

# GRIN-Global

## System Overview and Design

Iowa State University

Sunday, November 14, 2010

Presenter: Pete Cyr

(edited for the web)

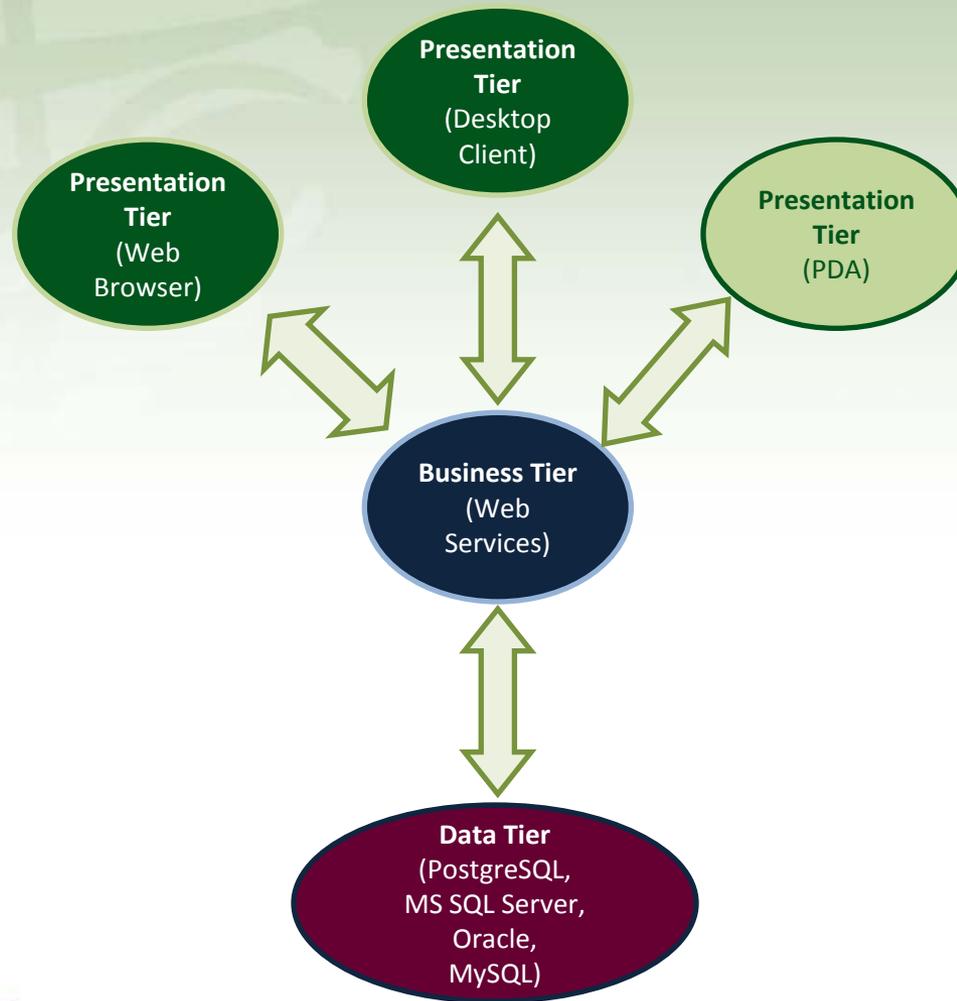


# GRIN-Global is accessible to all... free and without restriction

- All source code (including the database schema) is in the public domain and will be freely distributed
- Written using software development tools that are free
  - Microsoft .NET Framework 3.5
  - SVN version control system
  - Visual Studio 2008 Express
- Written to support free database systems
  - PostgreSQL
  - Microsoft SQL Server 2008 Express
  - Oracle Express
  - MySQL Community database



