



## **iiFramework Version 2 Release 4**

Technical Overview

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## **iiFramework – Overview**

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### **What is iiFramework?**

iiFramework is an application framework for building robust, scalable e-business web applications on a ColdFusion Server.

It is a software product that Infrastructure has created over the past three years. This framework is the result of creating and in some cases recreating two or three times the various subsystems that make up the iiFramework. We built these independent subsystems as they were needed in building over 50 e-business Internet, Extranet and Intranet applications that are currently in production.

This framework eliminates up to 30 to 60% of the PROGRAMMING necessary to build a robust, scalable and extensible web application. It addresses common programming tasks that are an issue for any mission critical web application such as:

- Near Real-Time Exception Reporting
- Group and User Security Management
- Content Management
- Navigation / Graphics Management
- Site Variable Management
- Presentation Layer Management
- Module Management
- Site Management

The framework is made up of seven subsystems that address the above mentioned programming tasks. Each subsystem is responsible for the management of each of these areas. These seven subsystems form the basis from which any e-business application can be built.

Much of any e-business project is spent on design and architecture including all of the above listed areas. Many of these areas are never addressed adequately due to time and budget constraints. With iiFramework you can deliver your web-based software quicker, at a reduced cost and with a huge increase in stability and “polish.”



## Who Should Use iiFramework?

iiFramework was designed to be used by ANY ColdFusion developer who is serious about delivering world-class web-based applications. Specifically if you are a development group of 1 or more developers and use ColdFusion to create web applications, whether Internet, Intranet, and/or Extranet applications, you will find that using iiFramework will:

- ❑ Save you time and money – making you more PROFITABLE
- ❑ Simplify overall design of the application, thus decreasing maintenance issues
- ❑ Standardize the way security and navigation is created for each site resulting in easier administration
- ❑ Enable non-programmers to have input and direct control over their part of the business

The rest of this report provides an overview of each subsystem – the needs, goals and responsibilities of each subsystem and how they relate to each other.



## **iiFramework Subsystems**

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The following subsystems make up the iiFramework library of code and database tables. iiFramework implements the basic supporting architecture necessary for any Internet / Intranet or Extranet application. The subsystems are:

- Group and User Security Management Subsystem
- Content Management Subsystem
- Navigation / Graphics Management Subsystem
- Site Variable Management Subsystem
- Presentation Layer Management Subsystem
- Module Management Subsystem
- Site Management Subsystem

By implementing these subsystems as a framework, the programmer does not have to specifically know how these subsystems work. In order to take full advantage of this framework, the developer must only learn a few APIs.

None of the following APIs are required, but can be used by the programmer to take full advantage of the iiFramework system.

### **User Interface APIs**

- iiQueryShow – Displays a recordset to the user, can contain links to add, modify, delete records.
- iiFont – Displays the font based on the current iiStyle.
- iiDialog – Displays a formatted dialog box, based on the current iiStyle.
- iiForm – Displays a form based on the current style.
- iiFormDetail – Displays forms based on the current style.
- iiVerifyFields – Provides server-side form field and data validation routines.
- iiLink – Use to create hyperlinks that take SID into account if needed.

### **Other APIs**

- iiAbort – Replacement for CFABORT
- iiCache – Replacement for CFCACHE
- iiPullDown – Use to create a table based lookup on a custom form.
- iiQuery – Replacement for CFQUERY which takes multiple sites into account. Must use this instead of CFQUERY. Also implements unlimited query caching – something ColdFusion cannot do “out of the box”.
- iiUserSessionSet – Set per user session variables



## **Group and User Security Management Subsystem**

The goal of this subsystem is to allow for an easy and standardized way of handling an unlimited number of user “groups” per application. By “handling” we mean the following:

- ❑ Easy registration of new users
- ❑ Movement of existing users from one group to another
- ❑ Creation of an unlimited number of groups – with each group having its own “profile” of pages the group may access.
- ❑ An easy method of sending email to all members of any particular group

### **Groups**

There are several “standard” groups installed with any website. These groups are:

- ❑ Admin Manager – Performs administration of all users, and security privileges of the website. This is your “super-user” group that can grant access to anyone else.
- ❑ Admin – This group has access to all content management and can add / modify users. This group cannot grant or deny access on a global scale to other user groups as can the Admin Manager group. This group can change access to individual pages.
- ❑ Content Manager – Administers content of all pages of websites excluding code. Cannot administer users or change access control.
- ❑ Member – This is the typical end-user group with access to your “protected” area, of advanced privileges, not granted to “public” or non-registered users. The member group can be broken up into multiple levels such as Gold, Silver, Bronze as the e-business needs dictate.

