RAD Methodology (Rapid Application Development)

Rapid application development (RAD) is a software development methodology that uses minimal planning in favor of rapid prototyping. The "planning" of software developed using RAD is interleaved with writing the software itself. The lack of extensive pre-planning generally allows software to be written much faster, and makes it easier to change requirements.

Primary goal is to design a software product which consumes less amount of time than those of traditional life cycles.

RAD takes the advantage of automated tools and techniques to restructure process of building information system.

Problems with Traditional Life Cycles:
1) One problem with previous methodologies was that applications took so long to build that requirements had changed before the system was complete, resulting in inadequate or even unusable systems.
2) Another problem was the assumption that a methodical requirements analysis phase alone would identify all the critical requirements.
RAD Tools: An Overview

RAD Tools (IDEs) for Quick Development of SW Systems’ Increments: Desktop Applications (examples)

- Apple Xcode
- C++Builder
- Clarion is a data-centric Advanced Rapid Application Development tool
- Code::Blocks
- Delphi
- Delphi for PHP
- Gambas Basic, Open source, Linux
- Gupta Team Developer / SQLWindows
- Habanero
- Microsoft Visual Basic
- Lazarus Pascal, Open Source, Multi-platform
- Panther
- RADvolution Designer
- Runtime Revolution
- REAL software REALbasic
- Softwell Maker is a desktop IDE with a cross-platform deployment component allowing publish application into almost any Java enable system.
- Thoroughbred OPENworkshop is a RAD for Windows, UNIX, Linux, and OpenVMS
- The Virtual Enterprise is an Interactive Voice Response (IVR) toolkit developed specifically for telephony and speech inside Microsoft Visual Studio.NET.
- wxDev-C++
- Microsoft Visual Foxpro
- WinDev
- XVT
- MX-Frame - Business Application Framework
- GNAVI
RAD Tools for Quick Development of Databases' Increments (examples)

- **Base One Foundation Component Library (BFC)** is a RAD framework for building .NET applications using SQL server, Oracle, Sybase, and MySQL databases.
- **Clariion** is a data-centric Advanced Rapid Application Development (ARAD) tool featuring roundtrip code generation. It is a database independent RAD Application Tool for building traditional GUI applications as well as scaling enterprise-level websites. IBM Rational Business Developer Extension supports database application development for IBM DB2, IBM Informix, Oracle databases, Microsoft SQL Server and other JDBC compliant relational databases.
- **IBM Rational Application Developer** supports database application development for IBM DB2, IBM Informix, Oracle database, Microsoft SQL Server and other JDBC compliant relational databases.
- **IBM Lotus Notes** is a RAD environment for collaboration and document management tasks. It is a code generator that builds database-driven web applications for .NET. It generates application Web pages, APEX, user interface code and data access logic (C#, Visual Basic .NET) and SQL queries without hand-coding.
- **FileMaker** is a cross-platform database application from FileMaker Inc. (a subsidiary of Apple Inc.)
- **Sybase PowerBuilder** is data-driven development tool for creating client/server, distributed, Web and Smart Clients applications for JEE, Win32, and .NET platforms.
- **WebDev** is an open source database-driven RAD development environment for building client (desktop) based applications.
- **Kexi** is an open source database-driven RAD development environment for building desktop applications. It is considered an alternative to Open Office Base in the Open Source environment and provides similar features to commercially available RAD development environments such as FileMaker, Alpha Five and Microsoft Access.
- **Oracle Forms** is a RAD environment for collaboration and document management tasks. Its code generator is a RAD development framework using XML specification files and the PHP development language. Oracle APEX is a commercial RAD development environment for both client and web-server based database driven applications. This tool is typically classified with commercial packages such as Microsoft Access and FileMaker.
- **Visual WebGui (VWG)** is an open-source rapid application development (RAD) framework for AJAX & Silverlight GUIs. It is a 100% AJAX, XML & .NET based Platform for designing and delivering cross platform web applications using a .NET standard to promote re-usability and to separate functionality into distinct modules.
- **WebGIS** is a web-based online rapid development tool with WYSIWYG SQL editor and framework based on CakePHP.
- **Web2py** is an open-source browser based database development tool which stores all forms, reports, data and any custom code in MySQL and displays the content dynamically. Oracle Application Development Framework uses Oracle's Developer a FREE IDE that supports ADF's JEEB framework.
- **Web GUI** is a RAD framework for web-based database driven applications with key features including in-browser coding support, XML/Design interface, DML (database abstraction layer), and translation support.
- **WebDev** is a web-based online rapid development tool with WYSIWYG SQL editor and framework based on CakePHP.
- **WebGUI** is an open-source, browser-based IDE based on Dojo, Spring and Hibernate.