# GRIN-Global 3-Tier Design



# Three Tier Architecture

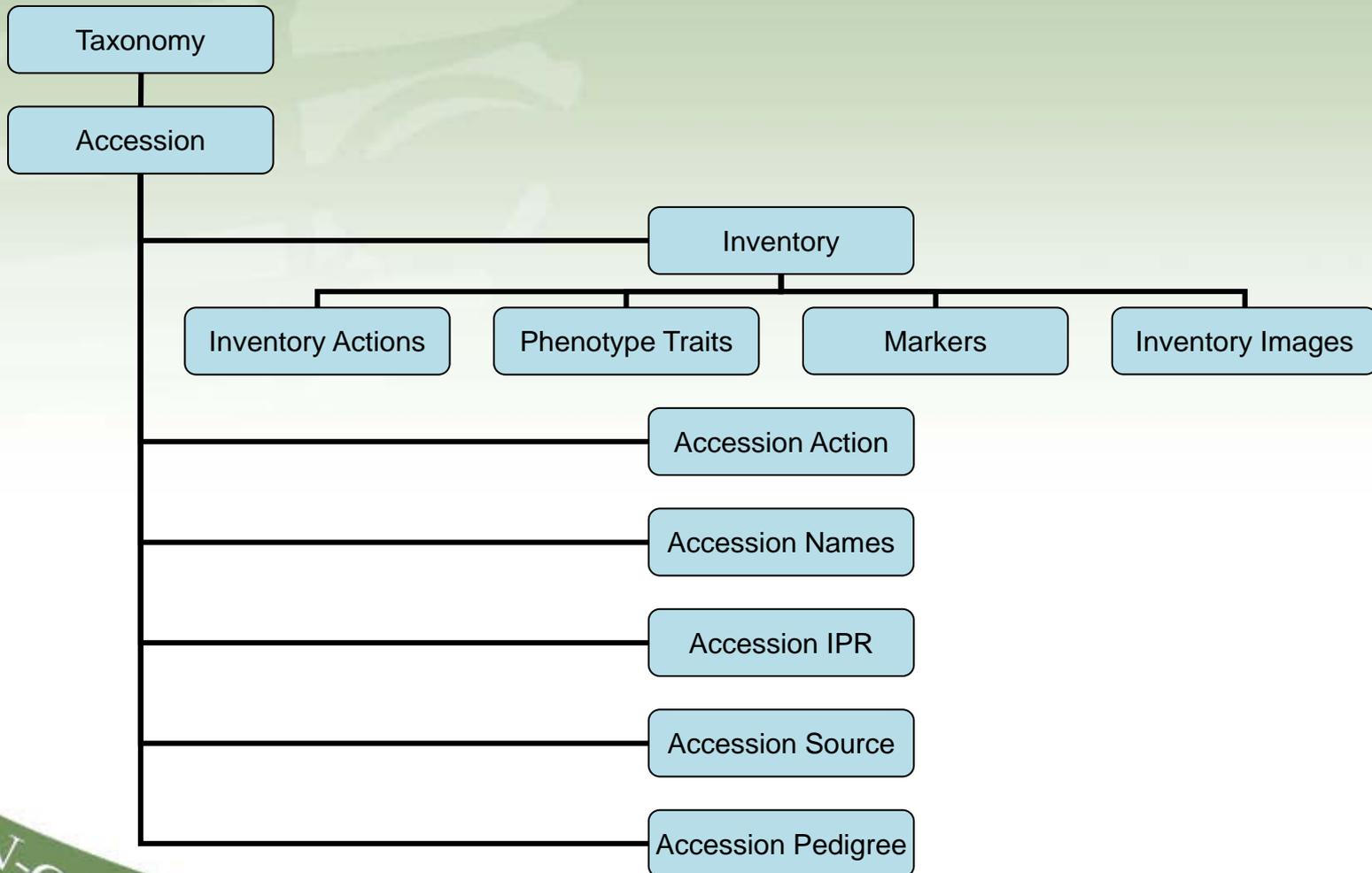
- Web Service-based
  - uses XML to share structured data between all clients and the business tier
- Adaptable and flexible
  - Readily adaptable to changes in operating systems (client can be ported to many platforms – desktop client, PDA, browser, etc.)
  - Easier to make changes to individual tiers without affecting the other tiers
- MaizeGDB – web service interoperability proof of concept
  - Provides on-demand accession inventory information real-time to the MaizeGDB website.
  - The web service is written using .NET 3.5
  - Client application at MaizeGDB was written in PHP – one small file added to PHP application