An entire group of users can be activated / inactivated at once.

### **Users and Authentication**

Simple or advanced demographic information can be requested from each user upon registration. Each user has a unique username and password that they define upon registration. The user can maintain his / her own profile and change their password at will. The administrator can also reset the user’s password, in which case the user is sent an email notification of the password change, which includes the new password. Upon login, the user can change his / her password as desired. Individual users can also be activated / inactivated at any time.



## Group and User Security Management Subsystem Features

Maintain unlimited groups and users per group. Create different “profiles” of users that you can grant / deny access on a per page level.

- ❑ iiSecurity - User Authentication System
  - ❑ Enforces timeouts on configurable number of minutes
  - ❑ If authentication necessary across form posts, automatically records and passes along all form field submissions
  - ❑ Automatically displays user login dialog upon user clicking on or entering URL for password protected page
  - ❑ Denies access to a user with improper access even when accessing URL directly
  - ❑ Users can be marked inactive and immediately lose access on their next click or form submission
  - ❑ Proprietary session ID created that is used to enforce security on a level where a session cannot be “adopted” by another user as is true with ColdFusion “out of the box”. See <http://www.infranet.com/ColdFusionSecurityHole.htm> for more details.
  - ❑ Same user cannot login from multiple IP addresses at the same time– greatly reduces userID sharing
  - ❑ Different users can simultaneously login using the same IP address to account for proxy servers
- ❑ Groups
  - ❑ Add New
  - ❑ Update
  - ❑ Delete
  - ❑ Inactivate Individual Users (without deleting them)
- ❑ Users
  - ❑ Add New specifying which group they belong to
  - ❑ Update
  - ❑ Delete
  - ❑ Inactivate Groups of Users (without deleting them)

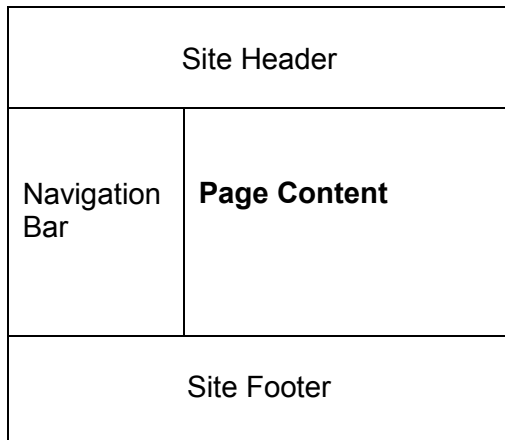


## Content Management Subsystem

Content management is about managing the content found on each page. In order to take advantage of the iiFramework Content Management subsystem, every page of the website must be “registered” with the system. Once registered, a “page” is made up of page content and properties. Their detailed attributes follow:

- ❑ Page Content
  - ❑ Title
  - ❑ Meta Keywords
  - ❑ Body Header
  - ❑ Code
  - ❑ Body Footer
- ❑ Properties
  - ❑ Link Name
  - ❑ Link Image
  - ❑ Is this a linked page?
  - ❑ Is this a secure page?
  - ❑ Is this page currently active?

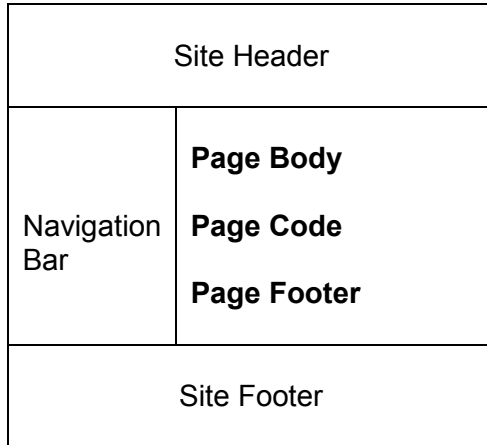
This subsystem allows us to manage the components of the actual “page content” area of a page. The header, navigation bar and footer are managed by other subsystems. See the diagram below.



*Diagram 1: Page Content as it Relates to Site Content in General.*



Within each page there are also three separately managed page sections. They are the Page Body, Page Code, and Page Footer. See the diagram below for details.



