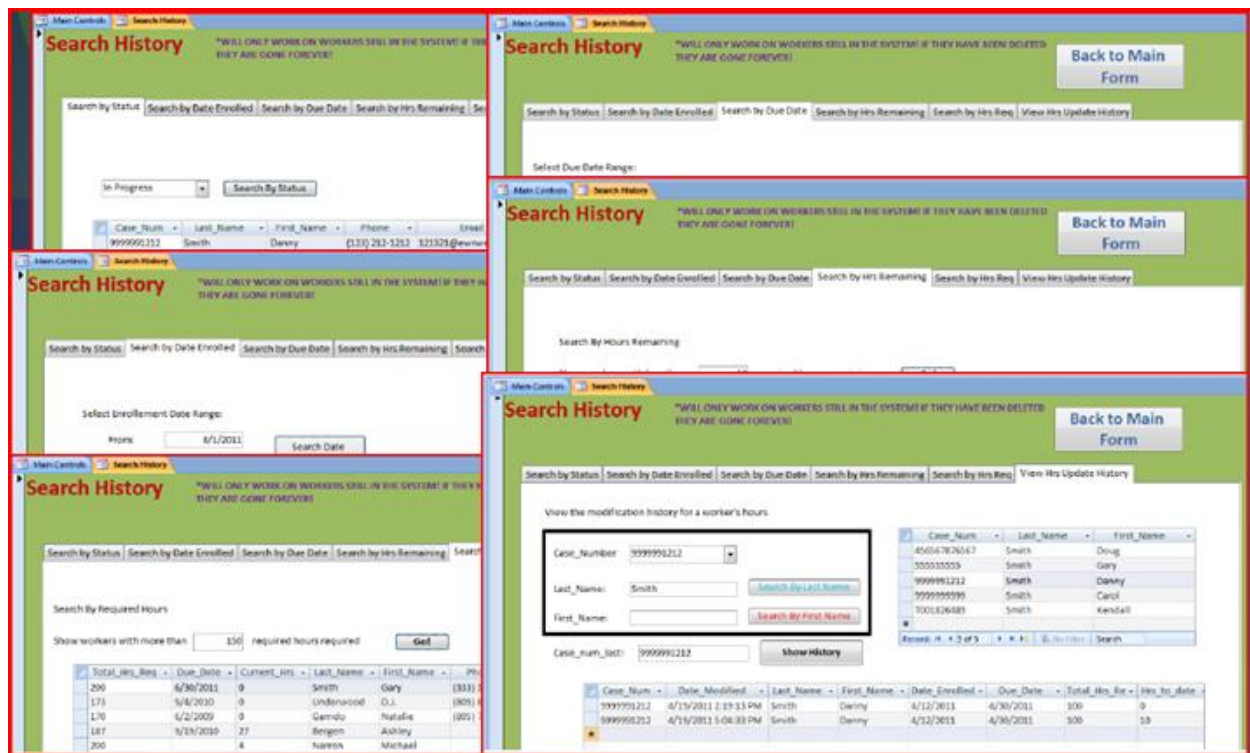


Figure 7: Search Options

Some of Microsoft Access' inherent security features were applied to the database. The entire file itself has been password protected. Access to the VBA code has been locked to reduce risk of tampering with the necessary functions. Access to the tables and queries has also been blocked to safeguard against manipulation. The EcoSLO office manager has been given the passwords and is in sole control of the database.

Unique Aspects of the Design

The search method to select a worker for updating their information was a bit tricky to overcome. In order to populate the text fields based off a worker's private case number I had to first send that number to a textbox in the form, the user could then click the "Fill Data" button that would cause the fields to populate with information pertaining to that specific worker. This approach had to be done because selecting a worker from the subform search field did not dynaset the textboxes in the form. Figure 8 shows an example of this roundabout method for populating textboxes.

Case_Num	Last_Name	First_Name
456567876567	Smith	Doug
555555555	Smith	Gary
9999991212	Smith	Danny
9999999999	Smith	Carol
T001826489	Smith	Kendall

Record: 14 of 3 of 5 No Filter Search

Case_Number:

Last_Name:

First_Name:

Case_num:

Date_Enrolled: Hrs_to_Date:

Due_Date: Current_Hrs:

Total_Hrs_Req: Hrs_Remaining:

Status:

Figure 8: Example of Populating Textboxes

Because there are three different ways to search for a specific worker (either by last name, first name, or case number), If-Then code had to be written to save the worker information based on which method was used to populate the textboxes. Figure 9 shows this If-Then code.

```

Private Sub Update_Hrs_Button_Click()

If Me.Case_Num_first_hours_update.Visible = False And Me.Case_num_last_hours_update.Visible = False Then
    DoCmd.OpenQuery "Update_Hrs_Drop_Query", acViewNormal, acEdit
    DoCmd.OpenQuery "Append_Hrs_Drop_History_Query", acViewNormal, acEdit
    DoCmd.SetWarnings False
    MsgBox "The worker's hours have been updated!", vbOKOnly, "Confirmed"
ElseIf Me.Case_Num_first_hours_update.Visible = True And IsNull(Me.Case_Num_Drop_Hours_Update.Value) Then
    DoCmd.OpenQuery "Update_Hrs_First_Query", acViewNormal, acEdit
    DoCmd.OpenQuery "Append_Hrs_First_History_Query", acViewNormal, acEdit
    DoCmd.SetWarnings False
    MsgBox "The worker's hours have been updated!", vbOKOnly, "Confirmed"
ElseIf Me.Case_num_last_hours_update.Visible And IsNull(Me.Case_Num_Drop_Hours_Update.Value) Then
    DoCmd.OpenQuery "Update_Hrs_Last_Query", acViewNormal, acEdit
    DoCmd.OpenQuery "Append_Hrs_Last_History_Query", acViewNormal, acEdit
    DoCmd.SetWarnings False
    MsgBox "The worker's hours have been updated!", vbOKOnly, "Confirmed"
Else
    MsgBox "Error in Case Number Selection", vbOKOnly, "Error"
Exit Sub
End If

End Sub

```

Figure 9: Code for saving worker information based on search method used

More code pertaining to how text fields are populated based on search methods can be found in Appendix II.

Overall, this roundabout method of searching and filling worker data behaves simple and works as intended.

Microsoft SharePoint Server

Microsoft SharePoint is collaborative web application software that can assist an organization with content management. This software allows for content and resource management under a unified infrastructure through the use of various helpful tools. These tools include; a manageable calendar of events, a shared documents library, the ability to store and track documents and the ability to share database systems. SharePoint allows centralized access to enterprise information and applications on a corporate network and is highly customizable.

The web based tools can be utilized by an office such as EcoSLO to provide web access for their clients. A community service worker would be able to access the EcoSLO SharePoint web site and register themselves into the system. They would also be able to submit scanned copies of their hour log sheets so that an EcoSLO office worker can confirm and update the worker's profile. The calendar of events can be used to inform the community service worker

about upcoming opportunities for service hours. Microsoft SharePoint would be able to facilitate the sharing of information between EcoSLO management and community service workers.

Defining Requirements

The following items have been identified as the base hardware and software requirements for basic implementation of Microsoft SharePoint [4]. These requirements are for having one computer as the stand-alone server.

Hardware Requirements

- 2.5 GHz Processor
- 2 GB RAM
- Disk Space: NTFS file system–formatted partition with 80 GB of free space plus adequate free space for Web sites
 - Space required for base installation, diagnostics (logging, debugging, memory dumps) and day to day operations
- DVD Disk Drive
- 1024 x 768 Resolution Monitor
- Minimum 56 Kbps connection speed

Software Requirements

- SharePoint License
 - Free version (Windows SharePoint Services), has limited functionality
 - Paid version (Microsoft Office SharePoint Server), has full functionality
- Windows Server 2008
 - Provides developers with a secure, flexible and connected web and applications platform, and make network services available remotely
- MS SQL Server
 - A reliable data management and reporting platform that helps deliver secure, remote synchronization and management capabilities.

- Enables organization to scale database operations, improve IT and developer efficiency, and enable highly scalable and well-managed business intelligence.
- Microsoft Forefront Protection 2010 for SharePoint
 - Provides content controls to help businesses protect Microsoft Office SharePoint
 - Block malware and out-of-policy content from entering SharePoint libraries.

Implementation Plan

Microsoft Project software was used to create a work breakdown structure for the main tasks necessary for basic installation and utilization of Microsoft SharePoint. Figure 10 shows this work breakdown structure.


