



Software Requirements Specification

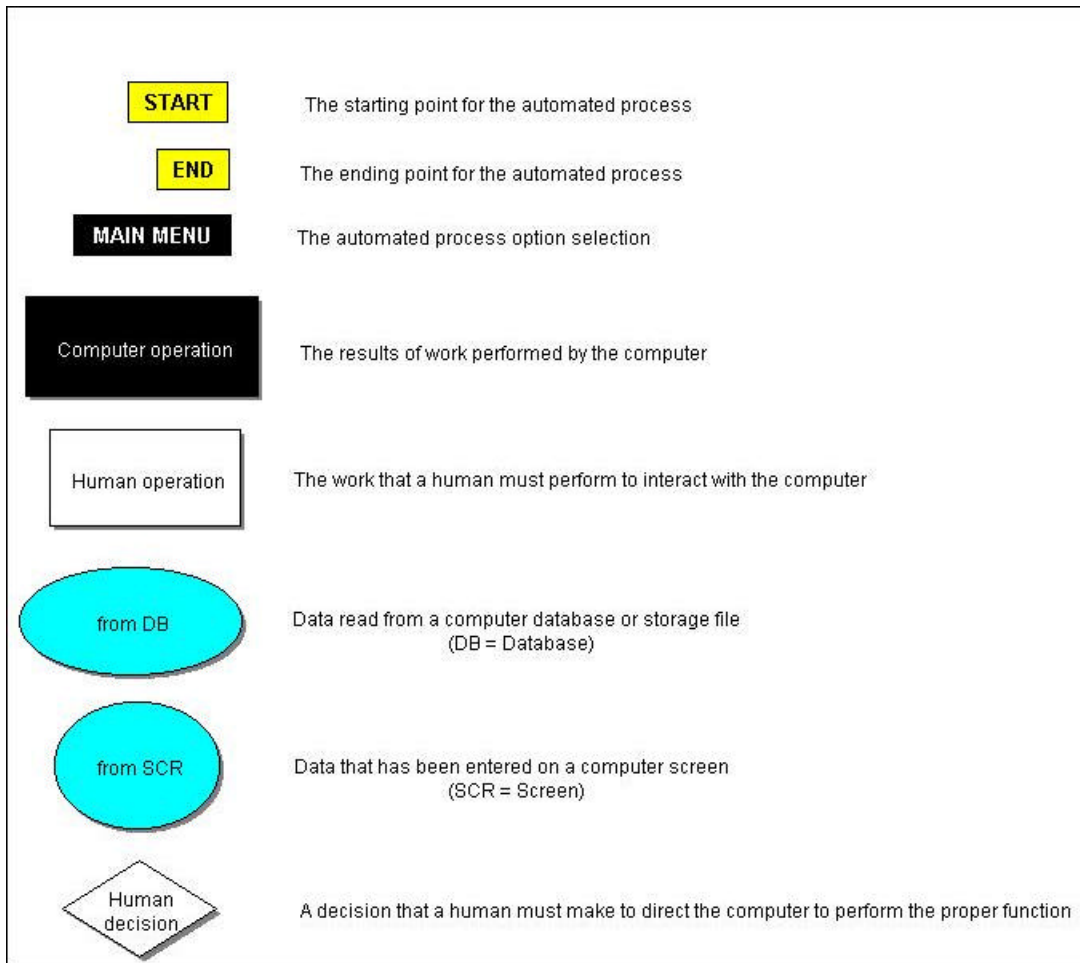
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II. Graphical Notations Used

The following diagram defines the graphical notation used to document the business rules for automation of the Inspection to Compliance Process.





1.1 Goals and Objectives

The main purpose of WMITS is to help automate the entire process that the Department of Environmental Quality (DEQ) Waste Management Division (WMD) staff members perform throughout an inspection. The goals of WMITS are:

- To minimize the time span of any inspection
- To minimize the amount of paper work required
- To provide a searchable database of all past inspections
- To provide an automated channel for the public to request information (under Freedom of Information Act)

Critique: It might be a good idea to provide a bit more detail with regard to what an "inspection" is and what it entails. We have to assume that the reader is not knowledgeable in this area. Alternatively, the reader should be referred to the System Spec where this information is provided.