*Diagram 2: The Three Elements of Page Content as it Relates to Site Content*

The use of each of these sections is optional. None of them have to be defined for a page, but if nothing is defined, you will end up with a blank page. If a section is not used, nothing appears on the page and no space is reserved for it to appear. Once defined, the sections take their place in the order pictured in Diagram 2.

The Page Header, Body, and Footer are designed to hold only static HTML based content. This HTML content is managed via the WYSIWYG editor. You must use a supported browser to utilize the WYSIWYG editor.

The Page Code section is where you place any programming code necessary for dynamic or customized functions for this page. This is how you achieve a dynamic, database driven page. You can include any valid ColdFusion code in the Page Code area.

As a note, the site header, site footer and navigation bar can be completely disabled for any given page.



## **Content Management Subsystem Features**

Manage Categories of page Content. Categories keep content pages logically grouped. Create new pages in the website and maintain their content and accessibility by each group of users.

- ❑ Add, Update and Delete Page Categories
- ❑ Add, Update and Delete Website Pages
- ❑ Page properties define the parameters needed to know how to display this page as a link and how to manage security and access to this page. The properties consist of the Page Category, Filename, Image file name (and width/height) for the navigation link (optional), selection of whether this page is currently active or not. Selection of whether or not this page should be linked to directly by the user, and whether or not this page should prompt the user for username / password if the user is not already logged in.
- ❑ Page content consists of a Title, Meta Tag Keywords, Body Content Area, Custom Code and Footer Content area.



## **Navigation Management Subsystem**

This subsystem manages navigation of the website, dynamically. It is responsible for displaying any links available to the current user. By default, any user not logged in assumes an association with the “Public” group. The public group can also have pages associated with it.

When the time comes to format the navigation bar of the website, the system determines which pages the current user has access to view, as well as, which pages are active and should be linked to.

The navigation subsystem then groups the links according to their page category and displays them. If the links have graphics associated with them, the graphics are displayed instead of textual links.

This subsystem is called again when the site footer is formatted to display small text-based links to these same pages as a footer to the page. This is an optional feature that can be turned off if not required.

There is no other direct management of this subsystem other than creating pages in the Content Management system and assigning the groups that should have access to them.

## **Navigation / Graphics Management Subsystem Features**

Manage the links available on each page according to a user’s group profile. Supports a “Public” group for normal non-secure web pages.

- Dynamic display of Page Categories based on user / group security profile
- Dynamic display of Page Links based on user / group security profile
- Dynamic display of Page Content based on user / group security profile
- Restriction on pages if directly linked with proper user / group security profile
- Set Page Access Levels for each Group
- Sort Page Categories
- Sort Pages
- Assign graphics to any / all links as desired



## **Site Variable Management Subsystem**

This subsystem manages any variables that are necessary for the operation of the site. Permission to change these parameters is governed by the same page security as is used throughout the system so any user group can be granted access to these functions.

### **Site Variable Management Subsystem Features**

The following configurable variables are managed by this subsystem:

- Site Meta tag Keywords
- Site Header HTML or File
- Site Footer HTML or File (optional)
- Background and Link Colors
  
- Set Logo Graphic
- Set Header Bar Graphic
- Set Background Graphic for navigation bar
- Set Background Color for non-graphical navigation bar
  
- Content Maintenance – turn WYSIWYG viewer on / off
- Email Settings – set all email addresses for the site
- HTML Color Schemes - Styles



## **Presentation Layer Management Subsystem**

This subsystem has responsibility for displaying any dynamic data to a user. It separates the business logic from the presentation of the data. The actual look and feel of this data is governed by what we call "iiStyle."

An iiStyle is made up of the following variables collectively:

- FontColor
- FontFace
- FontSize
- BGColor
- BGColor2
- Border
- Align
- Height
- Width
- CellPadding
- CellSpacing
- HeaderFontColor
- HeaderFontFace
- HeaderFontSize
- HeaderAlign
- HeaderBGColor
- TitleAlign
- TitleBGColor
- TitleFontColor
- TitleFontFace
- TitleFontSize

The style parameters of the site are initialized once and then used by all presentation layer APIs when formatting and displaying data to the end-user. This allows for creation of dynamic code without regard to the color schemes, fonts, and other settings to create the output. The style can be change or modified at any time to reflect the needs of the site.