		Task Name	Start	Finish	Predecessors	Resource Names
1		MS SharePoint Server 2007 Implementation Plan	Mon 6/13/11	Fri 7/22/11		
2		Planning	Mon 6/13/11	Thu 6/23/11		
3		Evaluate Microsoft Office SharePoint Server 2007 features	Mon 6/13/11	Mon 6/20/11		Project Manager
4		Evaluate EcoSLO's objectives for MS SharePoint Server 2007	Tue 6/21/11	Tue 6/21/11	3	Project Manager,EcoSLO Manager
5		Formulate preliminary cost/benefit analysis	Thu 6/23/11	Thu 6/23/11	8	Project Manager
6		Determine success criteria	Mon 6/13/11	Mon 6/13/11		
7		Document as Needed	Mon 6/13/11	Mon 6/13/11		
8		Review Technical Requirements	Wed 6/22/11	Wed 6/22/11		IT Staff
9		Identify Software Needs	Wed 6/22/11	Wed 6/22/11	4	
10		Identify Hardware needs	Wed 6/22/11	Wed 6/22/11	4	
11		Perform Risk Assessment	Mon 6/13/11	Thu 6/16/11		Project Manager
12		Identify and analyze potential risks	Mon 6/13/11	Mon 6/13/11		
13		Quantify potential impact of the risks	Tue 6/14/11	Tue 6/14/11	12	
14		Formulate Contingency Plans	Wed 6/15/11	Wed 6/15/11	13	
15		Document as Needed	Thu 6/16/11	Thu 6/16/11	14	
16		Configuration Management	Mon 6/13/11	Tue 6/14/11		IT Staff
17		Install Hardware	Mon 6/13/11	Mon 6/13/11		
18		Install Software	Mon 6/13/11	Mon 6/13/11		
19		Test	Tue 6/14/11	Tue 6/14/11	17,18	
20		Maintain System	Mon 6/13/11	Fri 7/22/11		IT Staff
21		Backup and Restore	Mon 6/13/11	Thu 6/16/11		
22		Perform backups	Mon 6/13/11	Tue 6/14/11		
23		Test restore/disaster recovery	Wed 6/15/11	Thu 6/16/11	22	
24		Monitor System Performance	Mon 6/13/11	Fri 7/22/11		
25		Monitor SQL Server performance	Mon 6/13/11	Mon 6/13/11		
26		Monitor Web front end performance	Mon 6/13/11	Fri 7/22/11		
27		Re-forecast system requirements and capacity	Mon 6/13/11	Mon 6/13/11		
28		Plan for additional capacity as needed	Mon 6/13/11	Mon 6/13/11		
29		Bi-Weekly performance review	Mon 6/13/11	Mon 6/13/11		
30		Continuous documentation of user feedback	Mon 6/13/11	Tue 6/14/11		EcoSLO Manager
31		UI and structure updates as necessary	Wed 6/15/11	Thu 6/16/11	30	IT Staff,Project Manager
32		Monthly Review Meetings	Mon 6/13/11	Mon 6/13/11		Project Manager

Figure 10: SharePoint Implementation Plan Work Breakdown Structure

The work breakdown structure shows that SharePoint implementation can be completed in a little over a month. This information has been presented to the office manager at EcoSLO and it is now up to her discretion whether she will choose to execute it or not.

Methodology

This chapter explains the methods used to define the initial state of the system. This section also explains how the improvements made were gauged.

In order to first understand the current system, an initial state value stream map was generated after several interviews with the main office workers at EcoSLO. Time studies were performed to have a baseline measurement for time spent per data entry process/generating reports. And finally, errors were quantified and used to generate a pareto chart to highlight the most problematic mistakes. Results and analysis of this information is discussed later in the Results chapter.

Initial State Value Stream Map

Figure 11 shows a value stream map of the main processes the EcoSLO office performs for the SLO County Court. There are three main functions required by the County Court.

The first process is the registration of the community service worker (CSW). When a court ordered community service worker enter the office they must present their court documents to the EcoSLO manager. These documents show the CSW's case number which serves as a unique identification number. The EcoSLO worker copies these documents to keep on file and accepts payment from the CSW to cover their administrative expenses. The CSW is then informed of community service opportunities and departs the office.

The second process is the logging of a CSW's service hours. A CSW will periodically enter the EcoSLO office to submit their hour log sheet. The EcoSLO worker enters their information into the MS Excel file and informs the CSW of new work opportunities.

The final process is to generate reports and submit them to the SLO County Court office. Reports are generated on a bi-weekly basis but can be special requested by the court.

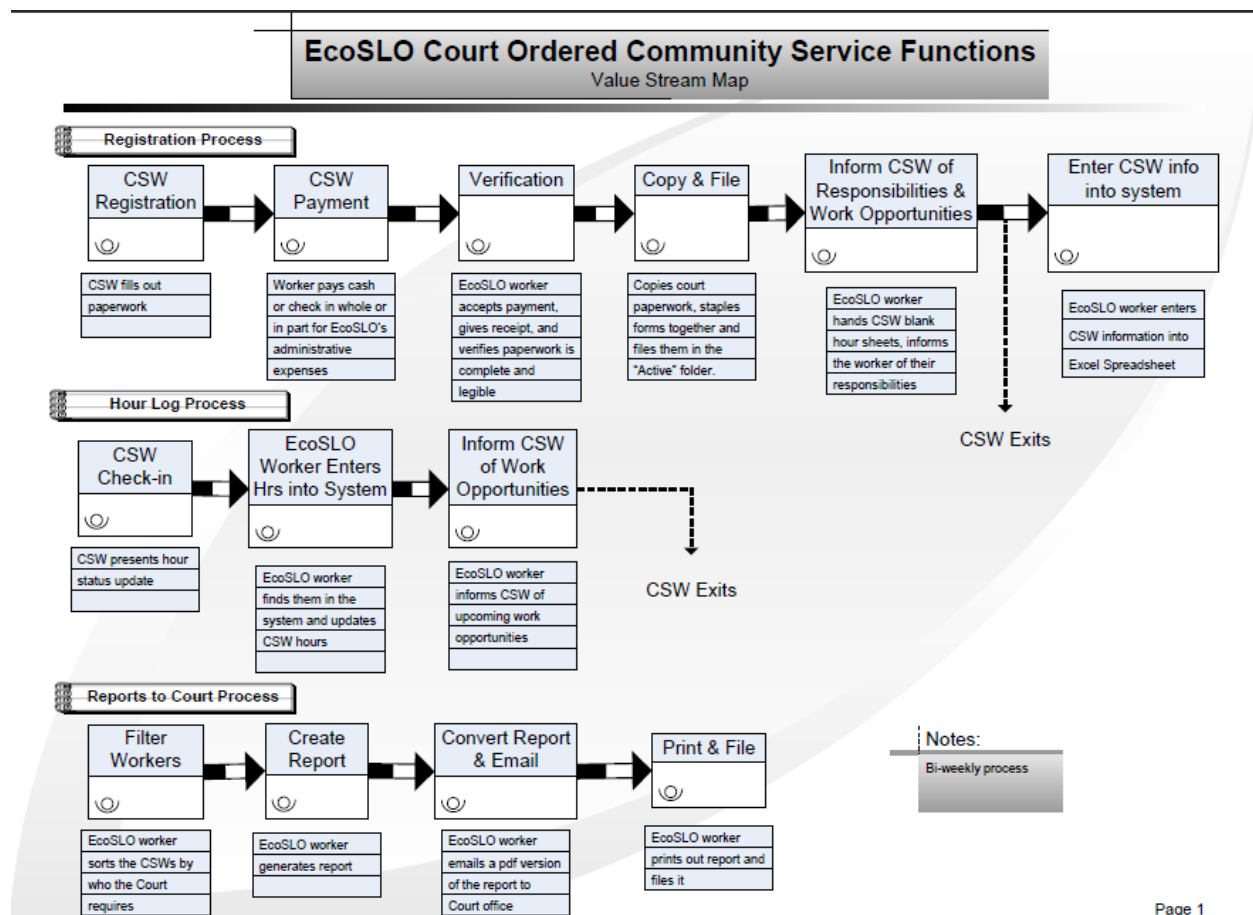


Figure 11: Initial State Value Stream Map

Page 1

Time Studies

Time studies were performed on the data entry process and the process of creating a report submitted to the court office. A standard stopwatch was used alongside a time study sheet. Figure 12 below shows the time study sheet for the process of entering a CSW's worker information into the MS Excel sheet. Thirty cycles were measured in order to approximate normality. The standard time for entering a single worker into the Excel system was found to be 1.2 minutes. Figure 13 shows the time study sheet for generating hour reports. The standard time for creating a single report that is submitted to the court was found to be 6.02 minutes. Appendix III shows larger/clearer versions of these time sheets.

Standard Times Calculation Sheet																																					
Operation: Worker Info Entry															Date: 4/29/2011																						
Observer: Juan P Ojeda Pedraza															Study Start Time: 9:40AM																						
Operator: Helly															Study End Time: 11:15AM																						
Element Description		Cycles =																														Summary Data					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	SUM	AVG	R	N		
1	Enter/Look Up Case Number	R	95	100	100	100	100	95	100	100	100	90	100	95	100	100	100	100	90	100	100	100	100	100	100	100	100	100	100	100	100	100	100	2365	98.83		
		T	19.8	18.4	16.7	19.6	19.1	22.5	16.4	19.5	19	26.5	19.3	23.4	16.1	22.5	22.4	17.9	20.9	14.7	18.6	19.2	17.9	17.4	25.4	19.8	16.5	22.5	21.1	19.4	21	24.5	537.5	19.92		19.68	
2	Enter Worker Name	R	100	100	100	100	100	100	105	105	105	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	3045	101.5		
		T	14.1	6.98	12.8	7.56	13	12.1	7.64	3.73	9	6.73	14.3	10	11.1	9.47	10.7	9.3	10.7	7.87	9.64	7.45	6.56	8.4	14.7	12.3	19.4	8.51	13.7	7.55	7.15	7.47	305.9	10.2			
3	Enter Contact Info (Phone/Email)	R	100	105	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	3005	100.2		
		T	27.5	17.1	25.1	25.6	24	25.1	24.4	24.1	19.2	19.7	24.5	24	17.4	23.2	18.9	18.8	25.7	15.1	22.6	11.2	20.2	19.9	23.9	9.72	21.3	14.9	21	18.9	17.9	623.9	20.8		20.83		
4	Enter Worker Address (Location)	R	100	100	100	100	100	100	100	100	100	100	95	95	95	95	100	90	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	2395	98.83		
		T	10.7	9.63	12.4	11.1	7.25	7.68	6.47	9.63	6.59	7.61	12.9	8.08	6.28	10.7	8.85	10.6	17.8	7.7	13	10	6.47	5.44	9.8	10.8	8.01	8.44	7.75	7.15	19.2	12.6	230.5	9.682		9.666	
5	Enter Payment Information	R	110	95	100	100	100	95	90	90	100	100	90	90	100	100	100	100	115	100	105	100	100	100	90	100	100	100	100	100	100	100	2970	99			
		T	2.74	7.68	3.24	10.7	9.13	12.1	8.47	9.34	10.6	10.9	7.56	8.92	13.1	16.4	13.1	11.1	3.8	11.8	7.85	11.5	9.32	11.2	16.4	11.7	10.3	8.22	12.5	8.92	11.4	10.8	300.6	10.02		9.921	
* Observed Time = Average Time * Time in seconds																																					
Total NT = 70.45																																					

Non-Cycle Elements		Frequency
1	phone call	3
2		
3		

Allowance		5%
Standard Time (seconds/unit)	74	1.2 min
Output/8 HourShift		

[illegible]

Pareto Chart of Errors

Over the course of 1.5 months I paid weekly visits to help with the data entry, and to help catch errors. Figure 14 shows a Pareto chart of the different errors caught during these visits. Hour entry errors were the most prevalent; this was due to a miscalculation in hours remaining subtracted from total hours required. Report generated with an error was the second most common error and this was due to the hour entry error being left uncorrected and was left in the report to the court. Contact info error was the final type of common error and this was mostly due to illegible penmanship from the CSW or a typographical error made in data entry.