RAD Tools for Quick Development of Web-Based Systems' Increments: Web-Based Tools (examples)

- **Active Agenda's code generator** is a RAD development framework using XML specification files and the PHP development language. Alpha Five is a commercial RAD development environment for both client and web-server based database driven applications. This tool is typically classified with commercial packages such as Microsoft Access and FileMaker.
- **Alpha Five** is a RAD framework for building .NET applications using SQL server, Oracle, Sybase, and MySQL databases.
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- **WebGIS** is a web-based online rapid development tool with WYSIWYG SQL editor and framework based on CakePHP.
Tools for Quick Development of Cross-Platform Systems’ Increments (examples)

- Boa constructor is a cross-platform, wxPython based Python RAD IDE
- Code::Blocks is a cross-platform C/C++ RAD IDE using wxWidgets; the latest developmental builds have a built-in form designer environment, so it’s similar to Borland C++ Builder and Microsoft Visual C++ MFC now.
- HyperNext is a freeware cross-platform software development system for Macintosh OS X & OS 9, and Microsoft Windows XP & Vista. It has many similarities with HyperCard and can compile to both stand alone applications and stacks for the cross-platform HyperNext Player.
- IBM Rational Business Developer Extension is a cross-platform, Rapid Application Development IDE for creating enterprise and web applications and services for Windows, Linux, Unix, Solaris, HPUX, AIX, System z and System i
- IBM Rational Application Developer is a cross-platform, Rapid Application Development IDE for creating enterprise and web applications and services for Windows, Linux and Unix (Solaris, HPUX, AIX)
- LANSA is a development environment for generating applications on multiple computer systems. The main feature of the LANSA environment is the RDML language. It is classified as a 4GL (4th generation computing language). It runs on many systems including MS Windows, Unix, and Linux. In its first release in 1987, the RDML language was known as lambda
- Lazarus is a cross-platform IDE similar to Borland Delphi.
- mPower is a Software Development tool which automates application development and rapidly creates enterprise-class Web applications over any database or platform.
- NetBeans is a cross-platform, RAD IDE for creating visual desktop, mobile, web, and SOA applications for Linux, Windows and Mac OS X. The IDE officially supports Java, Ruby, PHP, JavaScript and C/C++ programming languages.
- Omnis Studio is a cross-platform, Rapid Application Development tool or IDE for creating enterprise and web applications for Windows, Linux, Solaris, and Mac OS X.
- (OpenERP) is a RAD framework in python.
- OpenROAD is a cross-platform IDE for Linux/Unix, Windows with embedded SQL support
- Panther (and its open source version POSSE) is a cross-platform (Windows, Unix, Linux, TUI, GUI, Web) cross-database RAD toolset for development of GUI and TUI, database oriented applications.
- REALbasic is a cross-platform IDE for creating desktop applications for Windows, Linux and Mac OS X
- Runtime Revolution is a cross-platform RAD which creates desktop applications for Mac Classic, Mac OS X, Windows
- WebDynpro is SAP’s RAD to create web applications connected to function modules in mySAP ERP.
- Webально is a cross-platform IDE for creating Ruby on Rails web applications.
- Servoy is a cross-platform application development and deployment environment. Servoy consists of a GUI designer, a server-driven and runs scripts through JavaScript. Servoy allows applications to be deployed to both a native Smart client and a pure HTML Web client from the same codebase.
- WebStudio is an open source integrated development environment for desktop applications purely in C/C++
- CA Pex, a software development tool that combines the techniques of model-based development, patterns and code generation to accelerate the delivery and maintenance of multi-platform, distributed business applications

RAD Tools for Functionality Development (or, code generators) (examples)
Find the best RAD tool for application development that is...

- Free (Preferably Open Source)
- Easy to Use & Learn
- Cross Platform (Win, Mac, Linux)
- FAST
- Team Friendly

1) Source Code Generators
   - Preferred.
   - Most powerful.
   - Allows code generation from models!

