

**What is Baraza Framework:** Baraza is a Swahili word that means a deliberation meeting held by a collective group of a people of wisdom. The name **baraza** is used because the system came around by many heads with big minds coming together to develop it so as to come up with a working reliable system.

The Baraza Framework is a development Java Development initiative that makes application development easy. The framework takes advantage of XML to define its components. Using the framework, desktop applications, applets can be easily deployed using the same XML document with only slight modification.

*Baraza* is divided in three different blocks there is the *Java code block*, *XML block* and the *Database block*. The *Java code block* is again divided into four different blocks, that is; *applet*, *server* and *IDE*.

*Baraza* is a system that incorporates different independent projects that work independently using the same *Java code block* that uses the individual project *XML block* to produce a desired result. Feature of the *baraza frame* work:

- High development speed
- Low development cost
- Web enabled applications
- Very stable
- Well defined (well ordered design)
- Ease of operation (user friendly)
- Compatible with pc
- Reports, mailing lists, and forums are available.

**Login** First window which the user is supposed to enter the user name and password to use the system features that are only visible when you're logged in.

The window looks like this



Your **user name** is a unique identifier that you will use to login  
Your **password** is used for authentication when you login.

For your own security, please choose a good password

It should include letters, numbers, and symbols

Passwords are case sensitive. So, if you use lowercase or uppercase letters, you must type them in exactly the same way when logging in.

## **DATABASE**

Database provides standardized information about the system actually it's a large set of structured data, and run operations on the data requested by numerous users who use the system currently used in Baraza is PostgreSQL which probably handles virtually all the standard SQL constructs. It is easy (relatively speaking) to administer, it is fast, it is efficient.

### **BARAZA XML DEFINATION (Extensible Markup Language)**

The XML file contains all the variable names, method names and properties names along with additional information about the system XML which store and send information.

The illustration below shows an example of an XML file

```
<? xml version="1.0"?>
<APP name="sacco" database="sacco">
<TREE name="sacco">
  <NODE name="Main Entries">
    <NODE key="1" name="Members"></NODE>
    <NODE key="2" name="Periods"></NODE>
    <NODE key="3" name="Loan Types"></NODE>
  </NODE>
  <NODE name="Members Entries">
    <NODE key="4" name="Shares"></NODE>
    <NODE key="5" name="Loans"></NODE>
  </NODE>
  <NODE name="Reports">
    <NODE key="11" name="Members"></NODE>
    <NODE key="12" name="Contributions"></NODE>
  </NODE>
</TREE>

<DESK key="1" name="Members" w="585" h="520" splittype="vert" splitloc="200">
  <GRID name="members" pos="top" table="members" keyfield="memberid" filtered="true">
    <TEXTFIELD title="Member ID" w="240">memberid</TEXTFIELD>
    <TEXTFIELD title="Member Name" w="240">membername</TEXTFIELD>
    <TEXTFIELD title="Staff No" w="240">staffno</TEXTFIELD>
    <TEXTFIELD title="Start Date" w="240">startdate</TEXTFIELD>
    <TEXTFIELD title="Contribution" w="240">contribution</TEXTFIELD>
  </GRID>

  <FORM name="members" pos="bottom" table="members" linkfield="memberid">
    <TEXTFIELD title="Member ID" x="10" y="10" w="150" h="20">memberid</TEXTFIELD>
    <TEXTFIELD title="Staff No" x="290" y="10" w="150" h="20">staffno</TEXTFIELD>
    <TEXTFIELD title="Member Name" x="10" y="30" w="430" h="20">membername</TEXTFIELD>
    <TEXTFIELD title="Address" x="10" y="50" w="150" h="20">address</TEXTFIELD>
    <TEXTFIELD title="Zip code" x="290" y="50" w="150" h="20">zipcode</TEXTFIELD>
    <TEXTFIELD title="Town" x="10" y="70" w="150" h="20">town</TEXTFIELD>
    <TEXTFIELD title="Country" x="290" y="70" w="150" h="20">country</TEXTFIELD>
    <TEXTFIELD title="Contribution" x="10" y="90" w="150" h="20">contribution</TEXTFIELD>
    <TEXTDATE title="Start Date" x="290" y="90" w="150" h="20">startdate</TEXTDATE>
    <TEXTAREA title="Details" x="10" y="110" w="430" h="90">details</TEXTAREA>
  </FORM>

  <FILTER name="Members Filter" pos="bottom">
    <TEXTFIELD title="Member ID" x="10" y="10" w="240" h="20">memberid</TEXTFIELD>
    <TEXTFIELD title="Member Name" x="10" y="30" w="240" h="20">membername</TEXTFIELD>
    <TEXTFIELD title="Staff No" x="10" y="50" w="240" h="20">staffno</TEXTFIELD>
  </FILTER>
</DESK>
```