It is also important to note what the goals and objective of the Requirements document are. How does this document differ from the system spec.

1.2 System Statement of Scope

1.2.1 General Requirements

The following general requirements were laid out for our project named WMITS:

- A way in which DEQ could add new facilities to the database.
 - A way in which DEQ could generate electronic checklists.
 - A search on all electronic checklists.
 - A way in which they could generate letters to be sent out to facilities based on inspection results.
 - A way in which all letters and checklists could be stored electronically.
 - A way to search for existing facilities.
 - A way to print blank checklists and staff reports.
 - A way in which they could view data which was entered into the database prior to our software.
 - DEQ wanted a product that would allow them to easily add new checklists and letters or change existing checklists and letters.
-
- **Interface Enhancements**



Staff members of WMD have requested a lot of interface enhancements that will increase the usability of the product for the staff.

Critique: Be careful of phrases such as "a lot of". It would be far better to quantify the number of enhancements. If that isn't possible, specifying bounding values (e.g., "between 20 and 30 interface enhancements") would be appropriate.

- **Database Administrative Interface**

There is current no documented interface for WMD staff members to maintain the checklist and letter templates. Should no such interface existed, Cyber Rovers will have to implement one from scratch.

- **Online Help**

To develop an extensive help menu for the users and also to setup the online help for the need of the help in the future.

- **Training**

The staff members have also requested throughout training for the entire staff for use with the software.

We will also implement a web-based helpdesk for WMD staff members to report bugs and request support. The helpdesk will be located at <http://www.cyberrovers.com>.

1.2.2 Extended Enhancement

Palm Pilot Integration

Out of the two extended enhancement requests (palm pilot integration & online record access), the team and client both agree on doing the palm pilot integration. From the design point of view, online record access has a major security risk. The team has little or no experience with on-line security matters. Palm pilot integration on other hand, needs only long programming, which can be (and will be) achieved by the team. We also suggest to the DEQ that they can make the online record request to be the next semester's project.

Critique: A major project and product risk ["little security experience"] is noted in the above paragraph. It should be discussed in the RMMM

Before we decide on what kind of Palm Pilot we use, the team and the client have to explore several options.

Database Restructuring

The current database structure is not optimized at all. We will try to improve it as we go along.



Critique: Although this statement is probably realistic, it is not sufficient. The statement is vague and open to a wide variety of interpretations. The team to specifically indicate what they intend to accomplish as they improve the database. They should try to bound the improvement effort by providing as much detail as possible at this stage.

1.3 System Context

Eventually, multiple users will be using the product simultaneously. Therefore, concurrent connection will be an issue for implementation. In addition, this is a pilot product that hopefully, if successful, can be used in other locations as well. This leads to issues about future support for a larger user base.

1.4 Major Constraints

Time

We only have about two months to finish all documentation, software creation and enhancements. We have a lot of ideas but cannot implement them due to time constraint. One of the major ones is to move the application to be completely browser-based.

Funding

To develop and implement the Palm Pilot integration, we will need funding to buy at least one Palm Pilot. We will request the funding from University of Michigan – Dearborn should we decided to pursue this function.

2.0 Usage Scenario

2.1 User Profiles

There will be four levels of users:

- Full Control (Administrator)
- Read/Write/Modify All (Manager)
- Read/Write/Modify Own (Inspector)
- Read Only (General Public)

2.2 Use-cases

Read Only Users

The read-only users will only read the database and cannot insert, delete or modify any records.

Read/Write/Modify Own Users

This level of users will be able to insert new inspection details, facility information and generate letters. They will be also able to modify the entries they made in the past.

Read/Write/Modify All Users

This level of users will be able to do all the record maintenance tasks. They will be able to modify any records created by any users.

Full Control Users

This is the system administrative level which will be able to change any application settings, as well as maintaining user profiles.

Critique: The definition of roles is excellent. However, the team notes that security is an issue. It might be useful to indicate whether the roles noted above require different levels of security and if so, what they are, specifically.



