Prospect Management System
Application Design
Demo Guide

Revised 29 July, 2001

Aims of the Application Design Demo

The Prospect Management System *Application Design* Demo is designed to demonstrate the ease with which applications designed in APPX can be maintained and modified to accommodate changing business requirements. The application featured throughout the Demo is the Prospect Management System.

Assumed Knowledge

A familiarity with the Prospect Management System demo application is assumed. If you have not already run the Prospect Management System *Runtime* Demo, you should do so before running the Prospect Management System *Application Design* Demo.

A working knowledge of a Windows environment, the ability to launch applications from Explorer and to manipulate the desktop and its menus is assumed.

Please direct all comments and questions relating to this demo to:

info@appx.com

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Introduction

APPX is a powerful development tool and runtime environment. The APPX development environment can be used to develop full-featured, business applications quickly and easily. Whether your application is complex or simple, APPX can meet your business needs. APPX applications are readily maintainable and extensible with a minimum of effort. Start off small and expand your simple application into a suite of applications, or begin with a suite of ready-to-run business application templates that can be enhanced and made even more sophisticated to match the fluidity of your business rules. Either way, APPX can provide you with the perfect business solutions.

The APPX runtime environment provides all APPX applications with a consistent look and feel. All APPX applications also inherit significant functionality from the runtime environment. With each new release of APPX, your existing applications gain increased functionality, usually without requiring any programming changes.

APPX is a RAD (Rapid Application Development) tool. By using APPX, application designers can create full-featured business applications in a fraction of the time required to create comparable business applications when utilizing traditional programming languages. APPX's proven design philosophy allows application designers to focus on the business rules instead of the data processing rules. APPX provides the application framework. The application designer provides the business logic. The result is dynamic business application software that can easily keep pace with the ever-changing requirements of the 21st century workplace.
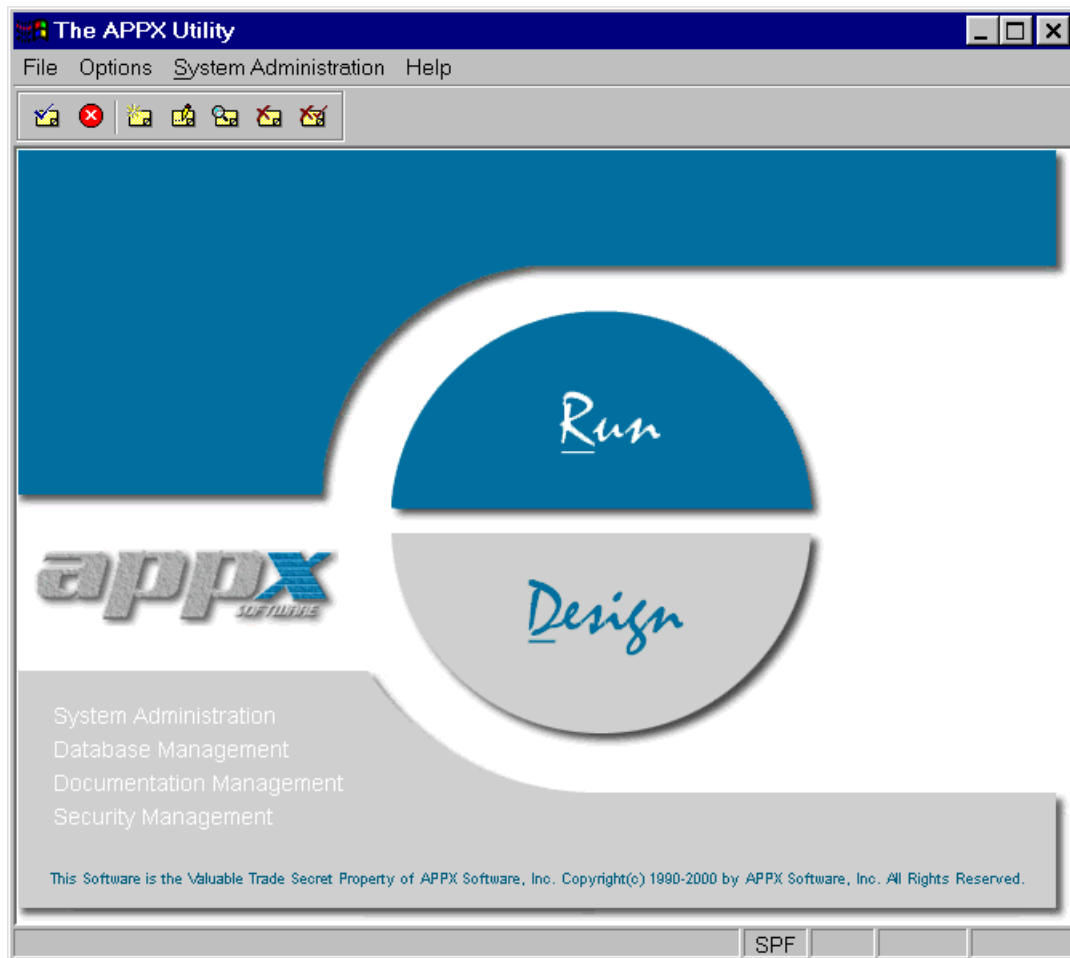
Figure 1 – The APPX Utility Menu

Getting Started

To run the Prospect Management System Application Design Demo, you will need to use the APPX Web Client or the APPX Desktop Client to connect to the APPX Demo Server where APPX and the demo software have been installed. The APPX Demo Server is accessible via the Internet.

The easiest way to run the demo is to use your Microsoft Internet Explorer web browser to access the Prospect Management System demo web page that can be found on the APPX web site at the following address:

http://www.tryappx.com/demos/prospect_management_system.htm

When you click on the "Run the Demo Using the APPX Web Client" link, another browser window will open and the APPX Web Client components will be installed into your browser. The first time you run the APPX Web Client, you will need to wait while the necessary APPX Web Client components are automatically installed. Depending on the speed of your Internet connection, the initial download and installation of the APPX Web Client components can take from 1 to 15 minutes. When the installation is complete, the APPX Web Client will display the APPX Demo Server screen (see *Figure 3* on the next page). Please note that the next time you use the APPX Web Client, your browser will be able to launch the APPX Web Client much more quickly since the APPX Web Client components will have been previously installed.

Another way to run the demo is to use the "standalone" APPX Desktop Client to login to the APPX Demo Server directly via the Internet. To use the APPX Desktop Client, you must first download and install the APPX Desktop Client to your desktop. The APPX Desktop Client can be downloaded from the Prospect Management System Demo web page identified above. To install the APPX Desktop Client, simply run the file you downloaded and follow the installation directions. After completing the installation of the APPX Desktop Client, ensure that you still have an Internet connection. Then, run the APPX Desktop Client using the program that was added to your Windows Start Programs menu by the installation process. After starting the APPX Desktop Client, enter the following "Remote" connection information when the APPX Client Login dialog box is presented (see *Figure 2* below):

Login:	prospect
Password:	prospect
Server:	vardemo.appx.com
Server Port:	8064
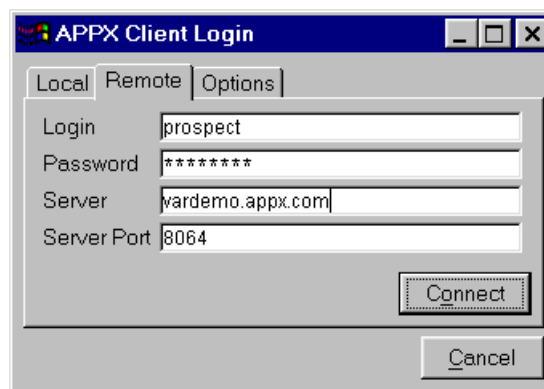
Figure 2 – The APPX Client Login Dialog Box

Once you have connected to the APPX Demo Server using either the APPX Web Client or the APPX Desktop Client, you will be presented with the APPX Demo Server screen for the Prospect Management System Demo (see *Figure 3* below).
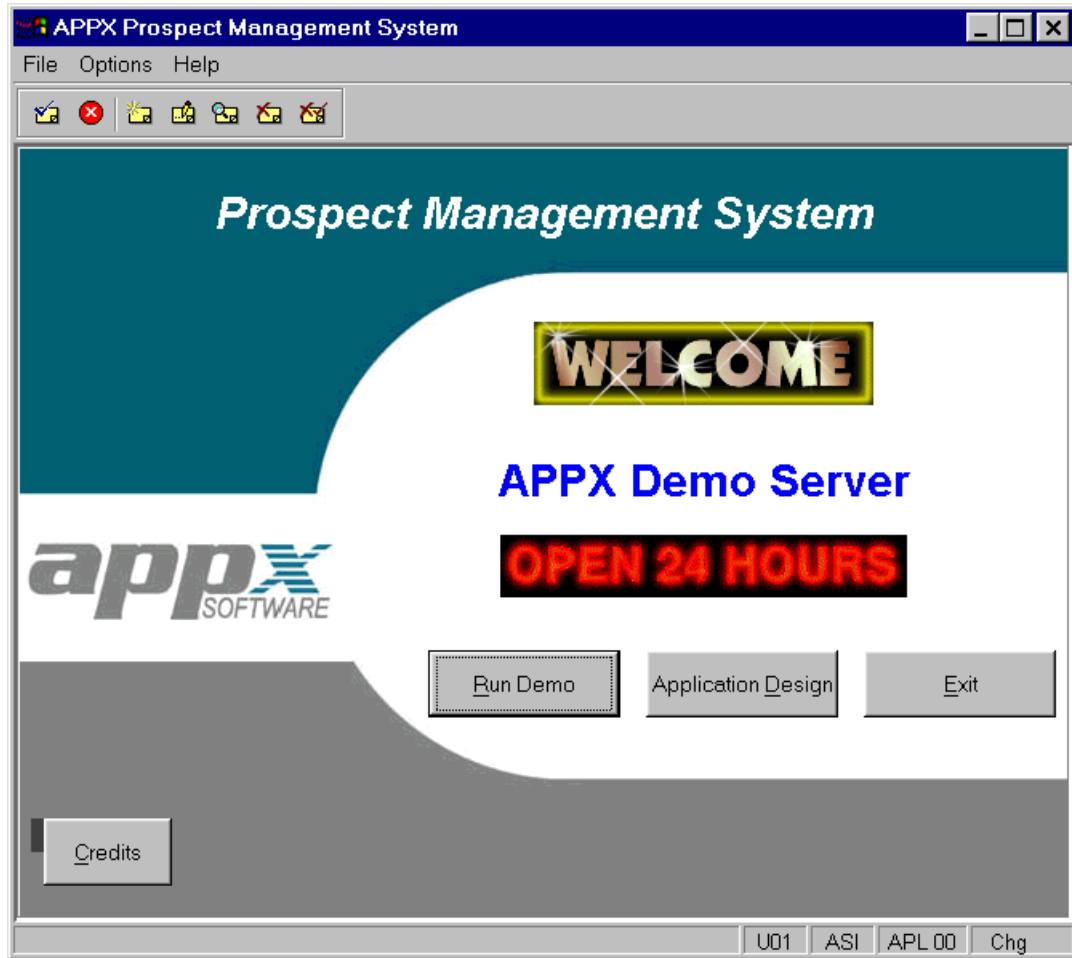
Figure 3 – The APPX Demo Server

The **"Application Design"** button will launch the Prospect Management System *Application Design* Demo. If you have not already run the Prospect Management System *Runtime* Demo, you should run that demo before you run the Prospect Management System *Application Design* Demo. There is a separate demo guide for the Prospect Management System *Runtime* Demo.

Navigating the System

Before we actually run the demo, let's examine some of the pull-down menus that you will see when you run APPX. These menus are always available to you while running any APPX application.

File Under the "File" pull-down menu you will find an option for 'Print Setup'. As you would expect, this invokes the standard (and no doubt familiar) Windows Print Setup dialog box (see *Figure 4*) and enables you to specify the default printer on which you would like your reports to print. The properties for the printer can also be set to accommodate the printing requirements of various reports.
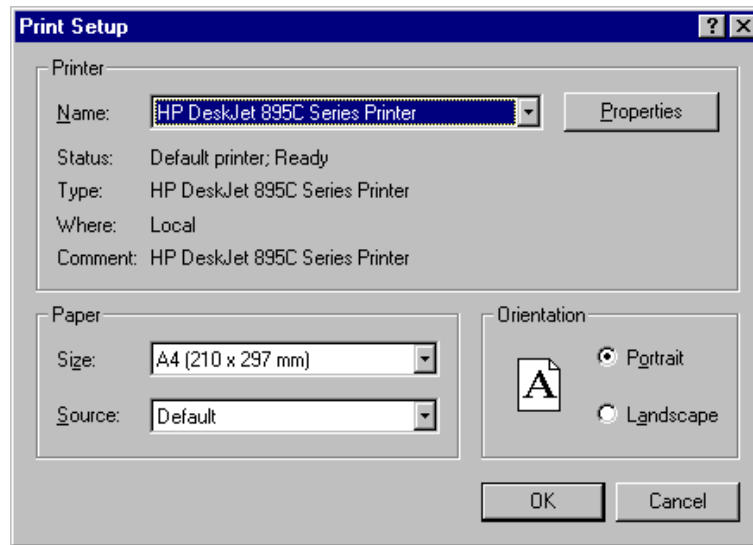
Figure 4 – The Print Setup Dialog Box

appx **The Prospect Management System** *Application Design* **Demo**

Options   On the "Options" pull-down menu you will find several useful options:
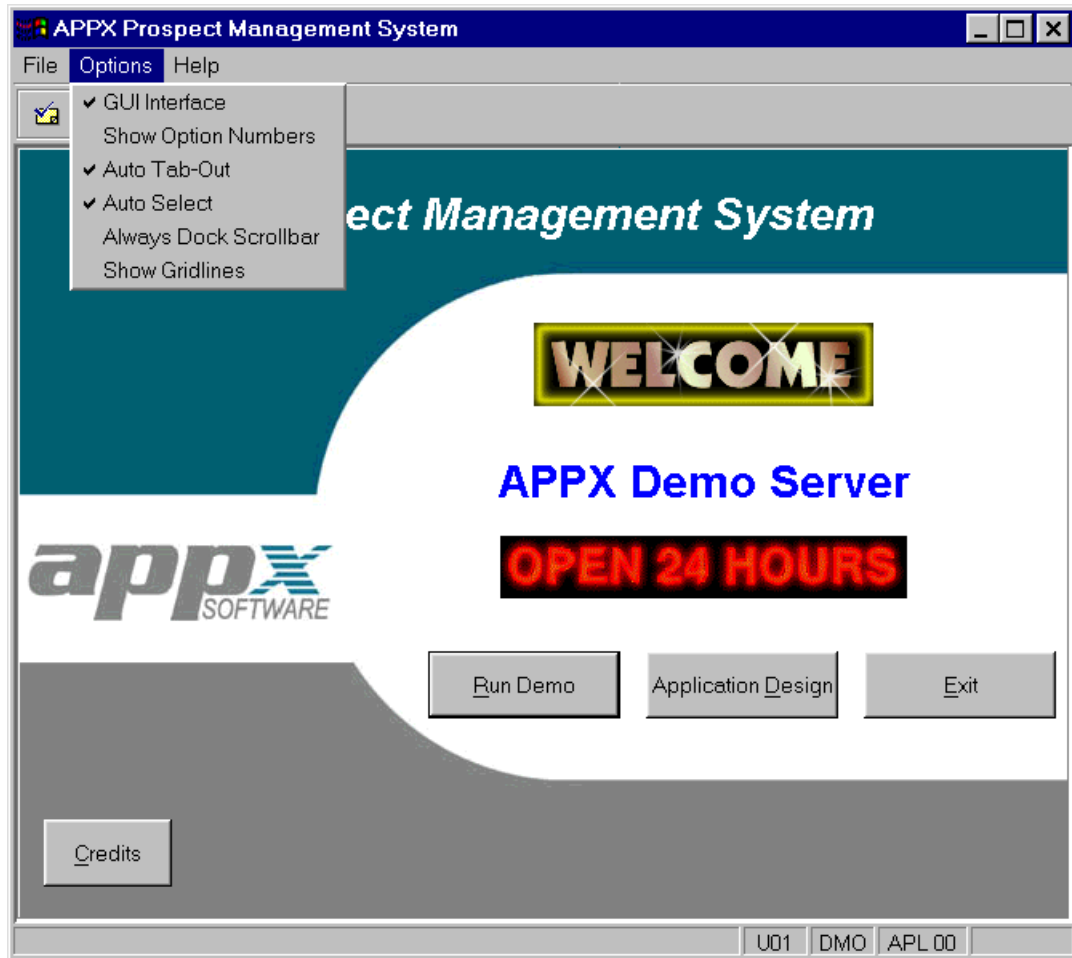
Figure 5 – The Print Setup Dialog Box

GUI Interface – This option allows you to control the appearance of your screens. This option is primarily for debugging use and should normally be enabled. You should not change this option unless you are instructed to do so by your system administrator.

Show Option Numbers – APPX applications are mouse enabled but can also be run entirely from the keyboard. If you intend to use the keyboard instead of your mouse, but you do not know the APPX option numbers for the various application features, then you should enable the 'Show Option Numbers' option.

Auto Tab-Out – If this option is enabled, then APPX will automatically tab to the next field when the current field has been filled with data from the keyboard.

Auto Select – If this option is enabled, then APPX will automatically select the contents of a field when the field gets the focus.

Always Dock Scroll Bar – If this option is enabled, then APPX will always display the scroll bar for scrolling regions of data entry screens. If this option is not enabled, then APPX will only display the scroll bar if the mouse pointer is moved near the right side of a scrolling region of an input process.

Show Gridlines – If this option is enabled, then APPX will superimpose a grid over the contents of the current screen. This option is primarily intended for use by an application designer to facilitate the design and layout of screens.

The APPX Toolbar

The buttons on the APPX toolbar at the top of the APPX screen (and shown in *Figure 6*) perform very specific pre-defined tasks and are standard throughout the entire system. If you have trouble remembering what any button does, simply move your cursor over the button and the appropriate tooltip will be displayed indicating the function of the button.
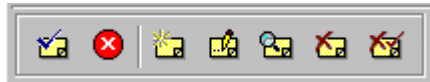
Figure 6 – The APPX Toolbar

These buttons perform the following tasks (which can also be achieved using the keys or combination of keys indicated in parentheses):

The **ENTER** button is used to save input and complete the current task. (**ENTER**)

The **CANCEL** button enables you to immediately cancel a task or process without saving. (**CTRL + F8**)

The **ADD MODE** button moves you into Add Mode so you can add new information. (**F9**)

The **CHANGE MODE** button moves you into Change Mode so you can change existing information. (**F12**)

The **INQUIRE MODE** button moves you into Inquire Mode so you can view, but not modify, existing information. (**F11**)

The **DELETE MODE** button moves you into Delete Mode so you can delete existing information. (F10) Once you enter DELETE MODE, you will be prompted to acknowledge that you wish to delete the selected record using the **ACKNOWLEDGE DELETE** key described below. The selected record will not be deleted until the action is confirmed.

The **ACKNOWLEDGE DELETE** key confirms that you wish to permanently delete a record. (**CTRL + F10**)

OPTION   The APPX **OPTION** key is used to invoke an APPX process from a menu process or from an input process by referencing it by its *internal* APPX Option #. The **OPTION** key is the "`" key. This key is usually on the top left of the keyboard next to the "1" key. A single digit option (such as "**OPTION** 1") is invoked by pressing and releasing the **OPTION** key once and then pressing the appropriate digit. A two digit option (such as **OPTION** 10) is invoked by pressing and releasing the **OPTION** key twice and then separately pressing the keys for the appropriate option number. Within APPX application design, there are occasions where you will need to use the **OPTION** key to utilize certain useful features. If you are not sure of the appropriate **OPTION** number, remember that you can enable SHOW OPTION NUMBERS on the "Options" pull-down menu. This will show you the *internal* APPX option numbers for buttons and pull-down menu items.

The function keys on your keyboard also perform pre-defined tasks as follows:

F1   The **HELP** key enables you to get online help. Position the mouse/cursor on the field for which you require assistance, then press F1and the help text will be displayed. Alternatively, you may select the '**?**' in the top right corner of your APPX window and then click on the field in question in order to see the help text.

F2   The **SCAN** key allows you to look up information in a file from your current process. Fields on which SCAN can be executed are generally identifiable by the binoculars button that appears to the right of the field.

F3   The **SELECT ACCESS PATH** key allows you to select which predefined index should be used when retrieving records from a file.

F4   The **PREVIOUS IMAGE** key allows you to return to a previous step. Think of it as a 'Back' key.

F5   The **NEXT RECORD** key allows you to move from your currently selected record to the next record when in inquire, change or delete mode.

F8/ESC   The **END** key allows you to exit or end the current process. You can use either the F8 or the ESC key.

HELPFUL TIP:

If you find yourself "lost" within an APPX application or "stuck" on a screen during the course of this demonstration, try one of the following:

? or F1   Select **HELP** if you are unsure what to enter in a particular field.

            Select **ENTER** to move forward.

ESC   Select **ESC** to exit the current screen.

            If all else fails, select **CANCEL** to immediately end your current task. Entries you made on the current screen will most likely be lost when CANCEL is used.

Most important of all, remember to check your screen for useful information. Error and Warning messages are displayed in the status bar at the bottom of your APPX screen and will often supply the answer to a problem you may be experiencing. This is where you will be advised of any invalid data that you have entered or any invalid options that you have selected.

Note: The options described above are standard throughout all APPX applications and will produce the same results regardless of which APPX application you are running. Once you are familiar with these keyboard shortcuts and toolbar usage, you will be able to navigate your way around any APPX application.

The Demo Company

Figure 7 – Dazzle's Prospect Management System

Dazzle Marketing Operations (DMO) is a fictitious company located in the Florida Keys. Dazzle specializes in distributing software worldwide. One of its primary tasks involves managing intensive marketing activities to businesses in need of productivity software. The key to their success is the Prospect Management System that they have designed based on the requirements of their marketing program. Though still under construction, the Prospect Management System enables Dazzle to track all sales and marketing activities to ensure that up-to-date information is readily available for all prospects.

Think of how this simple Application can grow with the company . . .

➢ Imagine it expanding into many applications that handle every aspect of the business from prospect management to accounting . . .
➢ Envision it running on the World Wide Web so that sales consultants can update the system even though they are not office-based . . .

As you are about to see, these things and much more are possible with APPX.

The Prospect Management System Demo Application

Dazzle's application enables its staff to perform the following functions:

- ❑ Enter and maintain Sales Representatives' records
- ❑ Enter and maintain Prospect records with full details including names and addresses, web address, number of employees, market sector, number of locations, etc. together with a history of sales and marketing activities relating to that prospect
- ❑ Generate reports on all marketing activities for a particular prospect including details of correspondence sent and received
- ❑ Generate sales forecast reports
- ❑ Track follow-up activities requiring action

Figure 7 on the previous page shows the main Prospect Demo Application menu, which the users see in their runtime environment.

During the course of this application design demonstration, you will actually change parts of this application and immediately run the modified application to test the changes.

Application Design – An Overview

The APPX development environment is made up of 3 major areas:

- The **APPX Engine**, which contains the standard data processing rules;
- The **Data Dictionary**, which is where the attributes of all the data used in any application are stored;
- A collection of **Processes** that are used to manipulate the data to perform the desired tasks.

The **APPX Engine** is something that you will not directly manipulate; rather, it takes the definitions of data from the Data Dictionary specifications and applies the business rules specified in the Processes to produce a result.

The **Data Dictionary** is the cornerstone of application development and contains all the definitions of the files that you use as well as any work fields you require. The dictionary specifications provide a central repository for all data and file attributes that the processes (menus, inputs, outputs, etc.) reference as they are developed. The APPX Data Dictionary is active, or integrated, which means that all the information that a designer specifies in the dictionary is used by, and places restrictions on, all processes within an APPX application. The principal components of APPX's Data Dictionary are Domains, Fields, and Files.

A *Domain* is a generic definition or template for fields that share a set of common attributes. With a Domain, you can specify the attributes of a field (such as Customer Number) once, and then refer to that Domain when defining a Customer Number field in all files within the application. This ensures consistency of definition and facilitates change since changes made to a domain are automatically inherited by all fields whose definition is based on the domain.

A *Field* is the most elemental data storage structure in an application. Fields are typically defined within files but can also be defined as standalone "work" fields. A *Work Field* is a temporary field that is not stored in a file and does not therefore permanently store application data. Work Fields are frequently used in applications to store intermediate data values, to facilitate calculations, and to display computed values.

A *File* or *Table* is a data storage structure that consists of a group of related fields. When defining a file you can specify whether it is a permanent file shared by all APPX users or a temporary, non-shared file. If it is a temporary file, you can further specify whether it should reside on Disk, or in Memory, and the scope of the file. You can change a file definition any time, even after data has been added to the file, and then use the Restructure utility, which APPX provides, to automatically map your existing data to conform to the new definition.

APPX applications include nine different type of **Processes**: Menu, Job, Input, Output, Update, Inquiry, Status, Query and Subroutine. Each process type has its own built-in behavior based on a comprehensive set of data processing rules. For example, an application designer can create an Input process for a file defined in the Data Dictionary to provide a user with the ability to maintain data in a file, without writing any program code. Processes can be called and executed by other processes, chained together, called iteratively, or run independently of other processes. Ranking the processes by the complexity of their built in behaviors rearranges them as follows: Input, Output, Query, Job, Inquiry, Menu, Status, Update and Subroutine.

For ease of organization, APPX allows you to logically group your file and process definitions into **applications**, identified by a 3-character application ID. APPX **Databases**, which identify the actual data for an application, are similarly identified by a 3-character database ID. You can have multiple versions of an application, for example a test version and a production version. You can have multiple databases based on the same application version in order to separate one company's or division's data from another. Different databases can also share common files.

The APPX design environment is fully integrated. For example, while defining an Input process you have the ability to look up any definition in the Data Dictionary, as well as the ability to change it. There are also several very useful utilities to create default Input and Output processes, perform cross references, print technical documentation, transfer designs from one application to another, and more.

How APPX Speeds and Simplifies Development

The built-in features of the APPX engine mean that the entire Application Design process is faster and less complex than creating the same application using traditional programming languages. APPX has been designed and optimized to automatically deal with all of the standard data processing issues required for any business application. This enables the APPX application designer to focus on the business aspects of the application, and provides for extremely fast development and maintenance of complex business applications.

At Runtime:
Once you have defined your data dictionary structures, they are used by APPX at runtime to automatically validate and control any data entered in the application. The automatic data processing rules include:

- checking valid values in a field
- checking valid data ranges
- controlling entering of upper and lower case characters
- controlling entering of signed numeric values in unsigned fields
- allowing data lookups to files
- controlling data alignment and pad characters
- allowing/disallowing blank values
- controlling field display masks
- controlling access to fields for security reasons
- allocating automatic sequence numbers on key fields (if required)
- recording data audit information

All of this is taken care of by APPX without a single line of programming code being required. In addition, APPX monitors all files for structural changes and provides automatic notification if a file restructure is required.

During Application Design:

- APPX automatically checks your Data Dictionary specifications for errors and, if errors are identified, allows you to immediately drill down to the error and repair it.

- APPX validates every reference to a file or field during Process design and validates usage to ensure consistency with Data Dictionary specifications.

- APPX offers you the option of checking a process for errors without actually running the process. This is particularly useful in the case of processes that modify data.

- When a data lookup is defined on a field in the Data Dictionary, APPX automatically includes this data lookup on any data entry processes subsequently added to your application.

- APPX allows you to copy existing fields, files and/or processes for modification and re-use.

- If you make a change to a field, that change is automatically reflected in any processes referencing that field. If you expand a field, you can use APPX's powerful utilities to check all processes for field overlaps and "drill down" straight to problem processes to make the necessary modifications.

- APPX includes utilities to automatically generate data entry screens and reports based on predefined Data Dictionary specifications.

- APPX includes extensive cross-referencing capabilities. For example, you can use the cross-reference to find where and how a field is used in your application.

Running APPX Application Design

During the course of this demo, you will be making some changes to this application to demonstrate how easy it is to maintain applications designed in APPX *even when you know very little about the design of the application*.

➢ From the APPX Demo Server Menu (shown in *Figure 3),* select Application Design by clicking on the **Application Design** button or by using the shortcut key **Alt + D.**
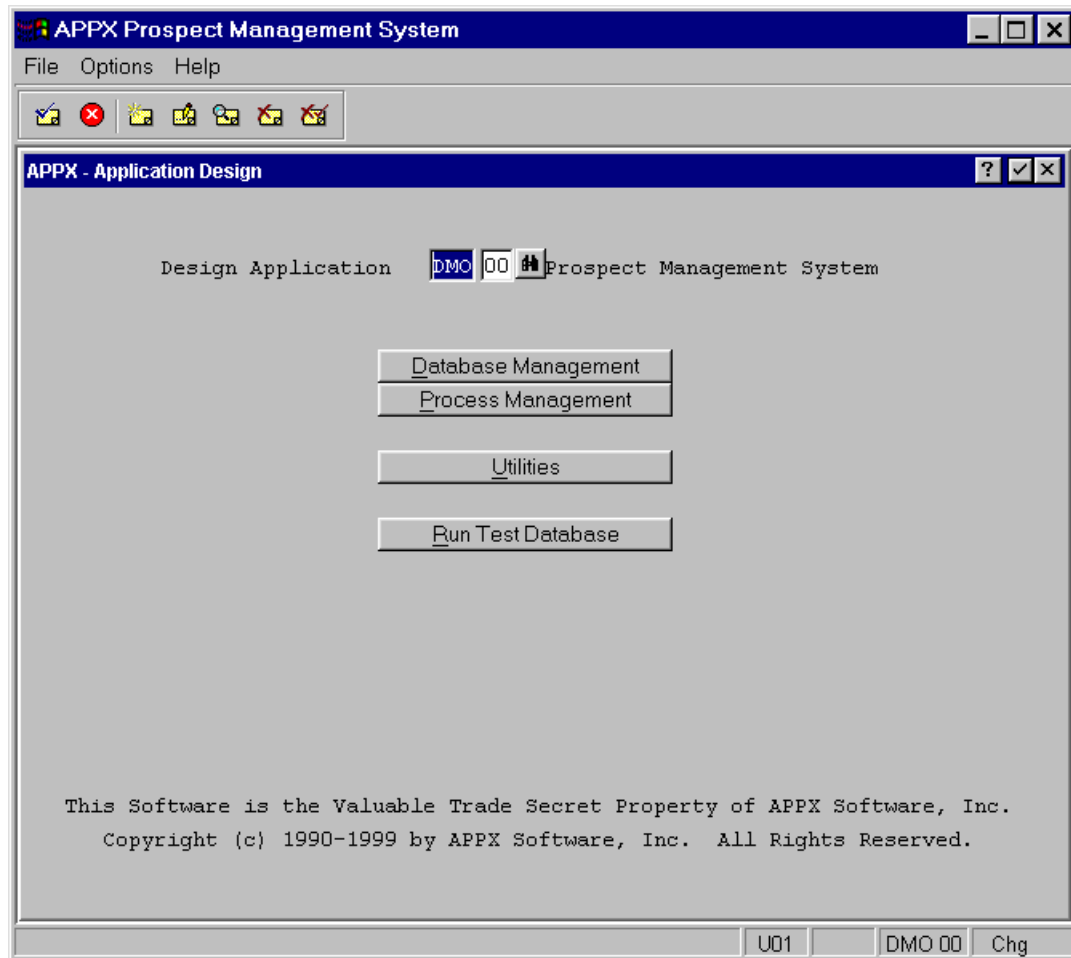
Figure 8 – APPX Application Design screen.

➢ You are presented with the main APPX Application Design screen *(Figure 8).* Notice that application **DMO**, version **00** (zero zero) has already been conveniently selected for you. Normally you would specify which application and version you want to design.

➢ Notice that the Application ID and version (DMO 00) is displayed in the status bar on the bottom right corner of the screen. This will continue to be displayed as you move through application design and offers an easy method of verifying that you are working within the correct application.

The **Database Management** option on this menu enables the designer to:
- view and/or maintain domains, files, fields and work fields
- process data dictionary specifications and translate them into a format more readily usable by APPX during process execution
- manage physical files (create files, restructure files, initialize files, etc.)

The **Process Management** option allows the designer to view and/or maintain processes. There are nine different process types as follows:

- **Menus** for selection of tasks or processes by users
- **Jobs** for running a logical sequence of processes in succession
- **Inputs** for entering and maintaining data
- **Outputs** for generating reports and special forms
- **Updates** for modifying, adding or deleting a set of records within a file or group of files
- **Queries** for selecting and sorting records for further processing (in outputs and updates, for example)
- **Inquiries** for presentation of data on-line to users (with an option to produce a hard copy of the displayed information)
- **Statuses** for providing error reporting options and for interrupting a series of processes for user intervention
- **Subroutines** for housing a set of rules used in multiple processes or for performing tasks outside of APPX.

The **Utilities** option includes facilities to allow the designer to carry out tasks including the following:

- design transfer (copy with rename) existing application design elements for modification and re-use
- change references (i.e., search and replace) to domains, files, fields, processes or application IDs
- run cross-references on design elements to find where and how they are used in an application or in multiple applications
- print technical documentation
- foreign language translations

The **Run Test Database** option enables the designer to specify a database ID against which to run the currently selected application in a test environment.

1.0 Exercise 1 – Change the Length of a Field

For the purposes of this demo, lets assume that you have recently joined Dazzle's IT Department as an APPX Application Designer Trainee. Business is booming and there is some concern by the sales manager that the existing Prospect Number field will not be large enough to accommodate the ever-increasing number of prospects. Currently this field is large enough to record up to '9999' prospects but this number will soon be reached so the field must be expanded.

You have not yet had a chance to familiarize yourself with the actual design of the DMO application but your supervisor has asked you, as your first task, to increase the size of the Prospect Number field from a four-digit numeric field to a five-digit numeric field in all files that include a Prospect Number field.

1.1 A Quick Look at a Domain

Your immediate problem is that you are not familiar with the files and fields in the DMO application. Consequently, you do not know which files include a Prospect Number field. You could browse thru the design of each file looking for Prospect Number fields. But, you recall from the ***Introduction to APPX Application Design*** class that you recently attended that a field that occurs in more than one file would most likely be defined by referencing a **Domain**. A Domain is a template that can be used to define a field that occurs in more than one file thereby ensuring a consistent definition of the field in all files. So, you decide to take a look at the Domains that have been defined for the DMO application.

➢ From the **APPX - Application Design** menu, select **Database Management** by either clicking on the **Database Management** button or by pressing **Alt + D**. The Database Management menu *(Figure E1.1)* is displayed.
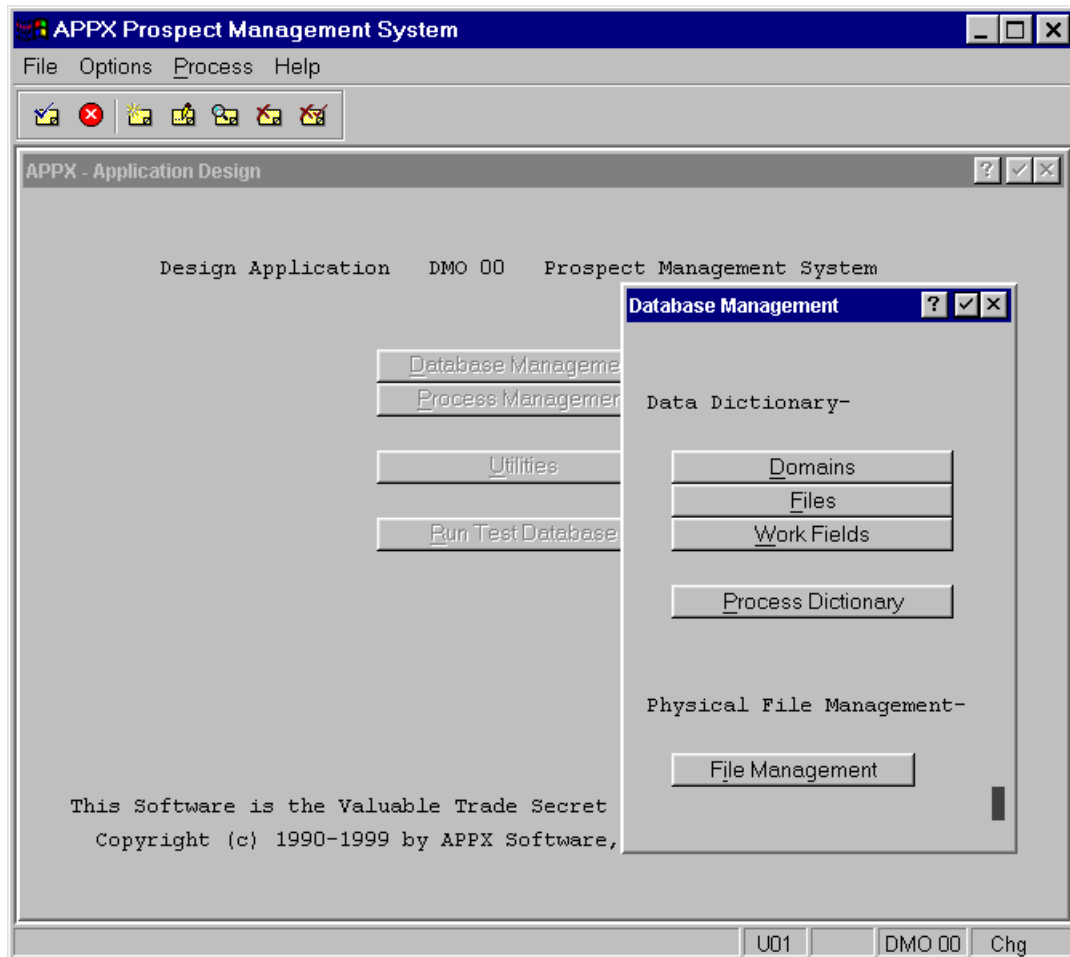

Figure E1.1 – Database Management Menu

➢ Select the **Domains** option by clicking on the **Domain** button or by pressing **Alt + D**. A scrolling list of domains is displayed *(Figure E1.2)*.
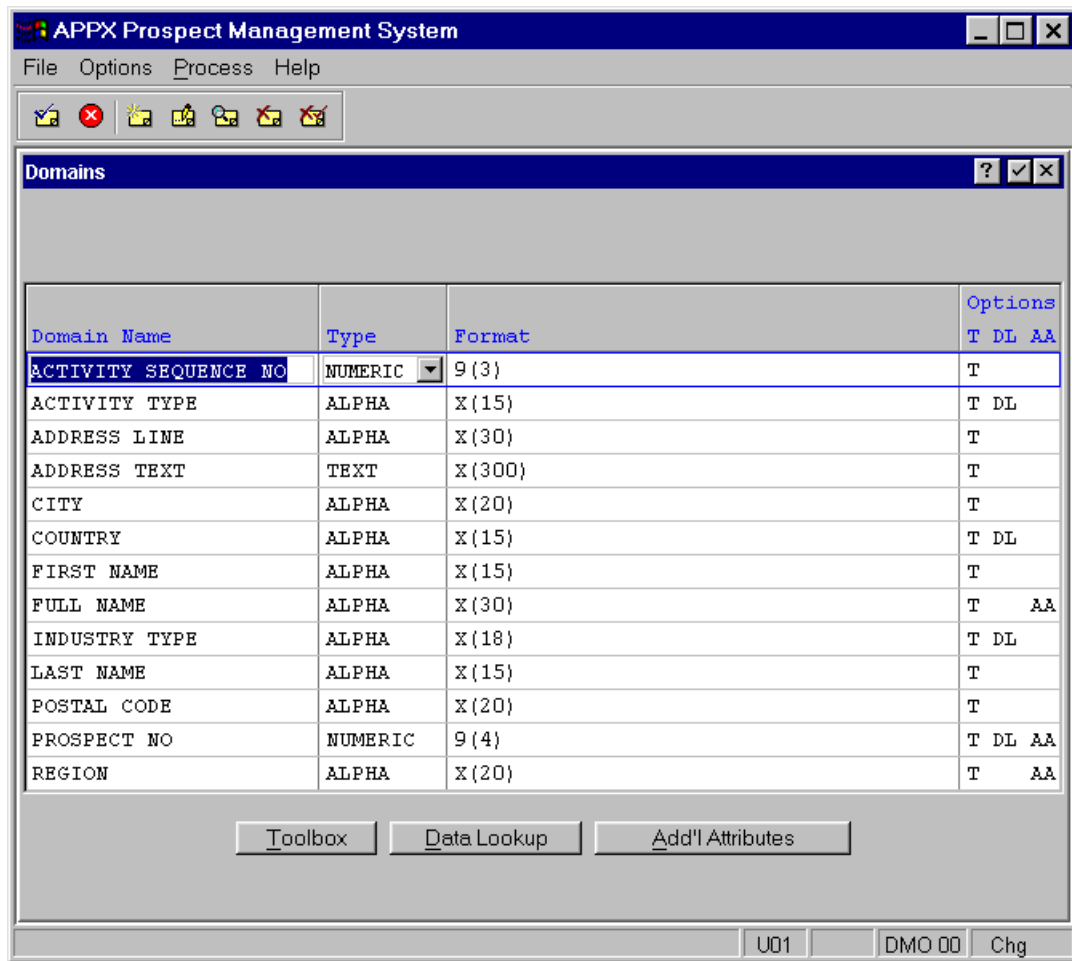

Figure E1.2 – Scrolling List of Domains

Upon examining the list of **Domains**, you see a Domain Name of **PROSPECT NO**. You also notice that the format information '9(4)' indicates that this domain is a template that can be used to define a 4-digit, unsigned, numeric field.