**<? Xml version="1.0"?>** this first line in the document - the XML declaration - defines the XML version and the character encoding used in the document. In this case the document conforms to the 1.0 specification of XML

**<APP name="sacco" database="sacco">** this line describes the root element of the document actually showing the name of it and the database name.

**<TREE name="sacco">** This lines describes how the names are arranged and displayed in hierarchical data

Every tree has a *root* node from which all nodes descend

Example of a tree

**<NODE name="Main Entries">***this are nodes attached to the tree which* actually provides a view of the data.

The node is the row displayed by the tree contains exactly one item of data.

**<DESK key="1" name="Members" w="585" h="520" splittype="vert" splitloc="200">** this where the node is created it has key, name which shows the name of the node it also has the height and width (which shows the size of the particular node, splittype shows how the node is being divided while the splitloc shows the size of the of the split.

**<FORM name="members" pos="bottom" table="members" linkfield="memberid">** this is where the form is being created whereby it has the form name of the table where the database is being referred to.

**<FILTER name="Members Filter" pos="bottom">** this is used as a search engine in the node.

There are a number of elements that are defined for the form and filter:

<EDITOR> - HTML Text component

<TEXTFIELD> - Single line text

<TEXTAREA> - Multi line text

<CHECKBOX> - True False checkbox

<TEXTEDATE> - Date entry

<DATESPIN> - Date selection

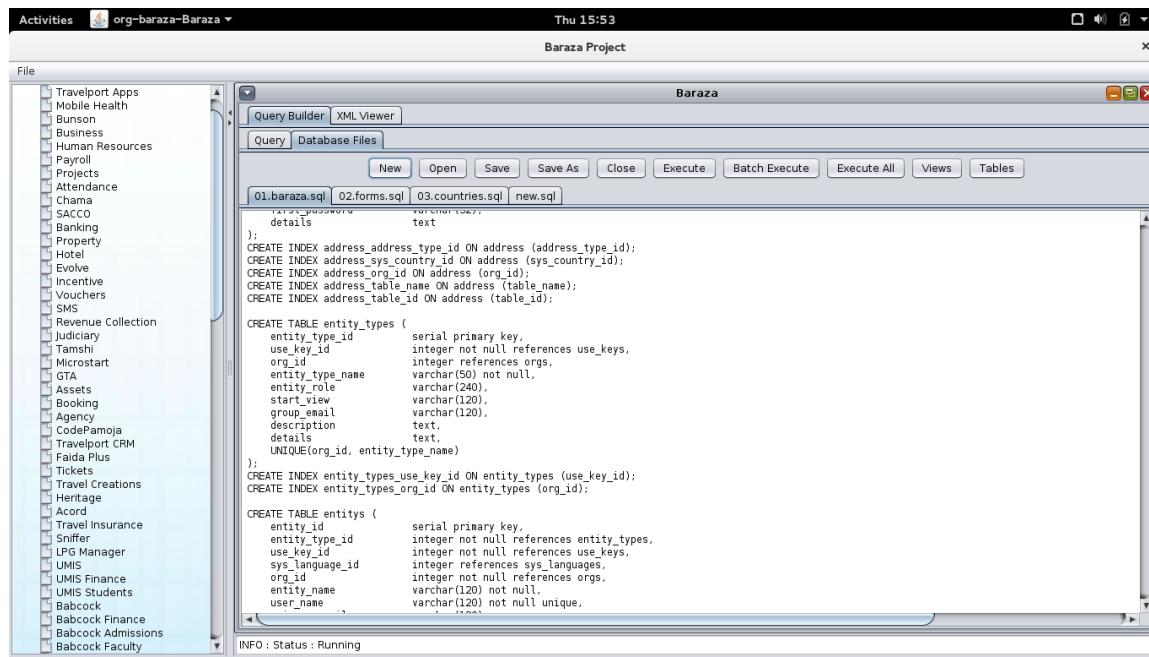
<TEXTTIME> - Time selection

<TIMESPIN> - Time selection

<COMBOBOX> - Item selection from a lookup list

<TEXTDECIMAL> - For decimal values

## **Baraza Example**



The screenshot shows the Baraza Project interface. On the left, there is a sidebar with a tree view containing various project names such as Travelport Apps, Mobile Health, Bunson, Business, Human Resources, Payroll, Projects, Attendance, Chama, Sacco, Banking, Property, Hotel, Eove, Incentive, Vouchers, SMS, Revenue Collection, Judiciary, Tamshi, Microstart, GTA, Assets, Booking, Agency, CodePamoja, Travelport CRM, Faida Plus, Tickets, Travel Creations, Heritage, Accord, Travel Insurance, Sniffer, LPG Manager, UMIS, UMIS Finance, UMIS Students, Babcock, Babcock Finance, Babcock Admissions, and Babcock Faculty. The main window title is "Baraza" and the tab selected is "Query". The query editor contains several SQL statements:

```
    r2v1_password      varchar(128);
    details            text;
);

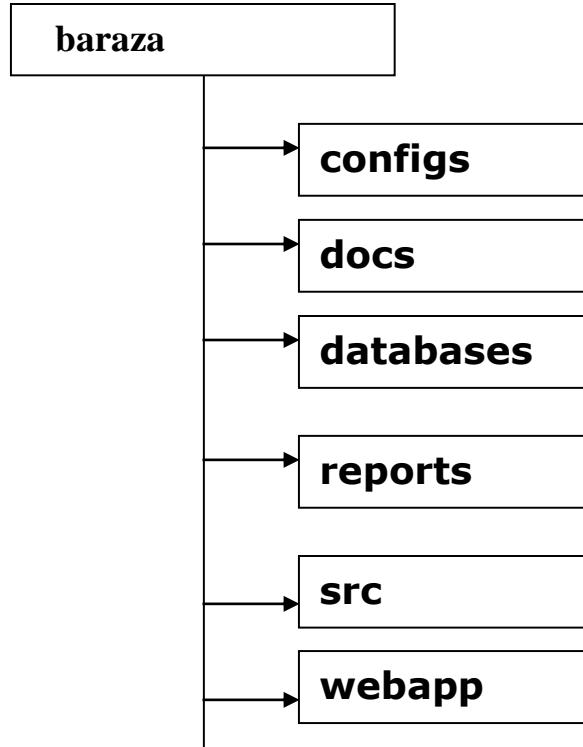
CREATE INDEX address_address_type_id ON address (address_type_id);
CREATE INDEX address_sys_country_id ON address (sys_country_id);
CREATE INDEX address_org_id ON address (org_id);
CREATE INDEX address_table_name ON address (table_name);
CREATE INDEX address_table_id ON address (table_id);

CREATE TABLE entity_types (
    entity_type_id      serial primary key,
    use_key_id          integer not null references use_keys,
    org_id              integer references orgs,
    entity_type_name   varchar(50) not null,
    entity_role         varchar(240),
    start_view          varchar(120),
    group_email         varchar(120),
    description         text,
    details             text,
    UNIQUE(org_id, entity_type_name)
);
CREATE INDEX entity_types_use_key_id ON entity_types (use_key_id);
CREATE INDEX entity_types_org_id ON entity_types (org_id);

CREATE TABLE entityis (
    entity_id           serial primary key,
    entity_type_id      integer not null references entity_types,
    use_key_id          integer not null references use_keys,
    sys_language_id     integer references sys_languages,
    org_id              integer not null references orgs,
    entity_name         varchar(120) not null,
    user_name           varchar(120) not null unique,
    .....
```

At the bottom of the query editor, it says "INFO : Status : Running".

## **DESCRIPTION OF THE BARAZA DIRECTORY**



### **Configs**

This is a directory intended to contain all xml files which are used in the system.

### **Databases**

Mandatory directory for the system where the original purpose is to store data used by the system.

### **Docs**

Has a wide range of use this directory contains subdirectories which include changes, issues, readme, and todo.

*Changes* reflects the latest development (changes) done to the system, *issues* shows what is partly done and due to completion although it's functioning, *readme* shows what the system does, actually what the system is performing.