2) Database Interface Generators
   - Greatly usable, but not as much for RAD
   - Awesome for small projects and early prototyping
   - Easiest to find

3) Framework Generators
   - Same as above, but uses framework in tandem

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### Our Options (1/3)

1. **Code Designer**
   - Full fledged code generation from UML!
   - Only outputs C, C++, and Python
   - Cross Platform!

2. **PHP For Applications**
   - PHP RAD Application Framework, Quick code generation of web applications. Will not generate much code.
   - Web Based. So all platform.

3. **SmartCode Generator**
   - Creates interface code for applications automatically from database schema
   - Outputs C#, VB.Net
   - Windows Only 😞

4. **PHP Object Generator**
   - Produces commonly used code based on object schema (such as CRUD operations)
   - Limited functionality
   - Web Based (All Platform)
Our Options (2/3)

5. **Tankogen**
   - Tool for Model Driven Development (MDD)
   - Uses Xpath modeling language
   - Very complex, high potential for reusability
   - All Platforms (Java Required)

6. **PHPMyEdit**
   - Allows quick creation of MySQL reports and tables from DB.
   - Could be a good foundation for beginning prototypes
   - All platforms (deployed on Apache)

Our Options (3/3)

7. **Qcodo**
   - Framework that helps you avoid mundane code.
   - Object Oriented, helps rollout framework in minutes.
   - Creates ORM (Object Relational Model) from DB
   - Cross Platform

8. **ajaxCRUD**
   - PHP Class that allows quick CRUD operations on DB tables.
   - Decent starting point for any prototype.
   - All Platforms

9. **Atlas CakePHP Generator**
   - Web Code generator (in CakePHP framwork lang.)
   - Wizard style, to create MVC based prototype
   - All Platform

10. **RISE PHP Generator**
    - Renders source code for basic interface of database.
    - Models created using RISE model
    - Very versatile using plugins
    - Windows Only 😊
## RAD Tools for Functionality

### Comparative Analysis

<table>
<thead>
<tr>
<th>#</th>
<th>Tool's Name</th>
<th>Description</th>
<th>Functionality</th>
<th>Download Address</th>
<th>Required Platform</th>
</tr>
</thead>
</table>
# Tool’s Name | Description | Functionality | Download Address | Required Platform
--- | --- | --- | --- | ---
4 PHP Object Generator | Creates common code (on the fly in browser) based on an object schema. Examples are CRUD methods, parent-child relations etc. Very limited functionality. | Outputs PHP from web browser. Limited functionality. | [http://www.phpobjectgenerator.com](http://www.phpobjectgenerator.com) | All (Web Based Tool)

5 Tankogen | Tool for MDD (Model Driven Development) - Does source code generation. Based on XPath and allows visual modeling and meta-modeling | Generates multiple languages, allows visual and meta-modeling. Can use existing generators to create higher level ones. | [http://tankogen.free.fr/](http://tankogen.free.fr/) | All platforms (Java Based)

6 PHPMyEdit | Allows quick creation of mySQL tables and their data. Could be very useful in beginning stages of prototype creation, prior to writing more technical code. Could also be used to as a module or component in mockup prototypes. | Table manipulation code generation, paging, sorting, filtering. Design control using CSS. | [http://www.phpmyedit.org/](http://www.phpmyedit.org/) | All Platforms (Preferably Apache)

7 Qcodo | PHP Framework, to avoid coding mundane code. Object oriented, designed to roll out prototypes in minutes. Generates object relational model from database with both basic CRUD operations, getters and setters, etc. Built in functions to do common functions, like retrieval, counting etc. | Object oriented PHP + AJAX support, database profiling, object oriented querying system. | [http://www.qcodo.com/](http://www.qcodo.com/) | All platforms (OSX, Windows, Linux)

8 ajaxCRUD | A PHP Class that allows quick CRUD operations on a database table. Allows ultra-fast coding of a rapid prototype with minimal code. | CRUD Operations, Easily integrates into code, or good starting point. | [http://www.ajaxcrud.com/](http://www.ajaxcrud.com/) | All Platforms (Web Deployment)
### RAD Tools for Functionality