Critique: The sections that follow are identical to corresponding Sections of the System Specification. They can be included by reference, if so desired. The intent of the Requirements Specification is to flesh out additional detail with an emphasis on the requirements for the software. This "fleshing out" should be accomplished here.

3.0 Data Model and Description

3.1 Data Description

3.1.1 Data Objects and Dictionary

Administrative Information (Linked with Form)

1. F-ID:
This Number is given to each facility that is inspected or is to be inspected.
2. EPA ID:
3. F-Name:
Name of the facility that is inspected or is to be inspected.
4. F-Address:
This field contains facility address.
5. F-City:
This field contains the name of the city facility is located in.

Actions Completed on a Facility

1. Company ID
This field contains number given to each facility.
2. ID
This field contains number given to the specific inspection (Inspection Number)
3. Letter/Checklist Date
This field contains the date on which inspection checklist letter was generated.
4. Letter/Checklist Location
This field contains information on where the generated checklist letter is stored.
5. Inspector Initials
Initials of the inspector that did the inspection.

Inspection Form

1. ID Number
This field contains inspection ID Number.



2. Checklist Number
This field contains number given to the checklist generated after all the inspections.
3. Description
This field contains description of the inspection done at all facilities.
4. ID
This field contains compliance status of the facility during inspection.
5. EPA ID
This field contains acronym given to inspection process.
6. Abbreviated Flag
Yes or no status for the inspection.
7. Checklist ID
Description of the inspection.

Inspection Results

1. Actions ID
This field contains inspection ID Number given to each inspection.
2. ID Number
This field contains inspection ID Number
3. Item Results
This field contains results of the inspection done.
4. Comments
This field contains comments regarding inspections.
5. Add in comments too
Contains information to specify comments for someone particular.

Inspector Details

1. Inspector Initials
Initials of the inspector that did the inspection.
2. Inspector Name
This field contains name of the inspector.
3. Title
This field contains title given to inspector from DEQ.
4. Salutation
Expressions given to the name to automatically generate letter.
5. Phone Number
This field contains phone number of the inspector.

Compliance Options

1. ID
This field contains compliance option ID Number
2. Compliance Description



This field contains description of the compliance option.

EPA Code

1. EPA ID
Internal EPA ID.
2. EPA Code
Actual EPA code.

Letter Template and checklist

1. ID
This field contains letter/checklist ID Number
2. Name
Name or a description of the letter.
3. Location
Location information of the letter/checklist.
4. IsALetter
Checklist to know if the letter is generated or not.

Inspection Details (Linked with Form)

1. F-ID
ID Number given to each facility.
2. I Type
Inspection type 1.
3. I Type2
Inspection type 2.
4. Staff
This field contains staff's initials.
5. I Date1
This field contains the date on which inspection was done.
6. Priority
This field contains priority information of the inspection.
7. C Action
This field contains description of the compliance action.
8. C Date
This field contains compliance date.
9. Co Resp1
Inspection flag.
10. Inter LOW1
Inspection flag.
11. Co RespI3
Inspection flag.
12. Inter LOW2



- Inspection flag.
- 13. Co RespI3
Inspection flag.
- 14. 10-day
Inspection flag.
- 15. Co Resp10
Inspection flag.
- 16. LOW2
Inspection flag.
- 17. Co Resp2
Inspection flag.
- 18. C Due
Compliance due date.
- 19. RTC Date
Inspection flag.
- 20. CA
Inspection flag.
- 21. Ref Date
Reference date.
- 22. Comment

Unmatched Records

- 1. FACILITY NAME:
Name of the facility with unmatched records.
- 2. FACILITY NUMBER:
Facility number of the facility with unmatched records.
- 3. FACILITY TYPE:
Facility type of the unmatched record facility.
- 4. ADDRESS
Address of the specific facility.
- 5. CITY
Name of the city where the facility is located.
- 6. ZIP CODE
Zip code of the city where the facility is located.
- 7. THIS FILE DATES
Date of day the file was created.
- 8. COMMENTS:
Comments on the reports.