*Todo* this is what is supposed to be done towards improving the system which is actually work pending for the system,

### **Reports**

It's a mandatory directory where all reports for the system are stored

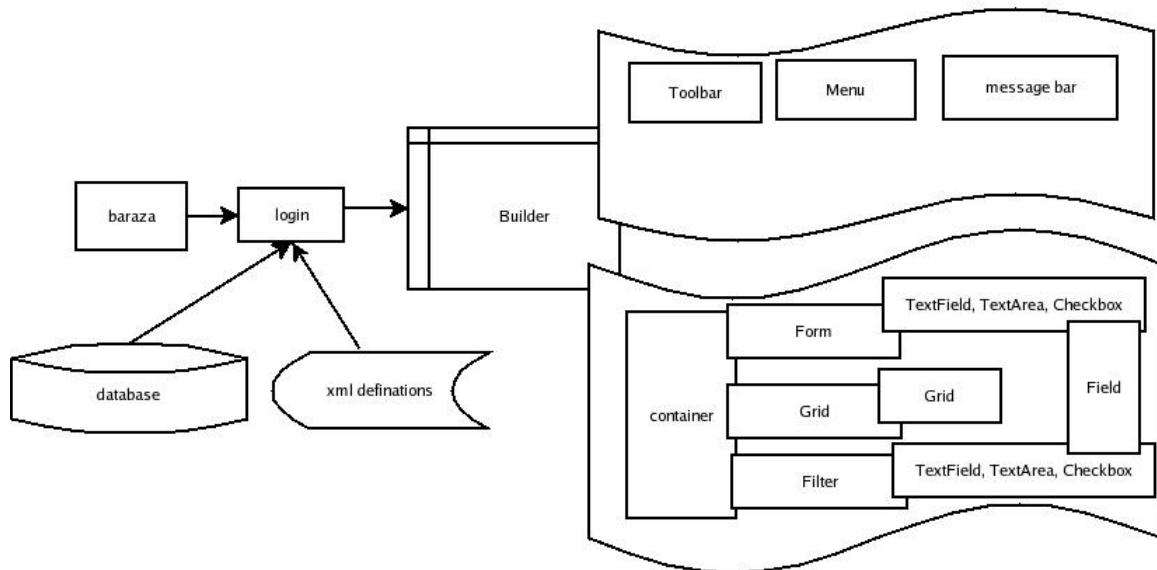
## Src

This where the main baraza class is stored actually the whole system code is stored in here.

## Webapp

Consists of (configs, jar, images, index.html, Lib, search temp, web-Inf)

## Component Flow



## The Servlet Web Page - Components

### ***1.1. The Top Level Menu***

The Top level menu gives the user options on the existing application modules. By clicking on any one of these options, the servlet application returns a page displaying the sub menu options available for the selected module. It may display a default data page which may be a form or data grid table.



**Example of a top level Menu**

### ***1.2. Sub Menus***

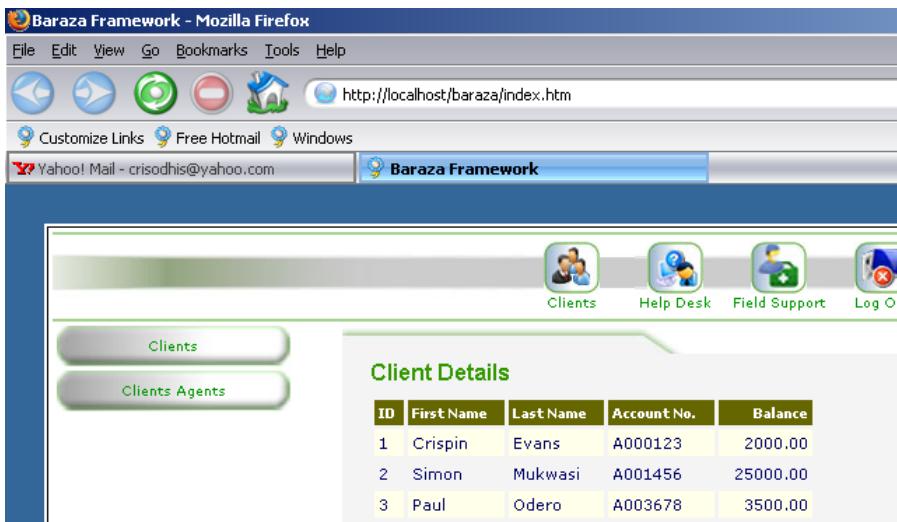
Each page within a module has sub menu items to enable the user carry out various tasks within the current module.