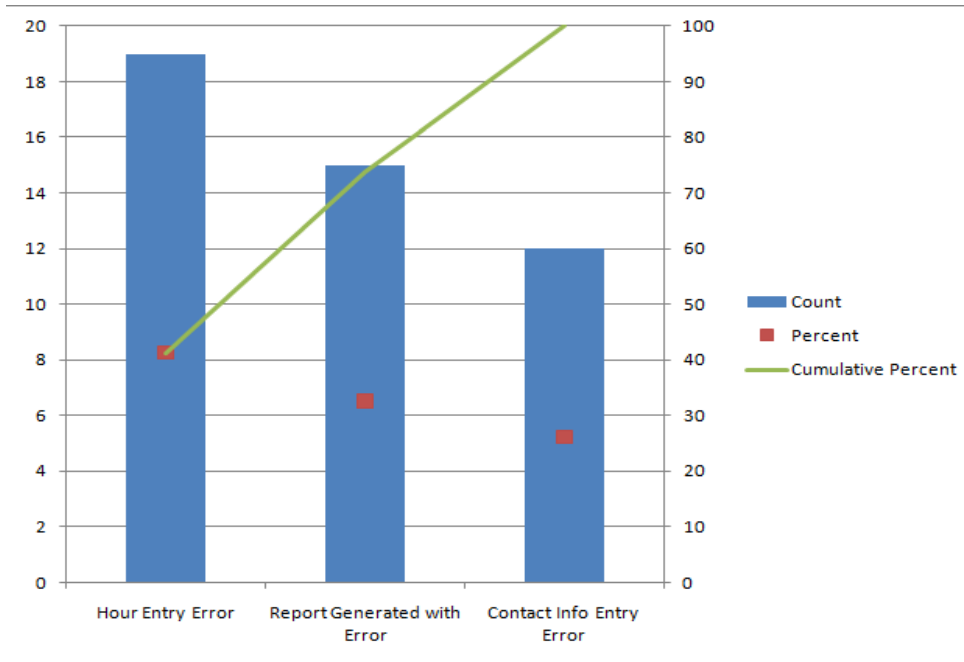


Figure 14: Pareto Chart of Errors

The average time spent correcting these errors is summarized in Table 1. The third column of Table 1 lists the possible consequence of each error if they were to be left uncorrected. If the contact information for a CSW is incorrect then there would be no way of getting a hold of them to inform them of their upcoming deadline or upcoming opportunities for community service. If there is an error in the hour log for a worker then the incorrect information could be submitted to the court. If this is the case, then the court could incorrectly issue an arrest warrant for someone who does not deserve it.

Table 1: Error Resolution Duration

Type of Error	Average Time Spent Correcting Error	Possible Major Consequence
Contact Info Entry Error	6 days	No way to contact CSW
Hour Entry Error	15 days	incorrect hours reported to court
Report Generated with Error	15 days	Warrant Issued by Court

New data was collected after the implementation of the MS Access database. This data will be shared and analyzed in the Results chapter of this report.

In this chapter the overall improvements made by the database system and the economic start-up costs of MS SharePoint are discussed. At the time of writing this report the EcoSLO office has only had the database for two and a half weeks. This has presented limited time to fully perform an evaluation on the improvements made. Following are time studies for entering workers into the database system as well as for generating reports.

Time Savings

New time studies were performed on the CSW data entry and the creation of the reports submitted to the County Court office. Figure 15 and Figure 16 show the time sheets for these, respectively. Appendix III shows clearer/fuller versions of these sheets.

Standard Times Calculation Sheet																																				
Operation:		Workshop Info Entry										Date:		9/24/2011																						
Observer:		Jean P Ojeda-Peraza										Study Start Time:																								
Operator:		Hally										Study End Time:																								
Element Description		Cycles =																														Summary Data				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	SUM	AVG	R	N	
1	Enter/Look Up Case Number	R	35	100	90	100	100	100	100	100	100	100	95	100	100	100	100	95	100	100	100	90	90	100	100	100	100	100	90	100	100	95	1470	38		19.03
		T	18.8	18.4	14.7	18.2	24.5	28.5	14.7	80.6	18.2	19	18.4	14.7	25.4	19.3	19	23.4	22.5	21	19.4	21	24.5	19	28.5	18.9	23.4	22.5	18.6	19.2	18.9	291.9	19.42			
2	Enter Worker Name	R	100	100	100	100	100	100	100	100	100	100	105	100	100	100	105	100	100	100	100	100	100	100	105	100	100	100	100	100	100	9545	103			
		T	14.1	6.98	7.87	9.64	7.45	7.47	6.73	7.87	9.64	7.45	3	6.98	7.87	14.7	7.56	9	8.51	7.15	7.55	7.15	7.47	9	6.73	14.3	10	8.51	3.64	7.45	14.1	1313	8.754		9.017	
3	Enter Contact Info (Phone/Email)	R	100	105	100	100	100	100	100	100	100	100	100	105	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	1510	70		
		T	27.5	17	25.7	16.1	22.6	17.9	19.7	25.7	16.1	22.6	18.2	17	25.7	19.8	25.6	18.2	24	21.3	18.9	21	18.9	17.8	19.2	19.7	24.5	24	21.3	16.1	22.6	27.5	36.9	21.08	21.23	
4	Enter Worker Address Location	R	100	100	100	100	100	100	100	100	100	100	100	95	100	100	100	100	100	100	100	100	95	100	100	100	100	100	100	100	100	100	1525	100		
		T	10.7	9.63	7.7	13	7	10	7.15	18.2	12.6	6.69	7.61	12.9	8.08	8.44	9.8	11	6.69	7.61	7.7	13	10	8.08	8.44	19.2	12.6	6.69	9.63	7.7	13	10.7	15.4	10.31	10.35	
5	Enter Payment Information	R	10	95	95	105	100	100	100	100	100	100	100	100	100	105	100	100	90	90	100	90	90	100	100	90	95	100	105	100	100	1008	100			
		T	2.74	7.68	11.8	7.95	11.5	8.92	11.4	10.8	10.6	8.22	11.4	10.8	10.9	11.8	7.85	11.5	9.9	7.56	8.92	8.22	16.4	10.7	10.6	8.92	10.6	7.68	11.8	7.85	11.5	2.74	113.7	9.475	9.954	
* Observed Time = Average Time																																Total NT =			63.18	
* Time in seconds																																				
Non-Cyclic Elements		Frequency	Allowance		5%																															
1			Standard Time (seconds/unit)		72.6		1.21 min																													
3			Output/8 Hour Shift																																	

Figure 15: Time sheet for new data entry method

[illegible]

Figure 16: Time sheet for creating reports using database

The time studies show that the time to enter workers into the system was reduced from 73.97 seconds to 72.6 seconds. This is not a very significant improvement. It should be noted that not much was changed in the data entry procedure and therefore a significant improvement in this regard cannot be expected. The time to create reports has been

significantly reduced from 361 seconds to 90 seconds. This can be accredited to the ease of filtering workers by date range worked in as easy as two clicks of the mouse.

The “costs” associated with these time savings were derived from calculating the time spent per year to generate reports at a California minimum wage rate (\$8.00). The bi-weekly process of generating and submitting reports to the County Court office results in 24 reports generated per year. Table 2 summarizes the calculations for costs of creating reports under these assumptions.

Table 2: Report Costs

	Old Excel Process	New Database Process
Annual time spent generating 24 bi-weekly reports (in minutes)	144.4	36.00
Annual cost spent generating reports (in USD)	\$19.25	\$4.80

An annual savings of \$14.45 on this task alone shows a definite improvement from the old system.

Reduction in Errors

As previously stated, the EcoSLO office has only had the new database system in place for a couple of weeks and therefore error frequency has yet to be quantified. A comment made by the EcoSLO main office worker regarding errors was that “there will certainly be less of them now. I’d certainly feel more confident letting volunteers handle the data entry.”

The various checkpoints in the form of confirmation messages should help reduce the errors.

MS SharePoint

MS SharePoint has yet to be implemented but that remains at the discretion of EcoSLO management whether they want to do so or not. Thus, possible improvements made by MS SharePoint have not been quantified.

Table 3 gives the breakdown of initial hardware and software requirements for a simple initial implementation of MS SharePoint. Quoted Sources [5], [6], and [11].