# GRIN-Global Has Two Applications for End Users

- Desktop Client (“Curator Tool” on local PC)
  - Curator Tool
  - Limited distribution (not for the public)
  - Designed for: inserts/updates/deletes
  - Feature-rich application eases curator tasks
  - Targeted to operating systems that support the .NET 3.5 Framework
- Browser/Web-based Client (“Public Website” on web server)
  - Open to public use
  - Designed for Searches and Ordering germplasm

# What data does GRIN-Global store?



# Database Schema

## Accession

- The Accession Record
  - Accession ID (very flexible – can be contained in 1, 2, or 3 fields), Taxonomy, Core?, Backup?, Status, Date Received, Life Form (Annual, Perennial, ...), Improvement Status (Cultivar, Wild, ...), Reproductive Uniformity (Inbred, Population, ...)
- Inventory (unlimited) – see next slide
- IPR (unlimited)
  - Type (PVP, SMTA, ...), Issue Date, Expiration Date, ...
- Source (unlimited)
  - Collectors, Date, Type, Geography, Lat/Long, Elevation, Origin?, Form Collected, Amount, Plants Sampled, ...
- Names (unlimited)
  - Name, Category, Rank, Cooperator, ...
- Actions (unlimited)
  - Action Name, Start Date, Completed Date, Method, Cooperator, ...
- Pedigree (one)
  - Female, Male, Released Date, Crossing Method
- Voucher (unlimited)
  - Cooperator, Number, Location, Date
- Citation (unlimited)
  - Title, Author, Year, Reference, URL, ...

# Database Schema

## Inventory

- The Inventory Record
  - Inventory ID (very flexible – 1, 2, or 3 fields), Form, Distributable?, Available?, Quantity, Storage Location, Lat/Long, Status, Pathogen Status, Pollination Method, Rootstock, ...
- Viability (unlimited)
  - Rule/Method, Date, % Normal, % Dormant, % Viable, Vigor Ranking, Rep. Count, ...
- Actions (unlimited)
  - Action Name, Start Date, Completed Date, Method, Cooperator, ...
- Names (unlimited)
  - Name, Category, Rank, Cooperator, ...
- Traits (unlimited)
  - Descriptor, Value (can be string, numeric, or code), Method, Lat/Long, Elevation, Quality Code, Verbatim Value (string), Statistics (frequency, mean, min, max, sd, rank, ...)
  - Raw values (unlimited)
- Marker (unlimited)
  - Marker ID, Assay Method, Scoring Method, Control Values, Observation Alleles Count, Max Alleles, Quality Code, Statistics (frequency, mean, min, max, sd, rank, ...)
  - Raw values (unlimited)
- Images/Attachments (unlimited)
  - Virtual Path, Title, Description, Content Type, Category, Copyright Information, Cooperator
- Quality Status (unlimited)
  - Test Type, Results Code, Start/Completed Dates, Method, Rep. Count, Cooperator

# Database Schema

## Order Requests

- The Order Request Record
  - Type, Order Date, Completed Date, Intended Use Code, Local Tracking Number, Requestor, Ship To, Final Recipient, ...
- Items (unlimited)
  - Name, Quantity Shipped , Inventory Shipped, Form Shipped, Status Code, Status Date, Verbatim Requested Taxonomy, ...
- Actions (unlimited)
  - Action Name, Start Date, Competed Date, Method, Cooperator, ...
- Images/Attachments (unlimited)
  - Virtual Path, Title, Description, Content Type, Category, Copyright Information, Cooperator

## Web Order Requests

- The Order Request Record
  - Order Date, Intended Use Code, Status Code, Requestor, ...
- Items (unlimited)
  - Name, Quantity Requested , Accession Requested, Form Requested, Status Code...
- Actions (unlimited)
  - Action Code, Start Date, Competed Date, Cooperator, ...
- Images/Attachments (unlimited)
  - Virtual Path, Title, Status, Content Type, Cooperator