**Example of a sub menu items.**

### **1.3. The Information Display Area**

This area of a page displays data for example a web form or table grid.



The screenshot shows a Mozilla Firefox browser window with the title "Baraza Framework - Mozilla Firefox". The address bar shows the URL "http://localhost/baraza/index.htm". The main content area displays a "Client Details" grid. The grid has columns for ID, First Name, Last Name, Account No., and Balance. The data in the grid is:

| ID | First Name | Last Name | Account No. | Balance  |
|----|------------|-----------|-------------|----------|
| 1  | Crispin    | Evans     | A000123     | 2000.00  |
| 2  | Simon      | Mukwasi   | A001456     | 25000.00 |
| 3  | Paul       | Odero     | A003678     | 3500.00  |

**Example Showing the client details grid in the information display area.**

### **1.4. Data Links**

Within forms or table grids, special hyperlinks exist that enable navigation to specific information groups.



The screenshot shows the same "Client Details" grid as the previous example. However, the data in the grid is different, showing four entries instead of three:

| ID | First Name | Last Name |
|----|------------|-----------|
| 1  | Crispin    | Evans     |
| 2  | Simon      | Mukwasi   |
| 3  | Paul       | Odero     |
| 4  | Pharis     | Mwangi    |

**Example showing data links under the ID Field.**

## 2. Page Layout

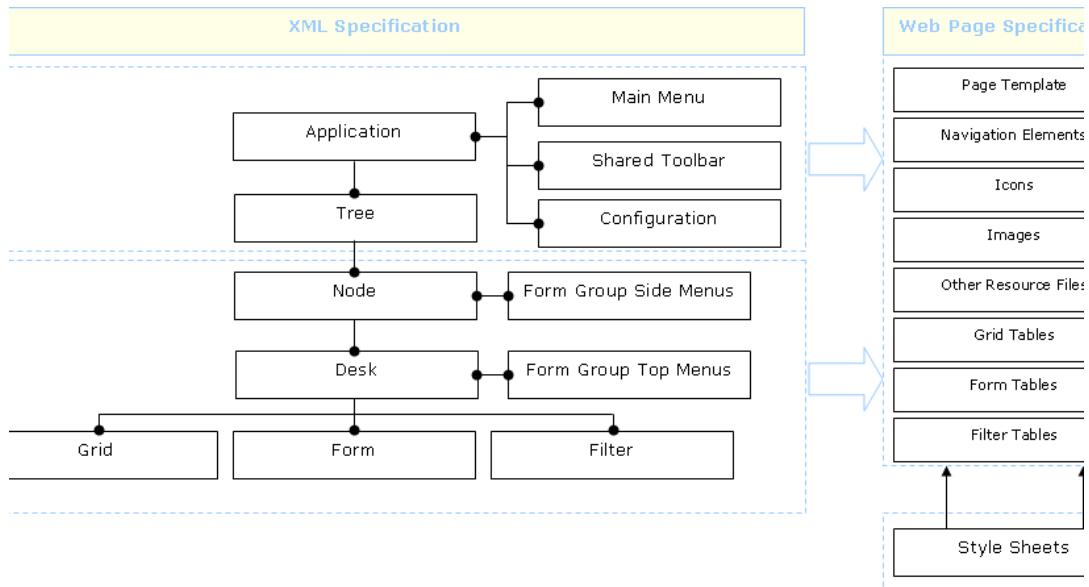
To enable uniform layout as well as ease of customization, the baraza web framework uses Cascaded Style Sheets (CSS) heavily. The Style sheets are used to determine:

1. Link Appearance and Behavior
2. Table Structure and Appearance
3. Cross Browser Presentation
4. General page appearance

Currently all styles are stored in a file called **baraza.css**. Each page links to this style sheet if it needs to take advantage of the variety of predefined styles.

The Style Definitions are important because they make page development to depend on pure HTML as much as possible to limit the use of client side scripting like Java Script. For Example the side buttons are simply created as blank graphics with no label, these are then placed as background images to a table cell. The button label can be written within the cell directly and easily as opposed to using java Script for image slicing. For this background image to be presented properly, CSS is used to determine the precise cell width and height.