➢ You select the **PROSPECT NO** domain by clicking on the appropriate row or by pressing **ENTER** after using the cursor down key to highlight the appropriate row. *Figure E1.3* shows the list of domains with the **PROSPECT NO** domain selected.

APPX Prospect Management System

File   Options   Process   Help

Domains

Domain Name	Type	Format	Options T DL AA
ACTIVITY SEQUENCE NO	NUMERIC	9(3)	T
ACTIVITY TYPE	ALPHA	X(15)	T DL
ADDRESS LINE	ALPHA	X(30)	T
ADDRESS TEXT	TEXT	X(300)	T
CITY	ALPHA	X(20)	T
COUNTRY	ALPHA	X(15)	T DL
FIRST NAME	ALPHA	X(15)	T
FULL NAME	ALPHA	X(30)	T AA
INDUSTRY TYPE	ALPHA	X(18)	T DL
LAST NAME	ALPHA	X(15)	T
POSTAL CODE	ALPHA	X(20)	T
PROSPECT NO	NUMERIC	9(4)	T DL AA
REGION	ALPHA	X(20)	T AA

Toolbox   Data Lookup   Add'l Attributes

U01   DMO 00   Chg

Figure E1.3 – The PROSPECT NO Domain

> Having selected the **PROSPECT NO** domain, you press **ENTER** to view the specifications for the domain as shown by *Figure E1.4*.

This screen confirms that the **PROSPECT NO** domain is defined as 4-digit, unsigned, numeric with no digits to the right of the decimal point.

Figure E1.4 – The Definition of the PROSPECT NO Domain

➢ You also notice that the **Additional Attributes** button is highlighted, so you click on it to see what additional attributes have been specified for this domain.

Figure E1.5 shows that the **PRODUCT NO** domain has a range specified and that only values greater than (GT) zero are allowed.
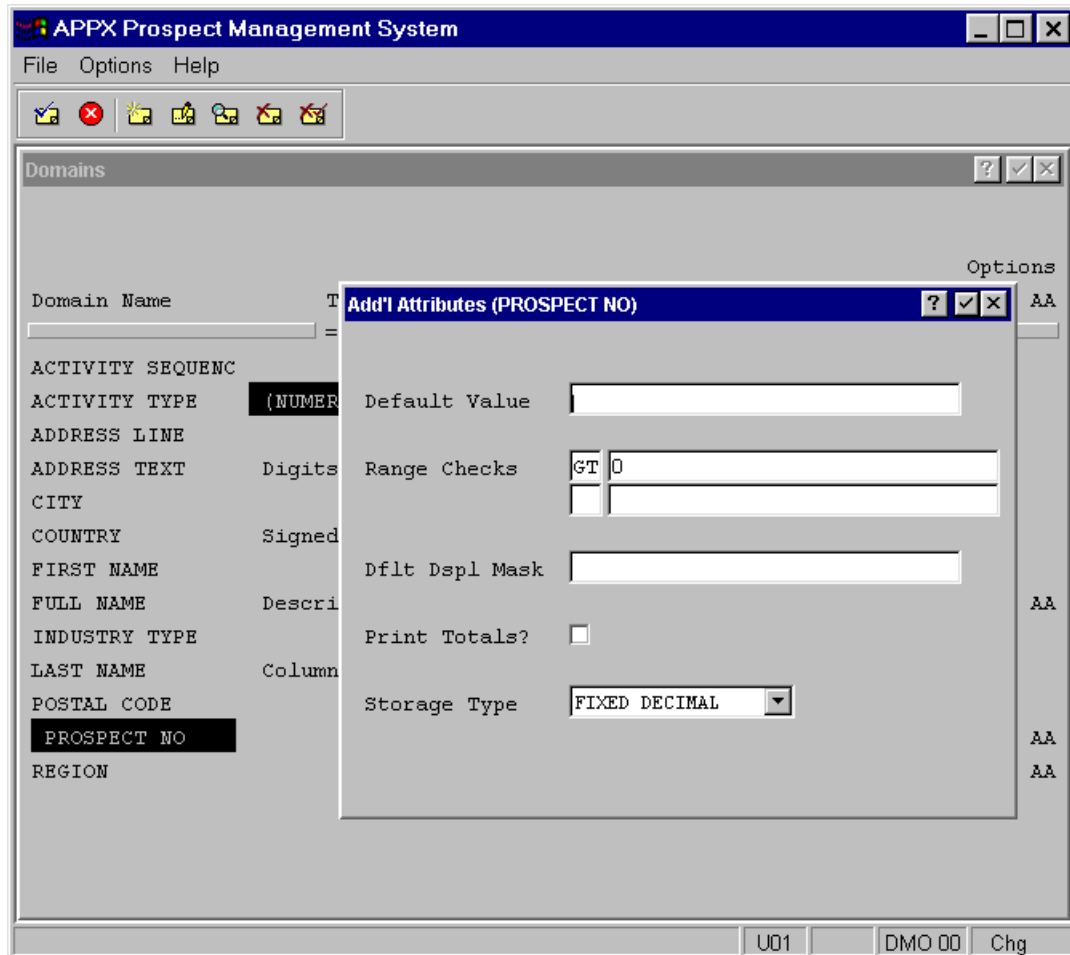
Figure E1.5 – Additional Attributes for the PROSPECT NO Domain

At this point, you are reasonably satisfied that this domain is the one you need to change. You know that all you need to do is change the number of digits from 4 to 5 and APPX will take care of updating all field definitions that are based on this domain throughout the entire application. APPX will also automatically update all input screens and reports to use the new, longer definition for all Prospect Number fields. And, you will be able to use the APPX Restructure Utility to automatically convert all of your existing data to include the extra digit.

But, it occurs to you that it would be prudent to use the **Domains Cross-Reference Utility** to locate and review all fields that are based on the **PROSPECT NO** domain before you actually make a change of this magnitude.

➢ You press **ESC** or **F8** to return to the specification screen for the **PROSPECT NO** domain.
➢ You press **ESC** or **F8** to return to the **Domains** screen.
➢ You press **ESC** or **F8** to return to the **Database Management** menu.
➢ You press **ESC** or **F8** to return to the **APPX – Application Design** menu.

1.2 The Domains Cross-Reference Utility

Having determined that there is a domain that can be used for defining Prospect Number data fields, you now would like to know which fields in the application have actually been defined using the **PROSPECT NO** domain. APPX includes a variety of powerful cross-reference utilities that are indispensable tools when making changes to an application, especially an application that you are not familiar with. The **Domain Cross-Reference Utility** is exactly what you need!

➢ From the **APPX - Application Design** menu, select the **Utilities** option.

➢ From the **Utilities** menu, select the **Cross-Reference** option.
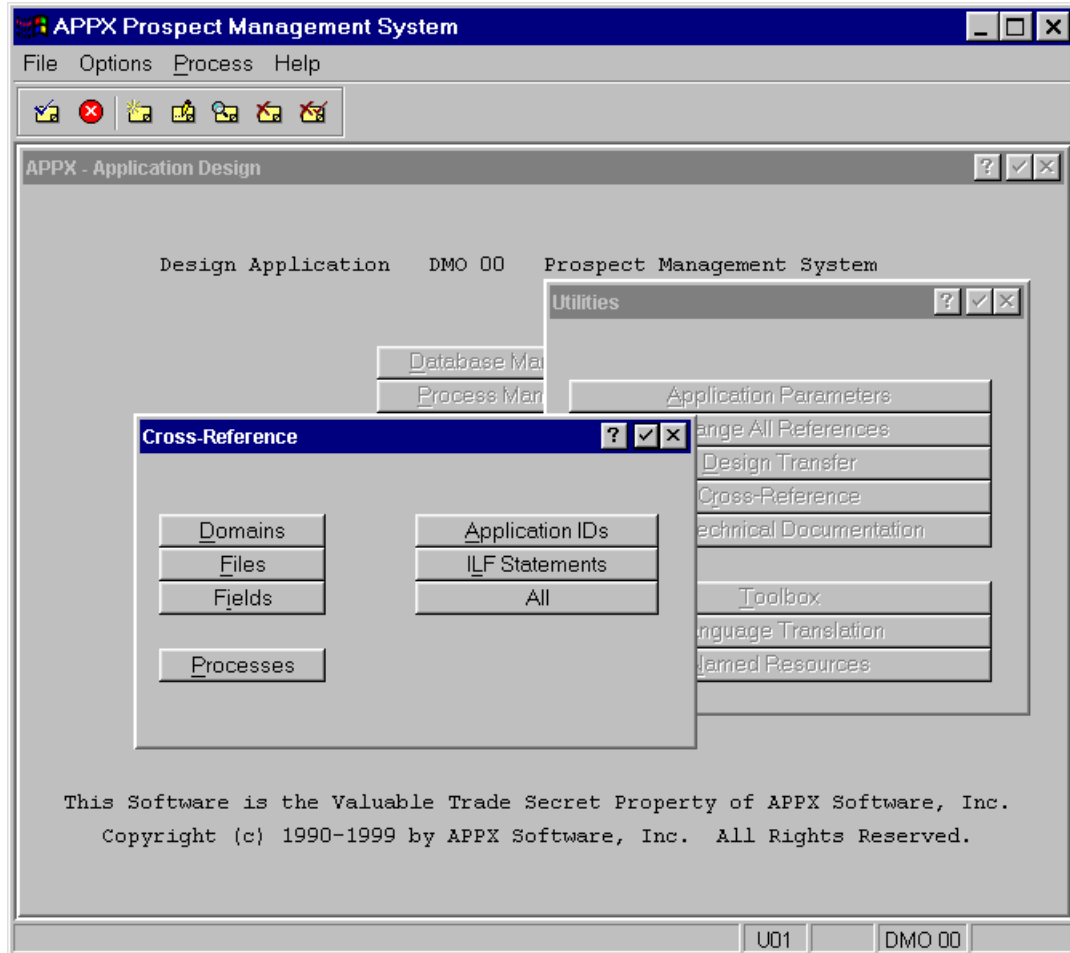
Figure E1.6 – Field Context

➢ From the **Cross-Reference** menu, select the **Domains** option since you want to find all references to the **PROSPECT NO** domain (*Figure E1.6*).

➢ When the **Cross-Reference (Domains)** input screen is displayed you are prompted to enter the name of the domain for which a cross-reference is to be run. The current application ID (**DMO**) is already entered for you (although you could change this if you wanted to run a Cross-Reference for a domain defined in a different application). Enter **PROSPECT NO** in the domain name field and press **ENTER** to validate the domain name you entered. If you have entered a valid domain name, the domain format specification will be displayed beside the field name you entered. The binoculars icon indicates that you can perform a lookup of the domain name in the event that you do not know the name of a particular domain. Remember, any time you see the binoculars button while running APPX, you can lookup values for the indicated field.

➢ Press **ENTER** to save your record. An empty Domain field is displayed to allow entry of additional domain names as shown in *Figure E1.7*.

Figure E1.7 – Cross-Reference for Domains

➢ Since you are only interested in this one domain, press **ESC** or **F8** to exit from this screen.

The **Cross-Reference Options** screen is presented *(Figure E1.8)*.
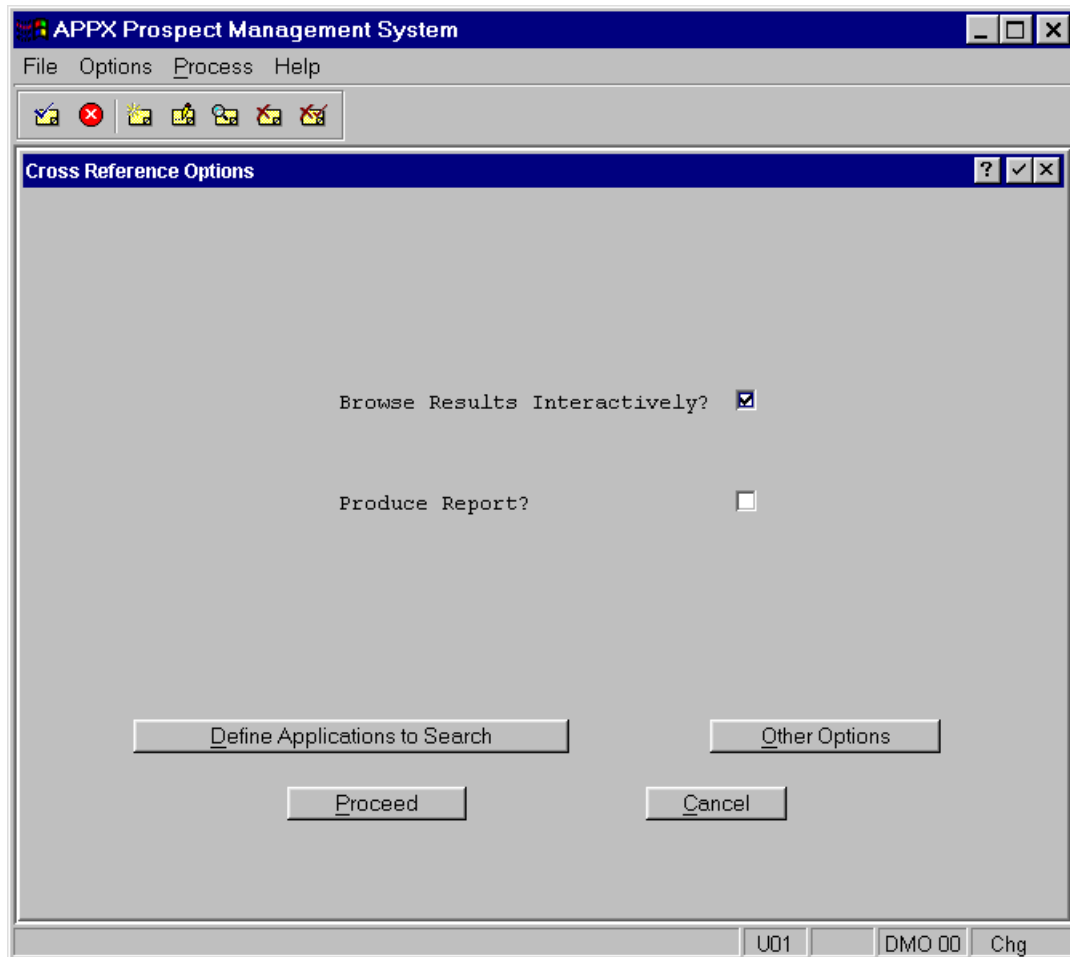
Figure E1.8 – Cross Reference Options
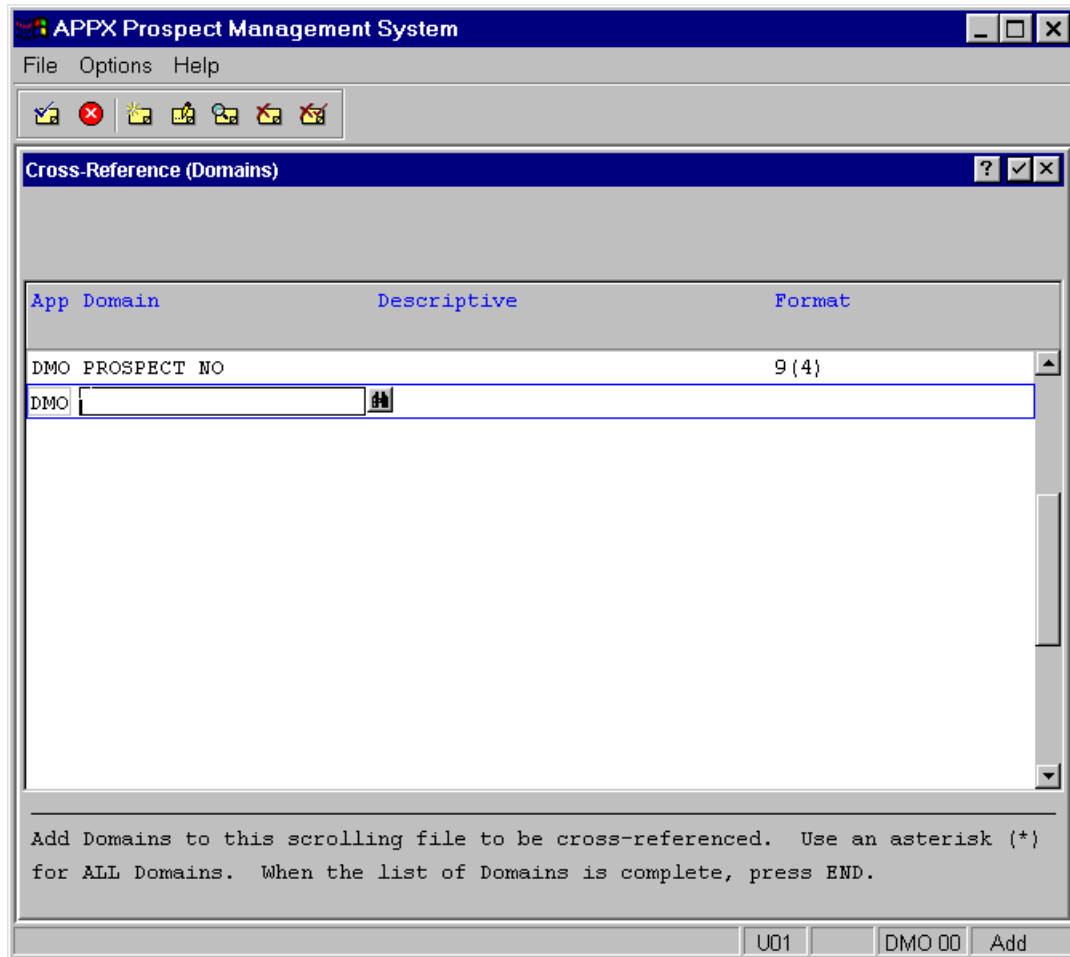
➢ By default, the **Browse Results Interactively?** field is checked. This will enable you to "drill down" directly to the location of each reference found.

➢ The **Produce Report?** Option determines whether or not a hard copy of the resulting output is to be produced. Leave this field at its default value of blank.

➢ Selecting **Define Applications to Search**, as the name suggests, allows you to specify a list of applications against which you want to run the cross-reference. Since you are only interested in application DMO this option is not of interest to you at this time. However, an APPX application designer working on a multi-application system would undoubtedly want to run the cross-reference against every application in the system, since domains can be shared across applications. If you click on this option, press **ESC** or **F8** to exit.

➢ Selecting the **Other Options** button will allow you to specify whether or not you want APPX to include ILF statements that have been "commented out" (and that are therefore not executed) in the Cross-Reference. If you click on this option, press **ESC** or **F8** to exit.

➢ To run the cross-reference, click on the **Proceed** button or press **ENTER** or click on the ✓ button in the top right of the cross-reference options screen.

Once the cross-reference has run, the results are presented on the **Interactive Cross-Reference** screen *(Figure E1.9)* for review. You can immediately see all the fields in the DMO application that reference the **PROSPECT NO** domain. You see that there are four different data files and one work field that reference the **PROSPECT NO** domain.

App	Typ	Id	App	Typ	Id	Rf Ct
DMO	Dom	PROSPECT NO	DMO	Fld	ACTIVITY PROSPECT NO	1
DMO	Dom	PROSPECT NO	DMO	Fld	CONTACT PROSPECT NO	1
DMO	Dom	PROSPECT NO	DMO	Fld	OPPORTUN PROSPECT NO	1
DMO	Dom	PROSPECT NO	DMO	Fld	PROSPECT NO	1
DMO	Dom	PROSPECT NO	DMO	Fld	WORK ORIG PROSPECT NO	1
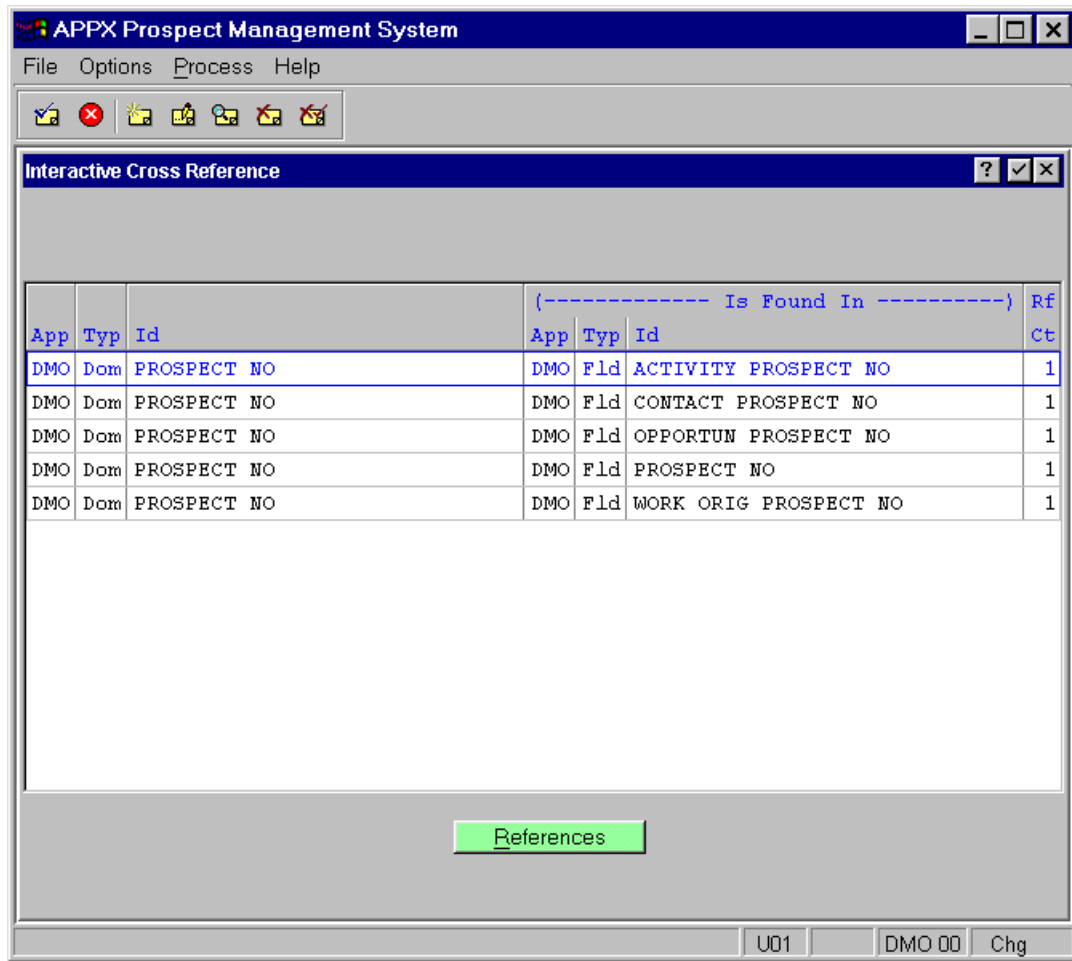
Figure E1.9 – Cross-Reference Results

➢ To view the context of a particular domain reference, select the desired reference and then click on the **References** button.

The resulting "Context" screen shows the name of the file in which the reference field is defined and the field sequence number. *Figure E1.10* shows that the **ACTIVITY PROSPECT NO** field that references the **PROSPECT NO** domain is in the **ACTIVITY** file.
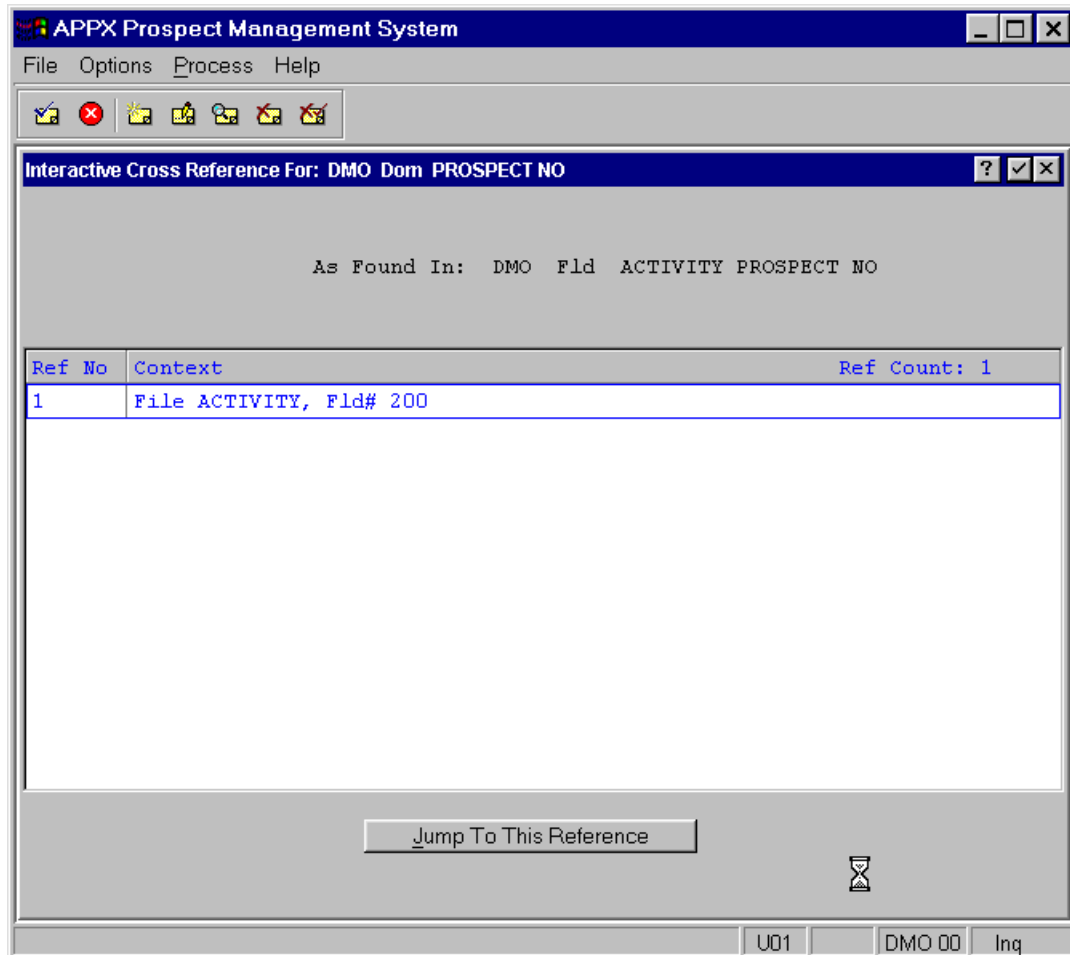
Figure E1.10 – Field Context

➢ Click on the **Jump To This Reference** option and APPX will automatically take you straight to the Data Dictionary entry for the field that references the domain *(Figure E1.11)*.

Figure E1.11 – Data Dictionary Entry for a Field

The **Fields** maintenance screen for the **ACTIVITY** file in the APPX Data Dictionary is displayed. Notice that the currently selected record is the **ACTIVITY PROSPECT NO** field, the field that references the **PROSPECT NO** domain.

➤ Press **ENTER** to view the field specifications (*Figure E1.12*). Notice that the definition of the **ACTIVITY PROSPECT NO** field is indeed based on the **PROSPECT NO** domain.
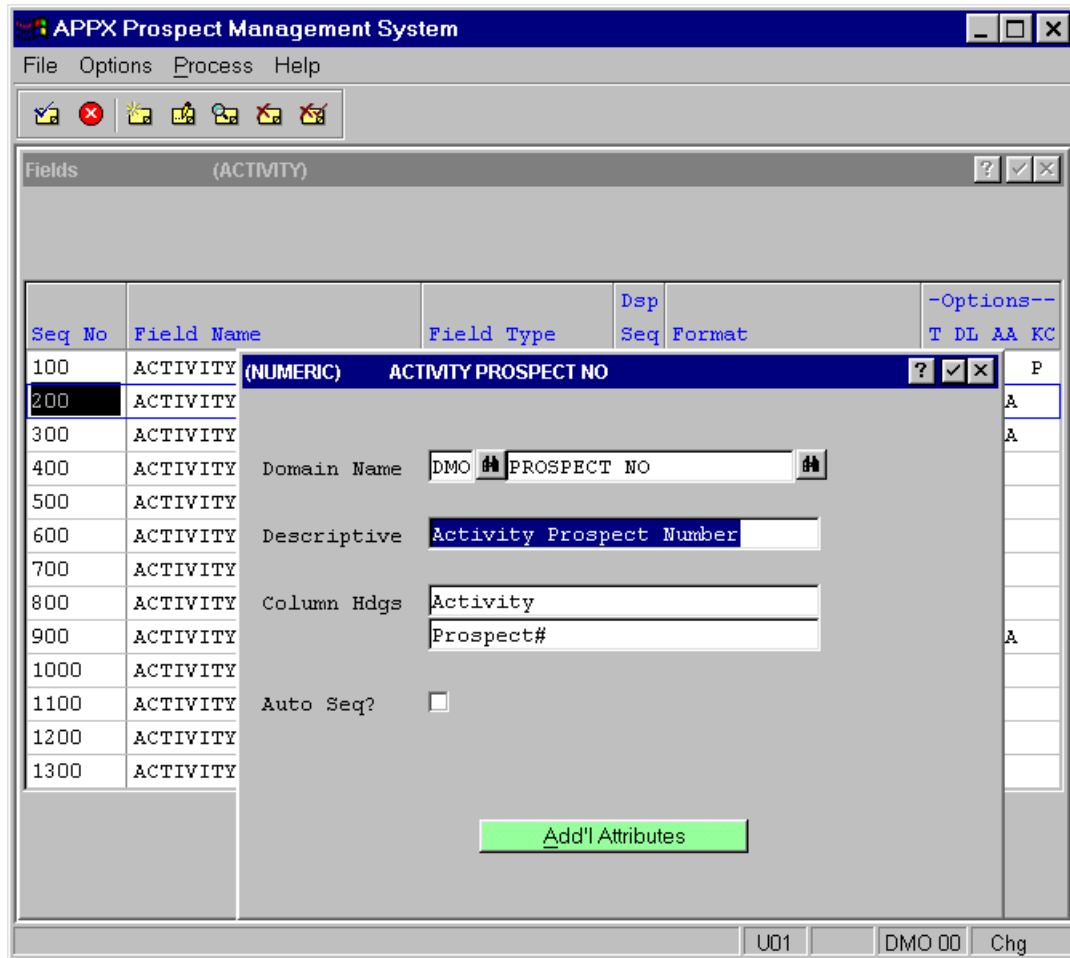
Figure E1.12 – Field Definition Based on a Domain

➤ Press **ESC** to return to the **Fields** screen.

➤ Press **ESC** to return to the cross-reference **context** screen.

➤ Press **ESC** to return to the **Interactive Cross-Reference** results screen.

➤ If you would like to examine the other four fields that reference the **PROSPECT NO** domain, please feel free to do so.

➤ After you have finished reviewing the fields that reference the **PROSPECT NO** domain, press **ESC** to exit from the **Domains Cross-Reference Utility**. You are presented with a **Confirmation** screen to confirm that you wish to exit the process *(Figure E1.13)*.
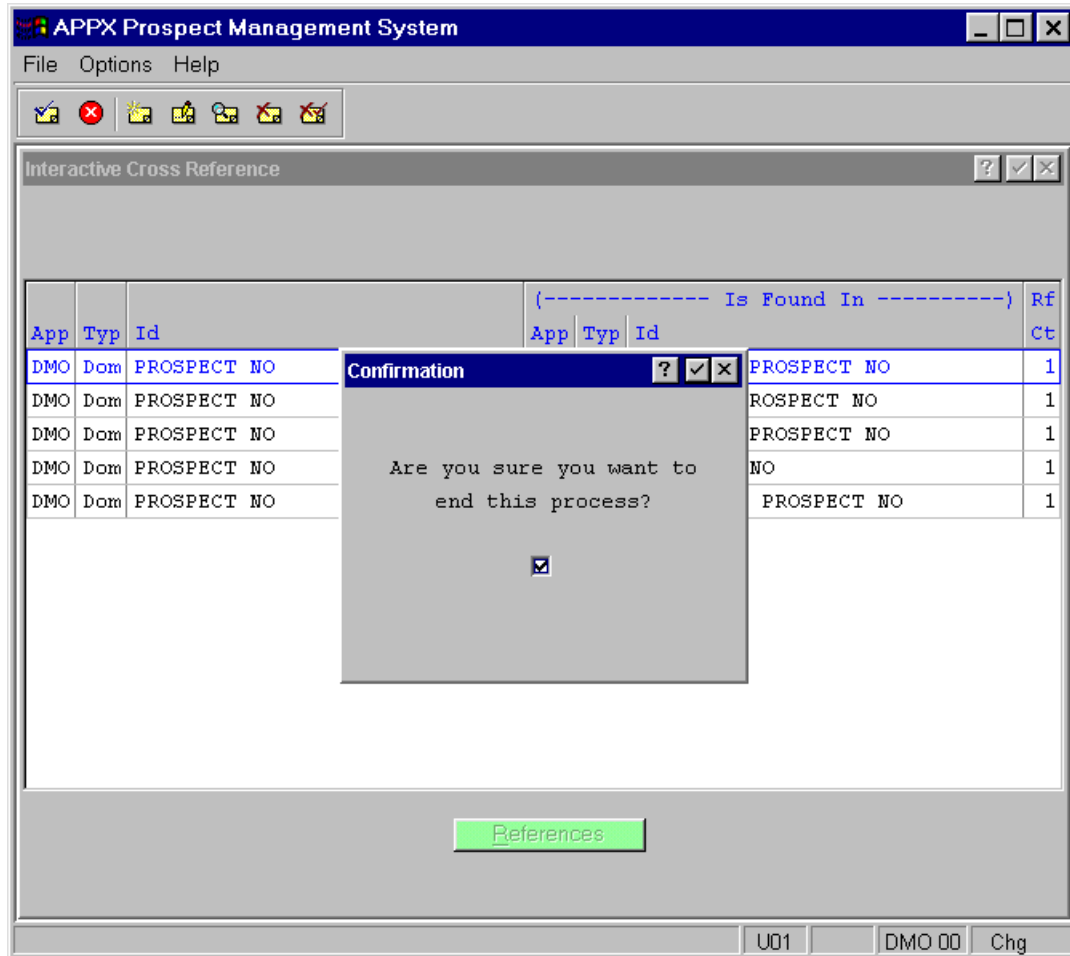
Figure E1.13 – Exit confirmation

➤ Click on the confirmation box to change its value to ✓ and then press **ENTER** to continue. You are returned to the **Cross-Reference** menu.

➤ Press **ESC** to exit from the **Cross-Reference** menu and return to the **Utilities** menu.

➤ Press **ESC** to exit from the **Utilities** menu and return to the main **APPX - Application Design** menu.

1.3 Changing the Definition of a Domain

Having located the **PROSPECT NO** domain and having reviewed the fields that reference it, you confidently decide to change the definition of the **PROSPECT NO** domain. By following the steps below, you access the PROSPECT NO domain specifications screen.

➢ From the **APPX - Application Design** menu, select **Database Management**.
➢ From the **Database Management** menu, select **Domains**.
➢ From the list of **Domains**, select the **PROSPECT NO** domain and press **ENTER**.

The specification screen for the **PROSPECT NO** domain is displayed as shown in *Figure E1.14* below.
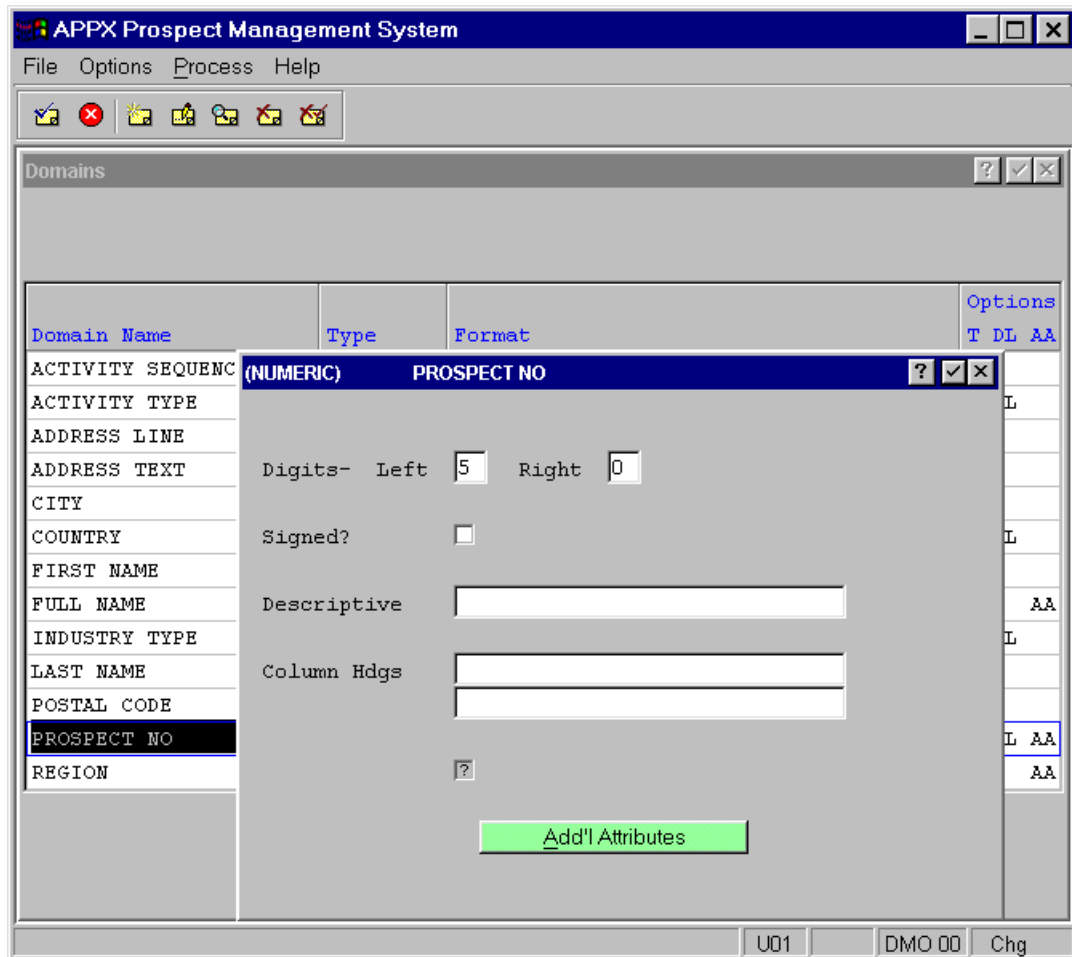
Figure E1.14 – Modified PROSPECT NO Domain Detail Screen

➢ Position your cursor on the **Digits Left field** and the current value (4) is automatically highlighted.