<table>
<thead>
<tr>
<th></th>
<th>Tool Name</th>
<th>Description</th>
<th>Website</th>
<th>Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>RISE PHP Generator</td>
<td>Renders PHP Source code for database access, etc. Models have to be made using the “RISE” model, which may take some additional learning, but appears very similar to UML and easy to adapt</td>
<td><a href="http://download.cnet.com/RISE-PHP-for-MySQL-Code-Generator...">http://download.cnet.com/RISE-PHP-for-MySQL-Code-Generator...</a></td>
<td>Windows</td>
</tr>
</tbody>
</table>

**Runner Up: Code Designer**

**Functionality**
- The most full featured.
- Generated lots of code, and did it from UML that was easy to draw and import.
- Generates only C++, C, Python (Unfamiliar)
- Cross platform
- Extensive knowledge of programming required to make use, but can set up a nice template for your code.
Runner Up: Qcodo (1/2)

Functionality

- More of an early stage prototyping framework than code generator
- ORM (object relational model) is the best way to “object orient” your DB.
- Product used by those like Lockheed Martin, Hewlett-Packard, Stanford Medicine, NASA
- Code generation creates 8 files (very usable ones) per database table, with many classes.

Runner Up: Qcodo (2/2)

Bad, disorganized prototype

```
if (REQUEST['action'] == 'save') {
    // Perform Save Code
}

<form>
    <input type="text" name="id"/>
    <input type="text" name="title"/>
    <input type="submit" name="action" value="save"/>
</form>
```

Cleaner, faster, more organized

```
class object

    function save() {
        if (is_array($this->id)) {
            // Already validated - Perform save Code
        }
    }

TRADITIONAL PHP FORM
```

```
QFORM OBJECT
```

```
HTML TEMPLATE INCLUDE
PRESENTATION LAYER
```
Winner: RISE

- More flexible for generation of web application architecture.
- Relies on PHP and C#.
- Supports popular databases (mySQL, PostgreSQL, MS SQL).
- Generates a SOAP interface and XML template for web services.
- Very easy to use, does a lot automatically that can be adjusted later (better for prototypes).
- Feature list: Here.

1) Easy to use editor. Similar to most UML design programs
2) Drag and drop your entities, interfaces, views, etc.
3) Double click items to edit, change attributes, methods etc.
4) Save your file, use one of the code generator plug-ins – you’ve got a code base ready to begin prototyping.

How does it save you time?

From your model, you can automatically create:

- **CRUD Interface**: Pretty much any web app requires.
  - Usually pain to write (repetitive) – think MVC, and your models.

- **Stub Functions**: Organize all your functionality in your design NOT while coding (params and return values well documented).

- **Views**: Create virtually joined data objects from your tables.

- **Tree** (recursive ER) creates

A stub method or simply stub in software development is a piece of code used to stand in for some other programming functionality. A stub may simulate the behavior of existing code (such as a procedure on a remote machine) or be a temporary substitute for yet-to-be-developed code. Stubs are therefore most useful in prototyping, distributed computing as well as general software development and testing.
This product, by no means, codes your project for you. It only sets up a real representation of your information model.

Deploying this code on your server would be very easy:
- Change DB Config
- Create entry point
- Create basic GUI interface
- Add functionality to your stub functions

Recommendation for Use

Education
- I would recommend this for use in a class project. It provides students with a overview of code development from a model.
- Students usually are designing small projects
- This could be used to introduce a larger “umbrella” project where only part of the functionality is developed but the entire model is represented and stubbed.

Business
- Definitely usable for prototyping early stage
- Test resilience of your database(s)
- Creates a SOAP interface! You can logically tie this to a production environment without fear of code interference!

Production ready software
- Usable, but would have to be extra careful to identify exploits etc.
- Does a good job of exception handling, error reporting, etc.
Conclusion

- There are many tools, but free ones that render code from models are scarce.

- RAD frameworks are helpful and HUGE coding-time savers, but lots of interpretation required

- RISE Tool contains just enough functionality to be usable for prototyping and early stage development, but not be too complex.

- This makes it suitable for a team based project.