## 3. Application Development Model



The above diagram illustrates the application development model. The application is developed by specifying it in an XML document. This is then processed by the java runtime environment to produce the resultant web components as highlighted in the web specification. The Core Development Model should take into account the following key issues.

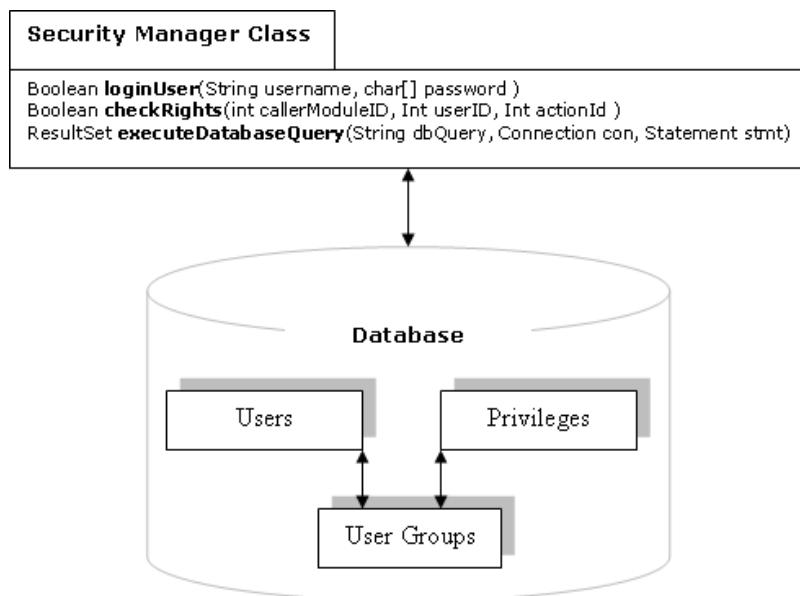
1. Security Management
2. Report Generation
3. Errors
4. Command Processing
5. Data Capture
6. Audit trail Analysis
7. Web Page creation

The following discussion will specify the generic or basic requirements of the above issues. These requirements should be met to ensure that the applications developed using this framework are stable and easily extensible.

### ***3.1. Security Management***

The security management class should offer the following core functions.

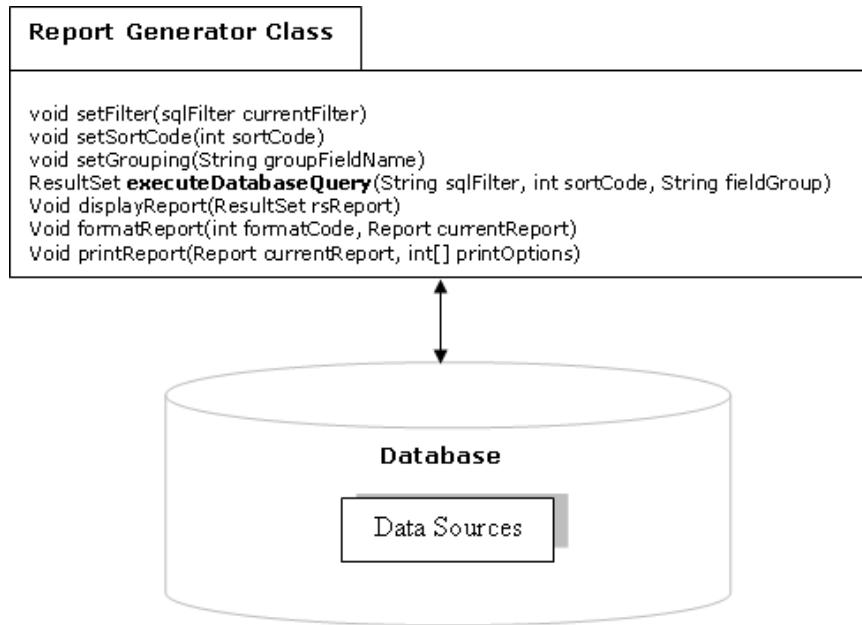
1. User Login
2. User Rights Verification
3. Ability to read a data source e.g. database or data file on disk.



### **3.2. Report Generation**

The report generation class should offer the following functionality.