➢ Change the **4** to a **5** since you want to expand the field from 4 digits to 5 digits as shown in *Figure E1.14* above.

➢ Press **ENTER** to save the revised domain specifications. You are returned to the **Domains** listing and automatically positioned on the next record in the listing.

➢ Press **ESC** to exit **Domains**.

➢ On exiting, **APPX automatically processes the Data Dictionary**. Note that in addition to processing Domains (since you have just changed a domain) APPX also processes Work Fields and the four files containing fields that reference this Domain – ACTIVITY, CONTACT, OPPORTUN and PROSPECT. Once the Data Dictionary has been processed APPX displays the results *(Figure E1.15)*. Use the **PageDown** key to move through the list of files processed and check that no Errors have been reported.
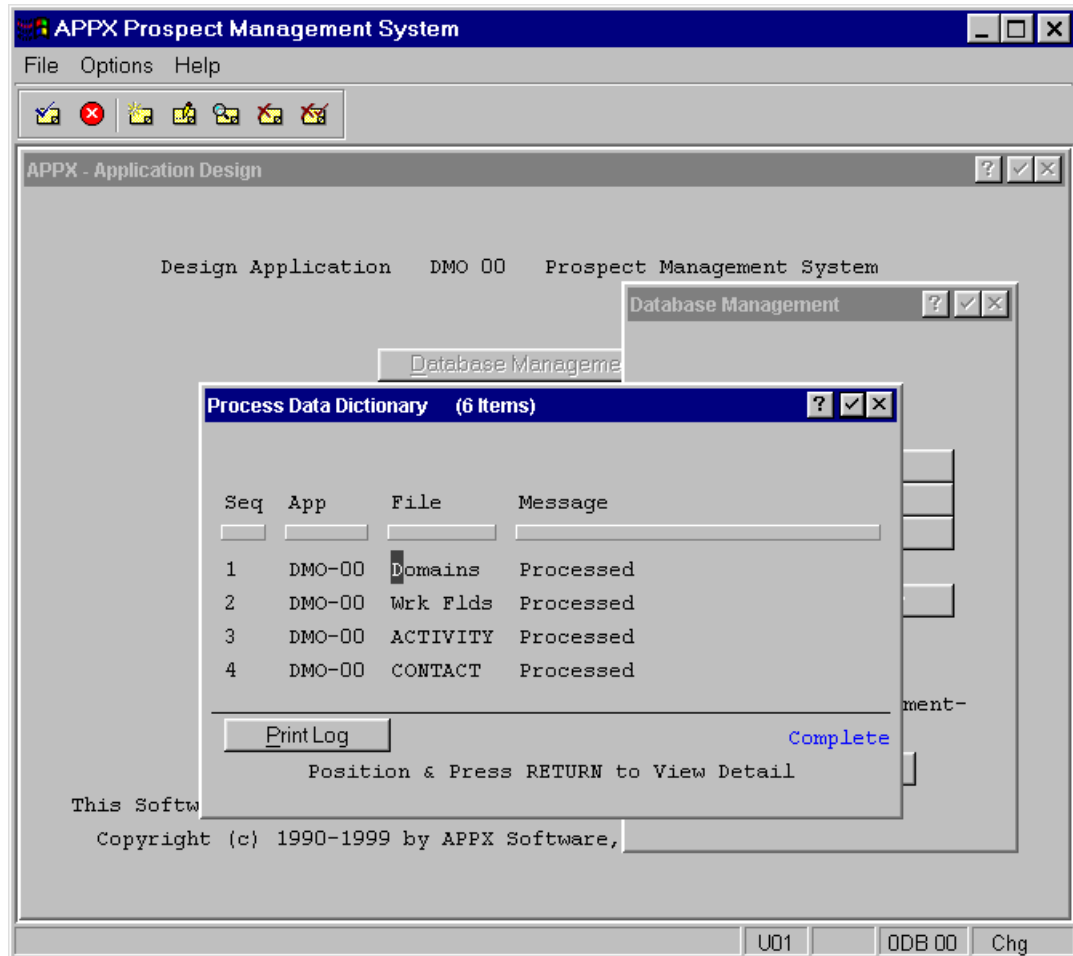
Figure E1.15 – Processing the APPX Data Dictionary

The change you have just made should not have resulted in any errors. If errors had been detected then positioning your cursor on the file in question and pressing **ENTER** would show the error description and enable you to go directly to the error and correct it.

➢ Press **ESC** to return to the **Database Management** menu.

➢ To confirm that the fields that reference the PROPSECT NO domain have been changed, select **Files**.

➢ The first file in the list is **ACTIVITY** which is one of the four files that include a reference to the **PROSPECT NO** domain. Since the file is already selected, press **ENTER** to move to the **Fields** level.

➢ As you view the **Fields** in *Figure E1.16*, you can see that the **ACTIVITY PROSPECT NO** field, which references the **PROSPECT NO** domain, is now displaying with a Format of **'9(5)'** thus indicating that the field is now 5 digits long. If you check the **CONTACT**, **OPPORTUN**, and **PROSPECT** files, you will see that the other fields referencing the **PROSPECT NO** domain also show the new field length.

Figure E1.16 – Fields in the ACTIVITY File

➢ Press **ESC** to return to the **File** listing.

➢ Press **ESC** to return to the **Database Management** menu.

Note that when you exited from the **Files** process, APPX did **not** automatically process the Data Dictionary. APPX monitors activity within **Domains**, **Files**, and **Work Fields** and will only process the Data Dictionary if changes have been made or if problems are identified. Also, note that the **Database Management** menu provides a **Process Dictionary** option that can be used to process the Data Dictionary on demand.

1.4 Restructuring Existing Data Files

Since you have changed the record structures of four files, you need to restructure the existing data in those files to match the new structures as now defined in the Data Dictionary for the application. The APPX Restructure Utility is a very powerful feature of APPX.

➢ From the **Database Management** menu click on the **File Management** button.

➢ The **Database Management** screen is presented *(Figure E1.17).*
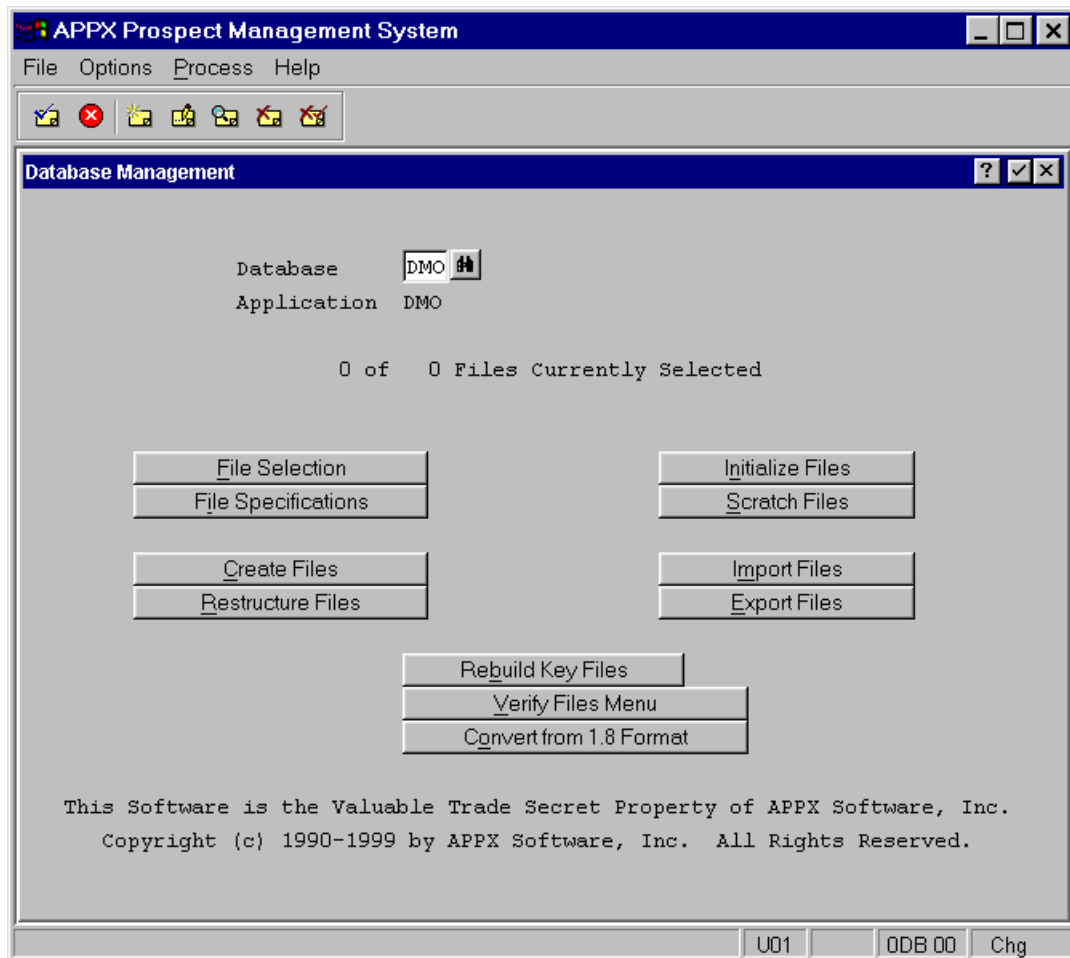
Figure E1.17 – Database Management Screen Before Selecting Files

➢ The **Database** field has a default value of **DMO** that is the correct value. Think of the Database ID as being an identifier for a set of data files for a particular Company or Division. In this case, Database **DMO** represents the data for our demo company, **Dazzle Marketing Operations, Inc.** APPX supports as many databases as you need for the various companies or divisions that might need to run an application. Notice that the Database field is modifiable since you might need to restructure more than one Database when you make changes to an Application's Data Dictionary.

➢ The **Application** field also has a value of **DMO**.

➢ Press **ENTER** to proceed. APPX will automatically select all of the files in the DMO application as shown in *Figure E1.18* below.
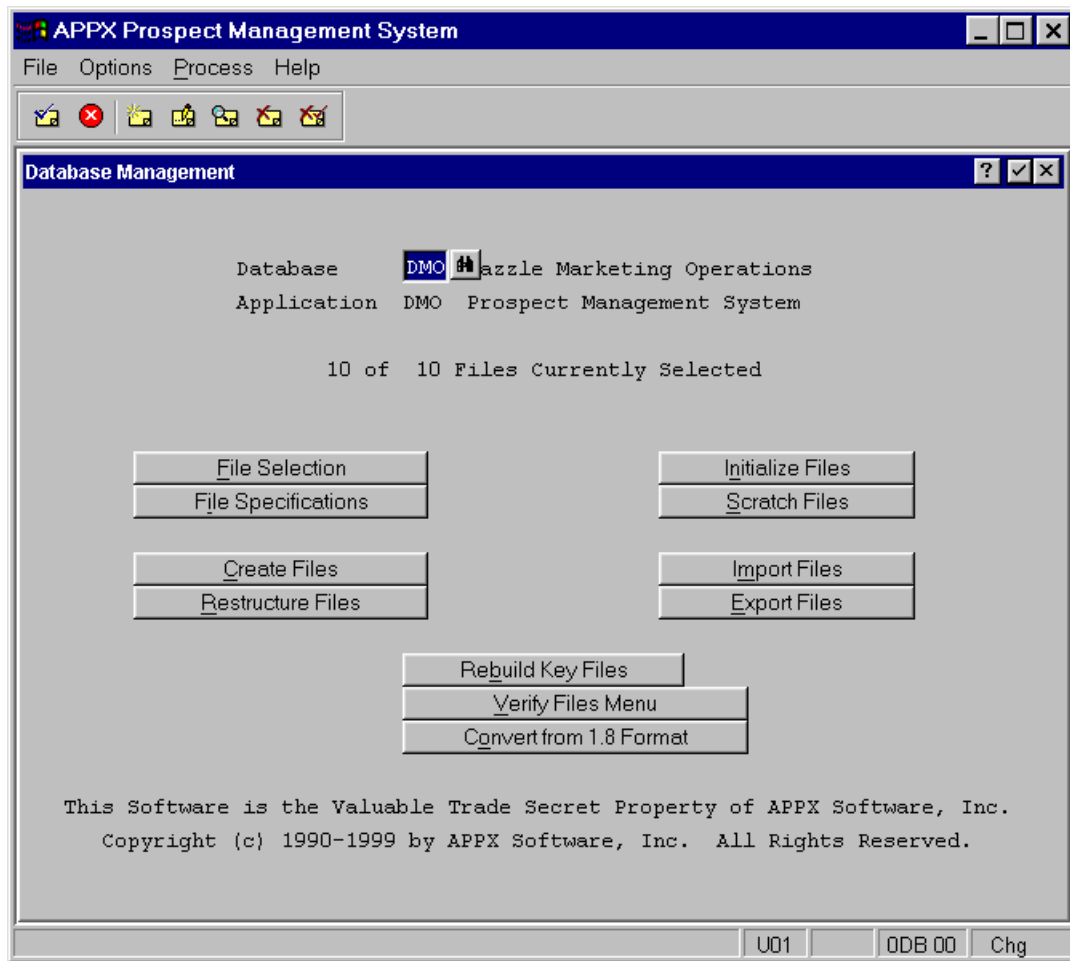
Figure E1.18 – Database Management Screen After Selecting Files

➢ You could use the **File Selection** option to select just the four files that were changed. But, a wonderful feature of APPX is that it already knows which files need to be restructured, and will only restructure those four files. Therefore, leave all files selected and select the **Restructure Files** option. APPX restructures each of the selected files in turn and displays the status of each on the screen, giving you the option to print the restructure log if desired *(Figure E1.19).*
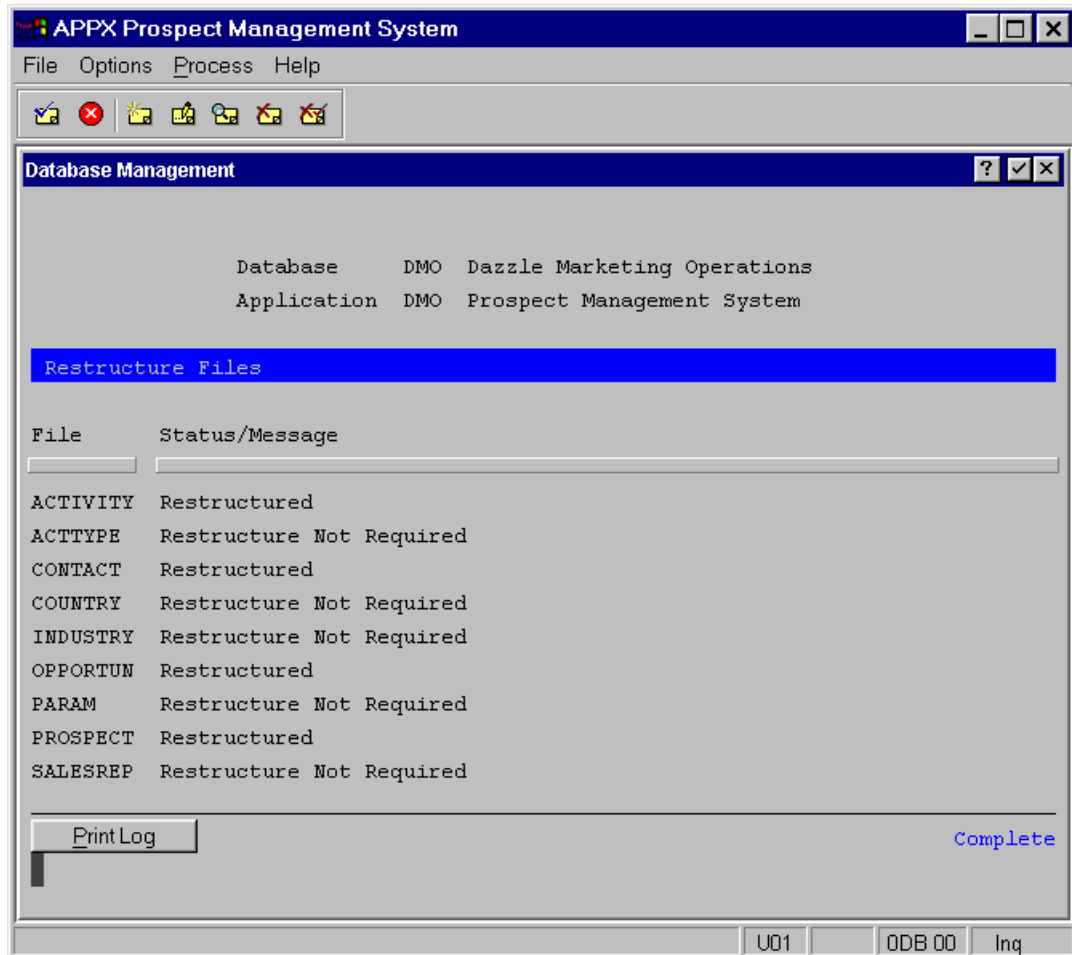
Figure E1.19 – Restructure Files Status Screen

➢ Press **ESC** to exit the **Restructure Files** status screen.

➢ Press **ESC** to exit to the **Database Management** menu

➢ Press **ESC** to exit to the **APPX - Application Design** menu.

1.5 Checking Processes for Item Overlap

Having made the changes to the Data Dictionary and having restructured the affected files, the next step is to check that the expansion of the domain and of the fields that are based on the domain has not caused fields on screens or reports to overlap other fields or text in any of the processes in application DMO. Fortunately, APPX includes a **Check Images For Item Overlap** utility.

- ➢ From the **APPX - Application Design** menu select the **Utilities** option.

- ➢ From the **Utilities** menu select the **Toolbox** option.

- ➢ From the **Toolbox** menu select the **Check Images for Item Overlap** option.

- ➢ When you select this option you are presented with an **Options** screen *(Figure E1.20)*. This screen prompts you to indicate whether or not you want APPX to flag items that are directly adjacent to other items (or text) on the image as errors. Accept the default value of Yes (✓) so you can manually review such occurrences of items and decide whether or not they need to be modified. Fields that overlap or that are too large and will no longer fit on the image will automatically be flagged as errors.
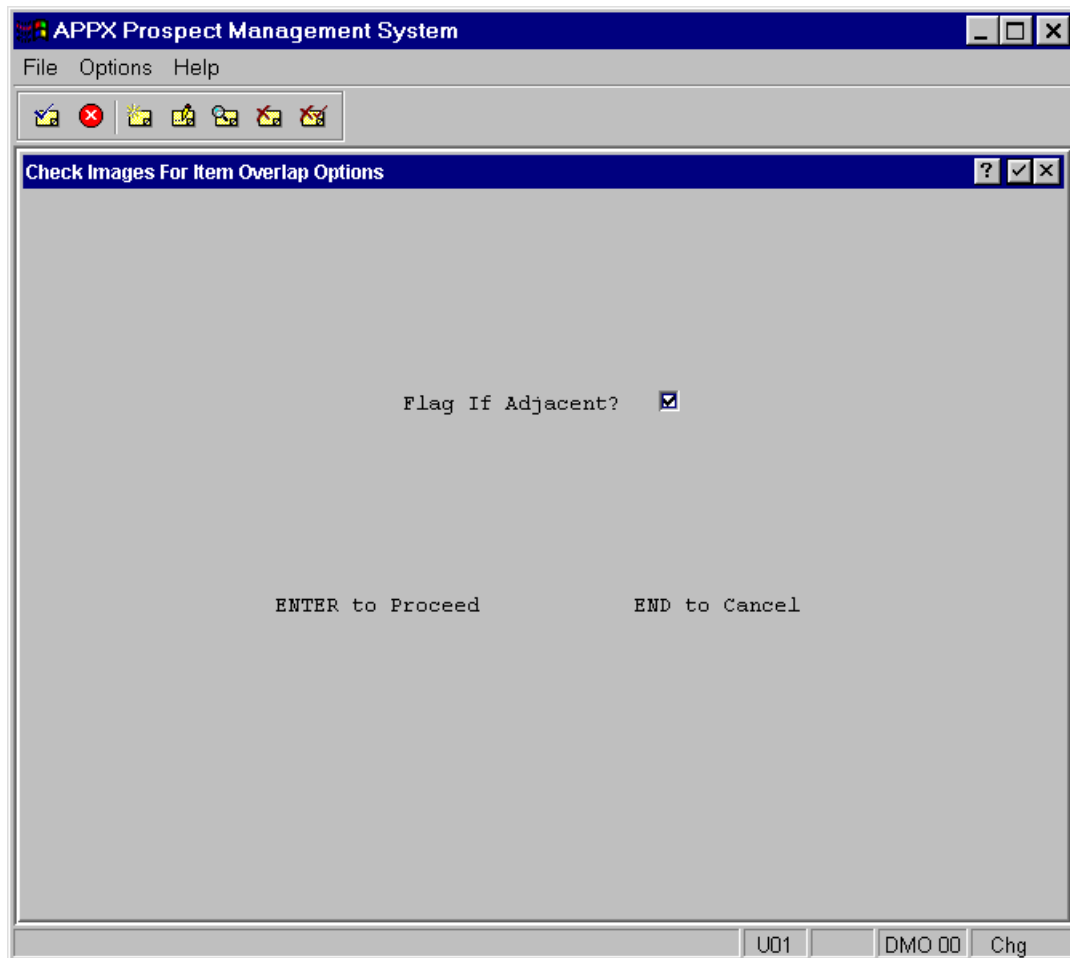
Figure E1.20 – Check Images for Item Overlap Options

- ➢ Press **ENTER** to continue.

As APPX runs the check, it displays a status screen *(Figure1.21)*.

APPX Prospect Management System

File   Options   Help

Check Images For Item Overlap and Item Too Large Errors

Process Type	Process Name	Frame Class	Frame Seq No	Img	Status
INPUT	ACTTYPE FILE MAINTENANCE	RECORD	100	1	Checked
INPUT	ACTTYPE FILE MAINTENANCE	RECORD	200	1	Checked
INPUT	CONTACTS FILE MAINTENANCE	RECORD	100	1	Checked
INPUT	CONTACTS FILE MAINTENANCE	RECORD	200	1	Checked
INPUT	COUNTRY FILE MAINTENANCE	RECORD	100	1	Checking
INPUT	COUNTRY FILE MAINTENANCE	RECORD	200	1	
INPUT	DISPLAY AUDIT INFO	RECORD	100	1	
INPUT	FOLLOWUP	RECORD	100	1	
INPUT	FOLLOWUP	RECORD	200	1	
INPUT	INDUSTRY FILE MAINTENANCE	RECORD	100	1	
INPUT	INDUSTRY FILE MAINTENANCE	RECORD	200	1	
INPUT	MARKETING ACTIVITY	RECORD	100	1	
INPUT	MARKETING ACTIVITY	RECORD	200	1	

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U01   DMO 00   Inq/Scr

Figure E1.21 – Item Overlap Status

When the item overlap check is complete, a final status screen is displayed showing only those processes containing **errors**. Since there are not any errors that result from the change you made, a final status screen is not displayed. Instead, the **Toolbox** menu is redisplayed. If processes with errors are found, they are listed on the final status screen. For each error listed, APPX allows you to "drill down" to the actual image where the overlap is found and immediately rearrange the image to accommodate the longer items.

➢   Press **ESC** to exit the **Toolbox** menu and return to the **Utilities** menu.

➢   Press **ESC** to return to the **APPX - Application Design** menu.

1.6 Testing Your Changes

➢ From the **APPX – Application Design** menu, select the **Run Test Database** option to run the Prospect Management System and test your changes. Explore the application and confirm that the new field length is actually in effect.

➢ After you have finished testing the application, press **ESC** from the **Prospect Management System** menu to return to the **APPX-Application Design** menu.

1.7 Exercise 1 – Summary

So far, **without any prior knowledge of the DMO application**, you have:

❑ Identified the domain that is used to define prospect number data fields;

❑ Identified all fields that are based on the PROSPECT NO domain;

❑ Expanded the domain and all fields based on the definition of the domain from a four-digit to a five-digit numeric field;

❑ Restructured the four affected data files so that the existing data in these files was modified to match the new record structures;

❑ Checked all processes to determine that there were no item overlaps as a result of expanding the field sizes.

❑ Tested the application to confirm that the changes work as anticipated.

These steps may have taken you ten or fifteen minutes to complete because you had to read and follow the instructions outlined in this guide.

An experienced APPX designer can perform these exact same steps in less than two minutes!

But…An experienced APPX designer who is also familiar with the DMO application can confidently complete the PROSPECT NO field length change in less than one minute.

Is there any other business application development environment you know of that can match this degree of productivity? There are no other changes that need to be made to the Prospect Management System Demo application to implement the change in length that you made to the prospect number field. The change is fully implemented. **Not a single line of code had to be changed. Not a single screen or report had to be changed**. The application, in its entirety, is still fully operational and fully implements the change in length made to the prospect number fields in four different files!

2.0 Exercise 2 - Adding New Fields to an Existing File

The management team at Dazzle would like to gather additional information on the type of prospects they are attracting. In particular they are interested in information relating to the software and operating systems currently being used by Dazzle's prospects, and also the number of users. To track this information, you are instructed to add three new fields to the PROSPECT file: Current Operating System, Current Software, and Current Number of Users.

2.1 Adding a TOKEN Field to a File

➢ From the **APPX - Application Design** menu, select the **Database Management** option.

➢ From the **Database Managemen**t menu, select the **Files** option.

➢ Select the **PROSPECT** file and then press **ENTER** to move to the **Fields** screen for the **PROSPECT** file. A quick way to accomplish this is to **double click** on **PROSPECT** in the scrolling file list. This will move you to the field level for the **PROSPECT** file as shown in *Figure E2.1* below.

Figure E2.1 – Fields in the PROSPECT File

➢ Change to **Add Mode** by pressing **F9** or by clicking on the button on the toolbar.

➢ APPX is now ready for you to enter the name of the first new field. Note that the file name has automatically been entered for you as a prefix for the Field Name *(Figure E2.2)*. The inclusion of the file name as a prefix in the field name is the recommended field naming convention in APPX. Adopting this programming standard makes it simple to identify the file to which a field belongs and thus makes an application more easily maintainable. APPX automatically sets the file name into the field name to encourage the designer to adhere to its recommended programming standards with minimal effort. Of course, you can choose to override this default and enter any field name.

Figure E2.2 – Adding a New Field to a File
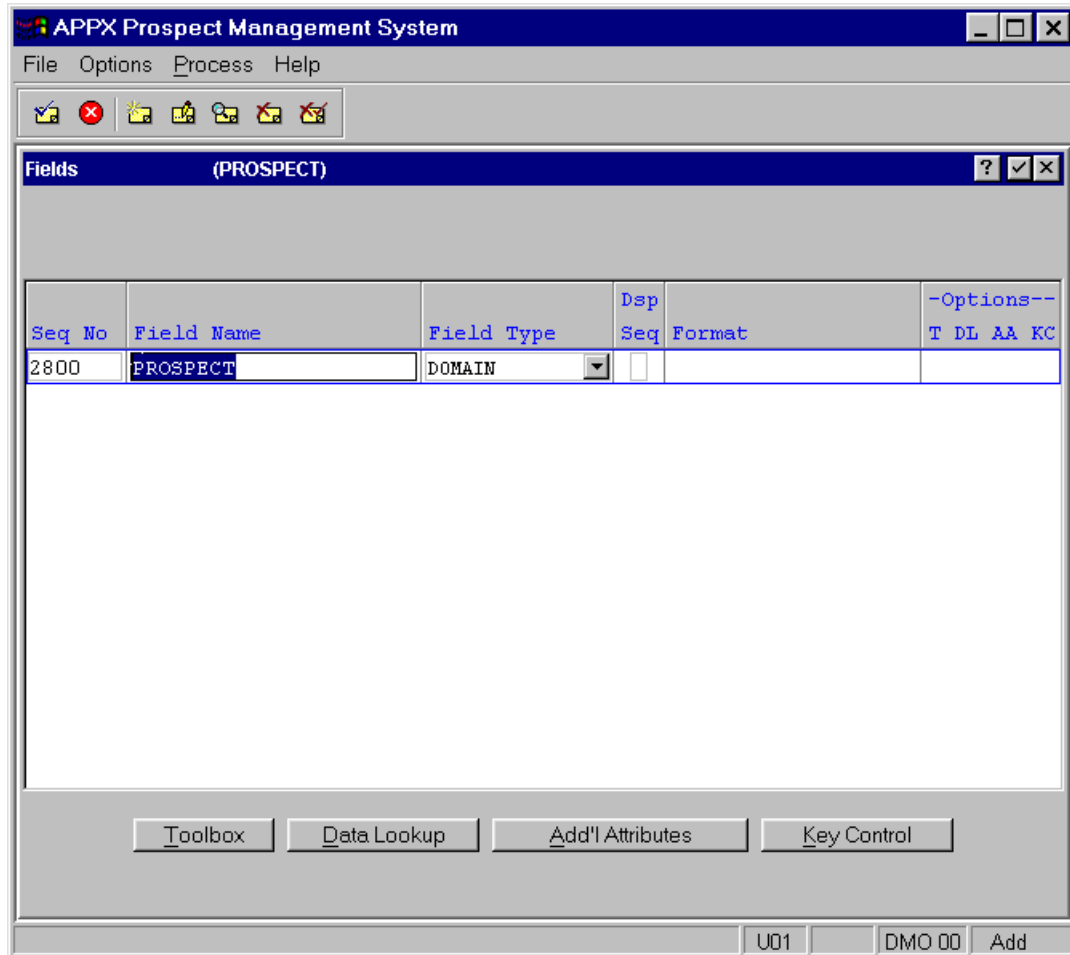
➢ Use the **right arrow key** or the **End** key to move to the end of the defaulted file name, press the **Space Bar** to append one space after the file name, and then enter "CURRENT O/S" (where O/S denotes Operating System) as the first new field name so it becomes **PROSPECT CURRENT O/S**. Note that the maximum length allowed for a field name in APPX is 22 characters.

Click on the ▾ button to the right of the Field Type field to view the list of valid field types. Briefly, the available field types are:

- **DOMAIN,** which assumes the attributes that are predefined for an alphanumeric, date, logic, or numeric domain.
- **ALPHA**, for fields that can contain numbers, letters, and special characters (such as *-, #,* or *&*).
- **FORMAT**, for fields that will contain an edit mask, such as postal codes, phone numbers, or the like.
- **SYSTEM**, for fields that can contain a usage type.
- **TEXT**, for text fields.
- **TOKEN**, for fields with specific values that are stored as corresponding numbers.
- **NUMERIC**, for fields restricted to number, decimal (.), and sign (-) entries.
- **DATE**, for fields that contain dates and/or times, from a hundredth of a second through a century.
- **LOGIC**, for fields with possible values of *yes (1)*, *no (0)*, or a blank to represent an unknown value.
- **SYNONYM,** which provides an alternative name for referencing an existing APPX field.
- **SUBSTRING,** which represents a discrete portion of a longer alphanumeric field.
- **GROUP HEADER,** which marks the beginning and end of a group of fields.
- **GROUP TRAILER**, which is used to define the final field in a group of fields defined by a GROUP HEADER.

➢ Select the **'TOKEN'** field type as shown in *Figure E2.3*. A TOKEN field type will enable you to define a list of valid values for this field, from which the user will be able to select at runtime. Using the Token field type ensures consistency in the data entered by users and will facilitate efficient data entry.
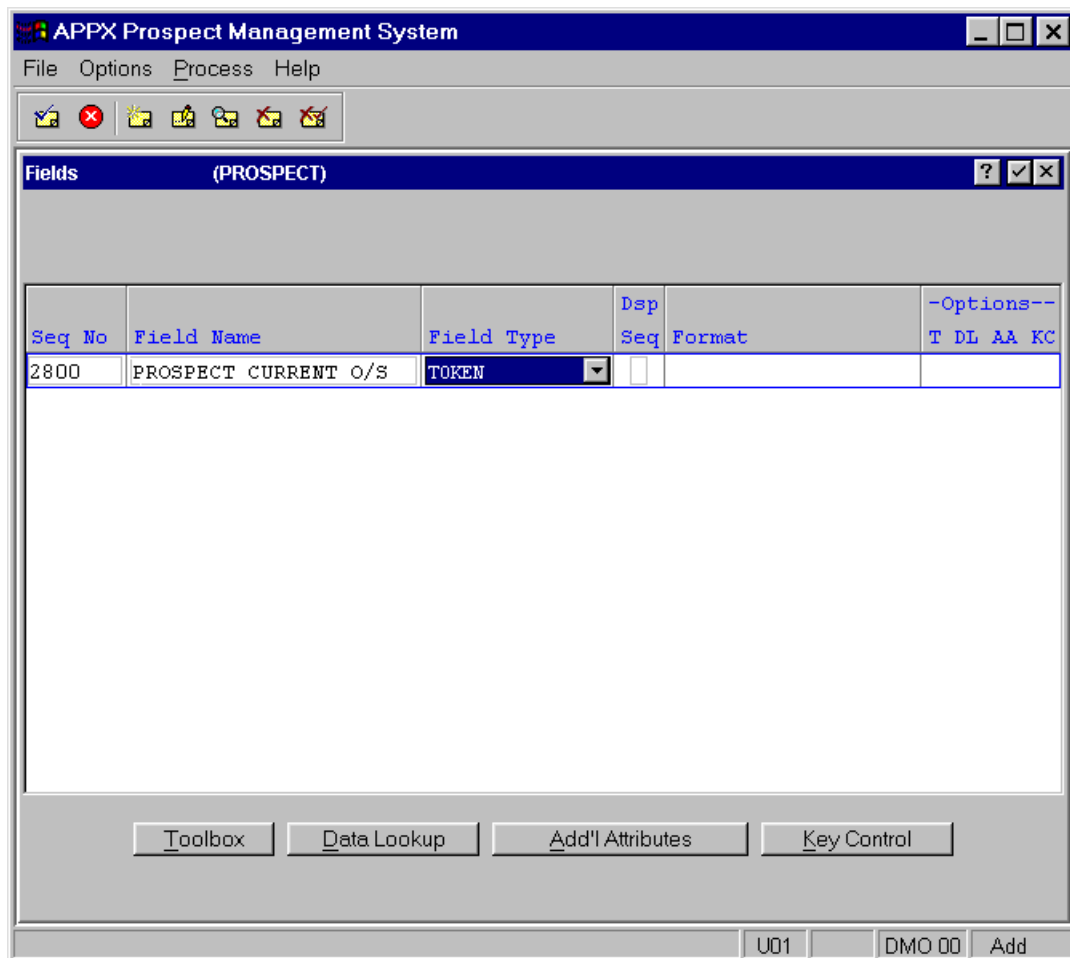
Figure E2.3 – Selecting the Field Type for a Field

➢ Press **ENTER** to save the information entered and move to the field specification screen.
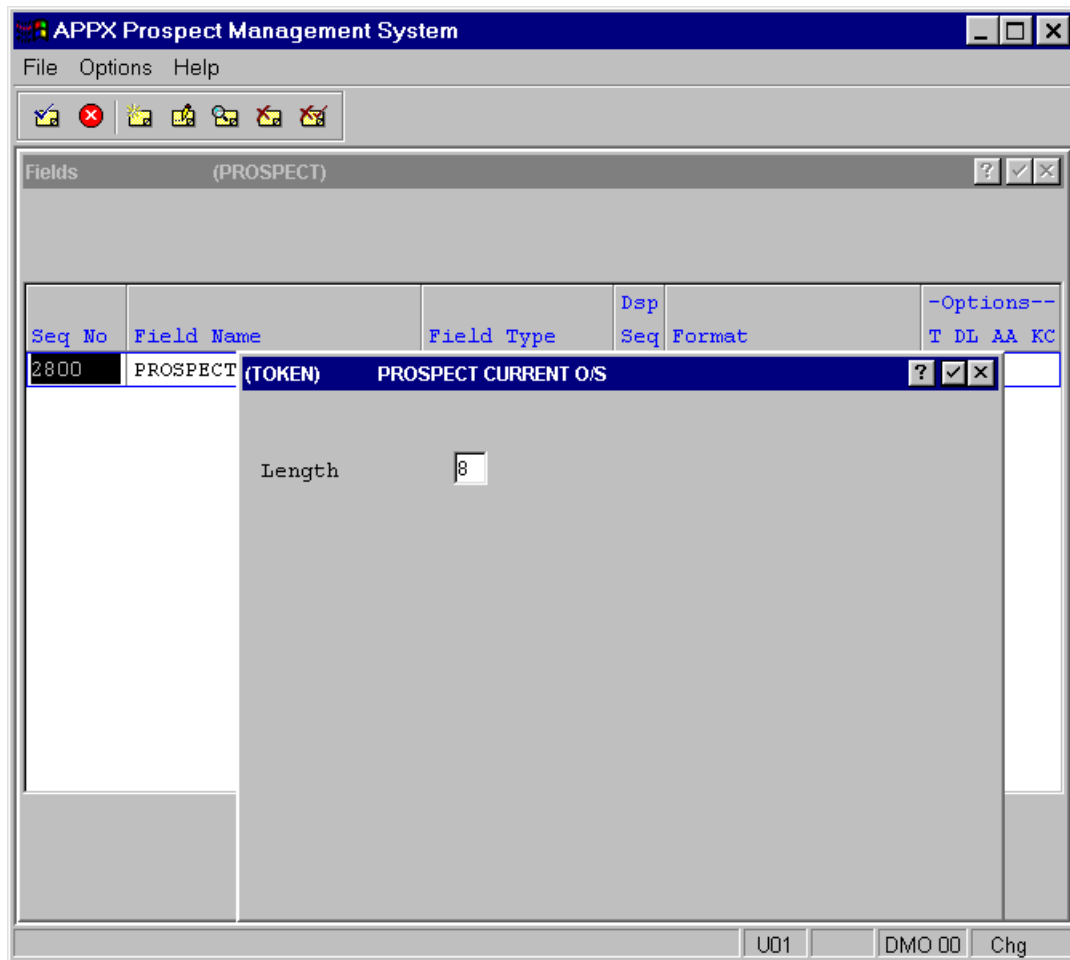
Figure E2.4 – Entering the Field Length

➢ Enter **8** as the field length and then press **ENTER** to continue.
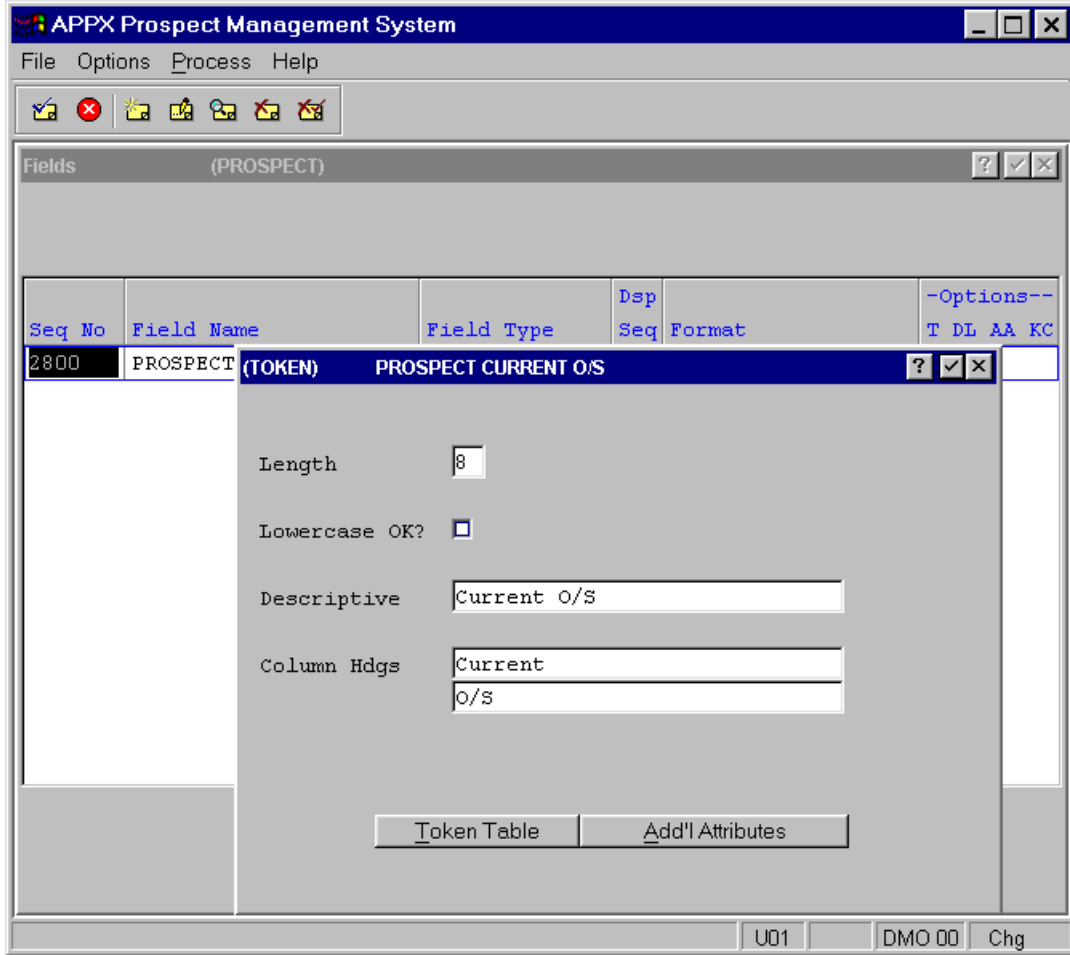
Figure E2.5 – Entering Other Field Specifications

➢ Click on the **'Lowercase OK?'** checkbox so the value changes to blank thus disallowing the entry of lowercase values.