Table 3: MS SharePoint Costs

Item	Cost
SharePoint License	\$0.00
MS SharePoint Foundation (SharePoint Services)	
Free version with limited functionality	
SQL Server License	\$768.00
MS SQL Server	
Windows Software Server	\$385.00
Windows Small Business Server	
Virus Protection & Back-Up	\$7.20 per user per year
MS Forefront Protection for SharePoint	
Hardware Infrastructure	\$200.00
Total	\$1360.20

Not included in the cost table, but considered integral to the successful implementation of SharePoint, is a capable IT personnel. According to salary.com, the median salary for a PC Maintenance Technician is \$40,511 [2]. An experienced computer technician is necessary for all the installation and maintenance of the MS SharePoint hardware and software.

With the costs of implementing and maintaining MS SharePoint being so extravagant (at least from the perspective of a non-profit community service office), it is unlikely that the EcoSLO office will go through with it. Regardless, the implementation plan has been proposed.

Conclusion

The purpose of this senior project was to design a simpler method for the EcoSLO office to manage community service worker information while reducing the number of errors in data entry. A literature review was conducted to investigate proper database design principles and to better understand the human-computer system requirements. Additionally, the helpful features of Microsoft SharePoint were looked into how they could be applied to the EcoSLO office.

Through constant communication with the client EcoSLO, the database designed for the EcoSLO office has been designed to their specifications. The database system has made it easier to manage community worker information. Entering and editing worker information has been facilitated by a simple interface. Certain checkpoints in the form of confirmation message boxes have been set in place for the EcoSLO worker to verify contents before submission. This will help to reduce errors. Finally, the method to filter workers for creating reports has been made simpler.

This senior project was appropriate for an industrial engineer because it involves the design of a personalized database system. It incorporates change management principles for incorporating a new system into an office. This senior project also recommends the implementation of a collaborative web-based enterprise system.

A certain level of personal satisfaction has been achieved at the completion of this senior project. The database system incorporates creative coding functions learned in IME 312 and other supplementary coding resources. This database system has been put into operation at the EcoSLO office and management has already stated how much easier it is for data entry. The next step would be to employ Microsoft SharePoint, but this remains at the discretion of EcoSLO management.

References

- [1] Atkinson, Malcolm et. al. *The Object-Oriented Database System Manifesto*. Computer Based Learning Unit, University of Leeds. 1994
- [2] "Average PC Maintenance Technician I Salary Information plus Job, Career Education & Unemployment Help." *Salary.com*. Salary.com. Web. 24 May 2011.
<<http://www1.salary.com/PC-Maintenance-Technician-I-Salary.html>>.
- [3] Brown, C. Marlin. *Human-Computer Interaction Design Guidelines*. Exeter: Intellect, 1999. Print.
- [4] "Determine hardware and software requirements (Office SharePoint Server)." *Microsoft TechNet: Resources for IT Professionals*. Microsoft Corporation, n.d. Web. 22 May 2011.
<<http://technet.microsoft.com/en-us/library/cc262485%28office.12%29.aspx>>.
- [5] Edelman, Russ. "Determining the True Cost of Microsoft SharePoint - Computerworld." Editorial. *Computerworld - IT News, Features, Blogs, Tech Reviews, Career Advice*. 29 June 2009. Web. 29 May 2011.
<http://www.computerworld.com/s/article/9134954/Determining_the_True_Cost_of_Microsoft_SharePoint>.
- [6] "Forefront Protection 2010 for SharePoint: Pricing and Licensing." *ForeFront Protection for Sharepoint*. Microsoft Corporation. Web. 19 May 2011.
<<http://www.microsoft.com/forefront/protection-for-sharepoint/en/us/pricing-licensing.aspx>>.
- [7] *Get Started with Access 2007 Security - Access - Microsoft Office. Office - Microsoft Office*. Microsoft Corp. Web. 21 Feb. 2011. <<http://office.microsoft.com/en-us/access-9help/get-started-with-access-2007-security-HA010198047.aspx>>.
- [8] Gio Wiederhold and Ramez El-Masri. *Entity-Relationships Approach to Systems Analysis and Design*, North-Holland, 1980, pages 237-257. Restored from SUMEX archives August 2002 by Thomas Rindfleisch.
- [9] Hernandez, Michael J. *Database Design for Mere Mortals: a Hands-on Guide to Relational Database Design*. Boston: Addison-Wesley, 2003. Print.
- [10] Microsoft SharePoint 2010 Evaluation Guide. Microsoft Corporation.

- [11] *Microsoft Store*. Microsoft Corporation. Web. 19 May 2011.
<<http://www.microsoftstore.com/store/msstore/cat/categoryID.44066800>>.
- [12] Miller, G. A. (1956), "The magical number seven, plus or minus two: Some limits on our capacity for processing information", *Psychological Review* 63 (2): 343–355.
- [13] Paton, Rob, and James McCalman. *Change Management: a Guide to Effective Implementation*. London: Sage Publications, 2004. Print.
- [14] *Security Considerations and Guidance for Access 2007*. MSDN | Microsoft Development, Subscriptions, Resources, and More. Web. 21 Feb. 2011.
<[http://msdn.microsoft.com/en-us/library/bb421308\(v=office.12\).aspx](http://msdn.microsoft.com/en-us/library/bb421308(v=office.12).aspx)>.
- [15] Sletteland, Holly. "EcoSLO Database Requirements Meetings." Personal interview. 21 Jan. 2011.
- [16] *What Is SharePoint?* Prod. Asif Rehmani. Perf. Wendy Henry. *YouTube.com*. Sharepoint-screencasts.com, 19 Dec. 2007. Web. 14 Feb. 2011.
<<http://www.youtube.com/watch?v=19NLKQBx0M&playnext=1&list=PL7F4C07C4DF07706E>>.
- [17] Wickens, Christopher D., Sallie E. Gordon, and Yili Liu. *An Introduction to Human Factors Engineering*. Upper Saddle River, NJ: Pearson Prentice Hall, 2004. Print.
- [18] Yang, Tao. "IME 312 Data Management & System Design." Lectures.

Appendix I: Database User's Manual



Personalized Database

User's Manual

By
Juan P Ojeda Pedraza
Spring 2011

Table of Contents

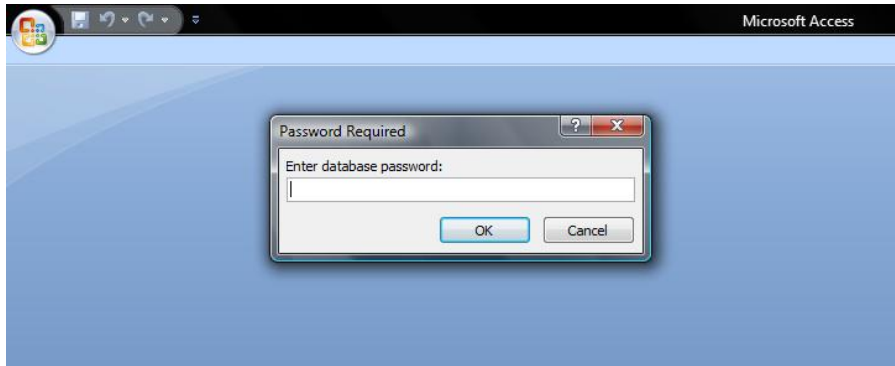
Start-Up.....	37
Opening the Database and Enabling Content	37
Main Control Page Overview	38
Worker Controls.....	39
Adding a New Worker.....	39
Editing a Worker's Information	40
Deleting a Worker	41
Hour Controls.....	42
Entering a Worker's Hour Requirements.....	42
Updating a Worker's Hours	43
Report Controls.....	44
Individual Worker Information Profile.....	44
Individual Worker Hours Profile	45
Multiple Worker Hours Report	46
History Search Options	47
Search by Status.....	47
Search by Date Enrolled.....	47
Search by Due Date.....	48
Search by Hours Remaining	48
Search by Hours Required.....	49
View Hours Update History	49

Start-Up

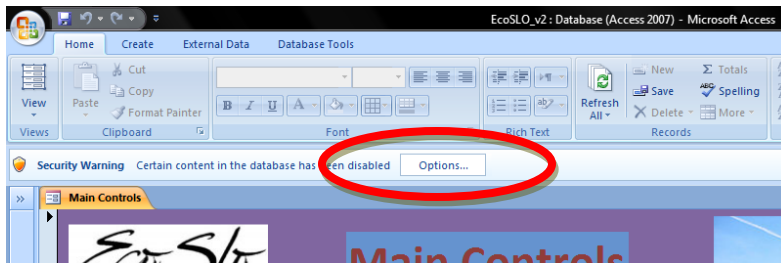
Opening the Database and Enabling Content

Locate the Microsoft Access database file “EcoSLO_v2” and click it to open the database.

In the Password entry field enter the password: _____



In order for the VBA code and the special query functions to function, you must enable this content. To do so, Select **Options** from the Security Warnings ribbon at the top.



Select “Enable this Content” and click **OK**.