RAD Tools for Graphic User Interface (GUI) Development (examples)
### Free WebApp GUI Development Tools Available

<table>
<thead>
<tr>
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<th>Tool’s Name</th>
<th>Tool’s Brief Description</th>
<th>Tool’s Main Functions</th>
<th>Web Address to Download this tool</th>
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<tr>
<td>2.</td>
<td>Code Designer</td>
<td>Code Designer is free and open-source RAD tool suitable for easy creation of various diagrams describing applications' structure and logic (class diagrams, state charts, ...). Tools were for generation of production-ready source code from them.</td>
<td>State Diagram and class diagram code generation</td>
<td>[<a href="http://www.code">http://www.code</a> designer.sourceforge.net](<a href="http://www.code">http://www.code</a> designer.sourceforge.net)</td>
<td>C, C++, Python</td>
</tr>
<tr>
<td>3.</td>
<td>3D- RAD</td>
<td>With 3D RAD – the hottest free 3D game maker available – learn how to make a 3D game in a fraction of the time it would take with other tools</td>
<td>GUI for 3D Gaming</td>
<td><a href="http://www.3d-">http://www.3d-</a> rad.com/3d-game-building.html</td>
<td>Mechanics</td>
</tr>
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<td>6.</td>
<td>Dataweb Project</td>
<td>Creates a rapid development tool for applications oriented to the manipulations of database. The applications created with this tool are immediately usable in net.</td>
<td>Database Applications</td>
<td>[<a href="http://www.data">http://www.data</a> web.org](<a href="http://www.data">http://www.data</a> web.org)</td>
<td>Basic SQL queries and Table relations</td>
</tr>
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</tr>
<tr>
<td>7</td>
<td>Radria</td>
<td>Radria (Rapid Development of Rich Internet Applications) is a collection of RAD tools, 100% web based, to build web applications faster.</td>
<td>Drag, drop, PHP and Javascript Database driven web app or mashup.</td>
<td><a href="http://radria.safirion.com/download.php">http://radria.safirion.com/download.php</a></td>
<td>Ajax, Mashup</td>
</tr>
<tr>
<td>8</td>
<td>PFP Studio</td>
<td>PFP Studio is a visual programming system for rapid application development (RAD) of Web based forms using PHP and Javascript. The frontend runs in a browser.</td>
<td>Database form generator</td>
<td><a href="http://sourceforge.net/projects/pfp-studio/files/">http://sourceforge.net/projects/pfp-studio/files/</a></td>
<td>PHP, HTML, javascript</td>
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<td>10</td>
<td>GUI RAD for qooxdoo</td>
<td>Rapid application development for qooxdoo framework.</td>
<td>You can drag &amp; drop components, define properties and generate the source code</td>
<td><a href="http://sourceforge.net/projects/qxradi/">http://sourceforge.net/projects/qxradi/</a></td>
<td>Qooxdoo Framework Framework for creating rich internet applications (RIAs)</td>
</tr>
</tbody>
</table>
WxForm Builder

1. WxFormBuilder aims to be an application that enables visual development and generating the corresponding code.
2. This way the application’s code is simplified while at the same time providing a simple mechanism for adding components.
3. The code generation makes use of a series of “templates” defined in the document of the class information, which are processed to generate the corresponding code.
4. Provides plug-ins for advanced functionality.

Code Designer

- CodeDesigner is free and open-source RAD tool suitable for easy creation of various diagrams describing applications’ structure and logic (class diagrams, state charts, …) and for generation of production-ready source code from them.
- The application is available for MS Windows, Linux and OS X and can be used as a free alternative to Enterprise Architect ($135 - $599) or IAR Visual State commercial tools.
- In contrast to other similar CASE tools the Code Designer is aimed to generation of production-ready source code from supported diagrams.
- It means that not only application skeleton can be generated from diagrams but complete full-featured application including its entry point (main function) can be produced by a one click.
- Algorithms Supported: GOTO algorithm (C, C++), Loop Case algorithm (C, C++), Else-if algorithm (C, C++, Python)
3D-RAD Game Designer

- Ready-to-use resources! → 3D RAD addons are resources that don't require neither coding nor modeling. Users can just add them to their projects, configure them and go!
- Whatever you create with 3D RAD can be exported as an addon that others can use in their projects, in a very productive way.
- Best part is the add on is available to the user without additional modeling or scripting.
- You can enable collision detection and realistic physics for your 3d models by simply importing them to your 3D RAD project (no coding!).
- These 'bodies' can then be combined visually with working joints, wheels, springs, forces and even airfoils, to create any sort of system.