➢ Accept the defaulted values for the Descriptive and Column Heading fields by pressing **ENTER** to continue.
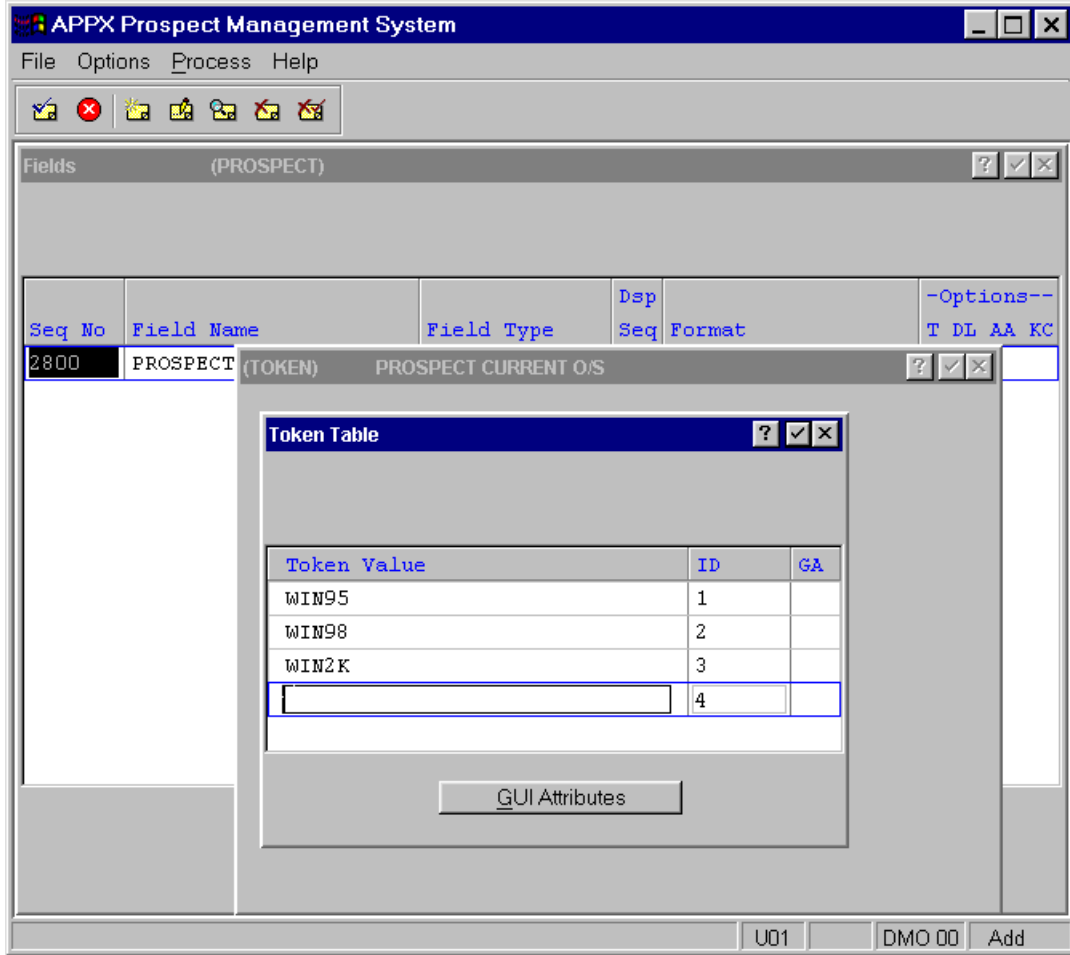
Figure E2.6 – Entering Token Table Values

➢ You are now prompted to enter the valid values for your token field. Each value that you add will be allocated a unique sequence number by APPX. Enter **WIN95** and press **ENTER** to save the Token value. Now enter the following Token values (pressing ENTER to save each one): WIN98, WIN2K, WINNT, IBM-AIX, HP/UX, LINUX, MAC, AS/400, and WANG VS. Feel free to enter additional values if you wish.

➢ Press **ESC** to exit the token file once you have finished entering the list of Token values.
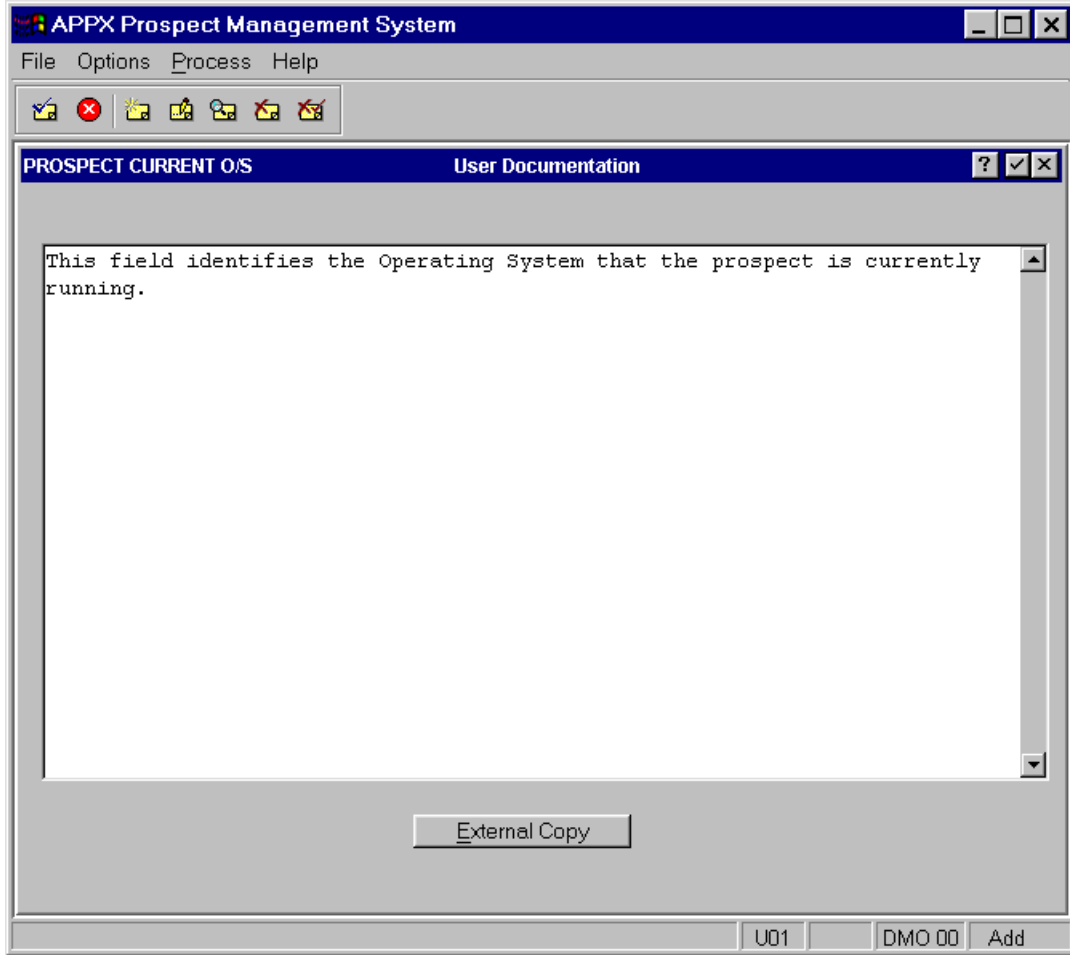
Figure E2.7 – Entering User Documentation for a Field

➢ Enter some suitable documentation for the field on the **User Documentation** screen. Bear in mind that this is the Help Text that the users will see at runtime if they request Help on this field.

➢ Press **ENTER** to complete the entry of the first new field.

2.2 *Adding an ALPHA Field to a File*
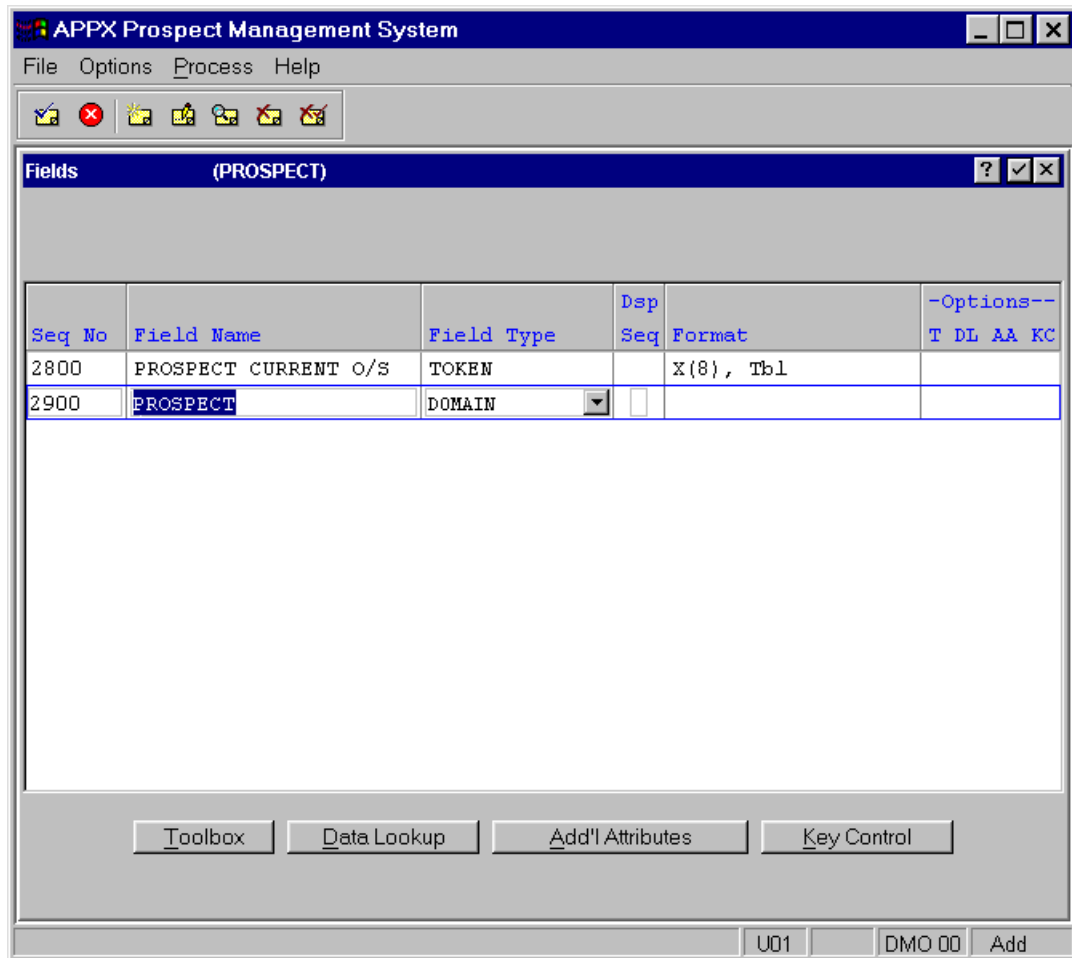
Figure E2.8 – Adding Another New Field to a File

➢ Now add the second field. Enter **PROSPECT CURRENT S/W** (with S/W representing Software) as the next field name.

➢ Select the **ALPHA** field type and press **ENTER**.

➢ Enter **20** as the field length and leave the 'Lowercase OK?' field checked (meaning 'Yes').

➢ Press **ENTER** to continue.

➢ Enter the **User Documentation** and press **ENTER** to complete the entry of the second new field.

2.3 *Adding a NUMERIC Field to a File*

➢ The name of the third field to add is **PROSPECT CURRENT USERS** (number of users).

➢ Select the field type **NUMERIC** for this field and press **ENTER**.

➢ Enter **5** in the Digits Left field and **0** in the Digits Right field.

➢ Accept the defaults for the remaining fields on the screen and press **ENTER** to continue.

➢ Enter the **User Documentation** and press **ENTER** to the entry of the field.

➢ *Figure E2.9* shows how the APPX screen should look once you have completed the entry of the last of the three new fields.
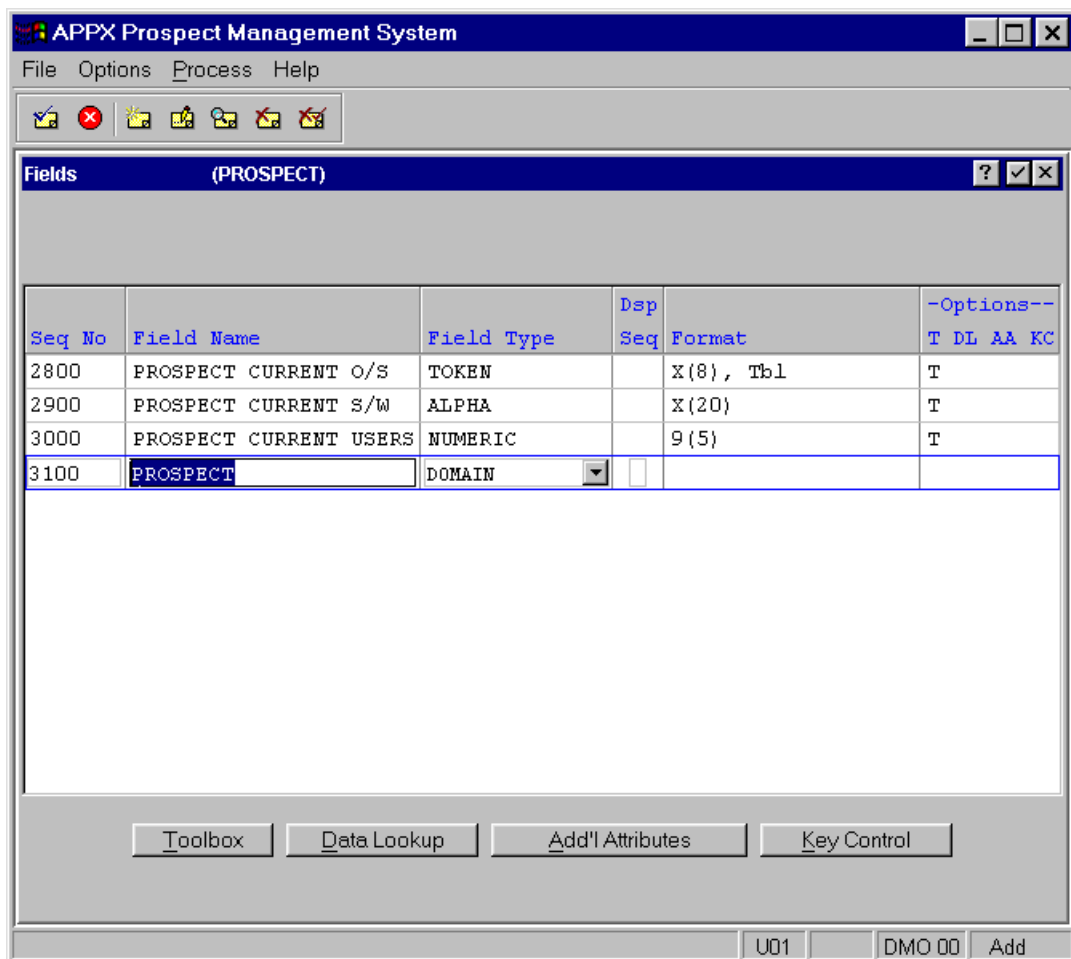
Figure E2.9 – The Fields Screen After Adding Three New Fields

➢ Press **ESC** to exit the PROSPECT **Fields** screen.

➢ Press **ESC** to exit the DMO **Files** screen.

2.4 Processing the Data Dictionary

➢ As you exit the **File** screen, APPX automatically processes the Data Dictionary. Notice that Domains and the PROSPECT file are both processed. A status screen is shown following the processing of the Data Dictionary *(Figure E2.10)*. If no error messages are displayed, then you know that the fields have been added successfully. If an error is displayed, then you will need to correct the problem indicated before continuing.
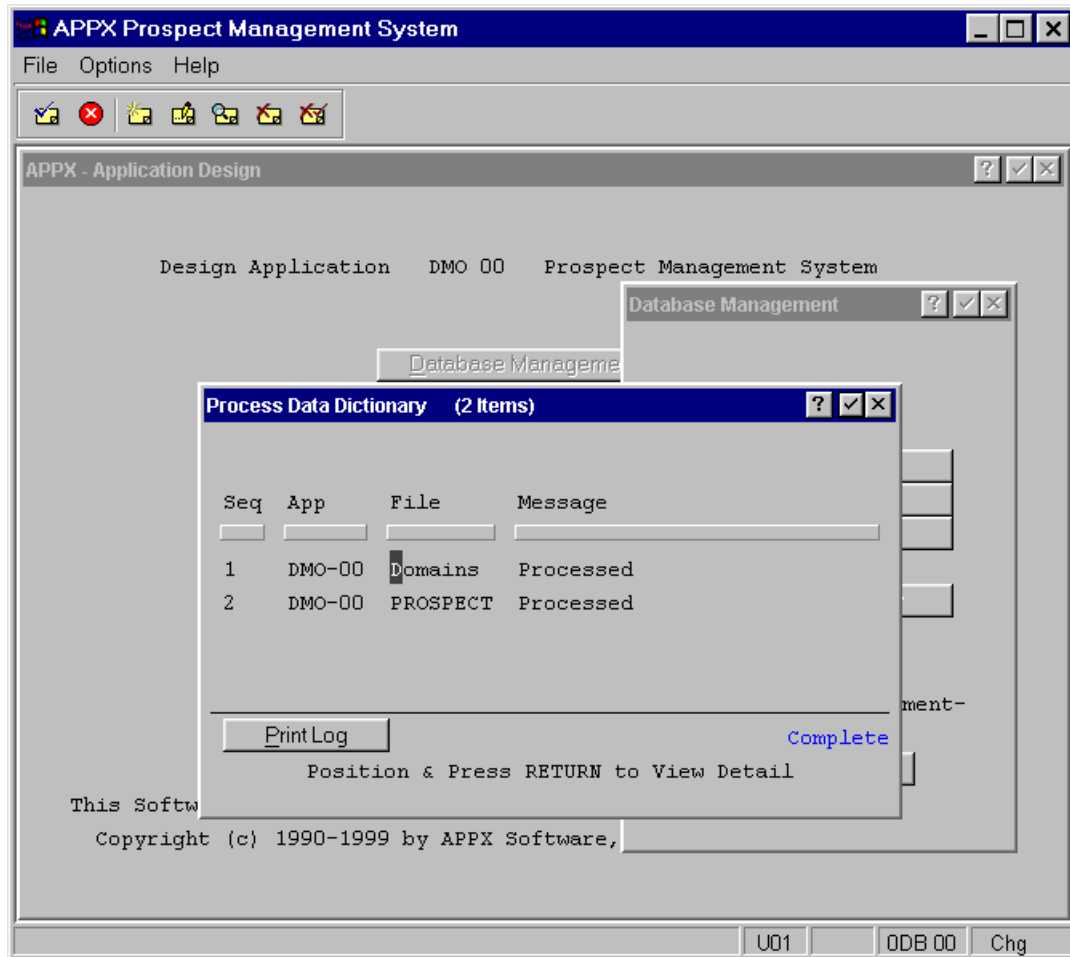
Figure E2.10 – Data Dictionary Processing Status Screen

➢ Press **ESC** to return to the Database Management menu.

➢ Since you have changed the structure of the PROSPECT file you must now restructure the existing data to match this new structure. Select **File Management** on the **Database Management** menu.

➢ Press **ENTER** to confirm the default database selection of **DMO** and to have APPX validate it and display the database description.

2.5 Restructuring Data Files

➢ Select the **Restructure Files** option to restructure the **PROSPECT** file.

Following the restructure, a status screen is displayed showing that the **PROSPECT** file has been restructured and the status of the restructure *(Figure E2.11)*.
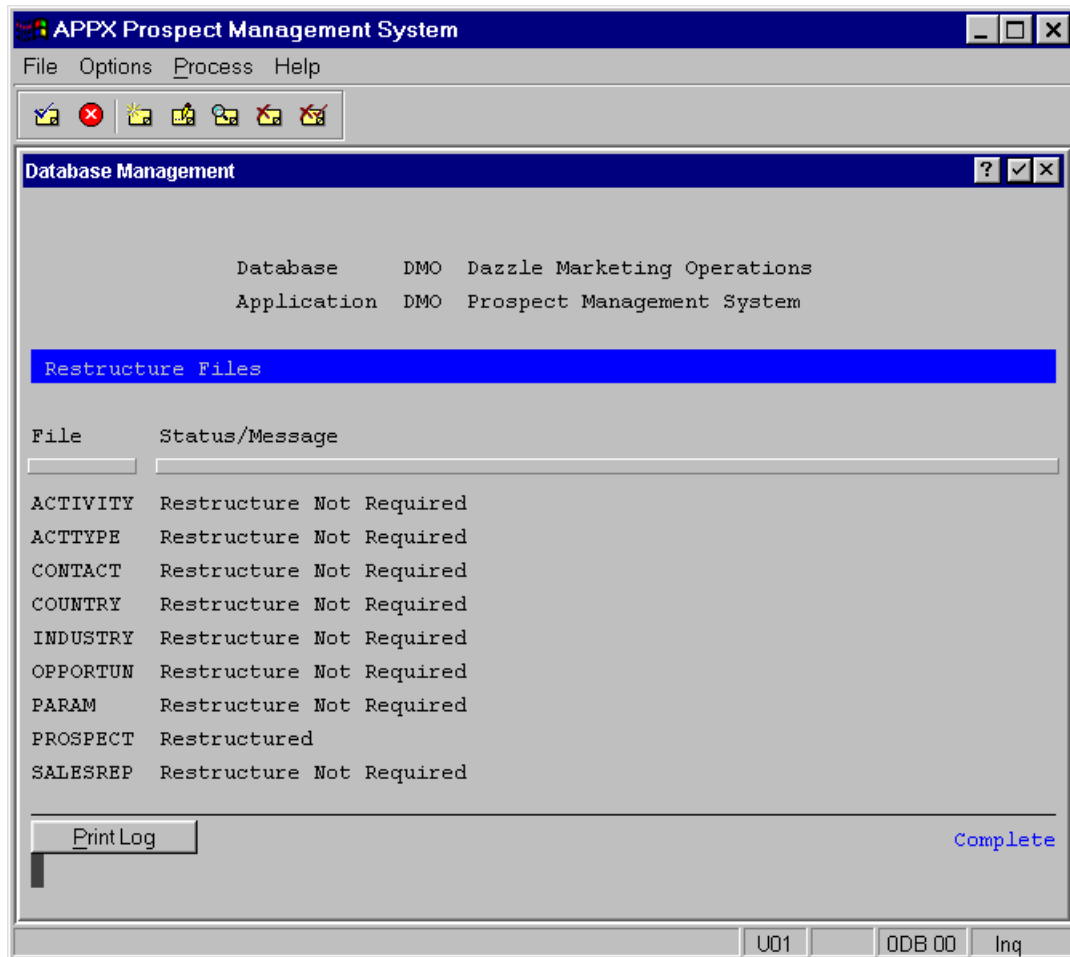
Figure E2.11 – APPX File Restructure Status Screen

➢ Press **ESC** to exit the File Restructure Status screen.

➢ Press **ESC** twice to return to the **APPX - Application Design** menu.

2.6 Exercise 2 – Summary

In this exercise, you have:

❑   Added three new fields to the PROSPECT file;

❑   Restructured the existing data files for database DMO;

At this point, the three new fields have been added to the PROSPECT file and the Prospect Management System is still fully operational. However, if any new prospect records are added to the PROSPECT file, the new fields will have their default values stored in the record since we have not yet provided an input process to allow entry of the field values.

3.0 Exercise 3 – Designing and Implementing a New Input Process

Having added three new fields to the PROSPECT file in *Exercise 2,* you must now provide your users with a means of entering data into these fields. For the purposes of this tutorial, rather than adding the fields to an existing Input Process (which would be a trivial exercise), you will create a new, pop-up Input Process that can be run on demand from the Prospects input process.

In this exercise, you will create a pop-up input process like the one show below in *Figure E3.1.*
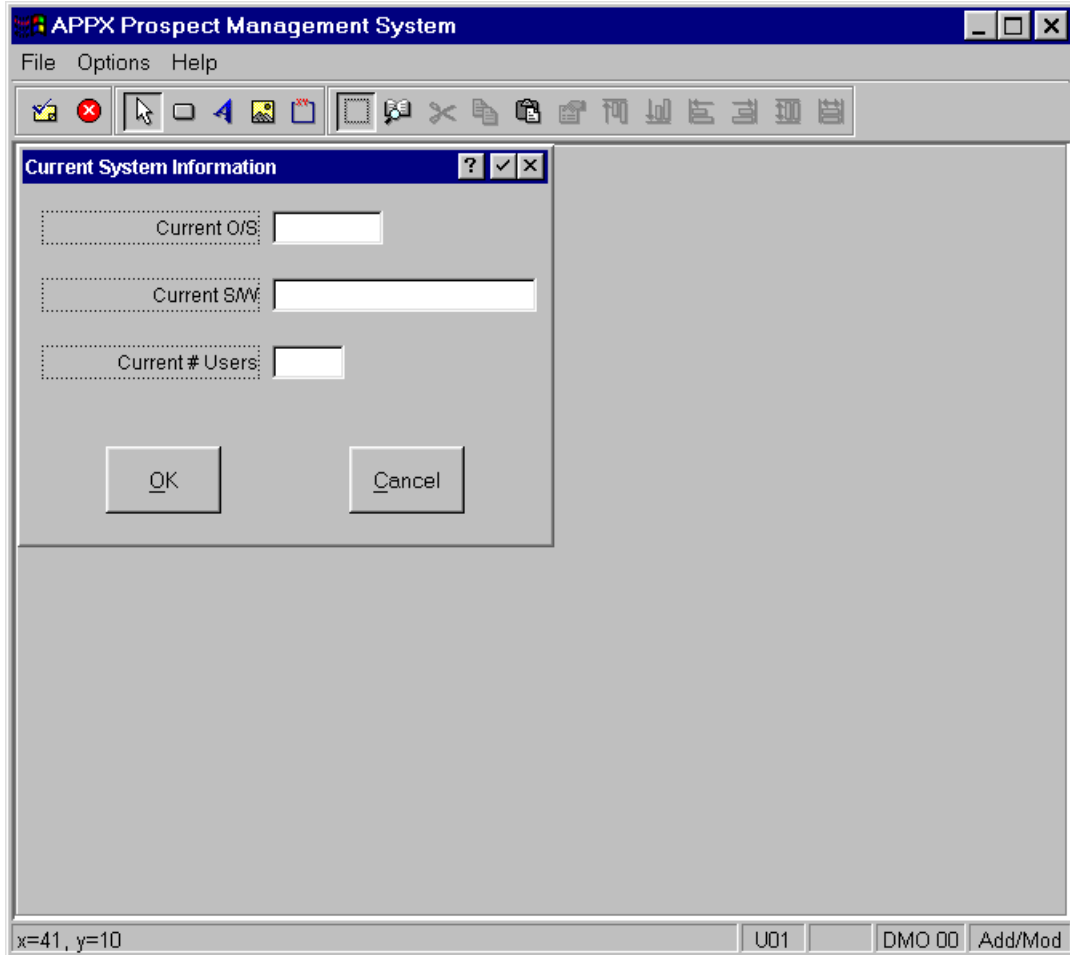
Figure E3.1 – Pop-up Input Process for "Current System Information" Fields

3.1 Design a New Input Process

The APPX Input Processes utility can be used to design a new input process for the Prospect Management System.

➢ From the **APPX - Application Design** menu, select **Process Management**.

➢ From the **Process Management** menu, select **Input**.

The **Input Processes** screen will be displayed as shown in *Figure E3.2* below. The **Input Processes** utility can be used to design and maintain input processes for the Prospect Management System.

Process Name	--- PCF ---- App File		-Opts- T R AA
ACTTYPE FILE MAINTENANCE	DMO ACTTYPE		T R AA
CONTACTS FILE MAINTENANCE	DMO CONTACT		T R
COUNTRY FILE MAINTENANCE	DMO COUNTRY		T R AA
DISPLAY AUDIT INFO			T R AA
FOLLOWUP	DMO OPPORTUN		T R AA
INDUSTRY FILE MAINTENANCE	DMO INDUSTRY		T R AA
MARKETING ACTIVITY	DMO ACTIVITY		T R
MARKETING ACTIVITY - DETAILS	DMO ACTIVITY		T R
PARAMETERS FILE MAINTENANCE	DMO PARAM		T
PROSPECT ADDRESS	DMO PROSPECT		T
PROSPECT FILE MAINTENANCE	DMO PROSPECT		T R AA
SALES OPPORTUNITIES	DMO OPPORTUN		T R
SALES OPPORTUNITIES - DETAILS	DMO OPPORTUN		T R AA

Figure E3.2 – Input Processes for Application DMO

➢ Since you want to define a new input process, press **F9** or click on the [ ] button on the APPX toolbar to move into Add Mode.

➢ Enter "**PROSPECT CURRENT SYSTEM INFO**" in the **Process Name** field. This will be the name of the new input process that you are adding.

The application ID of "**DMO**" has already been entered into the **PCF App** field for you.

➢ Enter "**PROSPECT**" in the **PCF File** field. The **PROSPECT** file is the name of the **PCF** (Process Control File) that will be maintained by this input process.
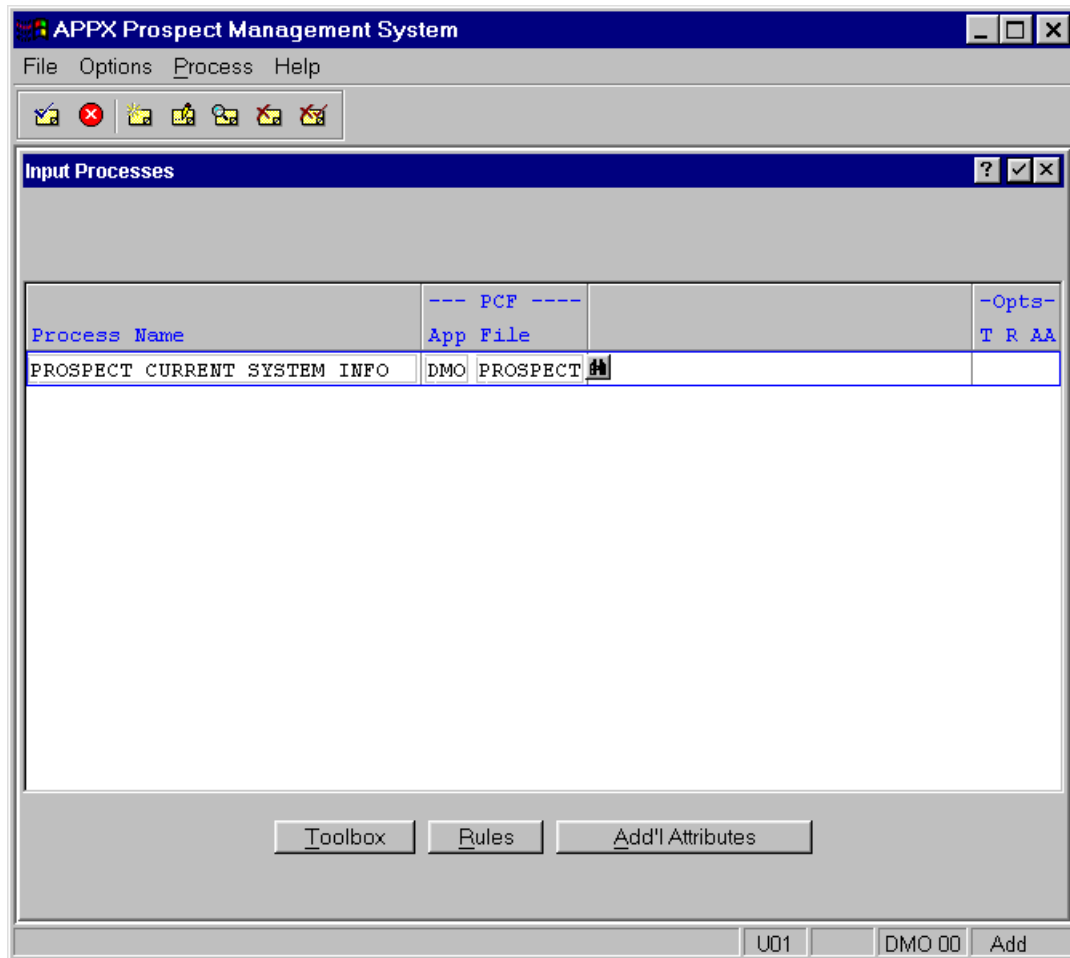
Figure E3.3 – Adding a New Input Process

➢ Press **ENTER** to move to the **User Documentation** screen and enter documentation text for this process as shown in *Figure E3.4* below.

➢ Press **ENTER** to save your documentation and move to the **Frames** screen for the new input process. Note: If you have entered more than one line of documentation, you may need to press **ENTER** a second time.
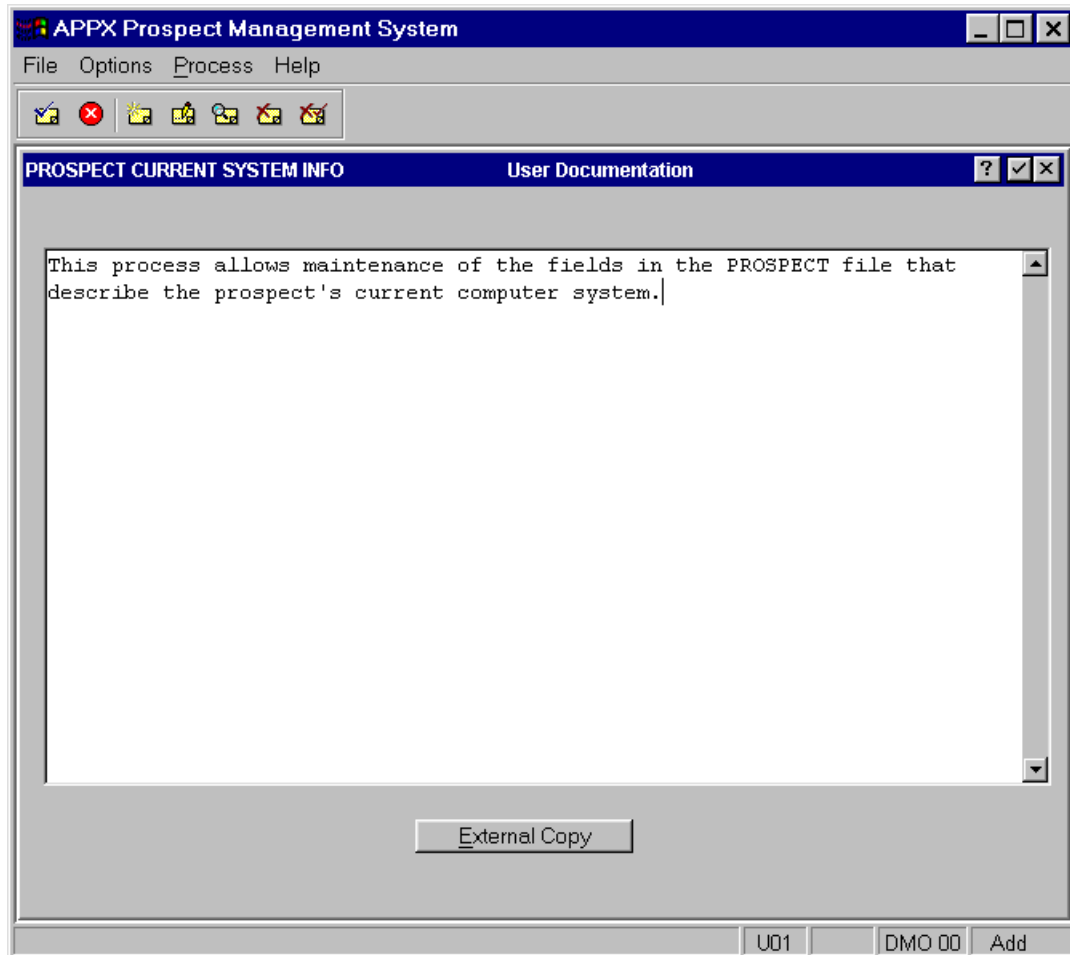
Figure E3.4 – Input Process Documentation

APPX input processes always have one or more frames. A frame defines a region on a screen within which an image will be presented for displaying and/or entering data. Each frame will have one or more images defined.

➢ Enter **"0"** (zero) in the **Row Position** field and **"0"** (zero) in the **Column Position** field. Zero values in these fields instruct APPX to center the pop-up input process on the screen when invoked. Of course you could just as easily specify your own coordinates for the positioning of the pop-up input process on the screen, but why not let APPX do the work for you?

➢ Enter **"10"** as the **Row Size** and **"40"** as the **Column Size**.

➢ Click on the **Box** field until it is **checked**. Checking this field tells APPX to draw a border box around your frame/image before it is displayed to the user.