Main Control Page Overview

Worker Controls

- Add a Worker: Leads to the form for adding new worker information
- Edit Worker Info: Leads to the form for editing worker information
- Delete a Worker: Leads to the form for **permanently** deleting a worker from the system

Hour Controls

- Enter Hours Req: Leads to the form for entering hour requirements for a worker that has been previously entered in the system
- Update Worker Hrs: Leads to the form for updating a worker's hours

Report Controls

- Individual Worker Info Report: Leads to the form to select and generate a single worker information report
- Individual Worker Hours Report: Leads to the form to generate a single worker's hours report

Search History

- Search Options: Leads to the form for various history search options



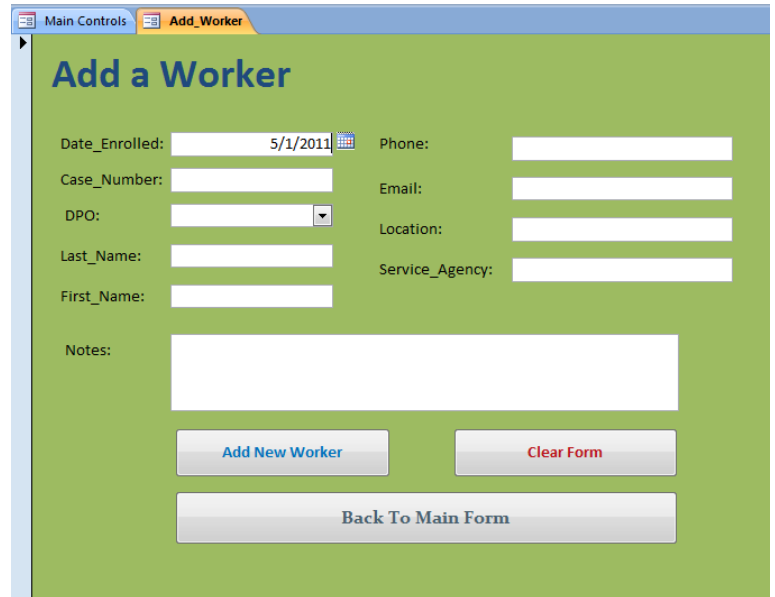
Worker Controls

Adding a New Worker

To add a new worker into the system Click the “Add a Worker” button on the main controls page.

The **Date Enrolled** field is set to default to today’s date but can be changed by clicking the calendar icon on to the right.

A Case Number is required!!! If the worker does not have (or will not have) a court case number, you may enter their name in the structure of LASTNAMEfirstname (ex: SMITHjane) in this field. All other fields are optional.



Once all desired fields are filled in click the **Add New Worker** button.

To continue adding more workers, select **Clear Form** to blank out the fields and start entering a new worker’s information.

To return to the main controls page, select **Back To Main Form**.

Editing a Worker's Information

To edit a worker's information select "Edit Worker Info" from the Main Controls Page.

Here you can search for a worker by case number, last name, or first name. The worker information fields will automatically populate if you select a case number from the drop down menu. If you choose to search for a worker based on last or first name, you will have to select the **Fill Data** button (not pictured) to populated the information fields.*

Once you are finished making changes to a worker's information, select **Update Worker Info** to update that worker's information in the system.

To continue editing more workers, select **Clear Form** to blank out the fields and start with a new worker.

To return to the main controls page, select **Back To Main Form** (not pictured).

The screenshot shows a web application interface for updating worker information. The page has a green header with the title "Update Worker Information". Below the header, there is a search section with a "Case_Number" dropdown menu, "Last_Name" and "First_Name" text input fields, and buttons for "Search By Last Name" and "Search By First Name". The search section is highlighted with a black border. Below the search section, there are several text input fields for "Last_Name", "First_Name", "DPO", "Date_Enrolled", "Phone", "Email", "Location", "Service_Agency", "Payment", and "Notes". At the bottom of the form, there are two buttons: "Update Worker Info" and "Clear".

*These search functions apply to all pages with the search option.

Deleting a Worker

To delete a worker from the system **permanently** select “Delete a Worker” from the Main Controls page.

Here, you can search by case number, last name, or first name, with the same rules applying as before.

Verify the worker to be deleted and select **Delete Worker**.

To continue deleting more workers, select **Clear** and enter a new worker to be deleted.

To return to the main controls page, select **Back To Main Form**.

The screenshot shows a web application interface with a blue header bar containing two tabs: 'Main Controls' and 'Delete_Worker'. The 'Delete_Worker' tab is active. Below the header, the main content area has a green background and is titled 'Delete a Worker' in large red font. A black rectangular box highlights the search section at the top, which includes a 'Case Number' dropdown menu, a 'Last_Name' text input field with a 'Search By Last Name' button, and a 'First_Name' text input field with a 'Search By First Name' button. Below the search section, there are several text input fields arranged in two columns: 'DPO:', 'Last_Name:', 'First_Name:', 'Phone:', and 'Email:' on the left; and 'Location:', 'Service_Agency:', 'Payment:', 'Date Enrolled:', and 'Notes:' on the right. At the bottom of the form, there are three buttons: a red 'Delete Worker' button, a blue 'Clear' button, and a green 'Back To Main Form' button.

Hour Controls

Entering a Worker's Hour Requirements

To enter a worker's hour requirements select "Enter Hours Req" from the Main Controls page.

Search by case number, last name, or first name rules apply here as well.

The **Date Enrolled** field will automatically be set as the day's date but can be changed.

After exiting the **Hrs to Date** textbox the Hrs Remaining will be calculated, but PLEASE DOUBLE CHECK THIS VALUE.

Select **Enter Worker Hrs Required** to set and save the worker's hour requirements.

The screenshot shows a web application interface for entering worker hour requirements. The interface has a blue header bar with two tabs: 'Main Controls' and 'Enter_Worker_Hours_Req'. The main content area has a green background and is titled 'Enter Worker Hours Required'. It contains several input fields and buttons. A black box highlights the search section, which includes a 'Case_Number' dropdown, 'Last_Name' and 'First_Name' text boxes, and 'Search By Last Name' and 'Search By First Name' buttons. Below this, there are fields for 'Date_Enrolled' (5/1/2011), 'Hrs_to_Date' (0.00), 'Due_Date', 'Current_Hrs' (0.00), 'Total_Hrs_Req', and 'Hrs_Remaining'. At the bottom, there are three buttons: 'Enter Worker Hrs Required', 'Clear', and 'Back To Main Form'.

To continue setting other worker's requirements, select the **Clear** button and start from the beginning.

To close the Enter Worker Hrs form and return to the Main Controls page, select **Back to Main Form**.

Updating a Worker's Hours

To update a worker's hour log select "Update Worker Hrs" from the Main Controls page.

****Search function rules apply here as well.**

Once you have verified the worker's hour changes select **Update Hrs** to set and save the worker's information.

To continue updating more workers' hours, select the **Clear** button and start from the search options.

To return to the Main Controls page select **Back to Main Form**.

The screenshot shows a web application interface with a blue header bar containing two tabs: "Main Controls" and "Update_Worker_Hours". The "Update_Worker_Hours" tab is active. Below the header, the page title "Update Worker Hours" is displayed in large blue text. A black rectangular box highlights the search section, which includes a "Case_Number" dropdown menu, a "Last_Name:" text input field with a "Search By Last Name" button, and a "First_Name:" text input field with a "Search By First Name" button. Below the search section, there are several input fields: "Date_Enrolled:", "Hrs_to_Date:" (with a value of 0.00), "Due_Date:", "Current_Hrs:" (with a value of 0.00), "Total_Hrs_Req:", "Hrs_Remaining:", and "Status:". At the bottom of the form, there are three buttons: "Update Hrs" (blue), "Clear" (red), and "Back to Main Form" (large grey button with red text).

Report Controls

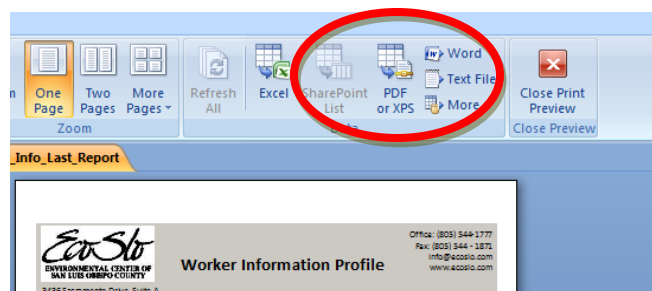
Individual Worker Information Profile

To create an information report for a single worker select “Individual Worker Information Report” from the Main Controls page.

Search for the worker in the same way as in previous sections

Select **View Worker Information** to see the worker’s report (shown below).

The report is shown in the Print Preview view. You can choose to print this report or you can save it as a .pdf file to save for later. To save as a .pdf select **PDF or XPS** in the top right ribbon.



To return to the Worker Report Form, close the print preview.

To return to the Main Controls page select **Back to Main Form**.

A screenshot of the 'Individual Worker Information Profile' form. The form has a green header and a white body. It contains several input fields: 'Case_Number' (a dropdown menu), 'Last_Name' (a text box), 'First_Name' (a text box), 'Case_num_last' (a text box), and 'Notes' (a text area). There are also buttons: 'Search By Last Name' (blue), 'Search By First Name' (red), 'View Worker Information' (blue), 'Clear' (red), and 'Back to Main Form' (blue). The form is titled 'Individual Worker Information Profile' in large blue letters.A screenshot of the 'Worker Information Profile' report. The report has a grey header with the 'EcoSto' logo and contact information. The main body is green and contains several input fields: 'Last_Name', 'First_Name', 'Case_Num', 'Date_Enrolled', 'Notes', 'Date_Last_Modified', 'DPO', 'Phone', 'Email', 'Location', 'Service_Agency', and 'Payment'. The report is titled 'Worker Information Profile' in large blue letters. At the bottom right, there is a date and time stamp: '5/1/2011 7:23:54 PM'.

Individual Worker Hours Profile

To create an hour report for a single worker select “Individual Worker Hours Report” from the Main Controls page.

Search for the worker in the same way as in previous sections

Select **View Worker Hours Profile** to see the worker’s hours report (shown below).

The report is shown in the Print Preview view. You can choose to print this report or you can save it as a .pdf file to save for later. To save as a .pdf select **PDF or XPS** in the top right ribbon.

To return to the Worker Hours Report Form, close the print preview.

To return to the Main Controls page select **Back to Main Form**.