Advantages of these 3 tools over other tools

**Wx Form Builder:**
1. Drag and Drop
2. Code Generation in C++, Python and XRC
3. Do not use a different platform/framework as other RAD tools.
4. Simple and quick development.

**Code Designer:**
1. Drag and Drop to generate state diagram and class Diagram.
2. Add functions, data type and variables in the diagram and it generates the code accordingly.
3. A bit complicated but better than other tools

**3D RAD game builder**
1. You can bring life to your 3d models and
2. Learn how to make a 3d game in a fraction of the time it would take with other tools
## Advantages & Disadvantages of RAD GUI tools

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Quick to build a product due to shorter life cycles.</td>
<td>1. Short iteration may not add enough functionality, leading to significant delays in final iterations.</td>
</tr>
<tr>
<td>2. Require less people to work on and consumes less time hence saves time and Money.</td>
<td>2. Programmers are required to work in pairs (which may be difficult for some developers).</td>
</tr>
<tr>
<td>3. Iterative process and user involvement may reduce the possibility of failure of the product.</td>
<td>3. The client may create an unrealistic product, leading the team to over- or under-develop functionality.</td>
</tr>
<tr>
<td>4. Greatly reduced manual coding.</td>
<td>4. Product may lose its competitive edge because of insufficient core functionality and may exhibit poor overall quality.</td>
</tr>
<tr>
<td>5. Flexibility in using automated tools.</td>
<td>5. Cost of integrated toolset and hardware to run it may be high.</td>
</tr>
<tr>
<td>6. Loss of scientific precision</td>
<td></td>
</tr>
</tbody>
</table>

### RAD Tools for Database Development (examples)
# Examples of Tools for Component-Based Design
(Tools for Quick Database Design)

- phpMyAdmin
- ORBADA
- VOLCANO
- JOSE
- PIGEON PLANNER
- TIMECLOCK
- INGRES
- DELPHI
- OPENOFFICE BASE
- DB4OBJECTS

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<tbody>
<tr>
<td>1</td>
<td>phpMyAdmin</td>
<td>PhpMyAdmin is a tool written in PHP intended to handle the administration of MySQL over the Web.</td>
<td>It can create/drop/alter tables, delete/edit/add fields, execute any SQL statement, manage keys on fields.</td>
<td>LINK</td>
<td>You need PHP 5.2.0 or newer MySQL 5.0 or newer Web browser with cookies.</td>
</tr>
<tr>
<td>2</td>
<td>ORBADA</td>
<td>ORBADA is a database, SQL, query client using JDBC drivers.</td>
<td>It is a tool to administrate and manage database structure. It is for Oracle, SQLite, Firebird, HSQLDB, DerbyDB, MySQL and other databases</td>
<td>LINK</td>
<td>JRE Windows/linux Drivers for databases</td>
</tr>
<tr>
<td></td>
<td>VOLCANO</td>
<td>Open source, universal database program.</td>
<td>User can make his own type of database and export it. Using own database files, *.dbf. Can use only with this program. Operating with databases in special GUI.</td>
<td>Windows xp or higher</td>
<td></td>
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<td>----------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>JOSE</td>
<td>Jose is a graphical Chess tool</td>
<td>You can store chess games in a database. You can view and edit games (including variations and comments). You can play against a plugged-in chess engine and use it for analysis.</td>
<td>All 32-bit MS Windows (95/98/NT/2000/XP), All POSIX (Linux/BSD/UNIX-like OSes), OS X, Linux, Win2K, WinXP, JRE</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>PIGEON PLANNER</td>
<td>Pigeon Planner aims to be a simple to use pigeon database</td>
<td>Add, edit, remove pigeons and view their details such as name, image, sex, colour, pedigree, relatives and results.</td>
<td>OS Independent (Written in an interpreted language)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>TIMECLOCK</td>
<td>Timeclock is a simple yet effective time clock system</td>
<td>It allows you to track all employee time as well as upcoming vacations and more, it can also replace manual sign-in sheets and such</td>
<td>atleast PHP 4.1.x, with mysql support --- MySQL --- Webserver --- Web browser</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>INGRES</td>
<td>Ingres is a open source sql relational database management system intended to support large commercial and government applications.</td>
<td>Ingres Corporation controls the development of Ingres and makes certified binaries available for download.</td>
<td>32-bit MS Windows (95/98/NT/2000/XP), Linux, Solaris, JRE</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>DELPHI</td>
<td>It is an open source database tool.</td>
<td>It creates, administrates and alters database.</td>
<td>32-bit MS Windows (95/98), All 32-bit MS Windows (95/98/NT/2000/XP)</td>
<td></td>
</tr>
</tbody>
</table>
BASE is a fully featured desktop database management system, designed to meet the needs of a broad array of users, from just tracking your personal CD collection, to producing a corporate monthly departmental sales report.