➢ Accept the defaults for all other fields on the **Frames** screen and press **ENTER** to move to the **Images** screen.
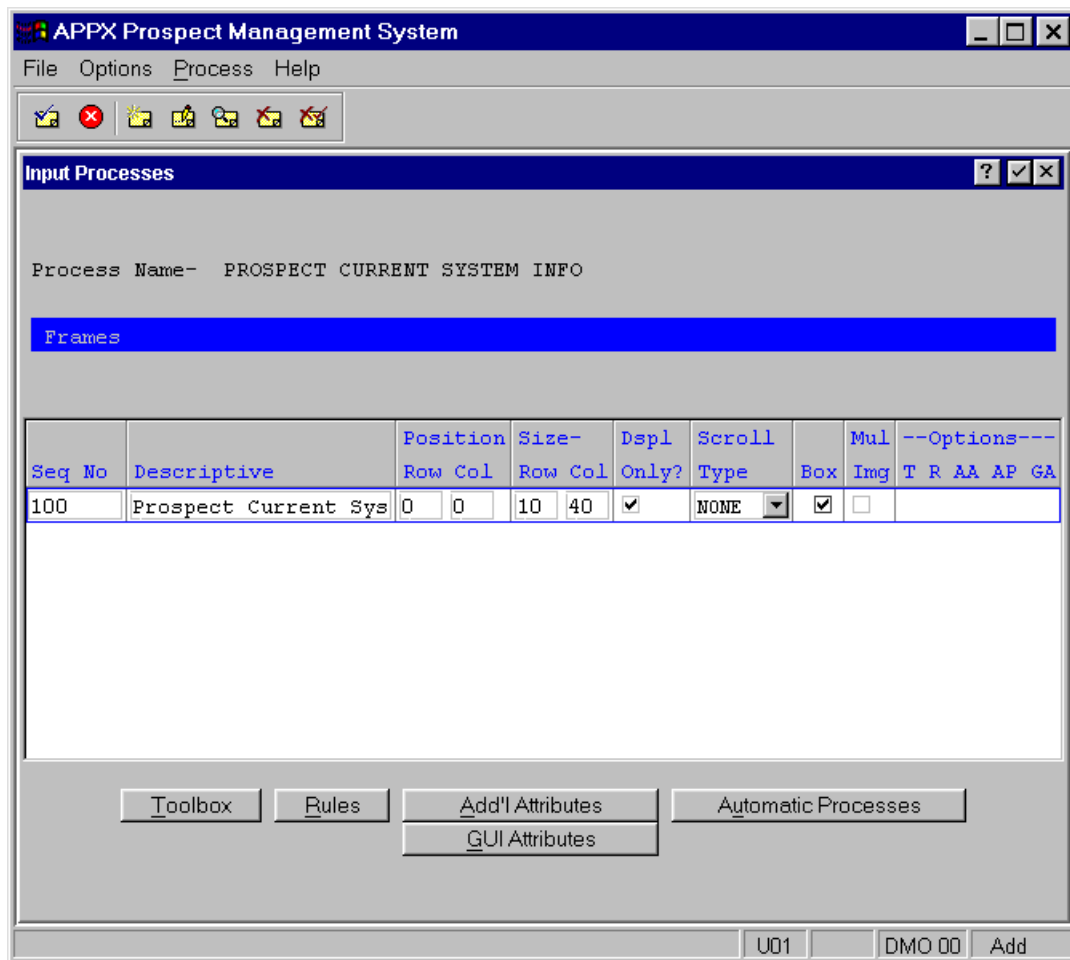
Figure E3.5 – Input Processes – Frames

Each Input Process **Frame** may have one or more **Images**. If there is more than one Image defined for a Frame, the Images are referred to as **Alternate Images**. However, only one image will actually be displayed at runtime. The image displayed will depend on the image selection criteria.

Your input process will have a single image. Notice that the **Descriptive** field has already been filled in for you in *Figure E3.6*.

Each Image can have GUI attributes specified. GUI attributes can be specified for a Titlebar and for other window features such as a wallpaper image, background color, and border style.
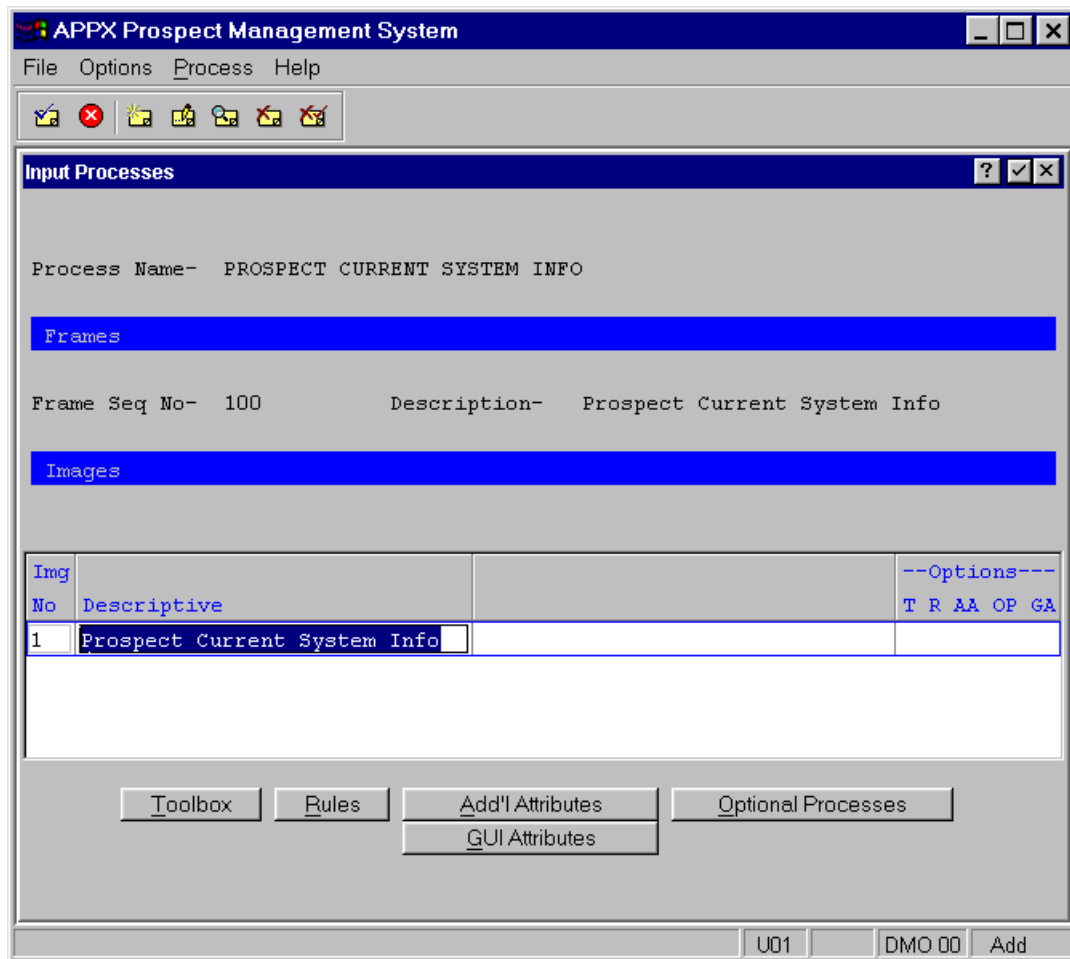
Figure E3.6 – Input Processes – Images

➢ For this Input Process Image, you would like to specify the attributes for a titlebar. Select **GUI Attributes** to access the **Window Properties** screen for this image.

➢ *Figure E3.7* shows the Window Properties screen for the image. Enter "**Current System Information"** as the **Title** for the titlebar. Simply specifying the text for the title is sufficient for APPX to know that you want a titlebar displayed for the pop-up input process screen image you are designing.
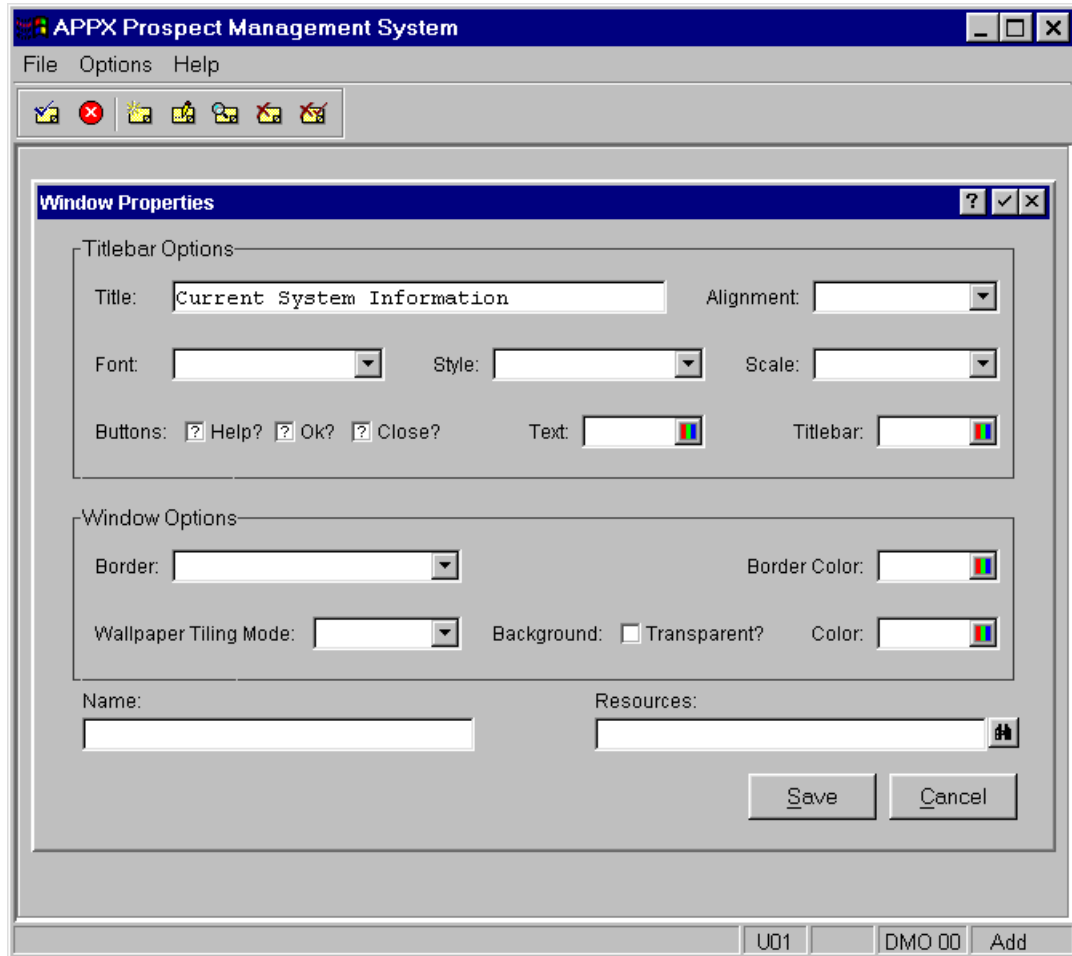
Figure E3.7 – Input Process Titlebar

➢ Press **ENTER** or click on the **Save** button to save the **Window Properties** and return to the **Images** screen.

Upon returning from **GUI Attributes**, you notice that the '**GA**' indicator has been set. This is APPX's way of telling you that you have specified at least one GUI Attribute for this image.

➢ From the **Images** screen, press **ENTER** to access the **Image Editor** where you will be able to design the actual layout of the screen.
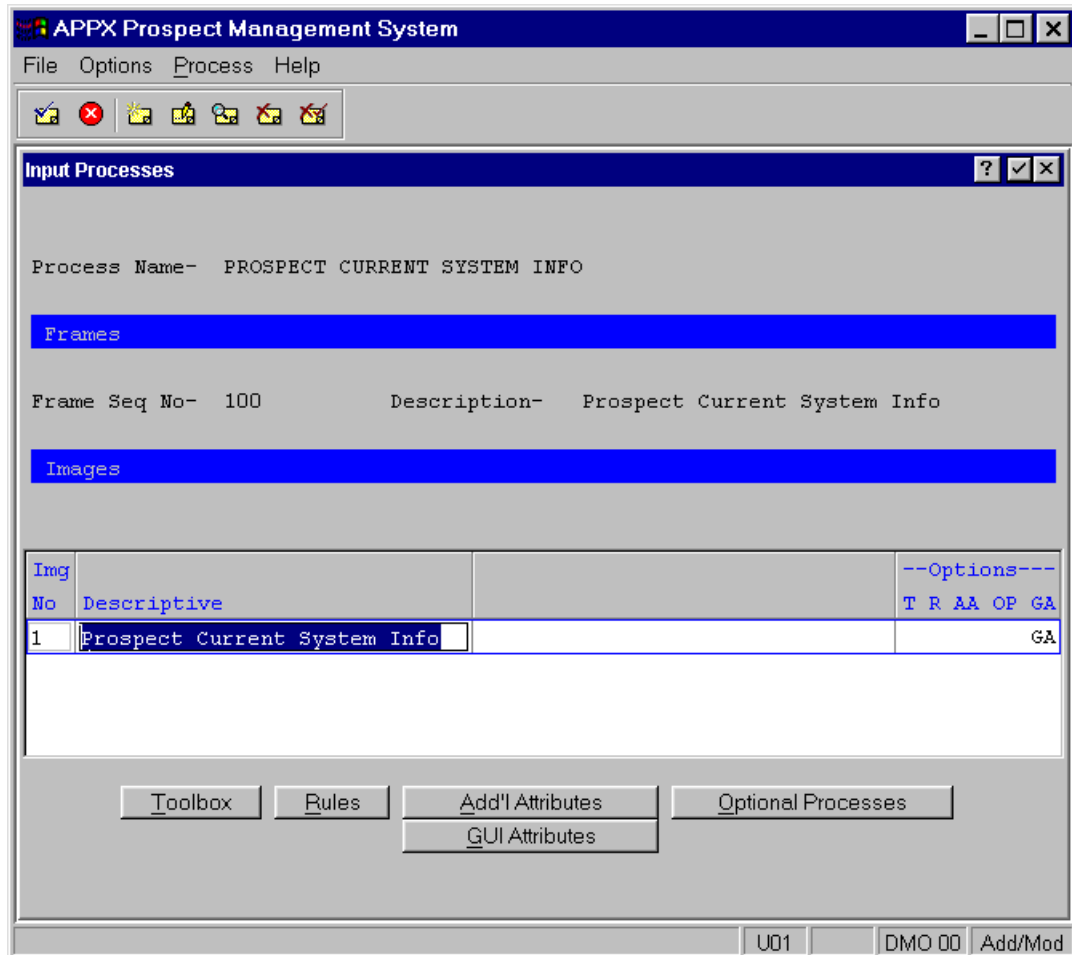
Figure E3.8 – The Images Screen After Entering GUI Attributes

appx The Prospect Management System *Application Design* **Demo**

The APPX Image Editor allows you to visually layout the screen exactly as the user will see it at runtime.
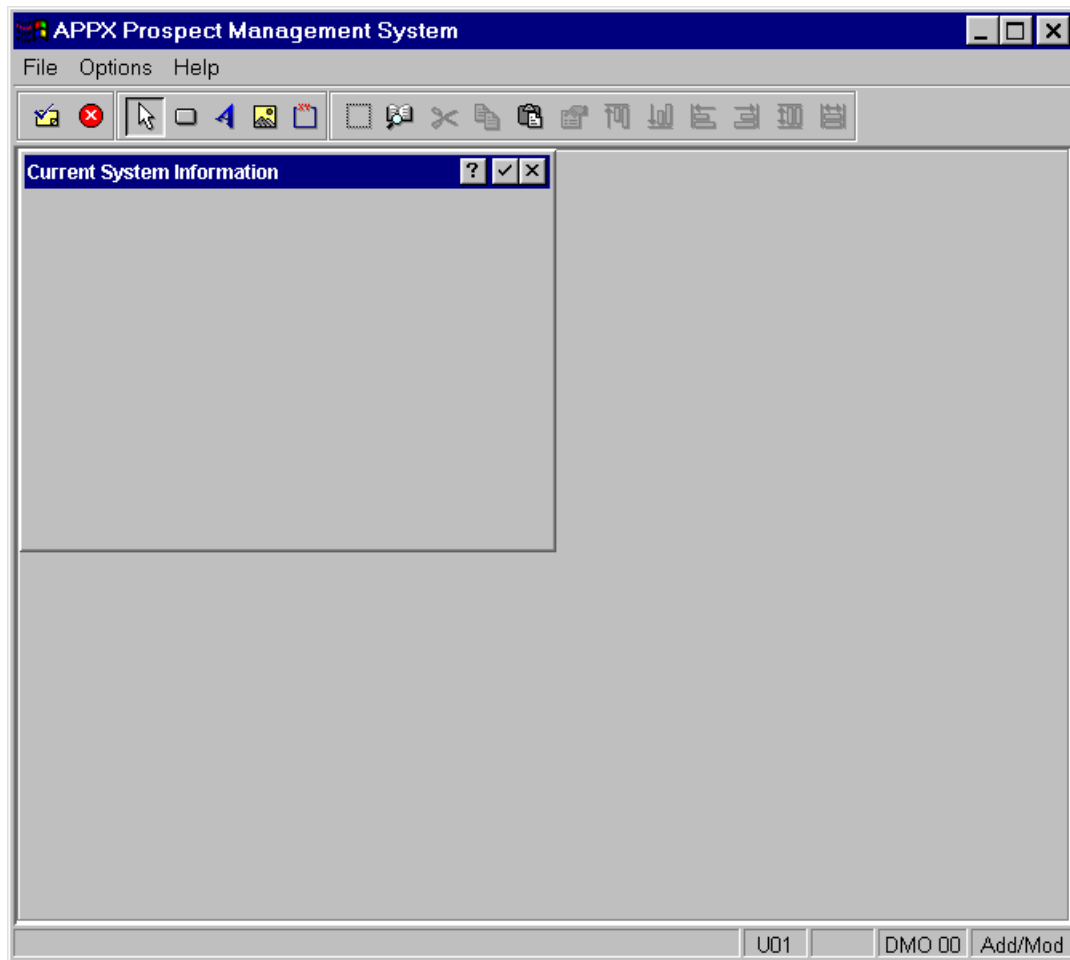
Figure E3.9 – The APPX Image Editor

Note that the image editor has displayed a "blank" pop-up screen image in *Figure E3.9* which already includes the titlebar that you just defined and that the standard Help, OK and Close buttons have been added to the titlebar. Your task is to now use the APPX Image Editor to add various GUI widgets such as labels, fields, and buttons to the screen image As you will soon see, this is very easily done.

The image editor toolbar provides buttons for defining various types of "static" GUI widgets (buttons, labels, pictures, and frames). As you will see later, data fields that you add to an image can be represented by a variety of GUI control types depending on the underlying field type.

The order in which you add widgets (GUI objects) to the image is not important. But, for the purposes of this demo, we will add widgets in the following order:

1) Labels
2) Fields
3) Buttons

➤ First, you need to add a Label for each of the three data fields that are to be placed on the image. Label widgets are used to add static or non-modifiable text to the screen. First, click on the Label tool ( ) on the toolbar. Then, position the mouse pointer to the point on the screen image where you would like to place the top left corner of the label, click, and, holding the left mouse button down, drag out a rectangle representing the approximate size you would like for the label. Release the mouse button and the Label Properties screen will pop up *(Figure E3.10 below)*.

➤ The **Label** field is used to specify the text that is to appear on the screen. For your first label, enter "**Current O/S**".

➤ For **Text Position** you will specify "**RIGHT**" so that the label text will be right justified within the label control.

➤ The only other field you will change on this screen is the Font Option **Scale**, which you will set to **90%**.

➤ There are several other fields on the Label Properties screen that you will leave blank at this time. For example, you could specify a preferred font, font style, text color, label fill color or label border. When widget fields are left blank APPX will apply default attributes when the item is displayed. It is often advantageous to specify as few GUI properties and let APPX determine appropriate default values.
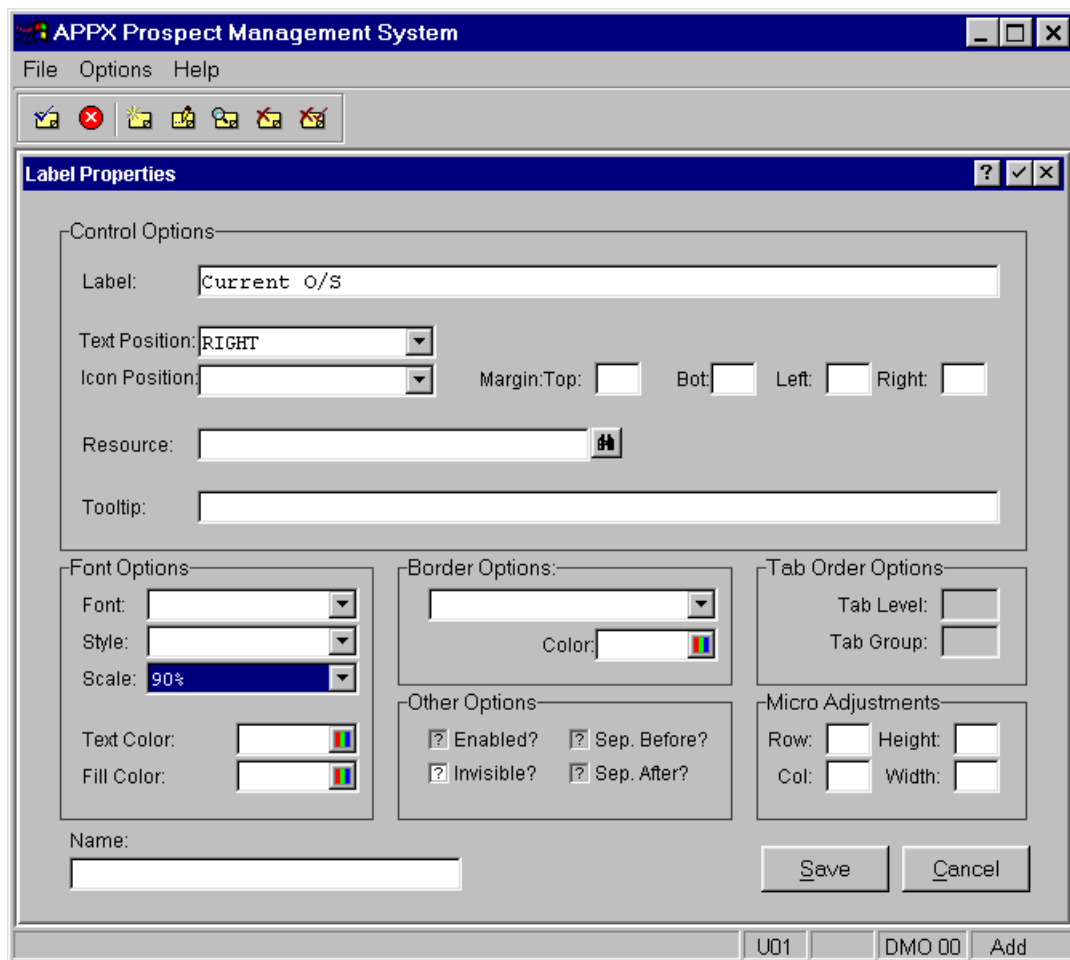
Figure E3.10 – 'Current O/S' Label Properties

➤ Click on the **Save** button or press **ENTER** to save the Label.

You are returned to the Image Editor. The label text is displayed on the screen image *(Figure E3.11)*.

Note: If you would like to see an outline showing the size of your labels (as shown in *Figure E3.11* below), click on the **Show Object Bounds** toolbar button to turn on this feature. This outline will not be visible to users at runtime.
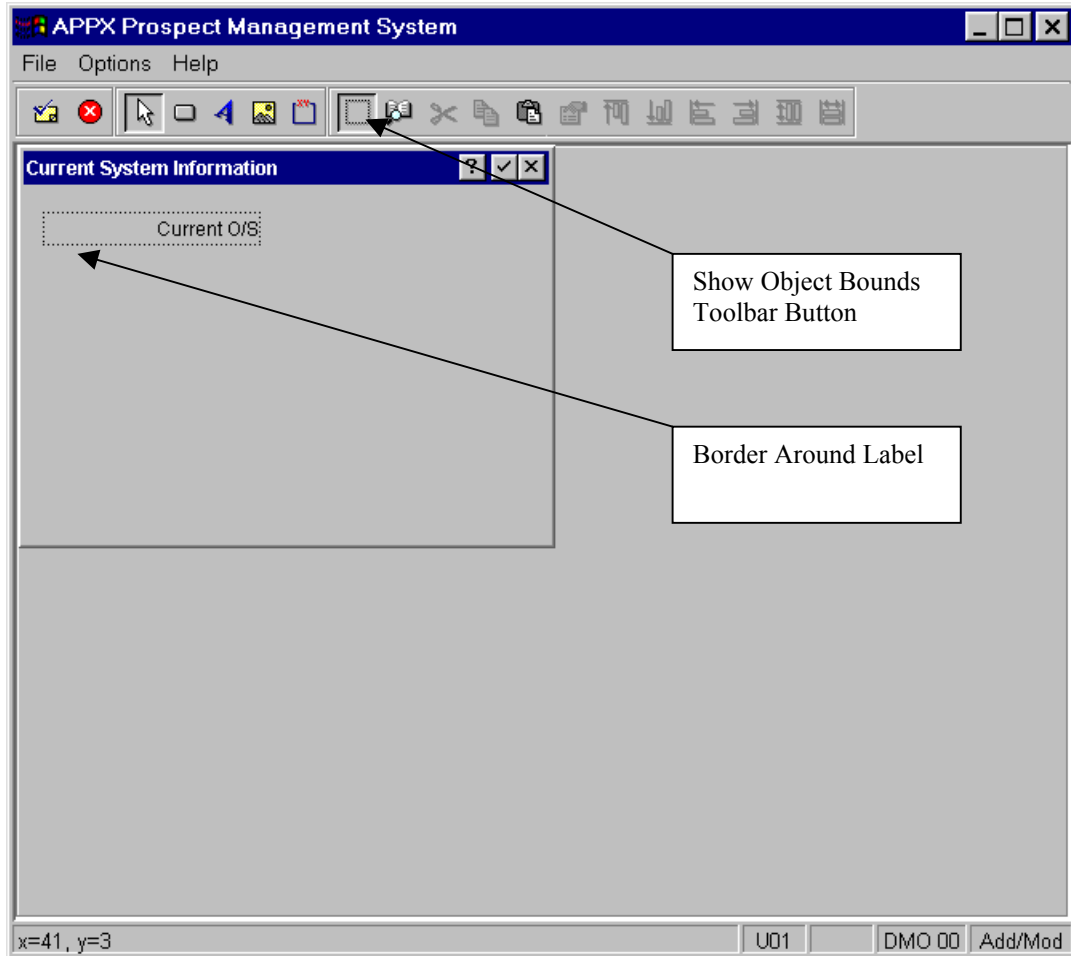
Figure E3.11 – Input Process Image After Adding First Label Widget

Note: After adding a label widget, you can click on the label to select it and you can use you mouse to reposition or resize the label on the screen image.

➢ Repeat these steps to add labels for **Current S/W** and **Current #Users**.

After adding all three labels, your screen image should look like the image shown in *Figure E3.12* below.
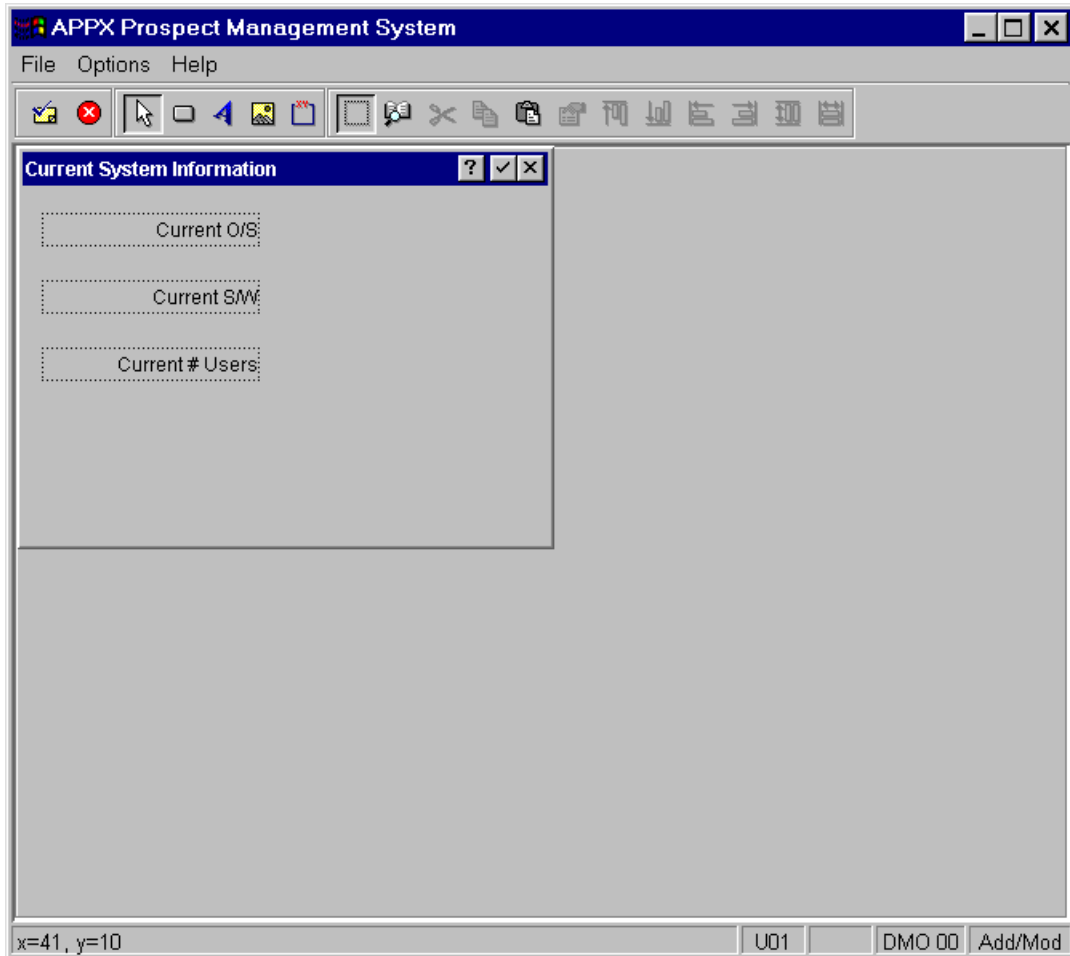
Figure E3.12 – Input Process Image After Adding Three Label Widgets

➢ The next step is to define the appropriate fields on the image. APPX conveniently includes a **Data Palette** which can be used to quickly "drag and drop" data fields from a list to the point on the image where you would like them to be positioned. To open the Data Palette, select the **Data Palette** icon [icon] on the APPX toolbar.

➢ You are presented with a **Data Palette** displaying a list of APPX applications from which to select *(Figure E3.13)*. You can resize and/or move the Data Palette window at any time to make viewing the file and field lists easier.
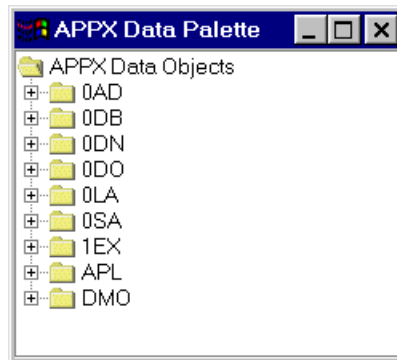
Figure E3.13 – APPX Data Palette - Applications

➢ Click on the "+" symbol to the left of the **DMO** folder icon (or double-click on DMO) to open the **DMO** folder. A list of all of the files in the DMO application is displayed as shown in *Figure E3.14* below.
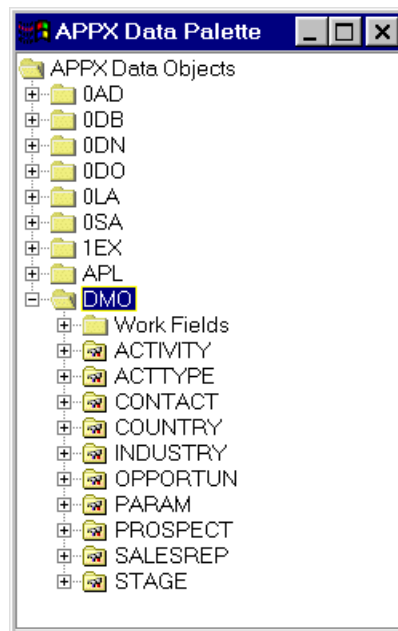
Figure E3.14 – APPX Data Palette - Files

➢ Select the **PROSPECT** file so the fields in that file are displayed.

➢ Use the **Scroll bar** to move to the end of the PROSPECT field listing. (*Figure E3.15*)
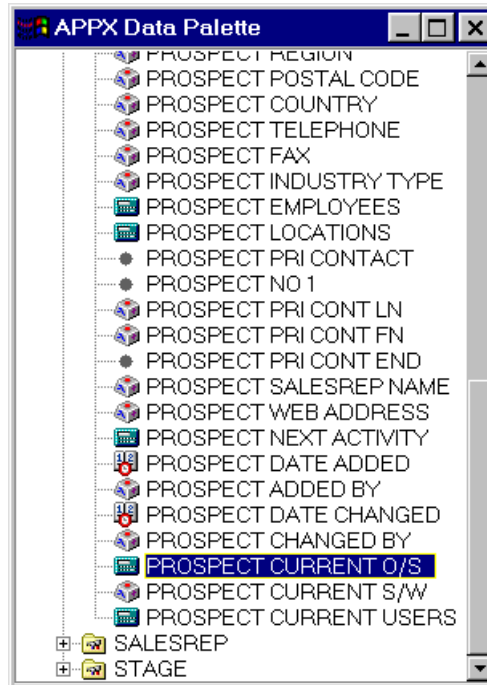
Figure E3.15 – APPX Data Palette - Fields

➢ Click on the **PROSPECT CURRENT O/S** field and, holding the left mouse button down, drag the field across your desktop and onto your screen image in the APPX Image Editor window and position it next to the Current O/S label. When the field is positioned where you want it, release the left mouse button and APPX will add the data field to the screen image. If you need to reposition the field at any time simply click on the field to select it and, holding down the left mouse button, drag the field to the desired position. You should not need to resize the field since APPX will have sized it according to the Data Dictionary specifications for the field.

➢ Repeat this process for both the **PROSPECT CURRENT S/W** field and the **PROSPECT CURRENT USERS** field, dragging each of them onto the screen image and positioning them next to their respective labels.

➢ Once all three fields have been added to your image, click on the ✖ in the top right corner of the APPX Data Palette window to close it since you are done with it.

➢ Back on your input image, if necessary, click on the labels and fields and drag them to appropriate positions on the image so they are aligned *(Figure E3.16).*
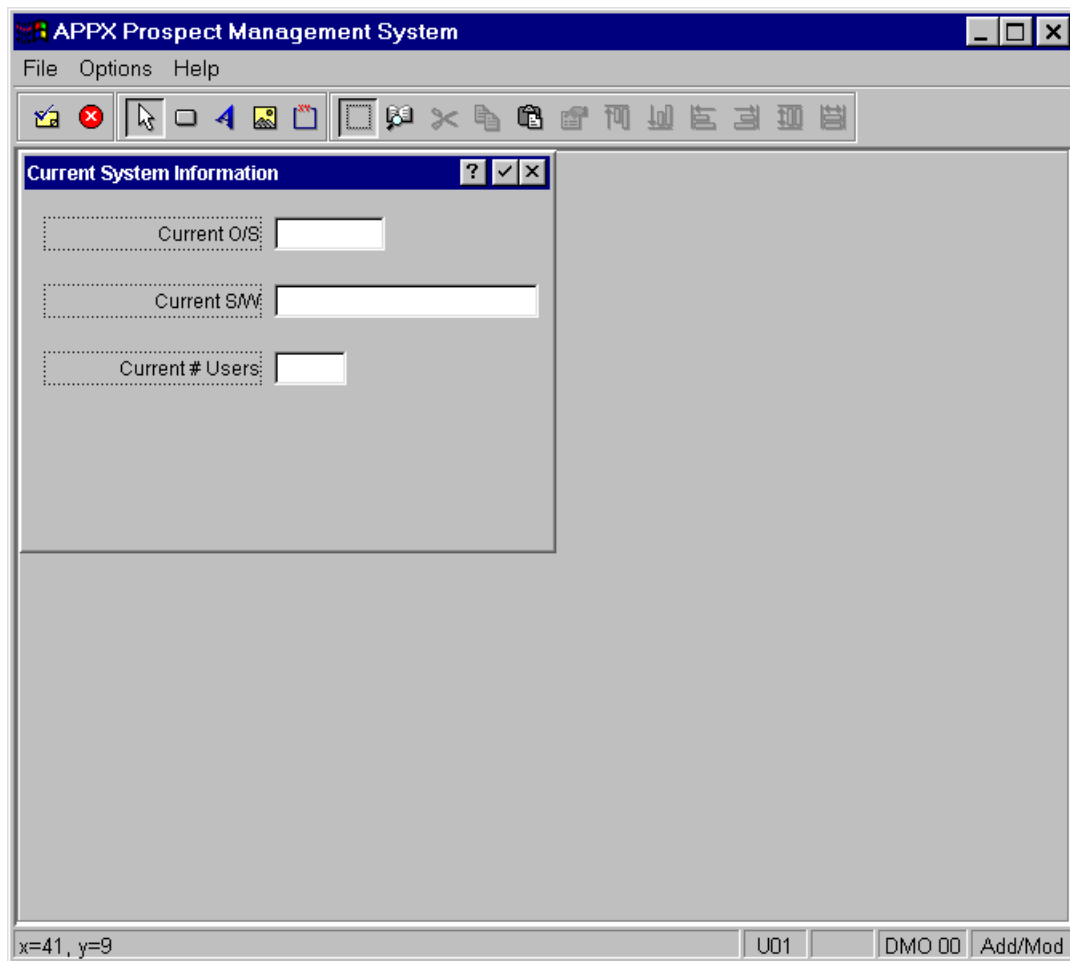
Figure E3.16 – Label & Field Alignment

Next, you need to add an **OK** button and a **Cancel** button.

➢ You decide to add the **OK** button first. Begin by selecting the button tool ( ) on the toolbar. Then, position the mouse pointer to the point on the screen image where you would like to place the top left corner of the **OK** button, click, and, holding the left mouse button down, drag out a rectangle representing the approximate size you would like for the button. Release the mouse button and the **Button Properties** screen will be displayed *(Figure E3.17 below)*.