The screenshot shows a web application interface with a blue header bar containing 'Main Controls' and 'Indiv_Worker_Hrs_Profile'. The main content area has a green background and is titled 'Individual Worker Hours Profile'. It contains several input fields and buttons: a 'Case_Number' dropdown menu, 'Last_Name:' and 'First_Name:' text boxes with 'Search By Last Name' and 'Search By First Name' buttons respectively, a 'Case_num_last:' text box with a 'View Worker Hours Profile' button, a 'Clear' button, and a large 'Back to Main Form' button at the bottom.

The screenshot shows a print preview of the 'Individual Worker Hours Report'. The header includes the 'EcoSlo' logo, the text 'ENVIRONMENTAL CENTER OF SAN LUIS OBISPO COUNTY', the address '3436 Sacramento Drive, Suite A San Luis Obispo, CA 93401', and contact information: 'Office: (805) 544-1777', 'Fax: (805) 544-1871', 'info@ecoslo.com', and 'www.ecoslo.com'. The report title is 'Individual Worker Hours Report'. The main body contains two columns of input fields for data entry: Case_Num, Last_Name, First_Name, DPD, Date_Enrolled, Due_Date, Total_Hrs_Req, Hrs_to_date, Current_Hrs, Hrs_Remaining, and Status. The footer shows the date '5/1/2011' and time '7:34:26 PM'.

Multiple Worker Hours Report

To create an hour report for a multiple worker select “Multiple Worker Hours Report” from the Main Controls page.

Here you can report for multiple workers within a specified enrollment date range.

Select **View Worker Hours Profile** to see the worker’s hours report (shown below).

The report is shown in the Print Preview view. You can choose to print this report or you can save it as a .pdf file to save for later. To save as a .pdf select **PDF or XPS** in the top right ribbon.

To return to the Worker Hours Report Form, close the print preview.

To return to the Main Controls page select **Back to Main Form**.

Main Controls Multiple Worker Hrs Report

Multiple Worker Hours Report

Generate Hour Report for workers enrolled between [DATE 1] and [DATE 2]:

Date 1:

Date 2:

EcoSlo
ENVIRONMENTAL CENTER OF
SAN LUIS OBISPO COUNTY
3436 Sacramento Drive, Suite A
San Luis Obispo, CA 93401

Worker Hours Report
3/31/2011 - 5/1/2011

Office: (805) 544-1777
Fax: (805) 544-1871
info@ecoslo.com
www.ecoslo.com

DPO	Last_Name	First_Name	Case_Num	Date Enrolled	Total Hrs Req	Hrs to date	Current Hrs	Hrs Remaining	Due_Date	Status
Traffic	Smith	Doug	456567876567	4/12/2011	140	20	0	120	5/27/2011	
Traffic	Smith	Gary	555555555	4/13/2011	200	60	0	140	6/30/2011	
Bench	Smith	Danny	9999991212	4/12/2011	100	10	5	90	4/30/2011	In Progress
Bench	Smith	Carol	9999999999	4/12/2011	75	20	0	55	6/1/2011	
	FIRST_TEST	FIRST_TEST	TEST_FIRST	4/19/2011	50	10	20	40	5/28/2011	
Traffic	TEST_ONE	TEST_ONE	TEST_ONE	4/19/2011	120	40	10	80	7/30/2011	In Progress
	TEST_TWO	TEST_TWO	TEST_TWO	4/19/2011	50	20	10	30	6/30/2011	In Progress
Traffic	TEST10	TEST10	TEST10	4/19/2011	200	20	20	180	4/30/2011	
Bench	TEST99	TEST99	TEST99	4/19/2011	100	30	10	70	5/31/2011	

9

5/1/2011 7:37:17 PM

History Search Options

Select “Search Options” from the Main Controls page to search for workers based on different criteria.

Search by Status

This search returns workers with the chosen status.

The screenshot shows the 'Search History' page with the 'Search by Status' tab selected. A dropdown menu is set to 'In Progress' and the 'Search By Status' button is clicked. The resulting table lists three test entries.

Case_Num	Last_Name	First_Name	Phone	Email	Notes
9999991212	Smith	Danny	(123) 212-1212	121321@ewrwef	none
TEST_ONE	TEST_ONE	TEST_ONE	(010) 101-0101	ONE_O_ONE@ONE.COM	ONE NONE
TEST_TWO	TEST_TWO	TEST_TWO	(202) 020-2020	TWO@GMAIL.COM	NONE

Search by Date Enrolled

This search returns workers within the chosen date interval.

The screenshot shows the 'Search History' page with the 'Search by Date Enrolled' tab selected. The 'Select Enrollement Date Range' section has 'From: 3/1/2011' and 'To: 5/1/2011' entered. The 'Search Date Enrolled by Range' button is clicked. The resulting table lists six workers enrolled within that period.

Date_Enrolled	Case_Num	Last_Name	First_Name	Phone	Email	Notes
4/5/2011	1233123123	red	blue	(123) 456-7887	qwert6@sderf.com	
4/5/2011	123456789	qwerty	asdfgh	() 5-4321	qwerty@qwerty	
4/6/2011	456567876567	Smith	Doug	(989) 898-9898	dfghj@asdfgh.com	
4/7/2011	555555555	Smith	Gary	(333) 344-5556	qer@asdfgh.com	
4/5/2011	9999991212	Smith	Danny	(123) 212-1212	121321@ewrwef	none
4/5/2011	9999999999	Smith	Carol	(987) 658-9989	fghtyu@tyuvb	none

Search by Due Date

This search returns workers within the chosen date interval.

The screenshot shows the 'Search History' interface. At the top, there are tabs for 'Main Controls' and 'Search History'. Below the tabs, there is a warning message: '*WILL ONLY WORK ON WORKERS STILL IN THE SYSTEM! IF THEY HAVE BEEN DELETED THEY ARE GONE FOREVER!'. To the right of the warning is a 'Back to Main Form' button. Below the warning, there are several search options: 'Search by Status', 'Search by Date Enrolled', 'Search by Due Date', 'Search by Hrs Remaining', 'Search by Hrs Req', and 'View Hrs Update History'. The 'Search by Due Date' option is selected. Below the search options, there is a 'Select Due Date Range:' section. It contains two input fields: 'From:' with the value '5/1/2011' and 'To:' with the value '6/30/2011'. To the right of these fields is a 'Search Due Date by Range' button. Below the search options and the date range selection, there is a table with the following data:

Due_Date	Case_Num	Last_Name	First_Name	Phone	Email
5/27/2011	456567876567	Smith	Doug	(989) 898-9898	dfghj@asdfgh.com
6/30/2011	5555555555	Smith	Gary	(333) 344-5556	qer@asdfgh.com
6/1/2011	9999999999	Smith	Carol	(987) 658-9989	fghtyu@tyuvb

Search by Hours Remaining

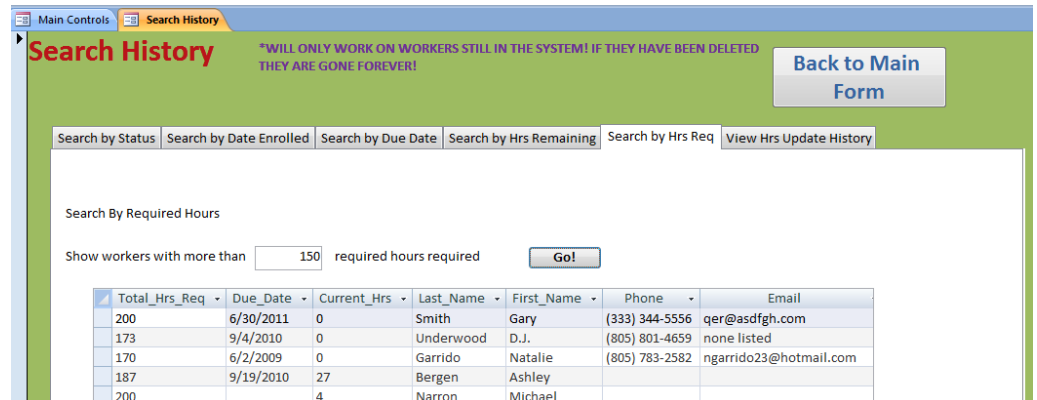
This search returns workers with less than the specified hours remaining.

The screenshot shows the 'Search History' interface. At the top, there are tabs for 'Main Controls' and 'Search History'. Below the tabs, there is a warning message: '*WILL ONLY WORK ON WORKERS STILL IN THE SYSTEM! IF THEY HAVE BEEN DELETED THEY ARE GONE FOREVER!'. To the right of the warning is a 'Back to Main Form' button. Below the warning, there are several search options: 'Search by Status', 'Search by Date Enrolled', 'Search by Due Date', 'Search by Hrs Remaining', 'Search by Hrs Req', and 'View Hrs Update History'. The 'Search by Hrs Remaining' option is selected. Below the search options, there is a 'Search By Hours Remaining' section. It contains a text input field with the value '50' and a 'Go!' button. Below the search options and the hours remaining selection, there is a table with the following data:

Hrs_Remaining	Due_Date	Hrs_to_date	Case_Num	Last_Name	First_Name	Phone
20	5/31/2011	80	ABC123GH1789	POWERS	KENNY	(567) 898-7654
33	9/4/2010	140	M000412118	Underwood	D.J.	(805) 801-4659
0	6/2/2009	170	M000424465	Garrido	Natalie	(805) 783-2582
0	6/2/2009	80	M000426861	Garrido	Natalie	(805) 530-2727
44	2/10/2010	72	M000427486	Lafica	Elizabeth	(805) 530-2727

Search by Hours Required

This search returns workers with more than the specified hours required.