BASE offers wizards to help users new to database design (or just new to BASE) to create Tables, Queries, Forms and Reports, along with a set of predefined table definitions for tracking Assets, Customers, Sales Orders, Invoices and much more.

**DB4OBJECTS**

db4o (database for objects) is an embeddable open source object database. It is a tool to create and manage database.

3 Best Tools for Quick Database Design

- phpMyAdmin
- ORBADA
- VOLCANO
**phpMyAdmin**
- browse and drop databases, tables, views, columns and indexes
- create, copy, drop, rename and alter databases, tables, columns and indexes
- load text files into tables
- create and read dumps of tables
- This tool offers GUI for maintaining users and creating databases and tables without executing a single line of SQL statements.
- Database can be managed from remote client using web browser.
- Can execute batch files with SQL statements.

**ORBADA**
- Running SQL queries
- Viewing database objects
- Export to CSV, Excel, DBF, XML, HTML, SQL (INSERT)
- Editing stored procedures/functions
- Many wizards
- Easier for developers

**VOLCANO**
- Create Database using GUI
- Edit database tables
- Delete tables or entities

<table>
<thead>
<tr>
<th>Tool Name</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>phpMyAdmin</td>
<td>It is web based - it runs on any server capable of handling PHP. Simple. Visual (no need to remember line commands). Browser based (no need for extra software). Widely available. Free</td>
<td>Some limitations in handling very large databases (this should not affect you unless you have tens of thousands of records). Somewhat slower than other systems such as Shell.</td>
</tr>
<tr>
<td>ORBADA</td>
<td>Can connect to any database like mysql, oracle, sqlite. Easy to browse data and edit them.</td>
<td>Requires drivers and connection strings to connect. No remote access</td>
</tr>
<tr>
<td>VOLCANO</td>
<td>Easy to create small databases. Data is stored in files which can be transferred. Easy to retrieve data.</td>
<td>Supports only 3 data types. Doesn't support large data. No drivers support</td>
</tr>
</tbody>
</table>
phpMyAdmin Demo

Topic 13
RAD Methodology
Conclusions
# RAD Methodology: Conclusions

- The shift from traditional session-based client/server development to open sessionless and collaborative development like Web 2.0 has increased the need for faster iterations through the phases of the software development process. This, coupled with the growing use of open source frameworks and products in core commercial development.

- Most RAD methodologies foster a) software re-use, b) small team structure and c) distributed system development, most RAD practitioners recognize that, ultimately, no one “rapid” methodology can provide an order of magnitude improvement over any other software development methodology.

- All types of RAD have the potential for providing a good framework for faster product development with improved software quality, but successful implementation and benefits often depend on a) project type, b) team structure, c) project schedule, d) software release cycles, e) corporate culture, f) team experience in RAD, etc.

- Some of the largest software development companies such as Microsoft and IBM do not extensively use RAD in the development of their flagship (major) products and for the most part, they still rely primarily on traditional waterfall methodologies with some degree of spiraling.

- There are many RAD tools available, but free ones that render code from models still have poor quality and very limited functionality.
Topic 13

RAD Methodology

Optional Lab:
Mastering Microsoft Expression Tool for Web GUI Design

(Lab Manual)
Tools to Model and Develop WebApp GUI

Topic 13

RAD Methodology

Optional Lab:
Mastering phpMyAdmin Tool
for quick Online Database Design

(Lab Manual)
phpMyAdmin in action ...

Topic 13
RAD Methodology

Optional Lab:
Bridging Web GUI (created with MS Expression) and Online Database (created with phpMyAdmin Tool) for quick GUI + Online Database Design

(Lab Manual)
Bridging ... in action ...