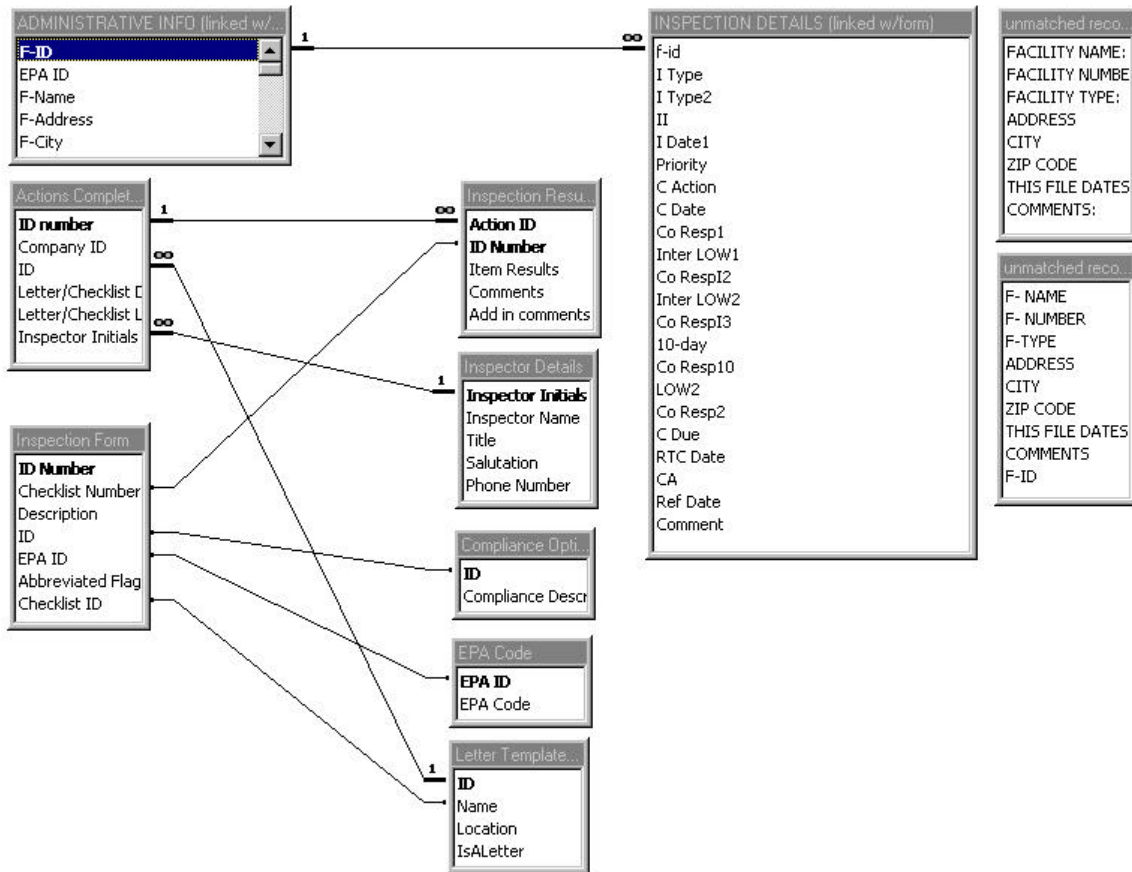
Unmatched Records with Facility Number

- 1. F-NAME
Name of the facility with unmatched record numbers
- 2. F-NUMBER



- Facility number of the facility with unmatched numbers.
- 3. F-TYPE
Facility type of the unmatched record number facility.
- 4. ADDRESS
Address of the specific facility.
- 5. CITY
Name of the city where the facility is located.
- 6. ZIP CODE
Zip code of the city where the facility is located.
- 7. THIS FILE DATES
Date of day the file was created.
- 8. COMMENTS
Comments on the reports.
- 9. F-ID
Numeric number that is given to each facility.