Notice how similar this screen is to the **Label Properties** screen. One the many advantages of APPX is the consistent designer interface which allows new developers to become proficient very quickly.
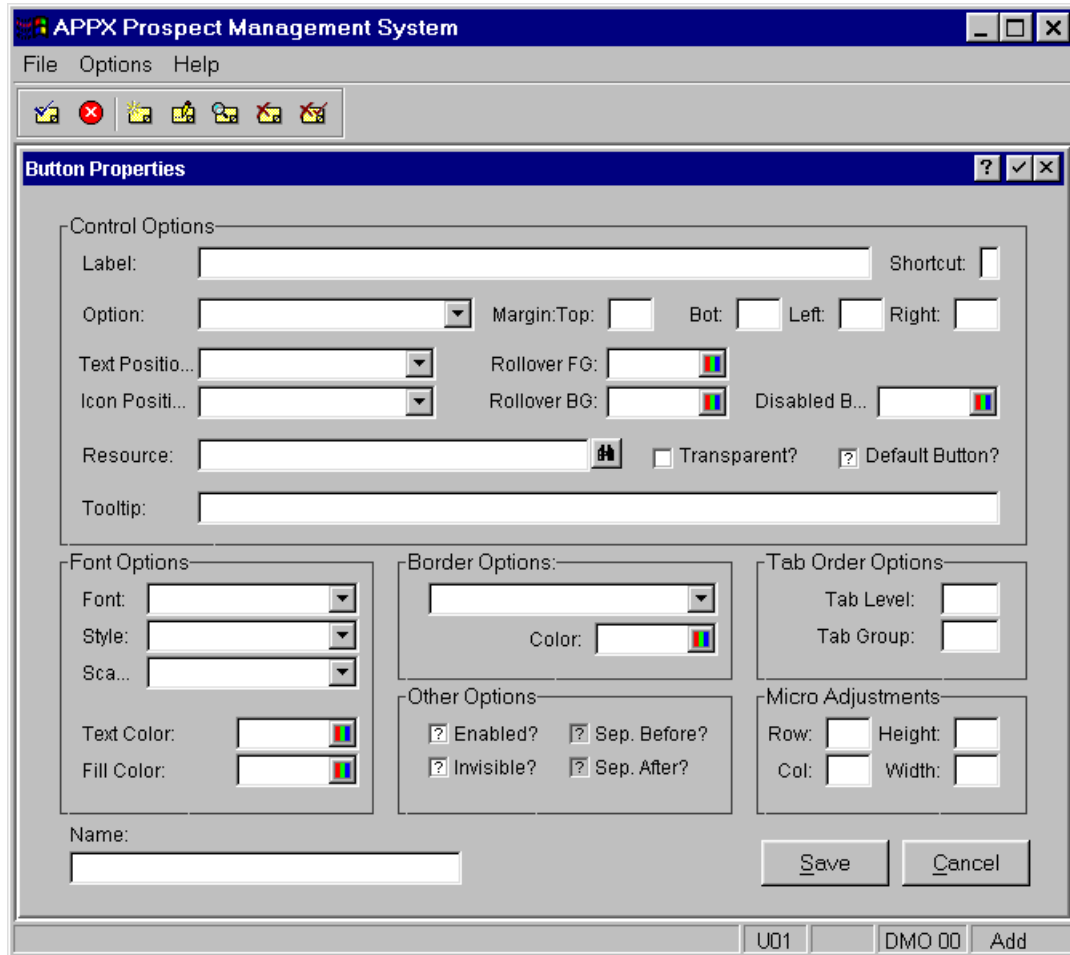
Figure E3.17 – Button Properties Screen

➢ The first button that you are going to define is the **OK** button so, in the **Label** field, enter **"OK"**.

➢ The **Shortcut** field is the hotkey for this button. Enter the letter, "**O**". This will enable the user to press Alt + O to save the record in addition to clicking on the **OK** button or pressing **ENTER**.

➢ The **Option** field is the APPX **Option** that will be sent when this button is clicked. You can scan on the field to make a selection from the list of available Options. Since the button that you are defining is the **OK** button, the Option value that you want to select is **RETURN** (which is the same as pressing the **ENTER** key).

➢ On the **Button Properties** screen you can define a rollover color for the button, change the text font, or do many other things, but for the purposes of this tutorial you can leave all other fields at their default values.

➢ Click on the **Save** button on the Button Properties screen to create the button.

➢ Now add a **Cancel** button. Enter "**Cancel**" in the **Label** field, "**C**" as the Shortcut, and "**CANCEL**" as the APPX Option to be sent when the button is clicked. Click on the **Save** button to create the button.

➢ Your input image should now look something like the image shown in *Figure E3.18*.
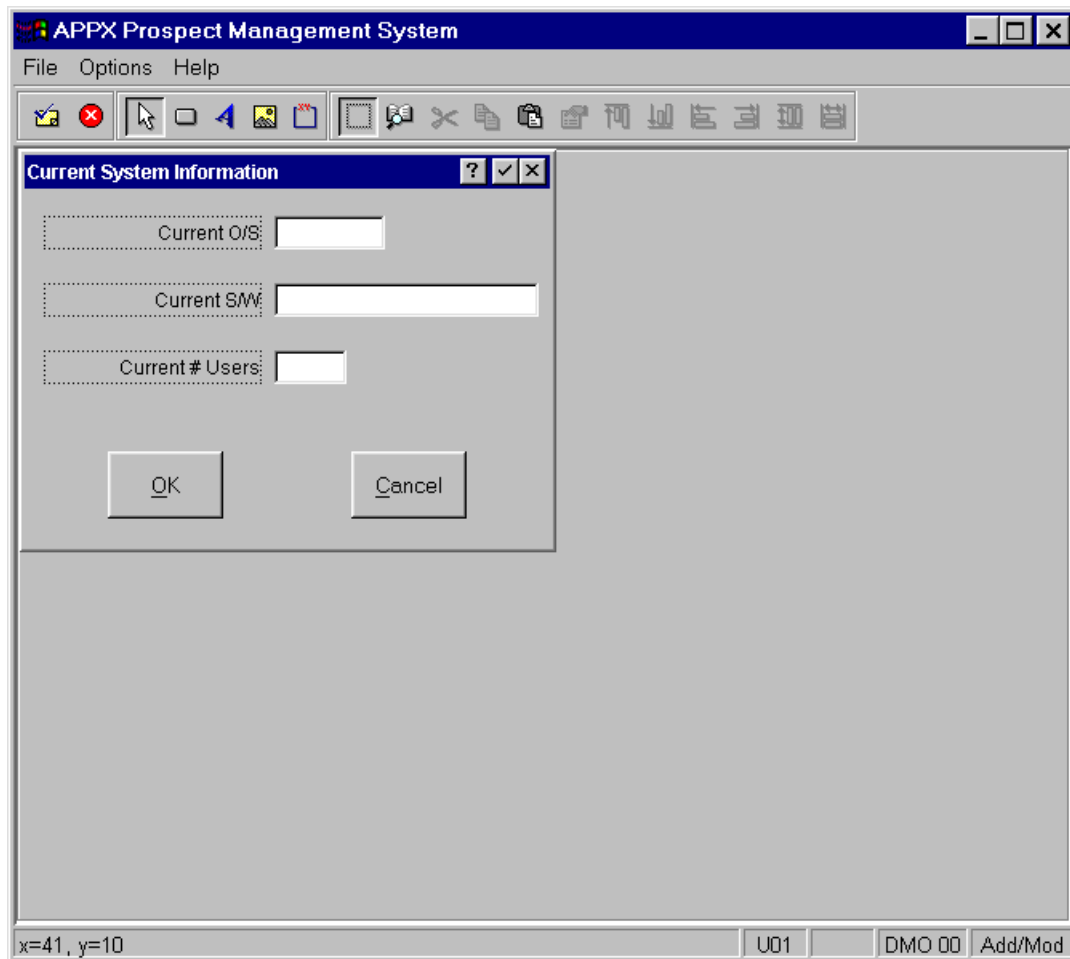
Figure E3.18 – Completed Input Image

➢ Your new input process is now complete.

➢ Press **F8** or **ESC** to save the image and return to the **Frames** screen.

➢ Press **ESC** to return to the **Input Processes** screen.

3.2 Adding an Optional Process

At this point, you have successfully created a new input process. But, there is no way for the user to run it. So, you now need to link this new input process to the existing Prospect Maintenance input process so it can be optionally run by a user while maintaining prospect records.

In this section of the exercise, you will add an **Optional Child** specification to the **PROSPECT FILE MAINTENANCE** input process and you will add a button on the image which will allow users to run the Optional Child.

➢   From the **Input Processes** screen, click on the [button image] button on the Toolbar (or press **F12**) to move into Change Mode and then press **ENTER** to display all input processes.

➢   Scroll through the **Input Processes** list and select the **PROSPECT FILE MAINTENANCE** input process.

➢   Press **ENTER** to access the **Frames** screen.

➢   Press **ENTER** to access the **Images** screen.

➢   The first task is to find an available option number that can be used to invoke your new input process. To review the existing **Optional Child Processes** for the **PROSPECT FILE MAINTENANCE** input process to determine which option numbers are available, click on the **Optional Processes** button.

➢   A scrolling list of the existing **Optional Child Processes** is displayed *(Figure E3.19)*.
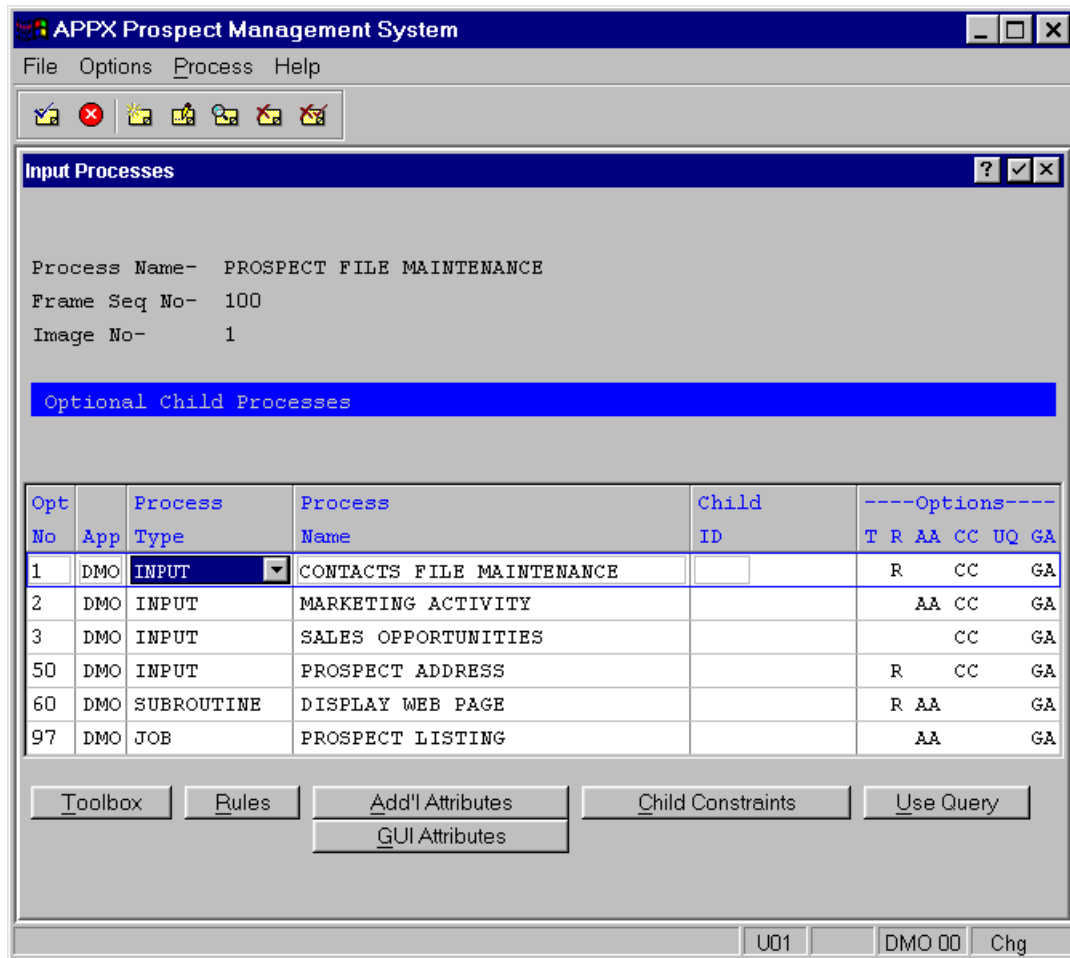
Figure E3.19 – Optional Child Processes Listing

From the listing you can see that the first three optional child processes have been assigned option numbers 1 through 3. Use the scroll bar (which appears as you move your cursor towards the far right column) to move through the existing optional processes. You will see that there are quite a few optional child processes already defined. But, since option number 4 has not been assigned, you can add your optional process as option number 4.

➢ Press **F9** to move into Add Mode so you can add a new **Optional Child Process**.

➢ Select the **Opt No** field and enter the digit "**4**".

➢ Select the **Process Type** field and enter "**INPUT**". You can use the ⏷ button to view a list of valid process types and select **INPUT** or you can simply press the letter "**I**" and **INPUT** will be automatically entered in the **Process Type** field.

➢ Select the **Process Name** field and enter "**PROSPECT CURRENT SYSTEM INFO**" (the name of the new input process you just created). If that is not what you called your input process or if you are having trouble remembering its name, simply press **F2** (**SCAN**) to view a list of all processes from which you can select the desired one.

➢ Press **ENTER** to continue and you are presented with a **Child Constraints** screen *(Figure E3.20)*.
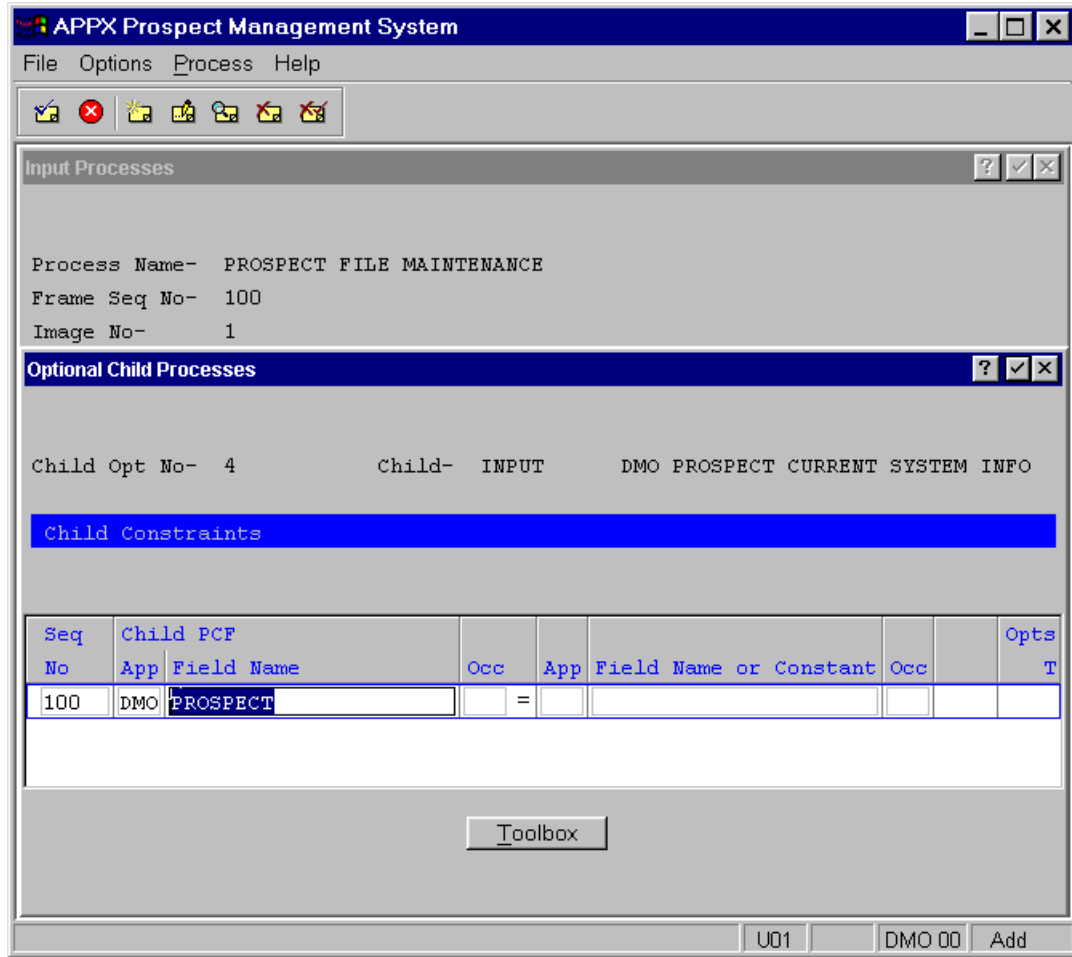
Figure E3.20 – Optional Process Child Constraints

➢ Child Constraints allow the APPX application designer to define the set of records that are to be maintainable by the child process. Remember that the input process you designed identified the PROSPECT file as the file that would be maintained. So, the child constraint is used to define the set of records in the PROSPECT file that will be maintainable when the child process is run. The left-hand side of the child constraint specification must always be a field in the Process Control File (PCF) of the child process that is to be run. The right-hand side of the child constraint specification must be a field within the parent process or a constant value. For your purposes, you want to specify that the child process is to maintain the exact same **PROSPECT** record as the parent process. So you need to constrain the data selection using the **PROSPECT NO** field. Both the parent process and the child process have the same Process Control File (PCF) which is the **PROSPECT** file. In the left-hand Application **"DMO"** and Field Name **"PROSPECT NO"**. In the right hand Application ID field enter **"DMO"** and in the right hand Field Name or Constant field enter **"PROSPECT NO"**. Note that the right hand Field Name/Constant accepts lowercase characters since a constant value may be in lowercase. However, if you enter an application ID and type a field name, the field name will automatically be converted to uppercase.

➢ Press **ENTER** to save the Child Constraint.

➢ *Figure E3.21* shows how your Child Constraint should look.


```
APPX Prospect Management System                          _ □ ✕

File   Options   Process   Help

☑  ⊗ | ⛶ ⛶ ⛶ ⛶ ⛶

Input Processes                                      ? ✓ ✕



Process Name-   PROSPECT FILE MAINTENANCE
Frame Seq No-   100
Image No-       1

Optional Child Processes                             ? ✓ ✕



Child Opt No-  4          Child-  INPUT     DMO PROSPECT CURRENT SYSTEM INFO

Child Constraints



 Seq   Child PCF                                          Opts
 No    App  Field Name        Occ   App  Field Name or Constant  Occ   T
 100   DMO  PROSPECT NO          =  DMO  PROSPECT NO
 200   DMO  PROSPECT             =



                    Toolbox

                                     U01      DMO 00   Add
```

Figure E3.21 – Child Constraint Record

➢ Press **ESC** to exit Child Constraints.

➢ Press **ESC** to exit the Optional Child Processes list and return to the Image level of the PROSPECT FILE MAINTENANCE input process.

➢ Next you need to add a button to the PROSPECT FILE MAINTENANCE image so your users can select this new Optional Process. You can create the button just as you did when you defined the Save and Cancel buttons on the image of your recently added input process. Press **ENTER** to move from the Image level of the input process to the image itself.

➢ Rather than spend time moving items around the image to make room for another button, you can simply add your new button at the bottom of the image between the GoTo and the Save buttons. Select the ☐ (button) icon on the toolbar. **Place the cursor somewhere between the GoTo and Save buttons and drag out an area for the button**.

➢ When you release the mouse button, the **Button Properties** screen is displayed.

➢ In the **Label** field type **Current System Setup**.

➢ Specify **U** as the **Shortcut** key. Note that each shortcut key on an image must be unique and, since there are already a number of buttons defined on the current image, many shortcut keys have already been assigned to other processes. Specifically, the letter 'C' has been assigned to the Cancel button.

➢ Enter **USER 4** as the **Option** to be sent when this button is clicked. The Option number that you select must match the Option Number field that was entered when the Optional Process was added.

➢ In the **Tooltip** field **enter a description** for this option. The text that you enter in this field will be displayed when the user positions the mouse cursor on this button.

➢ Leave all other fields at their default values and click **Save** to create the button.

➢ You are returned to the Prospects screen. Now **adjust your new button size and position** to suit your requirements. Note that you can **right-click on one of the other buttons on the screen**, select **Object Properties**, and investigate how other designers have defined buttons on this image. Your final image should look something like the image in *Figure E3.22*.
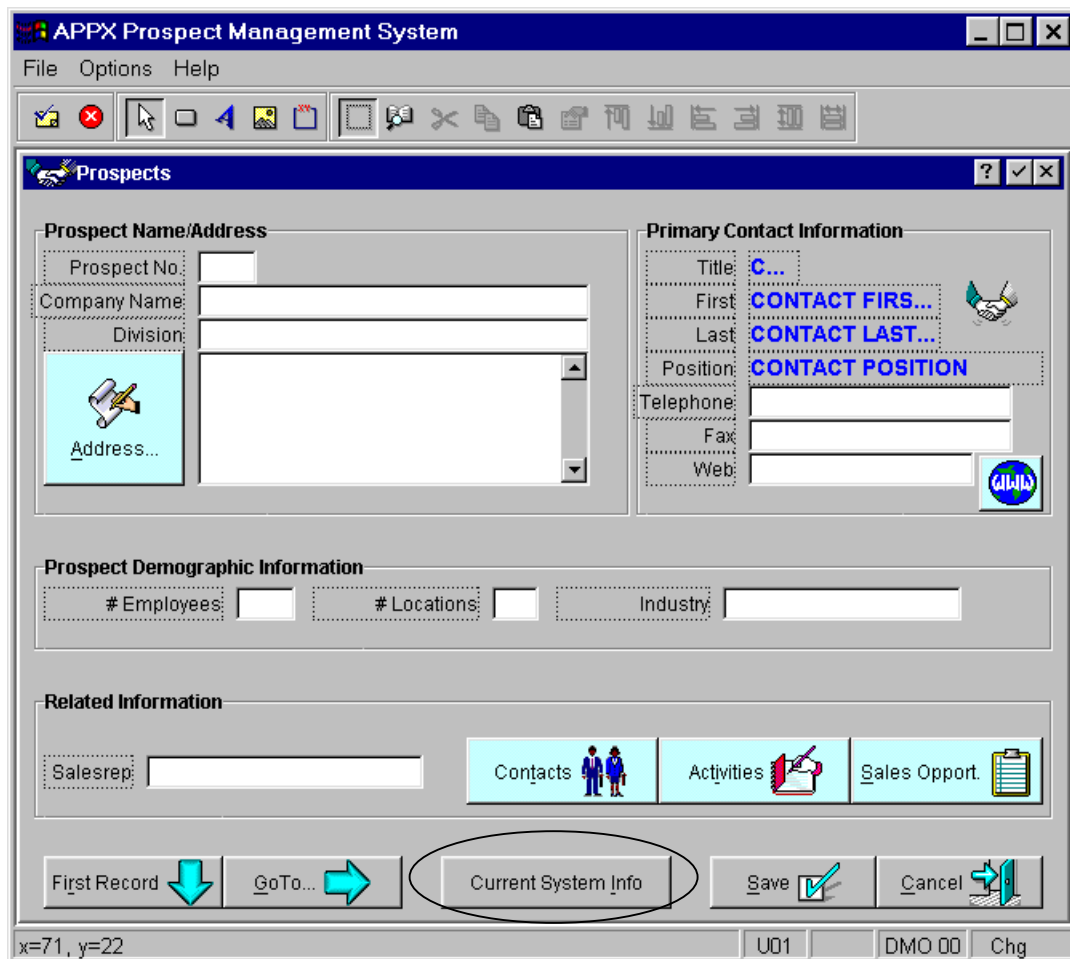
Figure E3.22 – Prospect Maintenance screen with new button

➢ Press **F8** or **ESC** to save and exit the PROSPECT FILE MAINTENANCE image.

➢ Now you need to test the process to ensure that the defined button is active and the correct process is invoked. There are a number of ways in which you can invoke this process. The first is to exit right back to the APPX startup menu, select Run (instead of Design), enter DMO as the Database, press ENTER so the Prospect Main Menu

is invoked and, from there, click on the Prospects button. The second is to exit back to the APPX Application Design menu (where you have already specified DMO/00 as the Application), click on the Run Test Database button, enter DMO as the Database, press ENTER so the Prospect Main Menu is displayed and, from there, click on the Prospects button. Yet another method is to click on the Toolbox option from the Image level (or the Frame or Process level) of the PROSPECT FILE MAINTENANCE process and, on the Toolbox menu, select the Invoke a Process option. The screen displayed is that shown in *Figure E3.23* below. APPX automatically defaults the database ID, application ID, process type and process name so you simply press ENTER to invoke the process.

➤ By far the simplest and quickest way to test this process is to use **Option 99 (``99)** while you are positioned at the Process, Frame or Image level of PROSPECT FILE MAINTENANCE. APPX automatically defaults the database ID (DMO), application ID (DMO 00), process type (INPUT) and process name (PROSPECT FILE MAINTENANCE) so you simply press ENTER to invoke the process *(Figure E3.21).* Option 99 is available throughout APPX Application Design for testing processes directly rather than running a menu and then invoking the process to be tested.
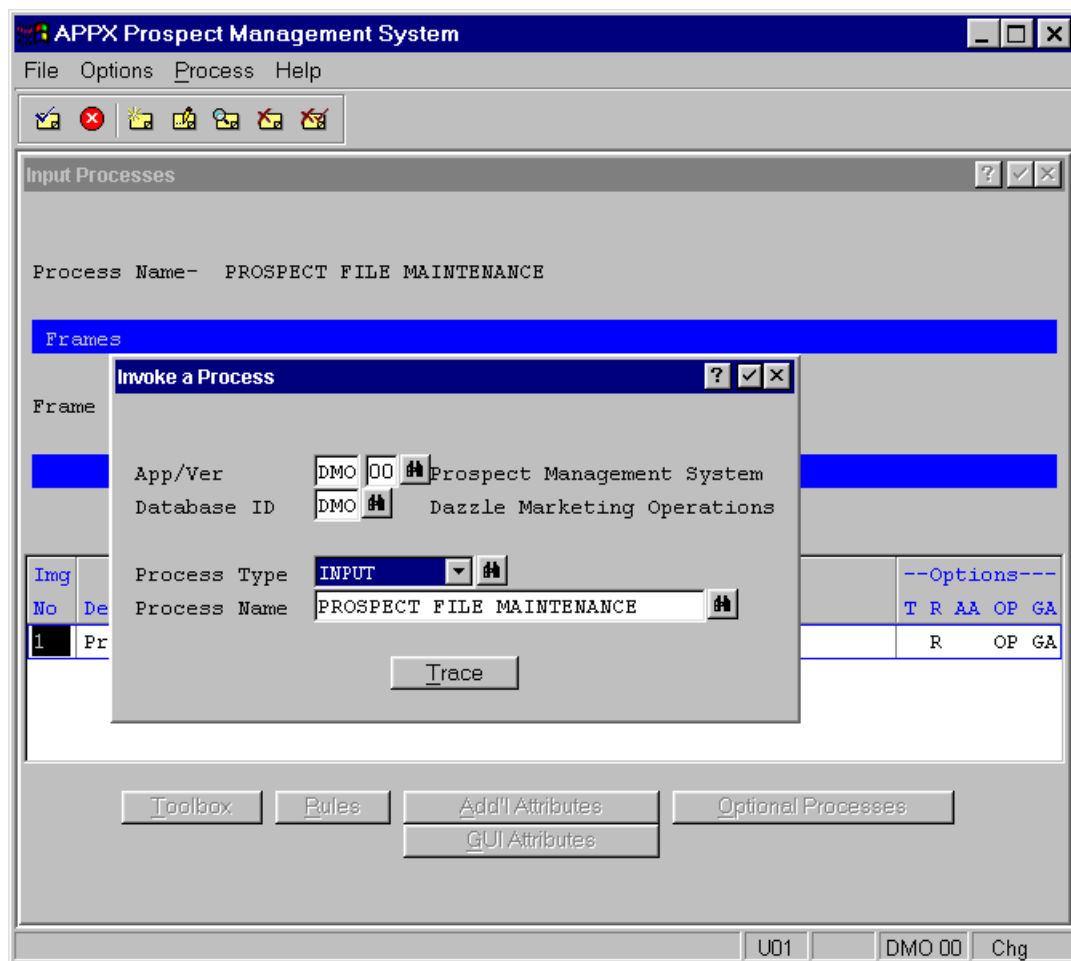
Figure E3.23 – Invoke a Process

➤ When the Prospects screen is displayed, press ENTER to display the first record in the file. Alternatively, of course, you could enter a Company Name and press ENTER to display a particular record, use the [icon] icon next to the Company Name field to scan the PROSPECT file and select a record from the displayed list or use the GoTo button to go to a particular record.

➤ Having selected a record, click on the **Current System Setup** button and your new input process is displayed. Add some data in the system setup fields and check to ensure that both your Save and Cancel buttons are working

correctly. Note that the Current O/S field has a button to the right of it *(Figure E3.24)*. That is because it was defined as a Token type field with a list of valid values.
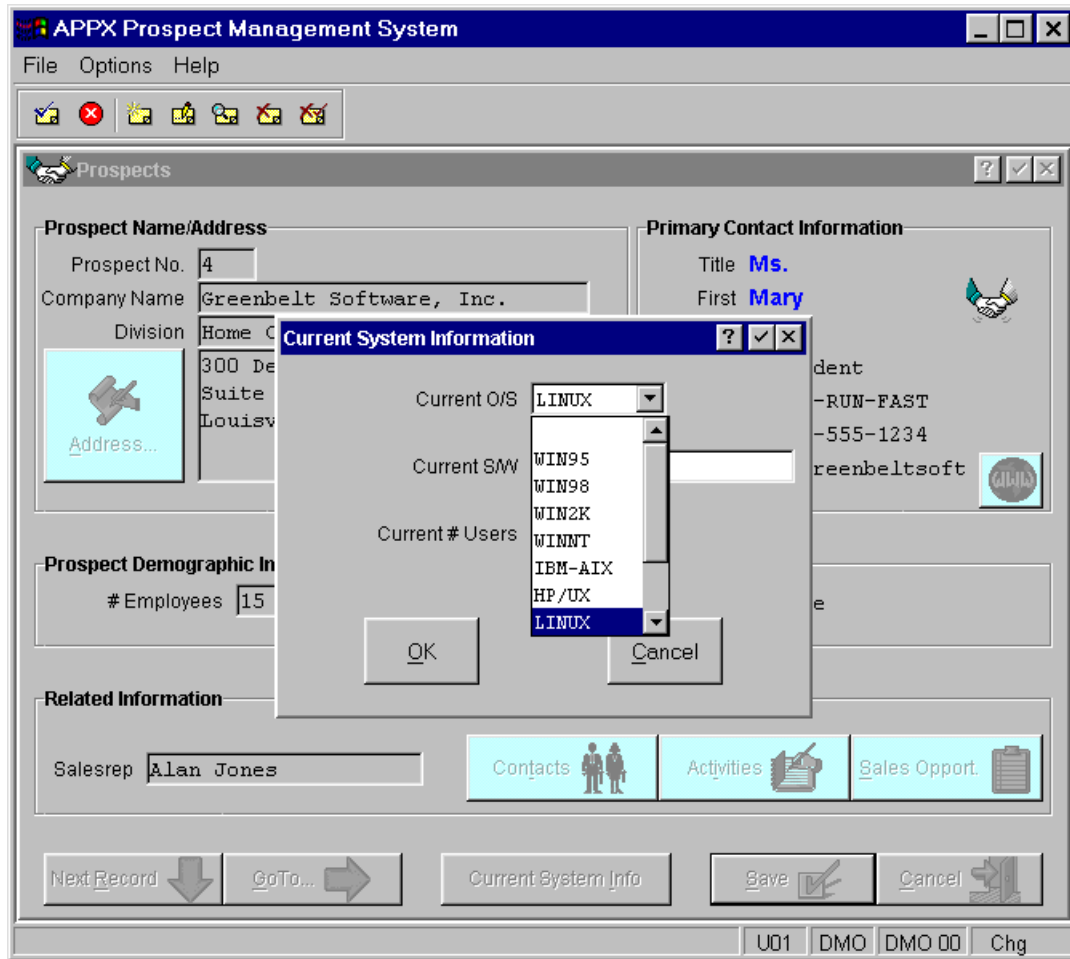
Figure E3.24 – Current System Setup

> For the purposes of the next exercise **update the Current System Setup fields for each Prospect** record. Once you have entered this information, use the **Save** button to save the record and return to the main Prospect Maintenance screen. Use the **Next Record** button or **F5** to move through the Prospect records.

> Once all records have been updated and you are back on the main Prospects Maintenance screen, click on **Cancel** to exit the currently selected record.

> Click **Close** to exit the Prospects Maintenance process and return to input process maintenance.

> Press **ESC four times** to return to the main APPX Application Design Menu.

4.0 *Exercise 4 - Creating a New Report*

In Exercise 2 you added three new fields to the Prospect file for storing information regarding a prospect's current system. In Exercise 3 you designed a pop-up input process to allow entry of this information. You now need to create a report that prints this information. You could design a new report in much the same way that you created the new input process in *Exercise 3*, but instead you decide to take advantage of one of APPX's report generation utilities to create the report. The report generation utilities can be used to very quickly create a report by simply providing a few simple specifications.

When you create this new report you will in fact be creating three new APPX processes:

- A **Query Process** that allows the user to select the records that will be included in the report at runtime and that determines the sort order and control breaks for data in the report.

- An **Output Process** that defines the report layout.

- A **Job Process** that defines the sequence of processes to run by instructing APPX to first run the query process and then run the output process.

4.1 Using the Standard Output Utility to Generate a Report

➢ From the **APPX Application Design** menu select the **Utilities** option.

➢ From the **Utilities** menu select the **Toolbox** option.

➢ Under the **Process Generation** heading on the Toolbox menu, select the **Standard Output** option to display the **Generate 'Standard' Output Process** setup screen as shown in *Figure E4.1*.
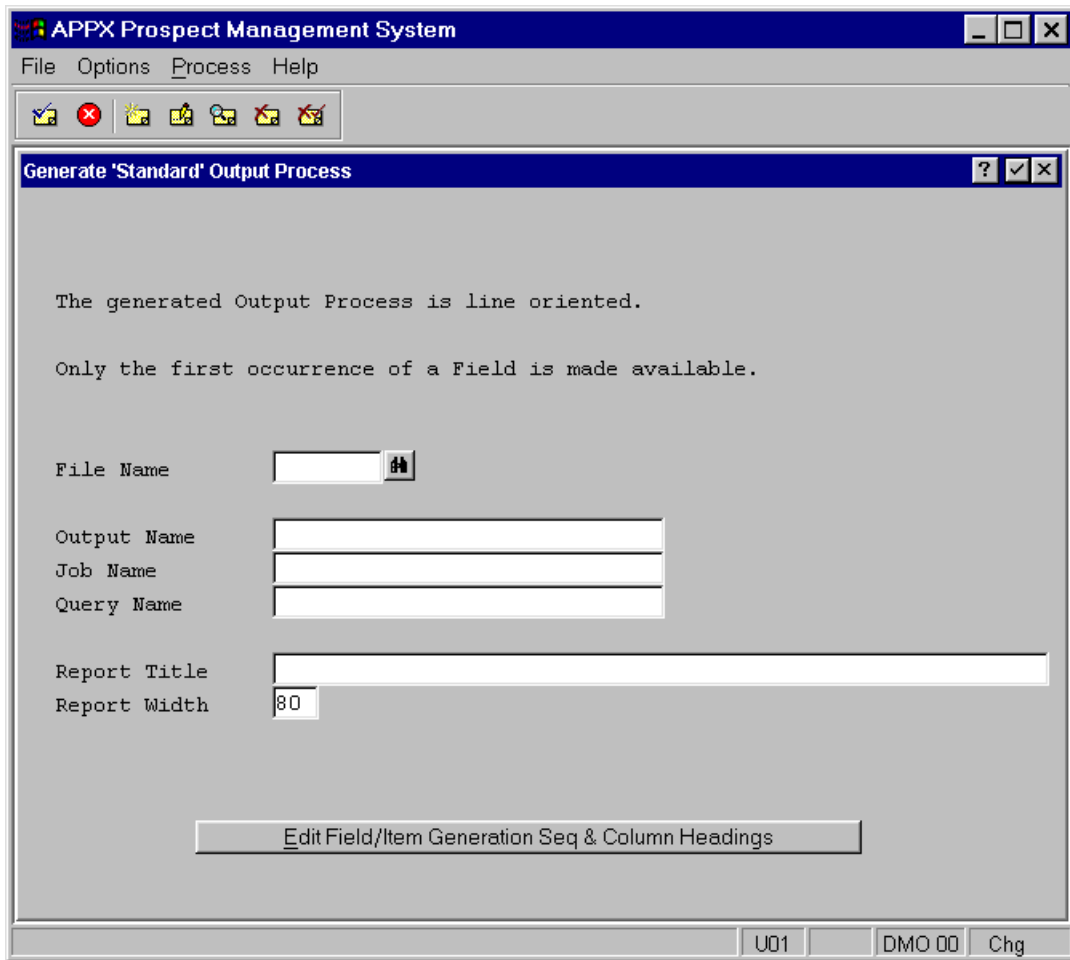
Figure E4.1 – Generate 'Standard' Output Process

➢ Enter **PROSPECT** in the **File Name** field since this file will be the control file for the processes that will be generated.

➢ Enter **PROSPECT SYSTEM INFO DETAILS** into the **Output Name** field. This is the name that will be assigned to the Output process that will be generated. Since you want the Job and Query processes to also have the same name as the Output process, use your mouse to select the contents of the **Output Name** field and press **CTRL + C** to copy the name.

➢ Select the **Job Name** field and press **CTRL + V** to paste the copied text.

➢ Select the **Query Name** field and press **CTRL + V** to paste the copied text.

➢ Select the **Report Title** field and enter the title that you want to be displayed on the top of each page of the report.

➢ Leave the **Report Width** field set at 80. Since you will only be including a few fields from the PROSPECT file on your report, 80 characters will be sufficient.

➢ Press **Enter** and APPX will validate the **File Name** and display the file description next to the **File Name** field.

Your screen should now look like the screen shown below in *Figure E4.2*.

Figure E4.2 – Completed Output Generation Screen

> Select the **Edit Field/Item Generation Seq & Column Headings** option. This will allow you to select the fields to be included in the Query process record selection criteria, the Query process sort order, and on the report itself.
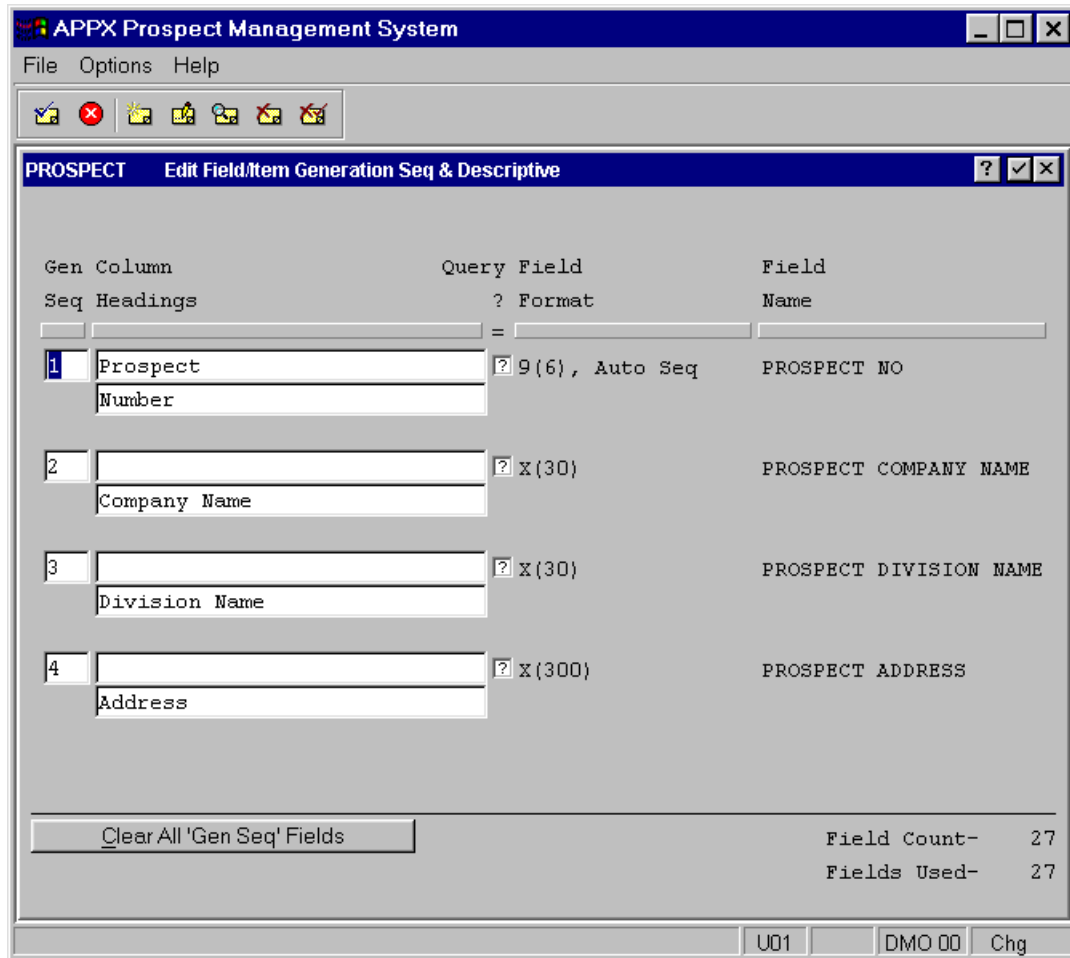
Figure E4.3 – Edit Field/Item Generation Seq & Descriptive Screen

> Click on the **Clear All 'Gen Seq' Fields** so the currently selected fields are deselected.