## **Presentation Layer Management Subsystem Features**

The libraries used in this subsystem provide most of the look and feel, and data formatting routines for presentation to the user. These APIs can easily be adapted to incorporate presentation of data via a Web Browser, WAP, PDA, email or other device.

- ❑ iiStyle – For browser-based output, we have designed a “style” selection from the application layer. An application-wide variable is set denoting the current iiStyle, which determines the current colors, fonts, table and form formatting. This then allows the programmer to program without regard to any HTML formatting or color standards for the site. This use of iiStyles permeates the following library functions.
- ❑ iiFont – Selects and sets the font based on the current iiStyle.
- ❑ iiDialog – Creates a formatted “window” of data on the page according to the current iiStyle settings.
- ❑ iiQueryShow – Displays and formats any result set and allows specification of which fields should display, etc. iiQueryShow determines how to present and format the data based on application level settings.
- ❑ iiForms – Creates a two column formatted table with embedded form fields for user input. The look and feel of the form is formatted according to the current style. All manner of form input fields are supported including database lookup fields such as pulldowns, radio buttons, check boxes, multi-select boxes. Prefilling input fields to create an “update” form from current database content is also supported.



## **Module Management Subsystem**

The Module Management Subsystem is a powerful part of iiFramework. This subsystem manages packaged “modules” of code, content, and access controls. Once a particular set of pages has been programmed, content has been added, and user access control has been defined, the module manager will provide an easy to use interface for installation of that set of software and data to any other website in the system. See Site Management Subsystem for more on creating other websites.

This allows for the addition of new modules to a system, as well as, version control and installation of newer versions of modules to websites with existing modules.

## **Module Management Subsystem Features**

This subsystem is used in the creation and installation of modules from any site to any other site. A module is made up of application level pages along with their security access profiles. A module can be installed to one or more sites at a time.

- Create a module profile
- Copy a module



## Site Management Subsystem

The Site Management Subsystem's role is to provide a simple interface for creating and maintaining multiple web applications within the same database and file structure. It is responsible for allowing you or end-users to create new websites, customize them, and assign domain names to them.

This subsystem reduces the time necessary for setting up a new web application from one or two days to 2 minutes – literally. To make things easier, this subsystem lets you decide which existing website “template” to use for creating the new website. These templates are simply other websites built using iiFramework that have been marked as templates.

When creating a site based on a template, the Site Manager creates a new subdirectory for the new site and then copies all pages, images, security profiles, users, groups, and so forth.

You may want to keep all functionality of the old site, but customize the graphics, look and feel of the new site. You may also need to define new groups, redefine them and their access control. All of this can be done through your browser.

Additional steps can be taken to ensure that any custom functionality stays exactly the same for all sites. This means you can add new functions to one centralized code base and each site can instantly inherit the new functionality.

It is also possible to define new functions or “tweak” an existing function so that only one website obtains this changed functionality.

### Site Management Subsystem Features

This subsystem is used to create new websites. The new sites can be created by an administrator or by an end user using the Site Wizard.

- Create a new Site – Admin version
- Create a Site Wizard – End user version
- Update Sites



## **iiFramework Add-On Modules**

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The following modules have been designed and built for use within iiFramework. These modules provide access to the most commonly used functions within an e-business application.

These modules are not part of the base iiFramework product, but allow for powerful integration into any iiFramework-based site. The Module Manager can be used to add these modules to any iiFramework site.

### **iiJobs Module**

Advertise open job positions for your company. Categorization of Job Postings is supported.

- Add / Modify / Delete Job Listings
- Details are edited using the WYSIWYG editor

### **iiFAQ - Frequently Asked Questions Module**

Provide a searchable inventory of the questions and answers about your website, products, or services.

- Add / Modify / Delete FAQ Categories
- Add / Modify / Delete FAQ's including file attachments
- Details are edited using the WYSIWYG editor

### **iiNews Module**

Post Press Releases, or any other type of news, for easy listing / viewing. Categorization of News is supported.

- Add / Modify / Delete News Listings
- News items can be added and activated by publish date
- Details are edited using the WYSIWYG editor



## **iiStore Module**

iiStore is a plug and play “module” built to iiFramework specifications that can be “imported” into any iiFramework based web application. The module consists of support for all functions needed to manage and display catalog parts, manage shopping carts and lists, order management and e-commerce reporting and built-in affiliate program management.

### **Public / Member Interface**

These functions are available to end-users.