1. Allow data filtering by a certain data field or combination of several fields and attached conditions.
2. Allow data sorting numerically or alphabetically.
3. Allow for the grouping of a data set into subsets.
4. Ability to read a data source
5. Ability to display a report for printing or on screen.
6. Ability to format a report.
7. Ability to print a report

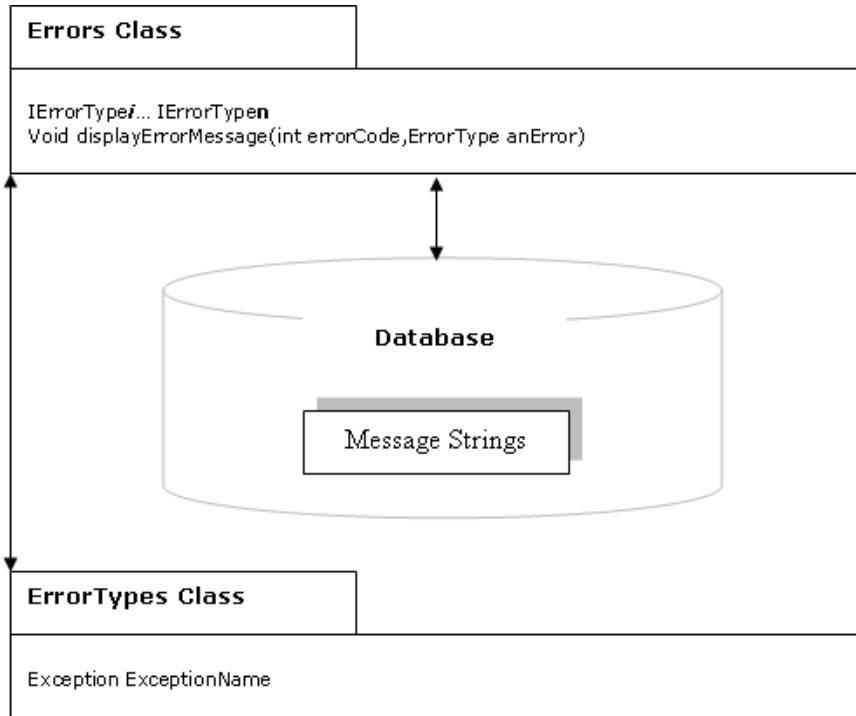


### **3.3. Errors**

To make the application framework as user-friendly as possible. It should provide a means for user defined error messages. Special Interfaces can be created tthat define these errors as types.

Ideally the definition should follow the following model:

1. Error Type
2. Corresponding Messages



### **3.4. Command Processor Class**

This corresponds to a generic library class that processes function calls. The model for this class is provision of 2 functions types. The first type does not return a value and the second type does. In whichever case, the function is told what resource is required and the code of the operation.

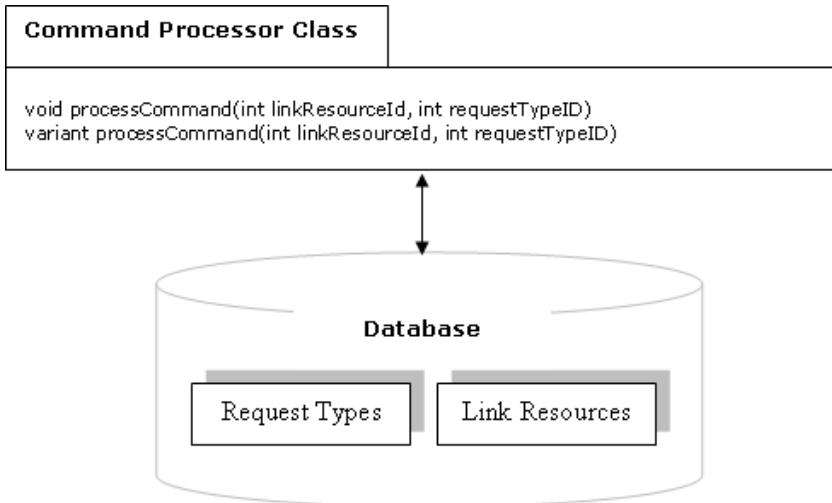
Eg..

If an image resource such as a button has an id of 34 and a resize operation has code 0020 (where 00= resize and 20 = twice) and we want the page being loaded to display buttons of this type at twice the size the resultant function call would be.