Search History

*WILL ONLY WORK ON WORKERS STILL IN THE SYSTEM! IF THEY HAVE BEEN DELETED THEY ARE GONE FOREVER!

[Back to Main Form](#)

Search by Status | Search by Date Enrolled | Search by Due Date | Search by Hrs Remaining | Search by Hrs Req | View Hrs Update History

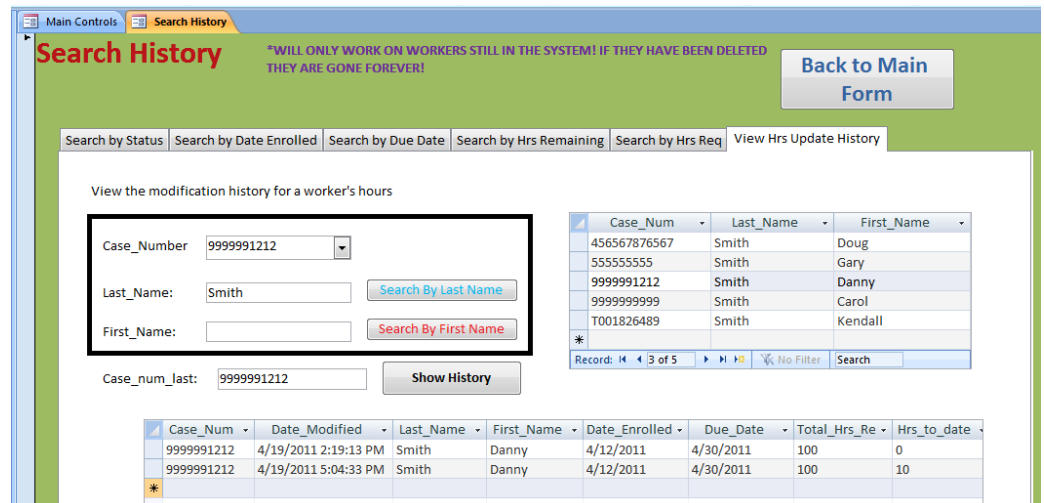
Search By Required Hours

Show workers with more than required hours required

Total_Hrs_Req	Due_Date	Current_Hrs	Last_Name	First_Name	Phone	Email
200	6/30/2011	0	Smith	Gary	(333) 344-5556	qer@asdfgh.com
173	9/4/2010	0	Underwood	D.J.	(805) 801-4659	none listed
170	6/2/2009	0	Garrido	Natalie	(805) 783-2582	ngarrido23@hotmail.com
187	9/19/2010	27	Bergen	Ashley		
200		4	Narron	Michael		

View Hours Update History

To view when or how often a worker's hours were modified you can search for a worker and select **View History** to view the date a modification to the worker's hours was made.



Search History

*WILL ONLY WORK ON WORKERS STILL IN THE SYSTEM! IF THEY HAVE BEEN DELETED THEY ARE GONE FOREVER!

[Back to Main Form](#)

Search by Status | Search by Date Enrolled | Search by Due Date | Search by Hrs Remaining | Search by Hrs Req | View Hrs Update History

View the modification history for a worker's hours

Case_Number:

Last_Name:

First_Name:

Case_num_last:

Case_Num	Last_Name	First_Name
456567876567	Smith	Doug
5555555555	Smith	Gary
9999991212	Smith	Danny
9999999999	Smith	Carol
T001826489	Smith	Kendall

Record: 1 of 5 |

Case_Num	Date_Modified	Last_Name	First_Name	Date_Enrolled	Due_Date	Total_Hrs_Re	Hrs_to_date
9999991212	4/19/2011 2:19:13 PM	Smith	Danny	4/12/2011	4/30/2011	100	0
9999991212	4/19/2011 5:04:33 PM	Smith	Danny	4/12/2011	4/30/2011	100	10

Appendix II: Unique Code

An example of the code used to populate field textboxes based on search method used (last name, first name, or case number):

```
Private Sub Show_Hrs_Button_Click()

If Me.Case_Num_first_hours_update.Visible = True And IsNull(Me.Case_Num_Drop_Hours_Update.Value) Then

Me.Date_Enrolled_Hrs_Update.Value = DLookup("Date_Enrolled", "Hours_and_Status", "[Case_Num] = Case_Num_first_hours_update.Value")
Me.Due_Date_Hrs_Update.Value = DLookup("Due_Date", "Hours_and_Status", "[Case_Num] = Case_Num_first_hours_update.Value")
Me.Total_Hrs_Update.Value = DLookup("Total_Hrs_Req", "Hours_and_Status", "[Case_Num] = Case_Num_first_hours_update.Value")
Me.Hrs_To_Date_Update.Value = DLookup("Hrs_To_Date", "Hours_and_Status", "[Case_Num] = Case_Num_first_hours_update.Value")
Me.Current_Hrs_Update.Value = DLookup("Current_Hrs", "Hours_and_Status", "[Case_Num] = Case_Num_first_hours_update.Value")
Me.Hrs_Remaining_Update.Value = DLookup("Hrs_Remaining", "Hours_and_Status", "[Case_Num] = Case_Num_first_hours_update.Value")
Me.Status_Update.Value = DLookup("Status", "Hours_and_Status", "[Case_Num] = Case_Num_first_hours_update.Value")

ElseIf Me.Case_num_last_hours_update.Visible And IsNull(Me.Case_Num_Drop_Hours_Update.Value) Then

Me.Date_Enrolled_Hrs_Update.Value = DLookup("Date_Enrolled", "Hours_and_Status", "[Case_Num] = Case_Num_last_hours_update.Value")
Me.Due_Date_Hrs_Update.Value = DLookup("Due_Date", "Hours_and_Status", "[Case_Num] = Case_Num_last_hours_update.Value")
Me.Total_Hrs_Update.Value = DLookup("Total_Hrs_Req", "Hours_and_Status", "[Case_Num] = Case_Num_last_hours_update.Value")
Me.Hrs_To_Date_Update.Value = DLookup("Hrs_To_Date", "Hours_and_Status", "[Case_Num] = Case_Num_last_hours_update.Value")
Me.Current_Hrs_Update.Value = DLookup("Current_Hrs", "Hours_and_Status", "[Case_Num] = Case_Num_last_hours_update.Value")
Me.Hrs_Remaining_Update.Value = DLookup("Hrs_Remaining", "Hours_and_Status", "[Case_Num] = Case_Num_last_hours_update.Value")
Me.Status_Update.Value = DLookup("Status", "Hours_and_Status", "[Case_Num] = Case_Num_last_hours_update.Value")

Else

MsgBox "Invalid Case Num", vbOKOnly, "Error"
Exit Sub

End If

If IsNull(Me.Status_Update.Value) Then
Me.Status_Update.Value = "In Progress"
End If

End Sub
```

```
Private Sub Case_Num_Drop_Hours_Update_Change()

Me.Refresh

Me.Search_First_Name_Hours_Update_Query.Visible = False
Me.Search_Last_Name_Hours_Update_Query.Visible = False

Me.Date_Enrolled_Hrs_Update.Value = DLookup("Date_Enrolled", "Hours_and_Status", "[Case_Num] = Case_Num_Drop_Hours_Update.Value")
Me.Due_Date_Hrs_Update.Value = DLookup("Due_Date", "Hours_and_Status", "[Case_Num] = Case_Num_Drop_Hours_Update.Value")
Me.Total_Hrs_Update.Value = DLookup("Total_Hrs_Req", "Hours_and_Status", "[Case_Num] = Case_Num_Drop_Hours_Update.Value")
Me.Hrs_To_Date_Update.Value = DLookup("Hrs_To_Date", "Hours_and_Status", "[Case_Num] = Case_Num_Drop_Hours_Update.Value")
Me.Current_Hrs_Update.Value = DLookup("Current_Hrs", "Hours_and_Status", "[Case_Num] = Case_Num_Drop_Hours_Update.Value")
Me.Hrs_Remaining_Update.Value = DLookup("Hrs_Remaining", "Hours_and_Status", "[Case_Num] = Case_Num_Drop_Hours_Update.Value")
Me.Status_Update.Value = DLookup("Status", "Hours_and_Status", "[Case_Num] = Case_Num_Drop_Hours_Update.Value")

End Sub
```

Code to automatically calculate service hours remaining:

```
Private Sub Total_Hrs_Update_Exit(Cancel As Integer)

Me.Hrs_Remaining_Update.Value = Me.Total_Hrs_Update.Value - Me.Hrs_To_Date_Update.Value

End Sub
```

Appendix III: Time Study Sheets

Time study sheet for entering worker info into the old Excel system:

Standard Times Calculation Sheet																	
Operation:		Worker Info Entry								Date: 4/29/2011							
Observer:		Juan P Ojeda Pedraza								Study Start Time: 9:40AM							
Operator:		Holly								Study End Time: 11:15AM							
Element Description			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Enter/Look Up Case Number	R	95	100	100	100	100	95	100	100	100	90	100	95	100	100	10
		T	19.75	18.43	16.7	19.63	19.07	22.47	15.44	19.48	19.03	26.49	19.9	23.43	16.07	22.45	22.3
2	Enter Worker Name	R	100	110	100	110	100	100	105	105	105	110	100	100	100	100	10
		T	14.07	6.98	12.79	7.56	13.03	12.13	7.64	9.73	9	6.73	14.25	10	11.14	9.47	10.6
3	Enter Contact Info (Phone/Email)	R	100	105	100	100	100	100	100	100	100	100	100	100	100	100	10
		T	27.49	17.07	25.06	25.64	24.04	25.14	24.37	24.12	19.16	19.69	24.47	24.02	17.4	23.2	18.8
4	Enter Worker Address (Location)	R	100	100	100	100	100	100	100	100	100	100	100	95	95	95	11
		T	10.7	9.63	12.36	11.14	7.25	7.68	6.47	9.63	6.69	7.61	12.93	8.08	6.26	10.66	8.6
5	Enter Payment Information	R	110	95	100	100	100	95	90	90	100	100	90	90	100	100	10
		T	2.74	7.68	3.24	10.7	9.13	12.05	8.47	9.34	10.55	10.87	7.56	8.92	13.08	16.41	13.0
* Observed Time = Average Time																	
* Time in seconds																	
Non-Cyclic Elements		Frequency															
1	phone call	3															
2																	
3																	
Allowance		5%															
Standard Time (seconds/unit)		73.97	1.233 mins														
Output/8 Hour Shift																	

cycles =																Summary Data			
5	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	SUM	AVG	R	N
00	100	100	90	100	100	100	100	100	100	100	100	100	100	100	100	2965	98.833		
35	17.91	20.92	14.71	18.55	19.21	17.91	17.43	25.39	19.77	16.46	22.53	21.08	19.43	20.98	24.52	597.49	19.916		19.684
00	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	3045	101.5		
67	9.3	10.7	7.87	9.64	7.45	6.56	8.4	14.73	12.3	19.37	8.51	13.69	7.55	7.15	7.47	305.88	10.196		10.349
00	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	3005	100.17		
86	18.81	23.77	25.65	15.11	22.61	11.16	20.22	19.89	23.9	9.72	21.29	14.27	20.98	18.85	17.93	623.89	20.796		20.831
10	100	90	110	100	100	100	100	100	100	100	100	100	100	100	100	2995	99.833		
65	10.59	17.77	7.7	13.04	10.01	6.47	5.44	9.8	10.81	8.01	8.44	7.75	7.15	19.19	12.56	290.47	9.6823		9.6662
00	100	115	100	105	100	100	100	90	100	100	100	100	100	100	100	2970	99		
06	11.1	3.8	11.77	7.85	11.49	9.32	11.24	16.4	11.65	10.31	8.22	12.52	8.92	11.42	10.82	300.63	10.021		9.9208
						</													

Time study sheet for generating hour reports under the old Excel method:

Standard Times Calculation Sheet																	
Operation:		Generating Hour Reports										Date: 5/6/2011					
Observer:		Juan P Ojeda Pedraza										Study Start Time:					
Operator:		Holly										Study End Time:					
	Element Description		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Cycles
1	Filter For Workers to Report	R	100	100	100	100	100	100	90	100	100	90	115	100	95	100	
		T	12.94	12.74	13.74	11.8	12.83	12.4	14.03	11.75	11.38	14.24	6.92	10.47	14.29	11.69	
2	Copy & Paste Worker Information to Report Form	R	105	90	105	100	105	105	100	100	100	90	100	110	80	100	
		T	152.18	187.02	150.44	156.26	153.04	153.27	156.43	154.23	195.43	154.85	154.74	151.22	246.26	154.11	15
3	Add Status & Notes	R	100	150	110	110	150	170	100	110	110	95	140	110	100	150	
		T	89.06	14.35	36.41	30.4	15.44	10.59	90.49	35.46	34.42	93.45	13.38	33.28	85.11	12.11	8
4	Inspect Report	R	105	100	95	90	100	105	100	110	100	110	100	105	110	120	
		T	68.96	63.28	83.52	97.48	72.46	62.92	72.66	59.04	67.59	57.14	76.87	69.59	59.45	53.43	6
5	Print Report	R	100	115	100	115	110	110	100	110	90	100	100	100	115	115	
		T	42.23	34.81	43.47	35.49	38.1	37.15	43.34	37.26	48.39	39.85	46.58	43.18	36.99	36.69	4
* Observed Time = Average Time																	
* Time in seconds																	
Non-Cyclic Elements		Frequency															
1																	
2																	
3																	
Allowance		5%															
Standard Time (sec/unit)		361	6.02														
Output/8 Hour Shift																	

																	Summary Data			
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	SUM	AVG	R	N	
105	100	100	100	100	100	100	90	100	100	90	115	100	95	100	105	2990	99.667			
0.59	12.94	12.74	13.74	11.8	12.83	12.4	14.03	11.75	11.38	14.24	6.92	10.47	14.29	11.69	10.59	363.62	12.121		12.08	
100	105	90	105	100	105	105	100	100	90	100	100	110	80	100	100	2980	99.333			
3.61	152.2	187	150.4	156.3	153	153.3	156.4	154.2	195.4	154.9	154.7	151.2	246.3	154.1	153.6	4946.2	164.87		163.77	
100	100	150	110	110	150	170	100	110	110	95	140	110	100	150	100	3610	120.33			
5.18	89.06	14.35	36.41	30.4	15.44	10.59	90.49	35.46	34.42	93.45	13.38	33.28	85.11	12.11	85.18	1358.3	45.275		54.481	
100	105	100	95	90	100	105	100	110	100	110	100	105	110	120	100	3100	103.33			
6.49	68.96	63.28	83.52	97.48	72.46	62.92	72.66	59.04	67.59	57.14	76.87	69.59	59.45	53.43	66.49	2061.8	68.725		71.016	
100	100	115	100	115	110	110	100	110	90	100	100	100	115	115	100	3160	105.33			
0.98	42.23	34.81	43.47	35.49	38.1	37.15	43.34	37.26	48.39	39.85	46.58	43.18	36.99	36.69	40.98	1209	40.301		42.450	
																	Total NT =			343.80

Standard Times Calculation Sheet																		
Operation:		Worker Info Entry							Date:		5/26/2011							
Observer:		Juan P Ojeda Pedraza							Study Start Time:									
Operator:		Holly							Study End Time:									
Element Description			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Enter/Look Up Case Number	R	95	100	90	100	100	100	100	100	100	90	100	95	100	100	100	100
		T	19.8	18.4	14.7	18.6	19.2	24.5	26.5	14.7	18.6	19.2	19	18.4	14.7	25.4	19.6	19.6
2	Enter Worker Name	R	100	110	100	100	100	100	110	100	100	100	105	110	100	100	110	100
		T	14.1	6.98	7.87	9.64	7.45	7.47	6.73	7.87	9.64	7.45	9	6.98	7.87	14.7	7.56	14.7
3	Enter Contact Info (Phone/Email)	R	100	105	100	100	100	100	100	100	100	100	100	105	100	100	100	100
		T	27.5	17.1	25.7	15.1	22.6	17.9	19.7	25.7	15.1	22.6	19.2	17.1	25.7	19.9	25.6	19.9
4	Enter Worker Address (Location)	R	100	100	110	100	100	100	100	100	100	100	100	95	100	100	100	100
		T	10.7	9.63	7.7	13	10	7.15	19.2	12.6	6.69	7.61	12.9	8.08	8.44	9.8	11.1	6.1
5	Enter Payment Information	R	110	95	100	105	100	100	100	100	100	100	100	100	100	100	105	110
		T	2.74	7.68	11.8	7.85	11.5	8.92	11.4	10.8	10.6	8.22	11.4	10.8	10.9	11.8	7.85	11.8
* Observed Time = Average Time																		
* Time in seconds																		
Non-Cyclic Elements		Frequency																
1																		
2																		
3																		

Allowance	5%
Standard Time (seconds/unit)	72.6
Output/8 Hour Shift	

1.21 mins

53

Time study sheet for generating hour reports under the new database method:

Standard Times Calculation Sheet																			
Operation:		Generating Hour Reports										Date:		5/26/2011					
Observer:		Juan P Ojeda Pedraza										Study Start Time:							
Operator:		Holly										Study End Time:							
Element Description			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1	Filter For Workers to Report	R	100	105	100	105	100	95	100	95	90	100	95	95	95	100	95	100	95
		T	7	5.76	7.93	5.76	9.38	12.67	7.64	11.09	20.06	9.82	12.41	14.59	12.41	9.38	11.09	14.59	11.09
2	Inspect Report	R	100	100	95	100	100	100	95	100	105	100	95	105	95	100	110	110	110
		T	30.22	29.15	37.72	29.15	28.54	32.24	42.053	28.54	27.93	34.79	42.053	25.55	42.053	30.11	26.43	25.55	26.43
3	Print Report	R	100	115	100	115	110	110	115	100	100	100	100	100	110	90	110	110	110
		T	40.98	43.34	48.39	39.85	42.23	36.99	37.15	34.81	38.1	43.47	35.49	40.98	42.23	43.18	37.26	37.26	37.26
* Observed Time = Average Time																			
* Time in seconds																			
Non-Cyclic Elements		Frequency																	
1																			
2																			
3																			
Allowance		5%																	
Standard Time (sec/unit)		89.97547	1.50																
Output/8 Hour Shift		320																	

																	Summary Data			
5	17	18	19	20	21	22	23	24	25	26	27	28	29	30	SUM	AVG	R	N		
95	100	95	100	105	100	105	95	100	105	100	95	100	100	95	1375	98.214				
59	9.38	11.09	7.93	5.76	7.93	5.76	12.41	7	5.76	7.93	12.67	7.64	9.38	11.09	145.9	10.421		10.235		
105	100	100	100	95	95	100	110	110	95	100	100	100	100	110	1290	99.231				
55	28.54	30.22	29.15	37.72	37.72	29.15	26.43	26.43	37.72	29.15	32.24	30.11	28.54	26.43	429.99	33.076		32.822		
110	110	100	115	100	100	115	90	90	100	115	115	100	110	90	1375	105.77				
26	36.99	40.98	43.34	48.39	48.39	39.85	43.18	43.18	48.39	39.85	37.15	34.81	36.99	43.18	524.01	40.308		42.634		
																	Total NT =		85.69	