3.1.2 Relationships

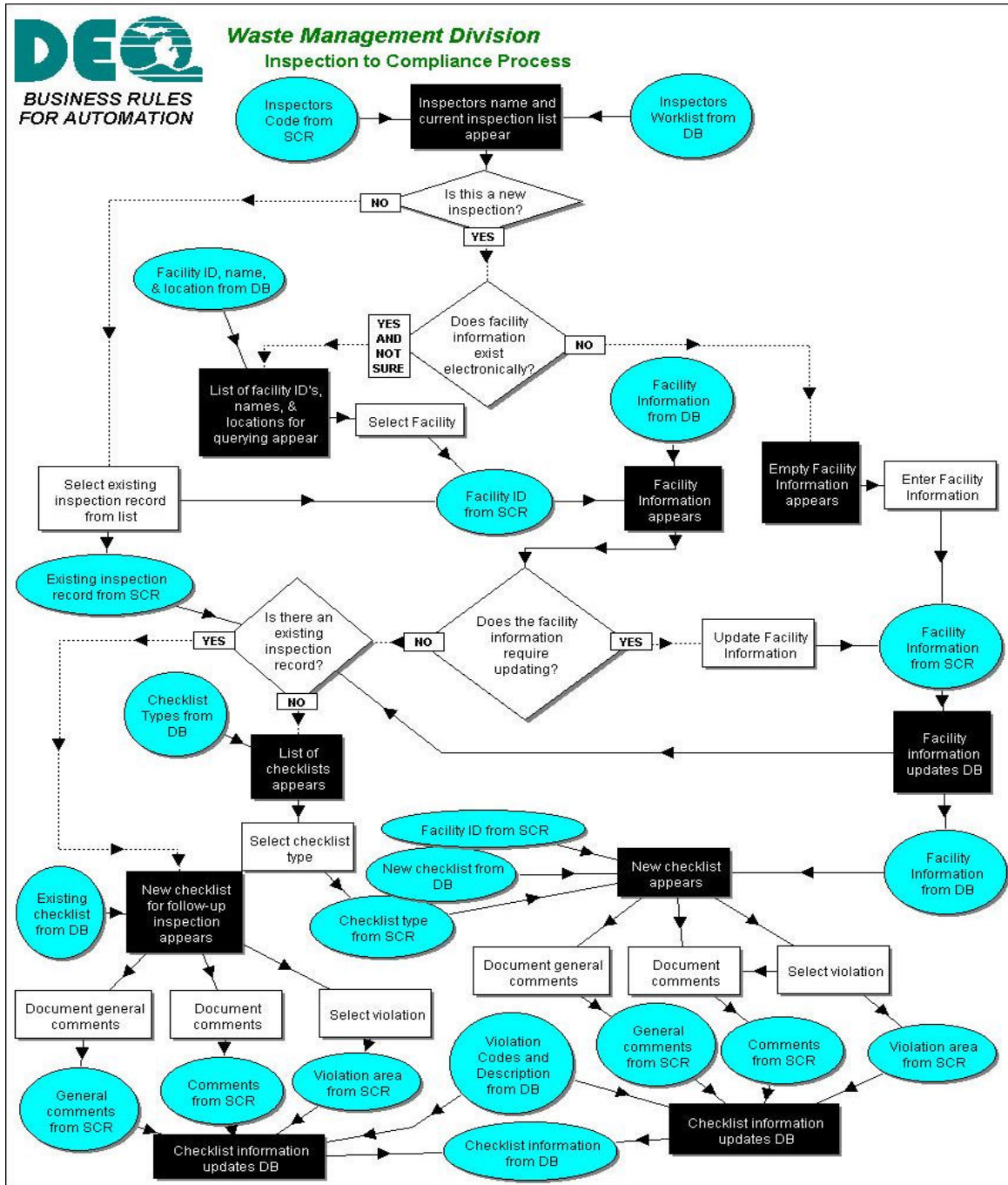




4.0 Functional Model and Description

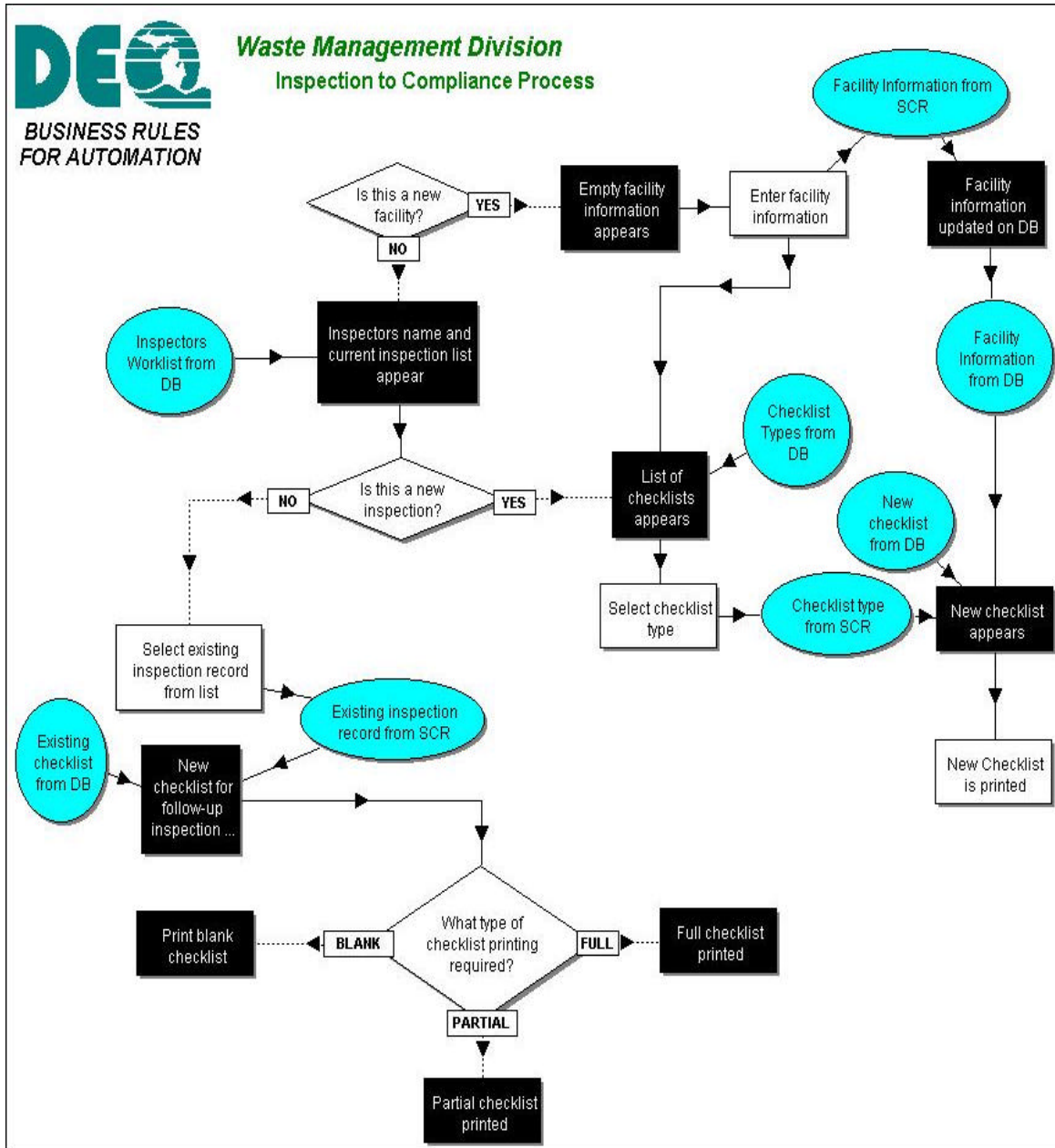
4.1 Subsystem Flow Diagrams

4.1.1 Create Checklist



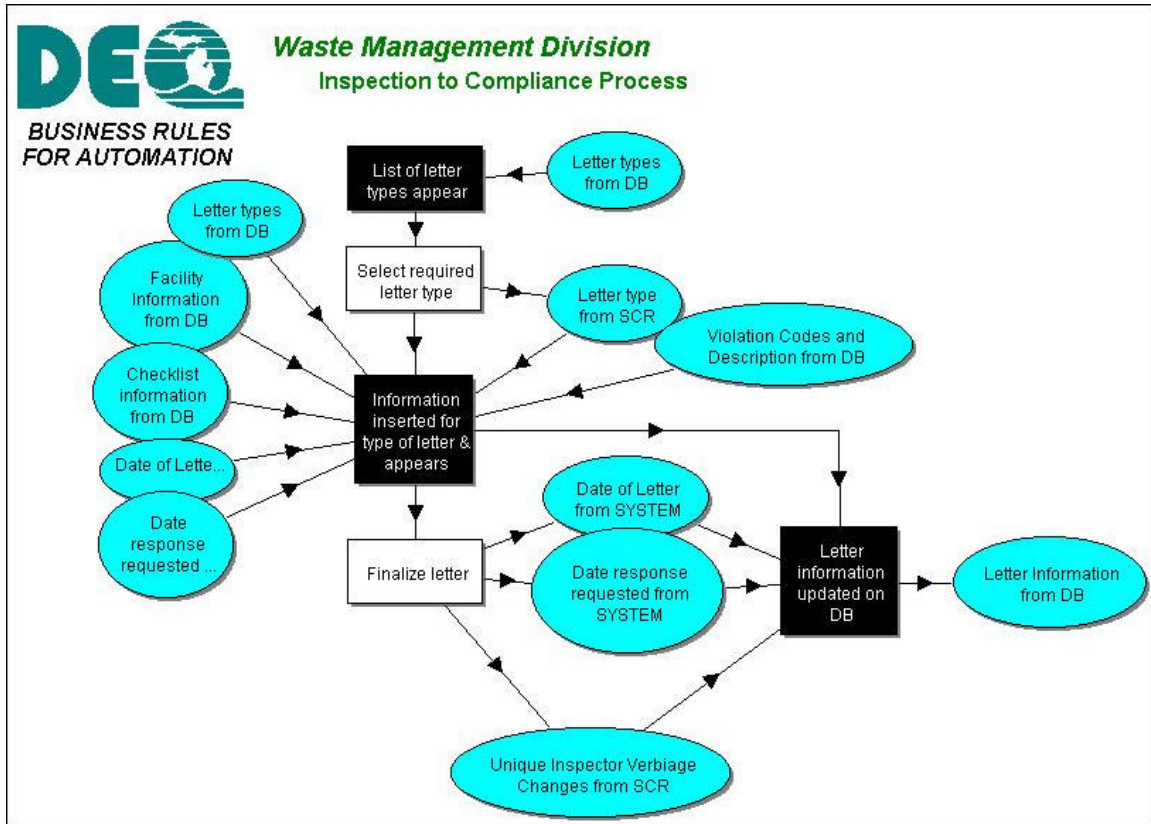


4.1.2 Print Checklist





4.1.3 Generate Letter





4.2 Human Interface

In the proposed environment without use of hand help inspectors from the DEQ goes out to facilities with checklist in the paper format and records the violation in a checklist. When inspector returns from the facility he or she has to insert the data in to the database which uses visual basic as front end. The software uses access as the back end system.

Inspector logs into the database using his or her id. The first screen that the inspector will come across is labeled Desktop Project Organizer. It contains seven buttons with several different options to choose from. User can choose a button to add a new facility into the database, can find an existing facility, print blank checklist for next inspection. User can also choose button to print a blank staff report, or to go to help menu, or to go to options page or exit out of the Visual Basic environment.

Depending on the selection made from the selection described in the paragraph above user will get several different windows.

Facility History window allows user to generate a new letter, checklist or staff report. It also allows users to view, modify or print existing checklist. User can also edit historic data, update family information or delete action using this window. The window also contains help and return to main menu buttons.

Facility information window allows user to fill in facility information with entries such as EPA ID, facility type, name, address, city, county, zip code, also information about owner or mailing addresses of the facility. It also allows users to fill in any comments regarding facility information.

If user searched for existing facility and facility cannot be found user will be shown facility information – no match window that will have search again, add new facility help or return to main menu options.