Image process Command(34,0020)

The specification of this class requires the definition of

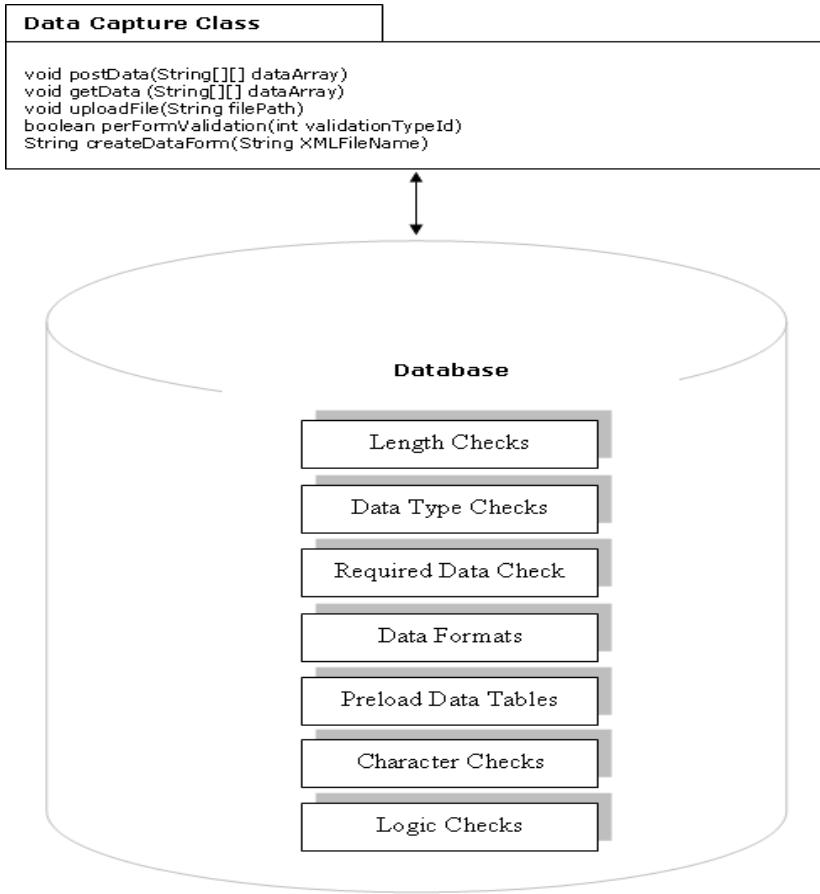
1. Request types
2. Resource Link Definitions



### ***3.5. Data Processing***

The core of this model is the handling of data. Key issues must be addressed to ensure that the data is properly handled. The Key data processing activities are:

1. Data Posting or Getting from Web Forms.
2. HTTP Header processing such as requests for a page or specification of redirects.
3. File Uploading
4. Validation

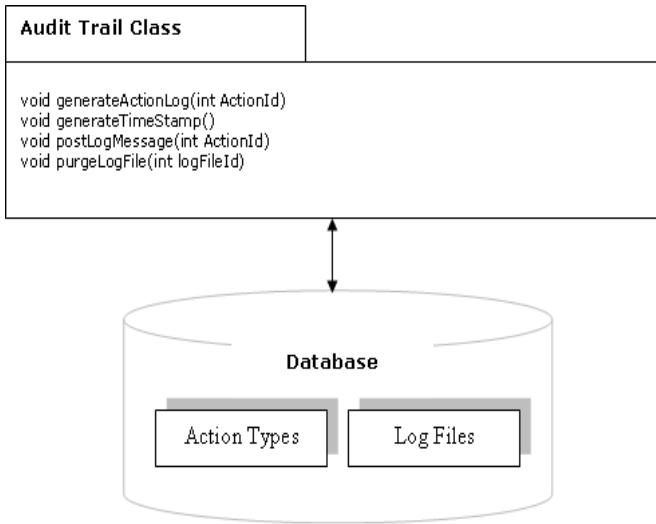


### ***3.6. Audit Trail Analysis***

The Audit trail Class is key to making the application development frame conform to standards in data security and accountability. In Practice it implements an integral logging function as depicted by the diagram below.

The Specification for this class requires:

1. Definition of Action Types
2. Action group to Log File Mapping.



### ***3.7. Web Page Definition***

The page definition process has several key functions that are used to create, format and display the pages. The Class manages styles, resources and applies templates.