#### **Shopping Cart**

- Add product from simple browsing
- Add to Shopping Cart from Past Orders
- Add to Shopping Cart from Shopping List
- Empty Cart
- Cart is tied to user and is saved in the database so that anytime the user logs in from any computer, he / she has access to the cart.

#### **Shopping lists**

- User can have multiple lists and name each one uniquely
- User can add items to shopping cart from a list or add an entire list
- “One click” shopping list ordering

#### **Checkout Support**

- Checkout process can interface with custom payment method
- Fulfillment by email / checking website for order status
- Fulfillment process can be customized

#### **Customer Marketing and Support**

- Register to receive email on specials (does not require user to register)
- Password reminder by email

#### **Product Catalog**

- List Products in each Category or as results from search
- Show products in text view or with thumbnail image view
- Add to Shopping List function
- Add to Shopping Cart function
- Display Product Title, Short Description and Product Detail
- Support for thumbnail image
- Support for full size image

#### **Advanced Searching**

- Record all search criteria
- Keyword Search
- Search on category / subcategory
- Price Range
- Name Brands or any brands
- Keyword on title
- Keyword on product description



#### **Order Management**

- User must register to place an order
- Place an order based on shopping cart contents – shopping cart will be stored in the database until user places the order or clears their cart. The user can login / logout over any period of time without losing the shopping cart contents.
- No limit to number of line items in order
- Limit quantity of each line item to 9999
- Check order amount against approved order amount for each customer

#### **Order Status / View**

- View Order Status on outstanding orders.
- View / Search Past Orders

### **iiStore Back-End Administrative Functions**

These functions are accessible by an administrator to maintain the store, and to do reporting.

#### **Parts Data Import / Maintenance**

- All Departments, Categories, SubCategories can be added / updated or deleted with secure login from any browser.
- All Part details can be added / updated / deleted with secure login from any browser.
- 2 Step standardized import mechanism allows for data to be custom transformed into a specific (flat) import structure and then non-custom code imports into relational database. This reduces the import time and allows for custom handlers to be written for different data formats, but one common import routine with data validity checks, etc as the data goes into the actual live database.

#### **Reporting**

- Daily Statistics Report by email to admin - Daily, Weekly, Monthly, Quarterly, Annual Companies, Users, Shopping Lists, Orders, etc
- Web-Based semi ad-hoc report to view monthly statistics on:
  - Search Orders by Customer (view total and alphabetical list of customers)
  - Search Orders by Order number
  - Orders by Volume (view largest purchasing customers)
  - Top "n" Selling Products



## **iiAffiliate Module**

The affiliate program is also a plug-and-play module that can be added to any website. It accomplishes two things. First it allows for userIDs to be associated with a particular affiliate. Second it provides commission calculation and management when coupled with the iiStore. Additional commission payments can be custom built for other payment types.

### **Affiliate User Front-End**

- Affiliate Registration / approval
- Provided affiliate link downloads
- When random user clicks on link from affiliate banner to ANY page of the website, the iiFramework recognizes this action and records the users' visit. If the user ever registers, the user is tied to the affiliate. Revenues based on each user can then be associated with each Affiliate and commissions can be calculated appropriately.
- Display HTML code necessary to display banners with affiliateID embedded in them.
- Full accounting shows affiliate total sales volume and commissions to be paid
- Each Affiliate can be assigned a default or custom commission percentage
- Calculate commissions on paid / shipped orders
- Generate report of commissions to be paid

### **Affiliate Back-End Management and Reports**

- Commission generation
- Outstanding commissions report
- Reports on Affiliate success
  - Total Affiliates
  - Number of Orders placed via affiliates
  - Revenue produced
  - Commissions paid



## **iiCaseManager Module**

This module was designed to specifically address requirements of legal industry law firms and their clients.

### **Document Sharing**

- Allows attorneys and clients to share documents with each other.
- Attorney can set specific privileges on each document to further control, on a user level, who has access to that document.
- Supports saving of all document revisions
- Supports creating file upload documents
- Supports "online documents" – revised using the WYSIWYG editor.

### **Discussions**

- Multiple discussion topics can be created
- All posts to discussion posted using the WYSIWYG editor
- Access to individual discussion topics can be specified, per user, at discussion creation

### **Shared Calendars**

- Attorney can post important dates and deadlines to keep entire project on track.
- Access to each calendar can be specified per user at calendar creation.