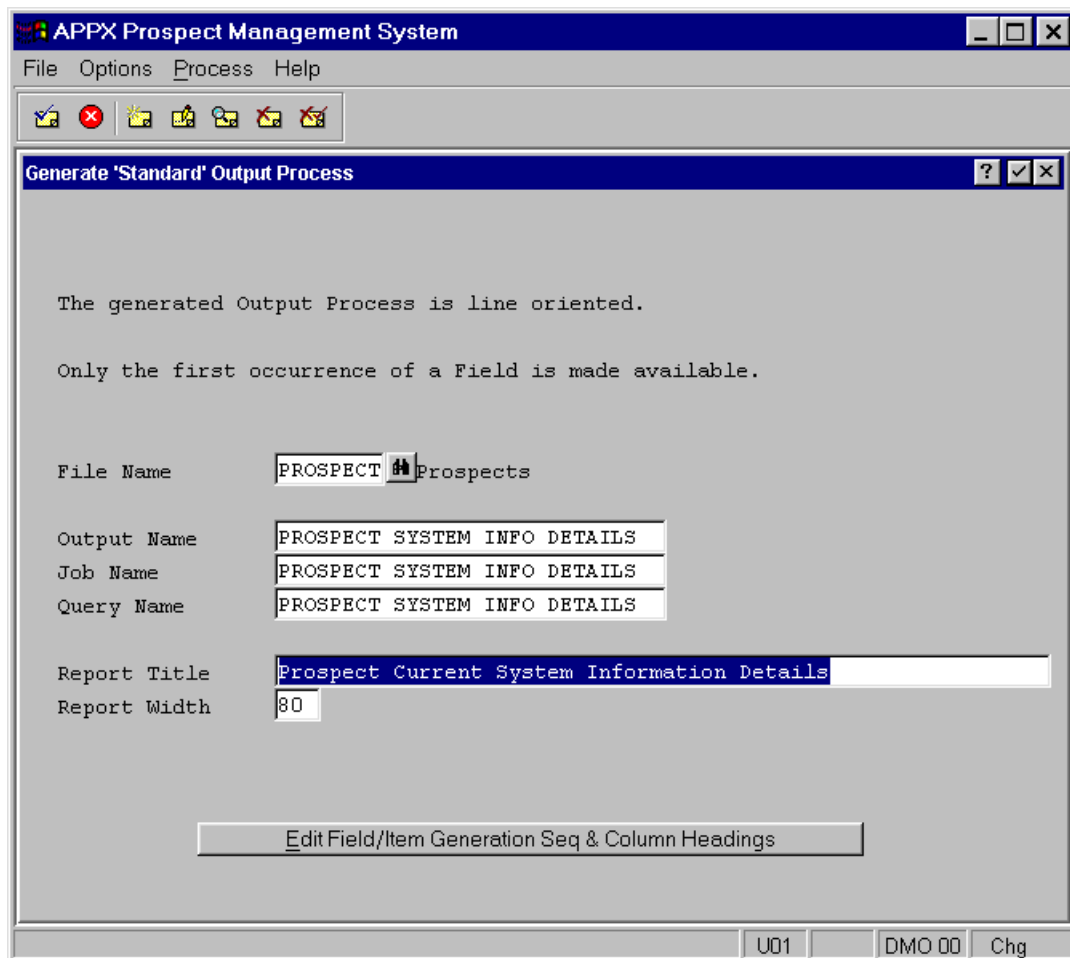> The only fields that you want to include in the report are **PROSPECT NO**, **PROSPECT COMPANY NAME** and the three new fields that you added to the **PROSPECT** file in relation to the current system setup information.

> Enter a **1** in the **Gen Seq** number field for the **PROSPECT NO** field.

> In the **Column Heading** field, define how you would like the heading for the **PROSPECT NO** field to appear on the report.

> In the **Query?** field to the right of the Column Heading field, click on the field so that it is 'checked'. This means that the **PROSPECT NO** field will be included as a record selection option when running the query and will also be available as a data sort item.

> Now move to the **Gen Seq** number field for **PROSPECT COMPANY NAME** field and enter the digit **2.** Change the column heading for that field to suit your requirements and click on the **Query?** field so it is checked.

> Press **Ctrl + PageDown** to move to the end of the field list. Enter a **Gen Seq** number of **3** for the **PROSPECT CURRENT O/S FIELD** field, change the Column Heading as required and check the **Query?** field.

➢ Repeat this process for the **Current S/W** and **Current Users** fields giving them **Gen Seq** numbers of **4** and **5** respectively and checking the **Query?** field so that the fields will be included as record selection options and sort options.

Your screen should now look like the screen shown below in *Figure E4.4.*
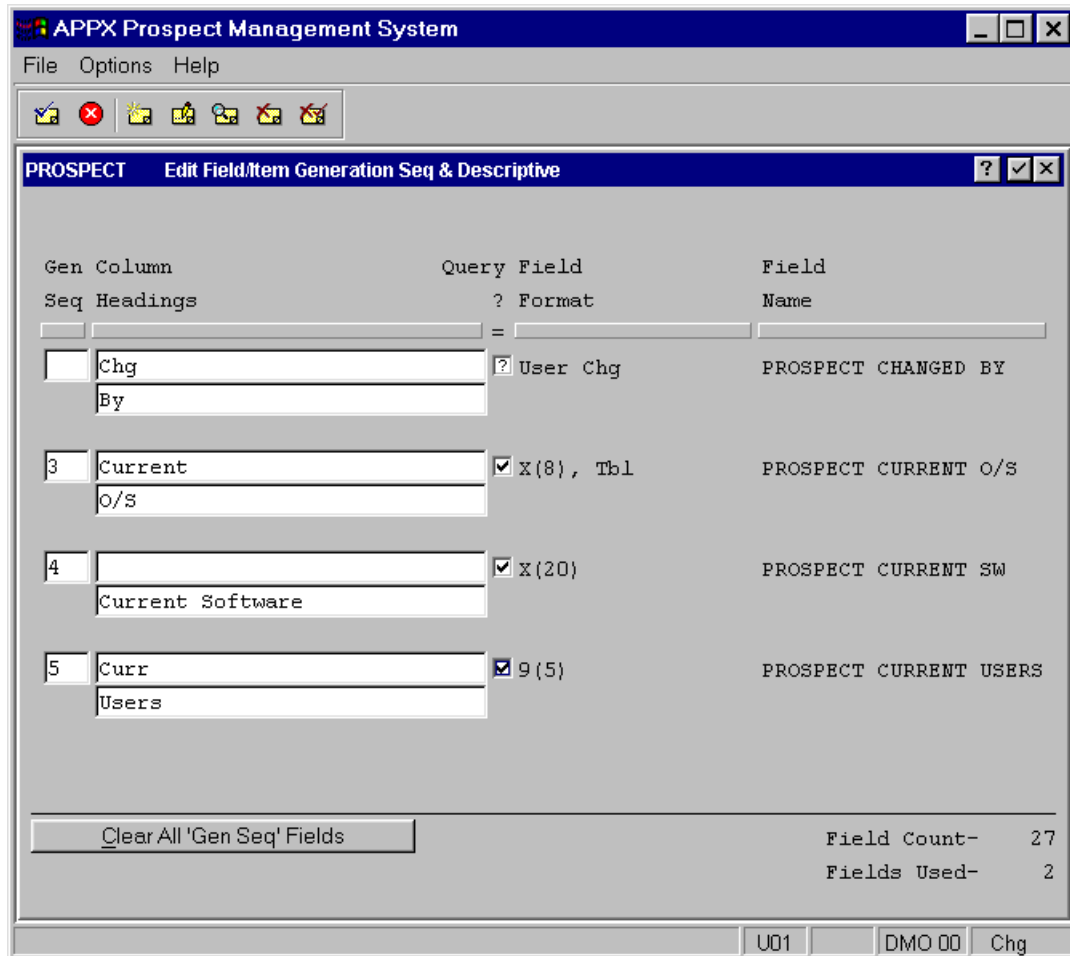
Figure E4.4 – Completed Edit Field/Item Generation Seq & Descriptive Screen

➢ Press **ENTER** to save your changes. Then press **Ctrl + PageUp** to move back to the beginning of the field list where you will see the fields listed for which you have entered a **Gen Seq** value.

➢ Press **ENTER** to return to the **Generate 'Standard' Output Process** screen.

➢ Press **ENTER** to generate the processes for the report. When the processes for the report have been generated APPX returns you to the **Toolbox** menu.

➢ Press **ESC** to exit the **Toolbox** menu.

➢ Press **ESC** to exit the **Utilities** menu.

4.2 Reviewing the Report JOB Which Was Generated

Having generated the report, you could now run the report. But, you first decide to take a look at the design of the JOB process and the other related processes that were created by the report generation utility.

➢ From the **APPX Application Design** menu, select the **Process Management** option.

➢ From the **Process Management** menu select **Job**. All of the jobs in the DMO application including the job process for the report that you just generated, **PROSPECT SYSTEM INFO DETAILS**, are now displayed on the **Job Processes** screen.

➢ Select the **PROSPECT SYSTEM INFO DETAILS** job and press **ENTER** to display the job steps for that job *(Figure E4.5)*. Job steps are also referred to as **Automatic Child Processes** in APPX.
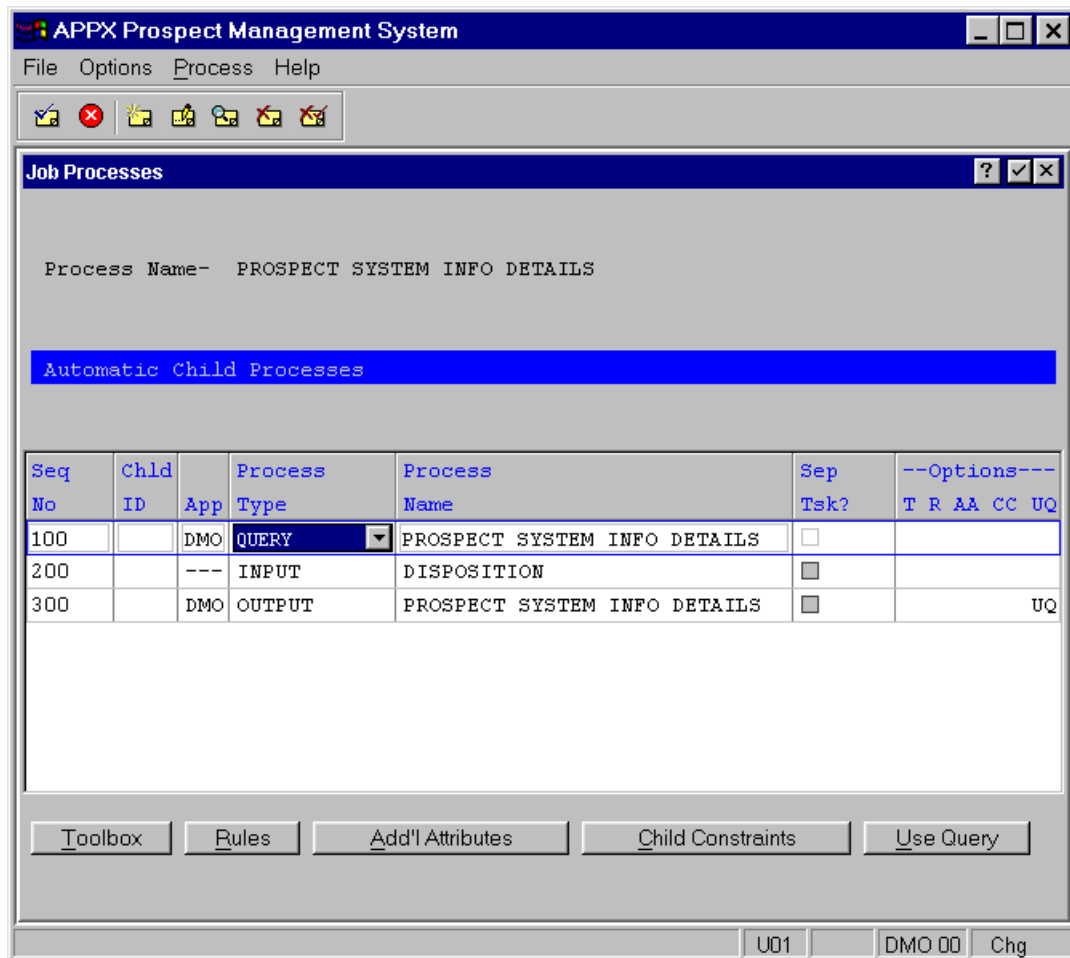
Figure E4.5 – Job Steps for Generated Report Job

➢ The first job step runs a **QUERY** process. You decide that you would like to view the design of this Query process, and, having noted that this job step is the currently selected Automatic Child Process record, you use Option 93 to directly access **Query Processes** design. **Query Processes** design is run and the **PROSPECT SYSTEM INFO DETAILS** query process is displayed in Inquire mode as shown in *Figure E4.6* below. Remember, you can use this convenient "drill down" capability anywhere within application design to directly access child processes.

The first screen of the Query Process *(Figure E4.6)* shows that the **PCF** (Process Control File) is the **PROSPECT** file as you specified when generating the report.

Notice that the **Display Sort?** field is checked. This means that a **Sort Order** screen will be displayed to the user at runtime. There may be reports that you design or generate where you do not want to allow the user to see or edit the report sort order and, in such circumstances, you would simply set the **Display Sort?** field to blank.
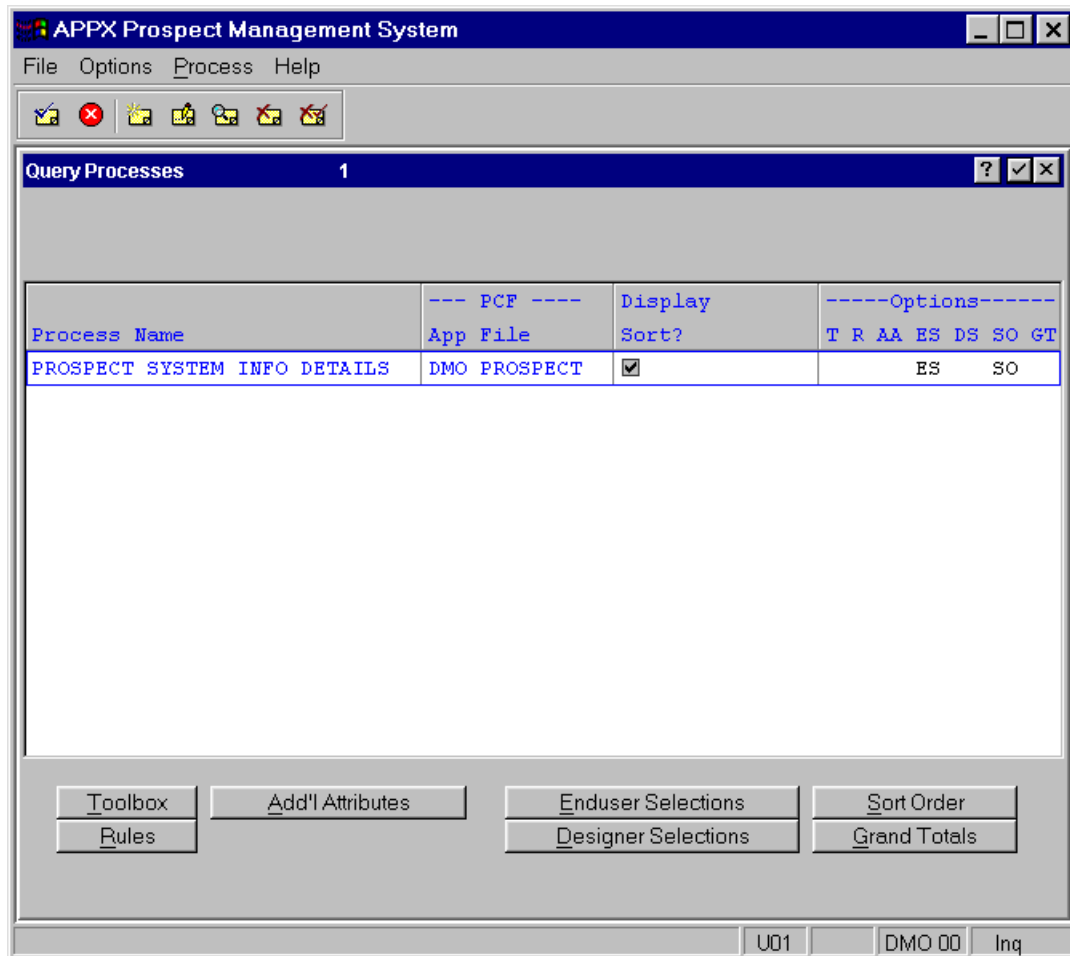
Figure E4.6 – Query Process

➢ You notice that the letters, "**ES**", are displayed under the **Options** heading which indicates that the Query Process includes **Enduser Selections**. Enduser Selection records have been created for the fields for which you specified a **Gen Seq** value and checked the **Query?** field when generating the job. Click on the **Enduser Selections** button to view the **Enduser Selections**. The five fields that you selected during the setup process are displayed as selections as shown in *Figure E4.7* below.

Although the Query has been automatically generated it can be modified. You can add, change or delete any of the Enduser Selections. As a default, APPX has generated the Enduser Selections with operators of GE (Greater than or Equal to) and LE (Less than or Equal to) but these can be changed to suit your requirements. Other valid operators are EQ (Equal to), NE (Not Equal to), GT (Greater Than), LT (Less Than), IN (Includes) and EX (Excludes). As a standard convention, the selection constraints specified in the Enduser Selections are 'ANDed'. However, it is possible to override this default and combine constraints with ANDs, ORs and Parentheses by editing the **Enduser Selections Expression**.
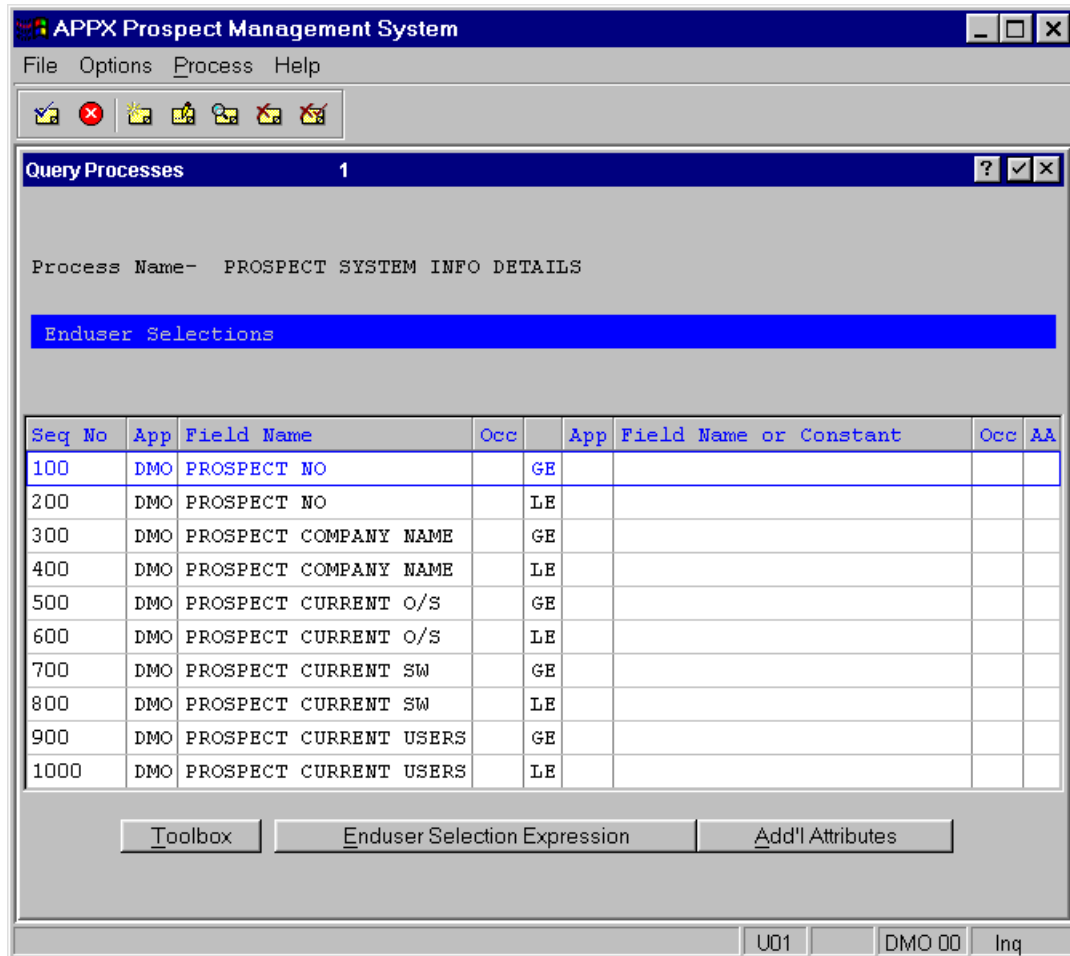
Figure E4.7 – Query Process Enduser Selections

➤ The **Add'l Attributes** option allows the designer to specify for each **Enduser Selections** record whether or not the user can modify the operators and/or right-side field of the Enduser Selections record when running the report.

➤ Press **ESC** to exit the **Enduser Selections** screen.

Note that there is also a **DS (Designer Selections)** button at the bottom of the screen. This is where the designer would specify record selection criteria that the user should not be able to see or modify at runtime.

➤ You notice that the letters, **"SO"**, are showing under the **Options** heading which indicates that the Query definition includes **Sort Order** specifications. Press **ENTER** to access the **Sort Order** screen as shown in *Figure E4.8* below.

As with the End user Selections, the generated Sort Order specifications can be modified by the designer. Also, the designer can determine whether or not the Sort Order can be modified by the user at runtime. Sort Order records can be individually controlled so that, if required, some can be modifiable while others are non-modifiable.

Figure E4.8 – Sort Order Screen

The **Grand Total** button at the bottom of the Query Process screen allows you to specify if and where grand totals will print on your report. Setting this field to NO means that no grand totals will be printed. Setting this field 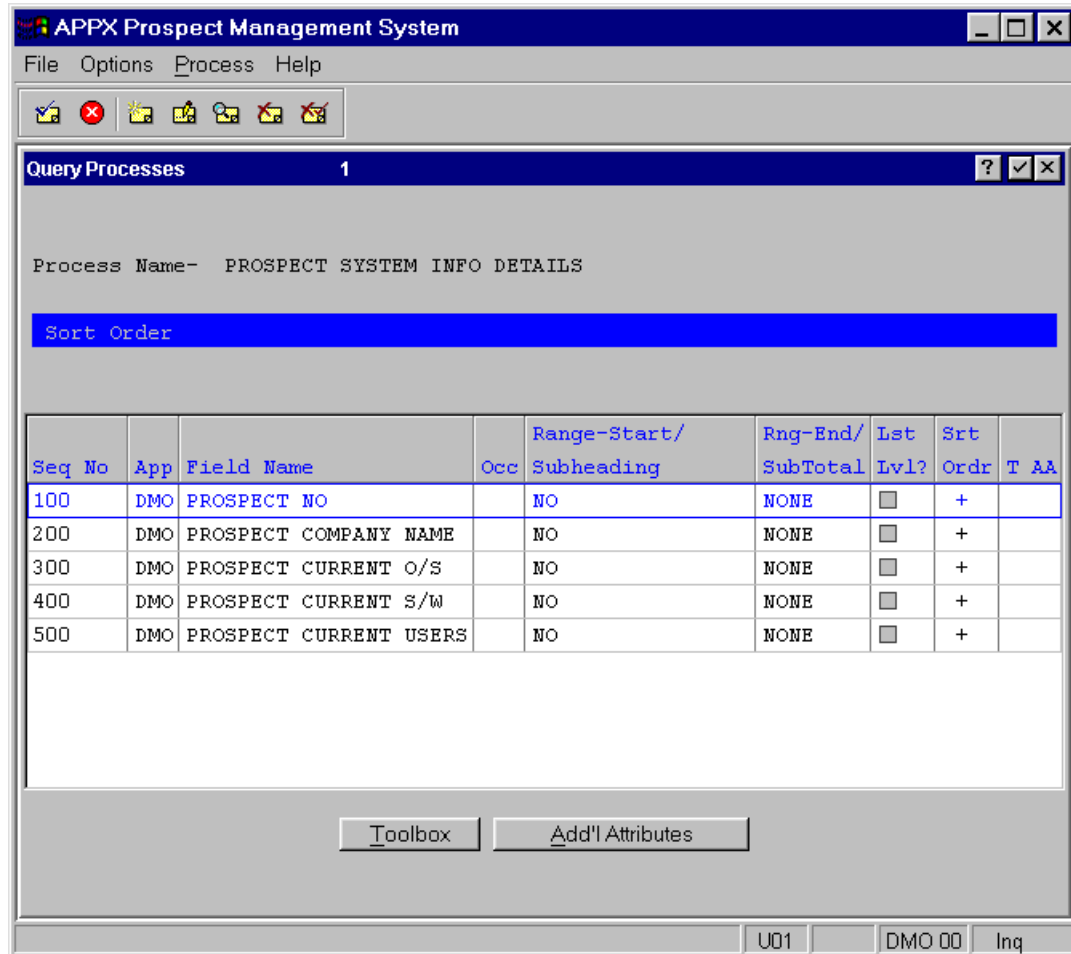to STANDARD means that grand totals will print directly following the last record or subtotal. Setting this field to NEW PAGE means that the report will skip to a new page before printing grand totals. You can also choose to make this field editable or non-editable by the user at runtime.

In addition to allowing control over the order in which records are displayed, the Sort Order screen also determines how records in the report are grouped and subtotaled. The **Range-Start/Subheading** field on the Sort Order screen allows you to specify whether or not you want a subheading printed on your report each time the value at a particular field level changes and, if so, how it should affect paging. You can choose to have no subheadings (NO), to have subheadings appear wherever the value changes (STANDARD), to skip to a new page whenever the value changes (NEW PAGE ONLY), or to skip to a new page and print subheadings whenever the value changes (NEW PAGE WITH HDG). The **Range-End/Subtotal** field on the Sort Order screen allows you to specify whether or not you want subtotals to print on your report when a field value changes and how it should affect paging. You can choose to have no subtotals (NONE), to have subtotals appear wherever a value changes (STANDARD) or to have subtotals appear on a new page when a value changes (NEW PAGE).

➢ Click on the **Add'l Attributes** button while your cursor is positioned on a **Sort Order** record. *Figure E4.9* shows the Sort Order **Add'l Attributes** screen that is displayed. This screen allows the designer to control whether or not the user can modify subheading or subtotal specifications at runtime or change whether the records are sorted in ascending or descending order.
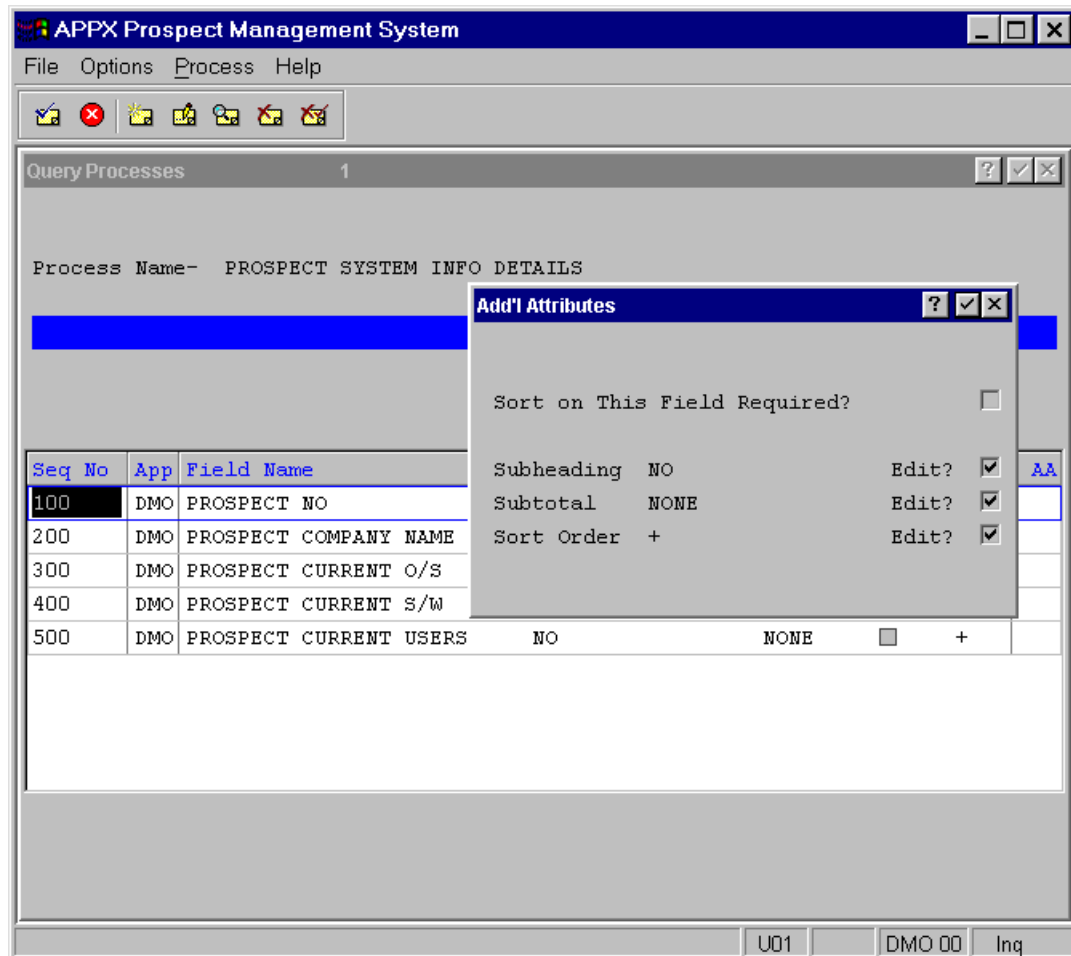
```
APPX Prospect Management System                    _ □ ✕
File  Options  Process  Help

Query Processes                1                     ? ✓ ✕


   Process Name-  PROSPECT SYSTEM INFO DETAILS
                                          Add'l Attributes          ? ✓ ✕


                                          Sort on This Field Required?      ☐

  Seq No  App  Field Name                 Subheading   NO        Edit? ☑    AA
  100     DMO  PROSPECT NO                Subtotal     NONE      Edit? ☑
  200     DMO  PROSPECT COMPANY NAME      Sort Order   +         Edit? ☑
  300     DMO  PROSPECT CURRENT O/S
  400     DMO  PROSPECT CURRENT S/W
  500     DMO  PROSPECT CURRENT USERS       NO              NONE     ☐     +




                                               U01    DMO 00   Inq
```

Figure E4.9 – Sort Order Additional Attributes

➢ Press **ESC** to exit the **Add'l Attributes** screen.

➢ Press **ESC** to exit the **Sort Order** screen.

➢ The next step in the **PROSPECT SYSTEM INFO DETAILS** job is the **DISPOSITION** process. The Disposition screen allows a user to specify where and how your report will print at runtime. You will look at the Disposition in some detail when you run the report. Note that the Application ID of the Disposition invoked in your job is "---". This indicates that the Disposition is an internal or predefined APPX process. Although you cannot edit the layout of a predefined process, you can use predefined fields to change the values of the fields displayed on the disposition screen. And, of course, you can design your own custom disposition processes. In addition, a standard feature of APPX is the ability to allow users to customize disposition settings at runtime and save them for later re-use.

➢ The final step in the job is the **OUTPUT**, which defines the layout of the report that will be printed to the screen or sent to a printer. Select the **OUTPUT** job step and then use **Option 94** to go directly to **Output Processes** design in Change Mode.

➢ In output processes, as with input processes, there are different levels within the process: Process level, Frame level and Image level. At the **Process level** *(Figure E4.10)* you can see that the PCF for the newly generated output is **PROSPECT** and the Report Width is 80 columns. The Standard Page Heading (**Std PgH**) box is checked which means that this report will use standard APPX page headings. You can clear this box and define your own page headings, if you wish. The Standard Column Headings (**Standard ColH**) box, on the other hand, is not checked and you will see when you move down to the Frame level that APPX has generated a frame to define the column headings for the report. Note also that the report has automatically been assigned a print File Name of DMOL (DMO Listing). When the report is run, APPX will append a unique sequence number to the File Name, and the report will be listed in the print queue under that name and unique sequence number (or on disk if stored).
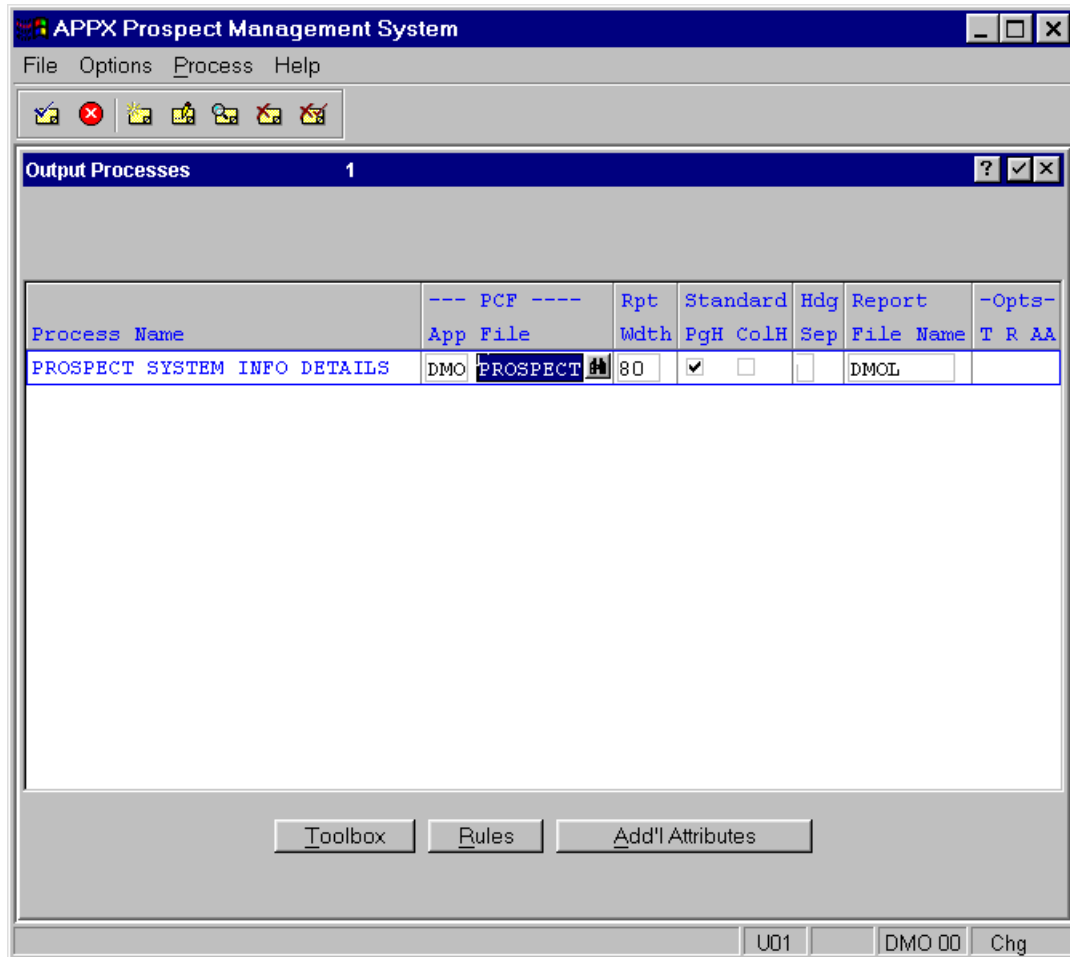

Figure E4.10 – Output Processes

➢ Press **ENTER** to move to the Frame level for this Output Process.

➢ There are two frames listed *(Figure E4.11)*. The first is a **PAGE-START** frame, which is the frame in which column headings are defined. The second is a **RECORD** frame, which contains the data items for the report.
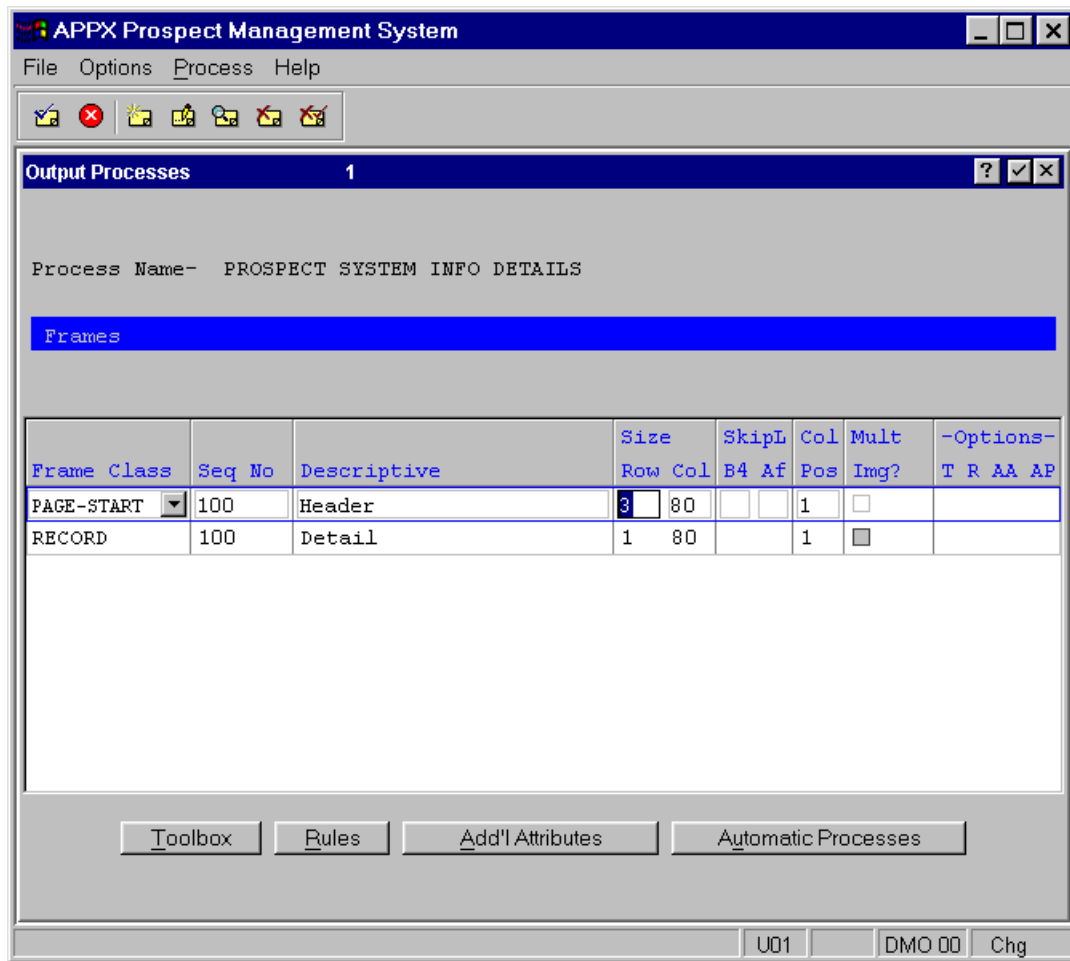

Figure E4.11 -- Output Process Frame listing

➢ While positioned on the **PAGE-START** frame, press **ENTER** to move to the Image level and then press **ENTER** again to move onto the image itself. On the image, you can see how the headings have been defined. Since you accessed this process in Change Mode you can edit the headings if required.