If user selects historic data option from the window above he or she will be presented with the historic data window which will allow user to fill in data such as inspection type, first inspection date, secondary inspection date, compliance action, company response, inspectors information and completed activities etc.

In options window user will be allowed to change location of the database, letters, help file location and location to save generated letters. This window will also contain cancel, save changes, help buttons.

From select a checklist window user can select a checklist to either fill out or print a blank one of. From this screen you can also access the help file and return to the Facility History screen.



From select a letter window user can choose the letter that you would like to generate and generate a letter for the facility that you are currently working on. You can also access the help file and return to the Facility History screen.

Search for an existing facility window enables user to search for a facility that you believe has already been entered into the database. You can search by name, city, address, EPA ID, or any combination of the four. If one of your search criteria is facility address that will be all that is searched on regardless of the other search criteria you have entered. If at least one of your search criteria is facility name or facility city and the exact facility name is not found, a list of close matches will be displayed. If one of the close matches is the facility that you are searching for, you can simply double click on that close match and you will be taken to the Facility History screen where information about that facility will be displayed. If none of the close matches are the facility that you are looking for, you can either search again or add a new facility. If your facility is found through the search, you will be taken to the Facility History screen and information about that facility will be displayed.

From the Staff Report window user can either generate a commented staff report for the facility which you are currently working on, print a blank staff report, access the help file, or return to the Facility History screen.



5.0 Restrictions, Limitations and Constraints

Time

We only have about two months to finish all documentation, bug fixings and enhancements. We have a lot of ideas but cannot implement them due to time constraint. One of the major ones is to move the application to be completely browser-based.

Funding

To develop and implement the Palm Pilot integration, we will need funding to buy at least one Palm Pilot. We will request the funding from University of Michigan – Dearborn should we decided to pursue this function.



6.0 Validation Criteria

We are creating new user interface using Visual Basic. This interface allows users to easily fill the checklist and thus enter data regarding inspection into the database. The older system makes the inspector's work very tedious with use of several different windows to complete the form. The interface that we will design will enable the user to complete the entire form with use of a single window. The tests to be carried out on these interface windows are described below.

We are concerned input of data into the software and their expected outputs. So we will carry out black box testing where several different steps will be taken to test the software so that when we use the software with specific data all the given outputs will match our expected results.

To test we will select a specific number from regulation window and using the **add highlighted item** button we will add the item to the inspected item list. This should list correct item from the regulation box to the inspected item box.

We will also test if we can add more than one item in to the inspected item boxes from the regulation box. If the software is designed correctly we should be able to do this without any troubles.

We will also check for the description associated with **regulation window** in the details of the regulation window. The details of the regulation must match with the list of details and their regulation number provided by Detroit Environmental Quality department.

We will test the **additional comment window** to see if the user is able to insert text in to it. We will also check the correctness of the text from the letter generated by comparing it with what we have entered in the addition comments box.

We will test if we are able to remove an item from inspected item box by using remove highlighted item button. We will make sure that only the selected item is removed in case the box contains more than one item in it. If the program is written correctly this should work.

We will test if we can remove multiple items together from the inspected item box. We should be able to remove multiple items at the same time without any trouble

We will test preview button to see if the letter is generated in the window to the right of the Generate checklist window. This window will contain the letter with listing of all the regulations selected. The letter should be generated without any troubles.



We will test for the correctness of the letter generated, that is all the regulation are listed and their description presented must match the items we entered during the test and the list of details provided from DEQ listing the regulations and details associated with them. We should achieve desired results without any problems.

We will check the cancel button to see if the user can exit out of the window without any problems when the button is selected. This should work without any problem.

We will check the help button to see if the help menu is made available to the user when help button is selected. The menu should popup without any problems when help button is selected.

At the end will test the save button to see if all the data is correctly recorded and the generated letter is saved. This should work without any troubles.

Critique: The above approach works reasonably well and provides a useful overview of the validation tests to be conducted. It might be worthwhile to define things in a more organized fashion. Equivalence classes can be defined; specific use cases can be identified to test specific usage scenarios; and behavioral tests can also be conducted these might be listed in separate categories and discussed briefly.