➢ Press **ESC** to move back to the Image level.

➢ Press **ESC** to move back to the Frame level.

➢ You are now positioned on the next Frame, the **RECORD** Frame. Press **ENTER twice** to move onto the actual image for the **RECORD** frame.

➤ The boxes that are painted across the image *(Figure E4.12)* represent the fields that have been defined on the image. As you position your cursor over each field the field name is displayed in the bottom left corner of the screen.
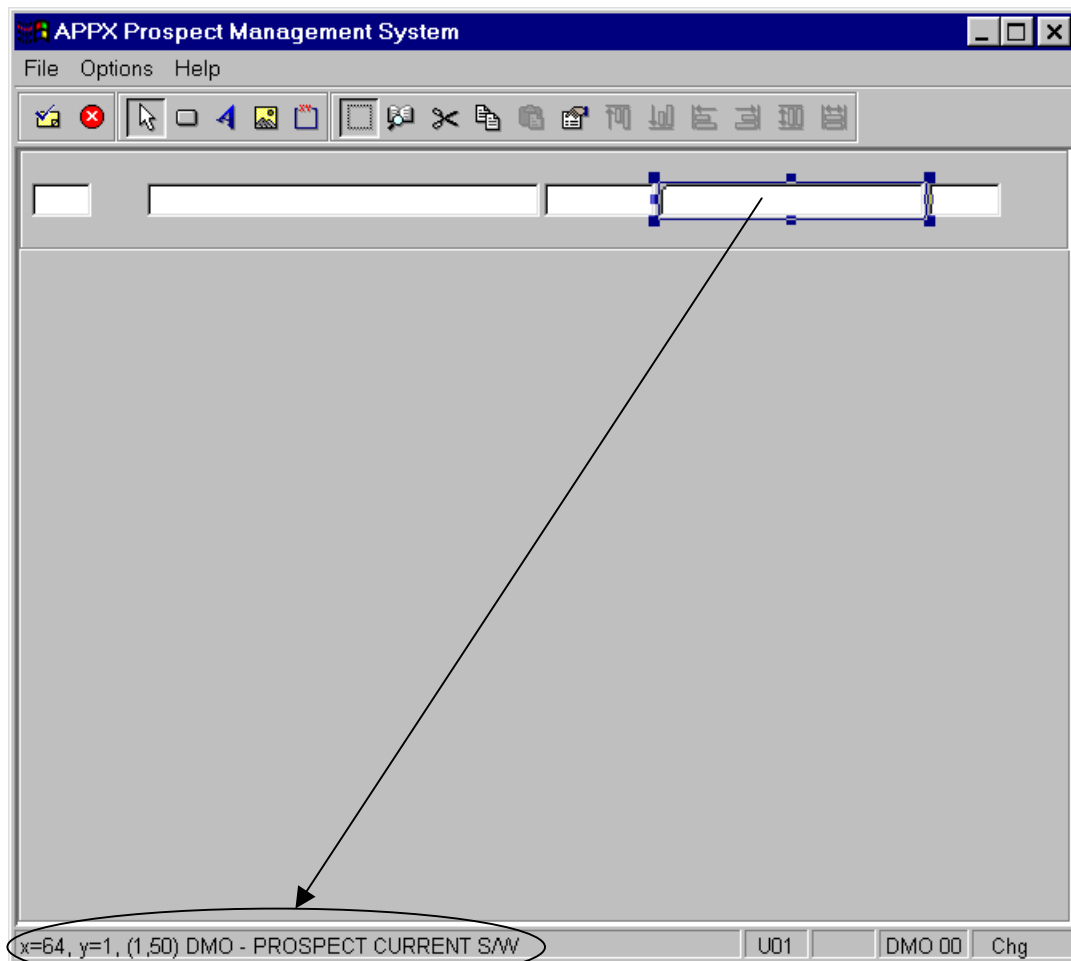

Figure E4.12 – Record Image display

➤ To view all fields that have been defined on your image simply press **F11** and a listing will be displayed showing field names, field types and field attributes (such as whether or not the field should be right-justified, set to blank if the value it contains is zero, and so forth). Don't forget that you can use the Help key (F1) or click on the **?** button in the top right of the Item Display screen to view help text for individual attribute fields. Press **ESC** to exit the Item Display screen and return to the image.

➤ If you wish to view the details for an individual item rather than for all items then you can simply double click on the field or right mouse click on the field and select Object Properties from the pop-up menu.

➤ This displays the field name and you can then click on the **Additional Attributes** button to view/change the field attributes *(Figure E4.13)*. Again you can use the **?** button to get detailed information on the various attributes which you can set.
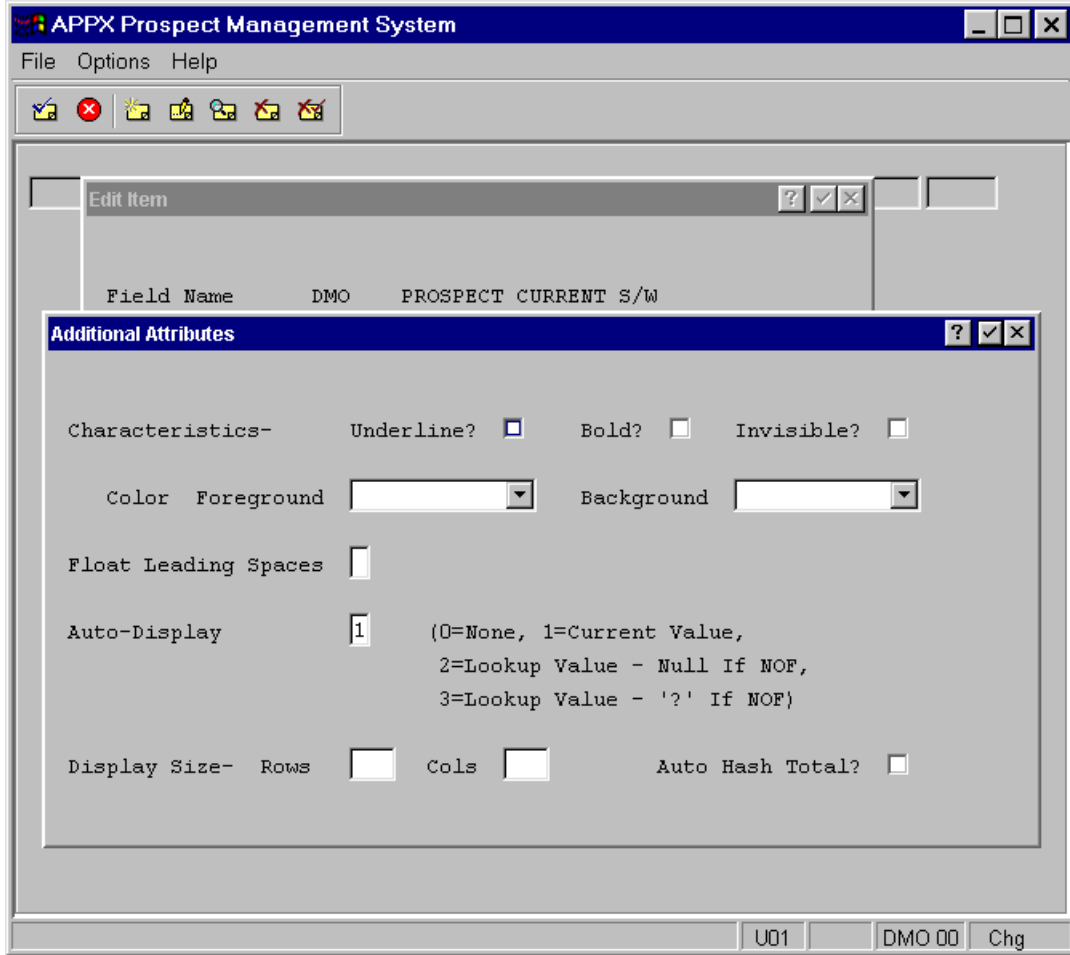
Figure E4.13 – Field Additional Attributes

➢ Press **ESC** to exit the **Additional Attributes** screen.

➢ Press **ESC** to exit the **Edit Item** screen and return to the image.

➢ Press **ESC** three times to exit the Output process and return to the Automatic Child Processes screen for the report Job.

4.3 Running the Report Which Was Generated

➢ Having satisfied your curiosity regarding design of the report which was generated, you now decide to run the Job and see what results are produced. You use **Option 99** to pop-up the screen to Invoke a Process and press **ENTER** to continue.
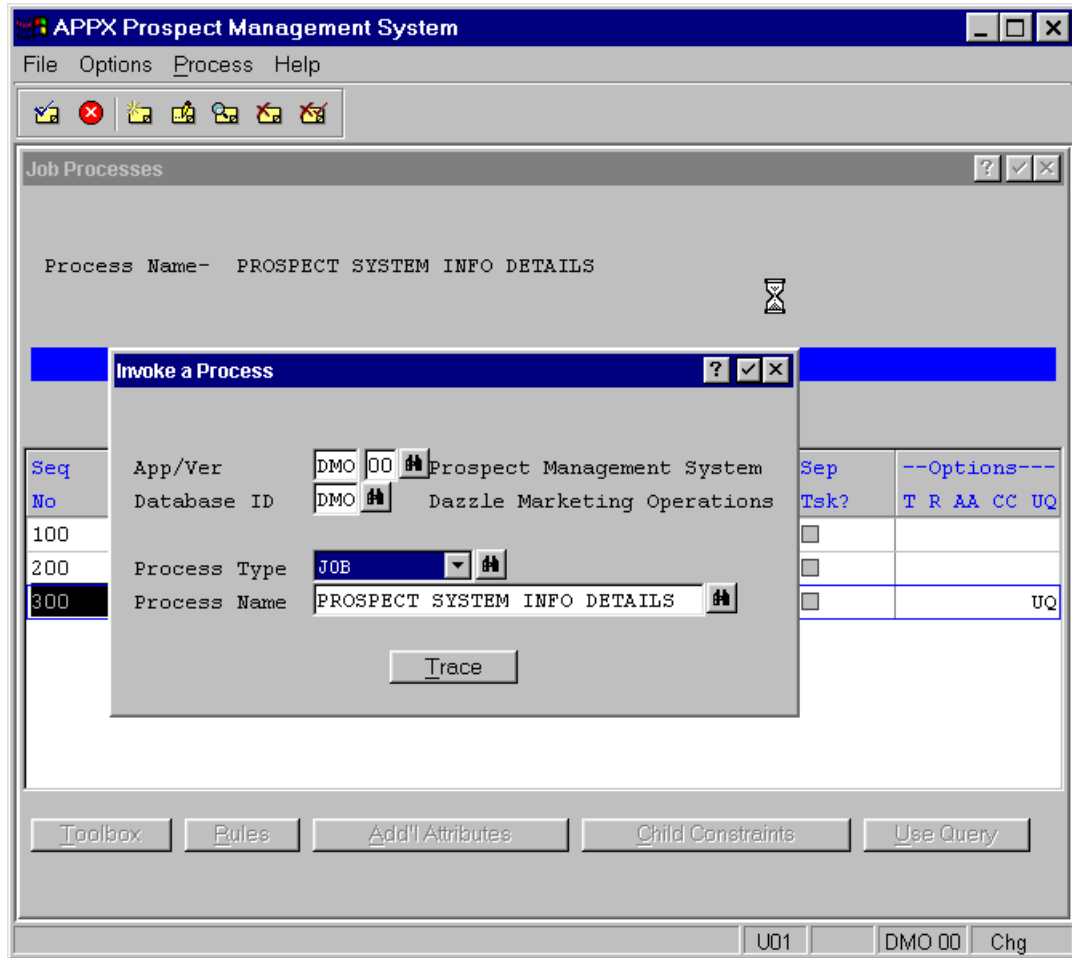

Figure E4.14 – Invoke a Process Screen

➢ The first screen that is presented is the **Record Selection** screen *(Figure E4.15)* where you can specify which records to include in the report. You can limit your record selection by Prospect Number, Company Name, Current Operating System, Current Software and Current Number of Users. You can limit your selection to ranges of any of the above and can change the operators to suit your requirements. Should you wish to specify a particular record then you can use the F2 key to scan the Prospect file when your cursor is positioned on the Field Name/Constant field to the right of the operator for either the Prospect No or Company Name (since both of these fields are keys to the PROSPECT file). Note that the Current O/S field has a ⬇ button to the right, which you can use to select a valid operating system. The Copy button at the bottom of the Record Selection screen allows you to copy current selection criteria (and modify them). Note that using the Copy option only changes the selection criteria for this occurrence of the report. When the report is run again, it will revert back to the original selection criteria.

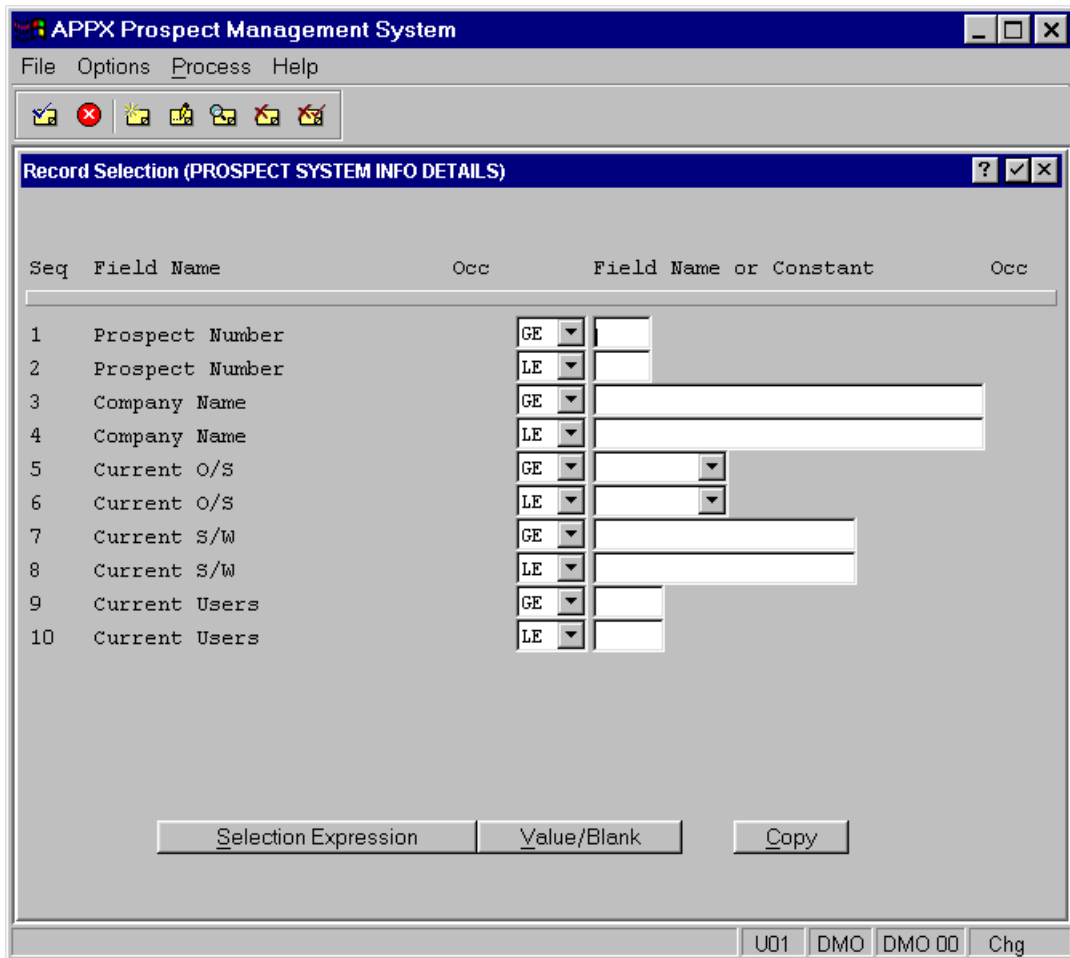➢ For the purposes of testing the report, leave all fields blank so all records are selected.

Figure E4.15 – Record Selection Screen

➢ Press **ENTER** to continue.

➢ The **Sort Order** screen is now displayed, enabling you to specify the subheadings, subtotals and grand totals that you require as well as whether you want the resulting report to display the records in ascending or descending order. Change the sort levels so the report is **sorted first by Current O/S** and then by prospect no, company name, etc. To do this you can either use the Clear Sort Levels button to remove the existing sort level numbers and then type in the required ones or you can simply type over the existing numbers. Use the [▼] button next to the **Range-Start/Subheading field to select a subheading of type Standard**. Press **ENTER** once you have made these changes and the screen will be redisplayed so it looks like that shown in *Figure E4.16* below.
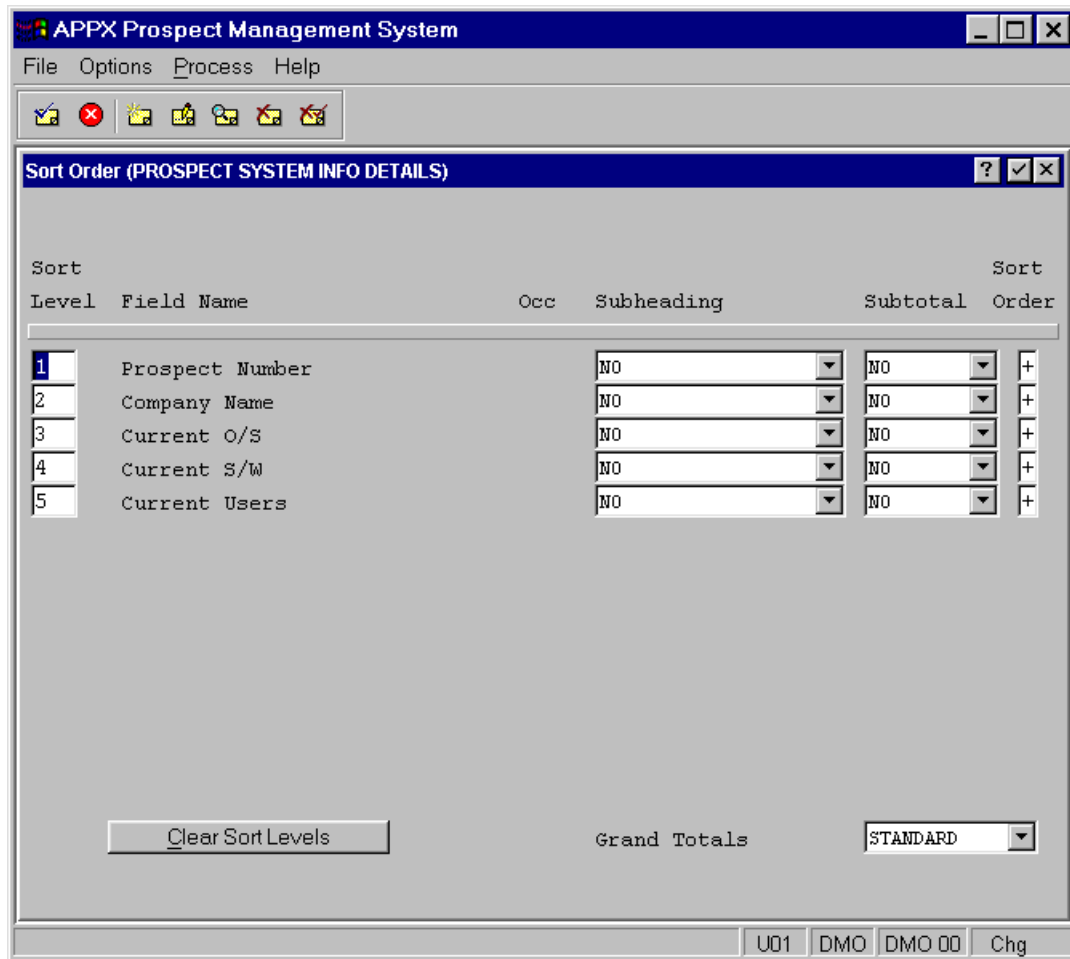

Figure E4.16 – Modified Sort Order screen

➢ Press **ENTER** to continue.

➢ The **Disposition** screen is the next screen to be displayed *(Figure E4.17)*. The Disposition screen allows you to specify where and how your report will print. **Check the 'Print on Screen?' box** so your report will be displayed on your screen when it runs. If you check the '**Print Hard Copy?**' box then your report will be sent to the printer specified in **Printer ID** (which of course you can change simply by clicking on the binoculars icon and selecting an alternative printer). You can add your own subheading text to the final report by entering the required text in the **Report Subheading** field. Additionally, you can change the **Form** on which your report prints, the **Number of Copies** and you can even select a different disposition simply by using the 'Select Disposition' button. The Disposition screen is also where you would specify that you want to save a report to disk so it can be printed later, transferred to another machine, viewed or manipulated by another program, and so forth.

➢ A particularly useful option on the disposition screen is the '**Browsable?**' option, which is a standard feature of APPX. If this box is checked and you print your report on screen, then you will have a drill-down capability. What this means in the case of the Prospect System Setup Details Report is that, while you are viewing your report on the screen, you will be able to position your cursor on any prospect, press **Option 33 (``33)** and APPX will automatically invoke the Prospect Maintenance input process thus allowing you to view the full details for the selected prospect.
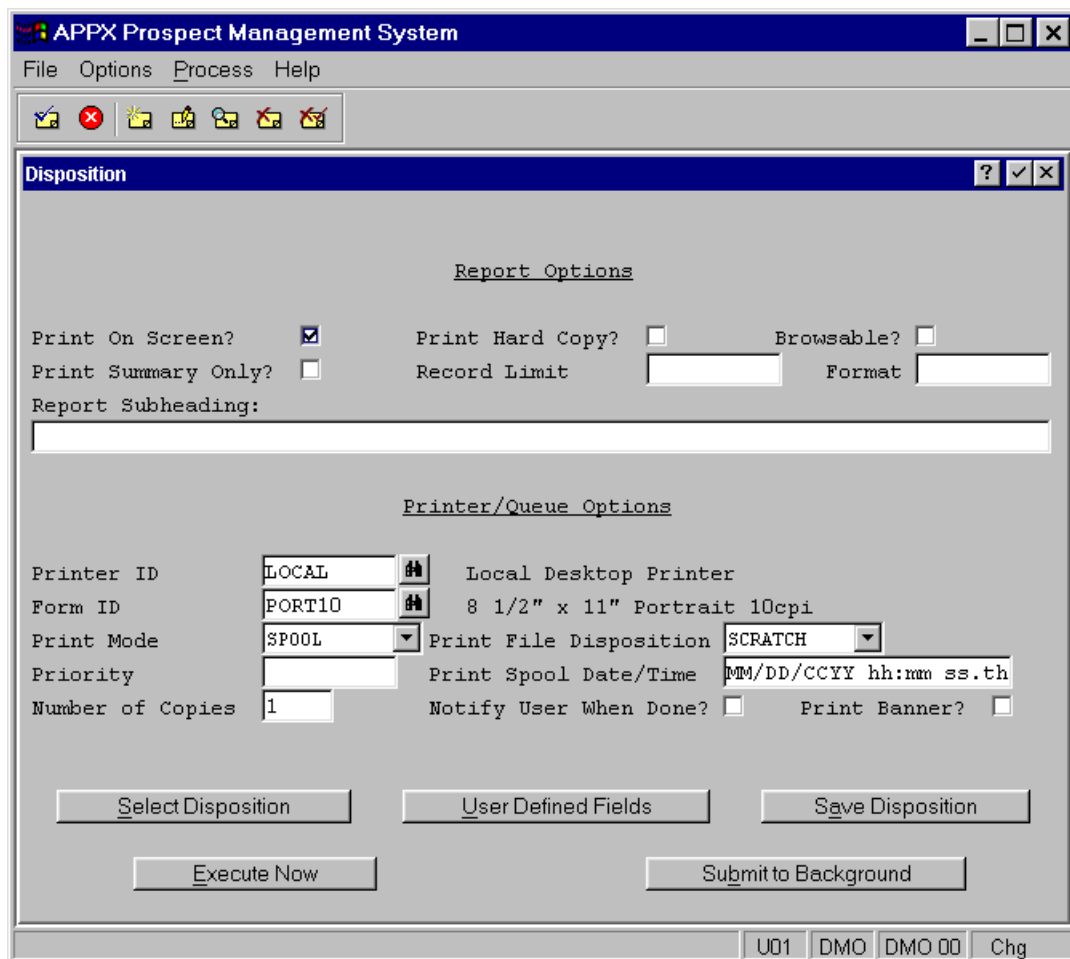

Figure E4.17 – Disposition Screen

➢ Once you have finished making your changes to the Disposition screen, click the **Execute Now** button (or press **ENTER**) to continue.

➢ Since you checked the Print On Screen? box the report is displayed on the screen *(Figure E4.18)*. Your record groupings may differ depending on the data that you entered for each Prospect's Current System Setup information.

➢ When your report appears on screen you can use the **arrow buttons** at the bottom left of the screen to move around the report: [arrow buttons]. From left to right, these buttons enable the user to move to the far left column of the report, move one screen to the left, move one column to the left, move one column to the right, move one screen to the right, move to the far right column, move to the top of the report, move up one screen, move up one line, move down one line, move down one screen and move to the end of the report.
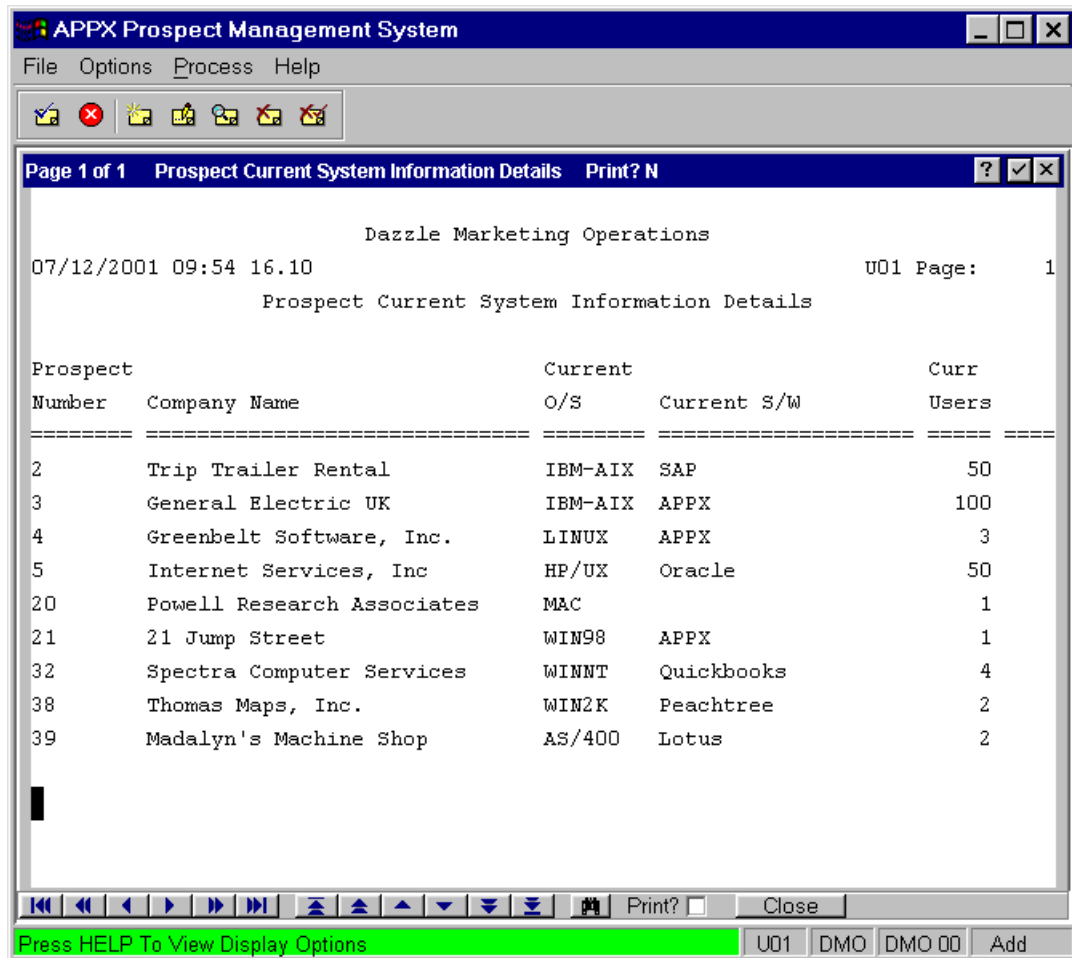

Figure E4.18 – Report On-Screen Display

➢ Also, you can use the binoculars icon at the bottom of your screen to **Search** your report for a particular value or string or to move to a specific page in the report.

➢ While the report is displayed on your screen, you can choose to print a hard copy even though you did not check the 'Print Hard Copy?' box on the disposition screen. You do so simply by checking the 'Print?' box at the bottom of the report. Conversely, if you had checked the 'Print Hard Copy?' on the disposition screen but decided when you viewed the report on the screen that you did not actually want to print it, then you could clear the 'Print?' box while your report was displayed on the screen and it would not print.

➢ Once you have viewed the report to your satisfaction, click the **Close** button, press **ESC** or **F8**, or click the ✖ button in the top right corner of the screen to **Exit and return to the Job**.

> It is important to remember that if you have checked both the 'Print on Screen' box and the 'Print Hard Copy' box, then your report will not be printed on the selected printer until you have finished viewing it on the screen.

The report is complete, and testing was successful, so now you need to make it available to the users at runtime. You will add it as an option on the Prospects File Maintenance screen.

➢ Press **ESC** to exit the job step listing.

➢ Press **ESC** to return to the Process Management Menu.

4.4 Add the Report to an Existing Process

➢ On the Process Management Menu select **Input**.

➢ Scroll through the Input Process listing and **select the PROSPECT FILE MAINTENANCE** process (use PageDown/PageUp or the hidden scroll bar which will appear as you move your mouse pointer to the right column of the screen).

➢ Press **ENTER** to move to the Frame level.

➢ Press **ENTER** to move to the Image level.

➢ Click on the **Optional Processes** button and the list of optional processes is displayed.

➢ Click on the ⬛ button (or press the **F9** key) to move into **Add Mode** so you can add a new optional process. Remember how you added an Optional Process for Current System Setup? This will be the same procedure except that you will not be adding a button on the image; rather, you will put the option on the Toolbar.

➢ The option number that defaults is 99, which is the next sequential number after the highest option number presently defined. Accept this default and enter a **Process Type of JOB** and a **Process Name of PROSPECT SYSTEM SETUP DETAILS**.

➢ Now click on the **GUI Attributes** button. GUI Attributes allow you to specify that you want the new option to appear on the Toolbar rather than being defined as a button on the image.

➢ The **Menu/Toolbar Properties** screen is displayed *(Figure E4.19)*.

➢ Enter a **Label** for the option and a **Shortcut** of Y. Enter **Audit** as the Group, placing this process with the other listing process already defined.

➢ Check both the **Pull down?** and **Right Click?** boxes to indicate that this option should be shown on both.

➢ Move to the **Toolbar Options** and **check the Show On:** box; then enter a **Tooltip** for the option.

➢ Move to the **Resources** section where you will specify the icon that will be assigned to this toolbar option. Since this is a report, specify **PRINTER** as the resource.
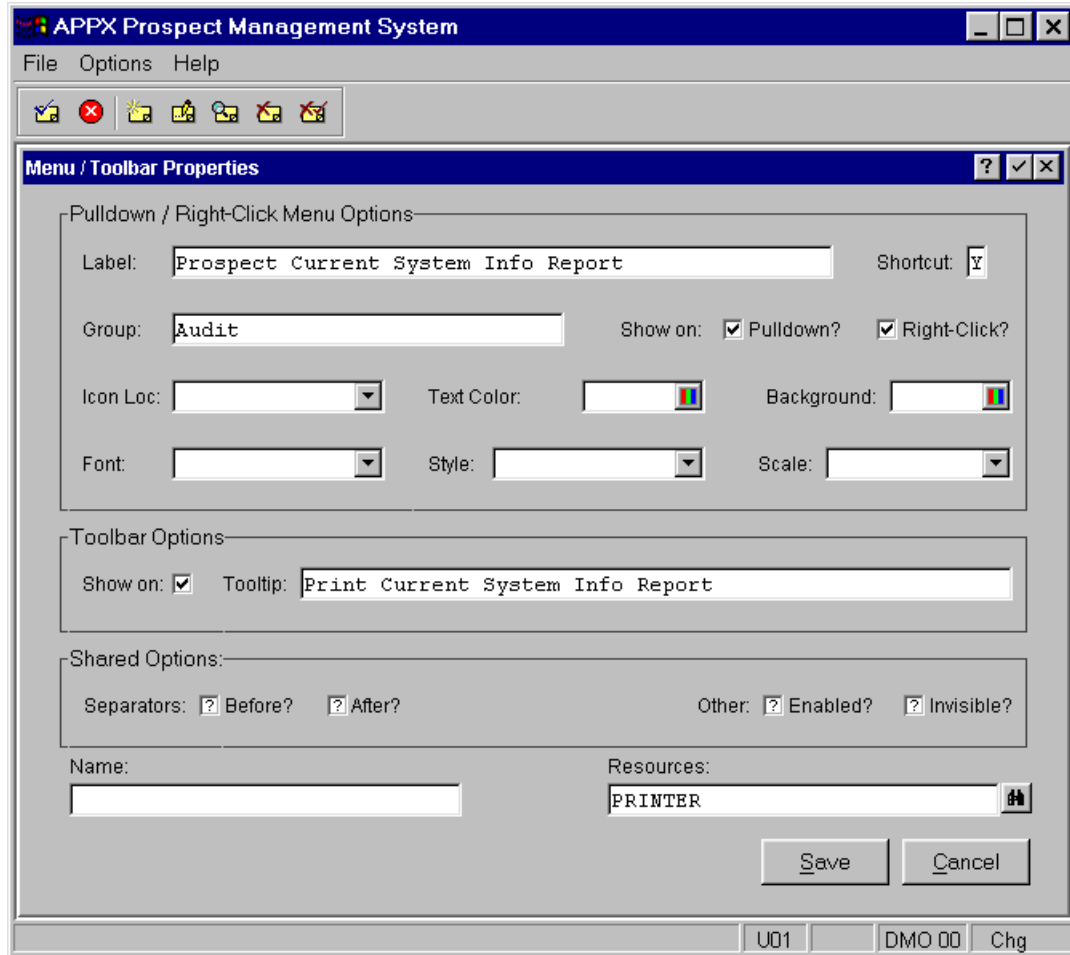
Figure E4.19 – Menu/Toolbar Properties screen

➢ Click on the **Save** button or press **ENTER** to save the option properties. APPX returns you to the Optional Processes screen.

➢ Press **ENTER** to save the record.

➢ Press **ESC** to exit Optional Processes.

➢ Use **Option 99 (``99)** to run the Prospect File Maintenance process. Select a record and the new optional process is now an available option on the Toolbar *(Figure E4.20).* To invoke the process, click on the Printer icon that has the appropriate tooltip.
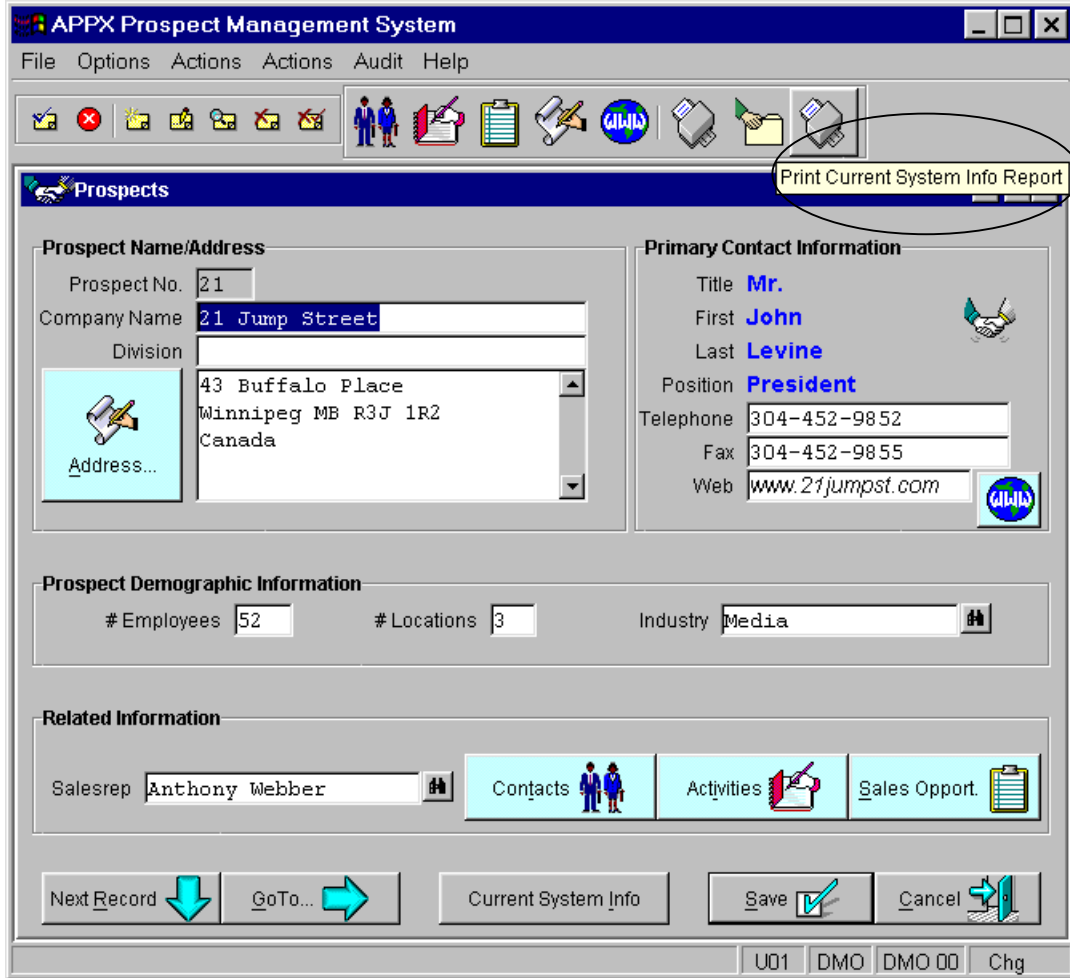
Figure E4.20 – New option on Toolbar

➤ Once you are satisfied that your new optional process is working as expected, click on the **Cancel** button to exit the currently selected record followed by **Close** to exit the Prospect File Maintenance process.

➤ You are returned to Application Design for the PROSPECT FILE MAINTENANCE process.

Conclusion – Application Design Demo

To summarize…

With minimal knowledge of APPX and the DMO application, you have:

❑ Changed the size of a field and restructured the existing data to match;

❑ Added three new fields to a file and restructured the existing data to match;

❑ Designed an input process that allows the user to record information in the new fields;

❑ Attached that process as an optional child to the existing Prospect Maintenance input process;

❑ Designed a new report that prints the newly added fields, and includes a variety of selection and sorting criteria so the user can group the report in many different ways;

❑ Attached the new report job as an optional child to the Prospect Maintenance input process.

All of this was done without writing a single line of procedural code. This is not to say that you will never need to write procedural code to supplement the specification-based design of an application. In fact, APPX includes a very powerful Integrated Language Facility for enter and editing command in event points. APPX also includes a very powerful interactive debug facility for testing and debugging procedural code within event points. But, these are topic for another time. Rest assured that APPX is a fully integrated design environment with all the capabilities that you need to develop full-featured, business applications.

<div align="center">Thank you for taking the time to explore APPX's Application Design capabilities.</div>