You don’t have to be a programmer anymore:

Applying Business Intelligence tools in a Natural Resources Agency

Texas Parks & Wildlife
Example: SAS products

- One of the most common statistical analysis software used by fish and wildlife researchers

- Recently, SAS has developed products oriented to business users that are more user-friendly and primarily menu-driven

- SAS Business Intelligence tools solve many shortcomings of earlier technologies
Analytics at State Agencies

- Historically, a limited number of highly-experienced programmers conduct all the analyses required by an agency.

- Biologists have to beg time from a programmer or attempt analyses with limited tools (such as Excel).

- Data is under-utilized.
What did we need from an analytical tool?

• Robust analytical tools, featuring high-quality graphics

• Easy access to data stored in a wide range of formats

• Minimal programming skill requirement

• Readily-available tools that serve a spectrum of users from beginners to power users
Business Intelligence

- Technologies that provide timely, accurate, & actionable information to decision-makers

- Integrates data across systems and database vendors used by disparate operational units of an organization

- Empowers analysts and decision-makers to more easily access information
Former TPWD Environment

- Oracle
- SQL Server
- Sybase
- MS Access
Business Intelligence

SAS Metadata Server

Oracle
SQL Server
Sybase
MS Access
Business Intelligence tools utilizing a SAS server

- Information Map Studio
- Add-In for Microsoft Office
- Enterprise Guide
- Web Report Studio
- Information Delivery Portal
Information Map Studio

• SQL views mapping to the source data

• Creates a simple table for end users, but is built from a complex query on relational databases

• Integrates data from disparate systems and offers the organization “one version of the truth”

• Adds a layer of security between sensitive data and end users
Information Map Studio
Add-In for Microsoft Office

- Accesses SAS procedures without leaving Office products (Excel, Word, PowerPoint)
- Menu-driven
- Access to local data and data on servers
- Run canned reports (Stored Processes) from within Office products
Add-In for Microsoft Office

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Invoking SAS from Excel
Choosing a procedure
Selecting variables
Setting options

Microsoft Excel - HSB Harvest.xls

Active Data: Active Selection

K28

Task Roles
Tests
Means
Comparison
Breakdown

PLOTS
Results
Titles

Means > Comparison

The main effect is: Treatment.

Methods to use
- Bonferroni t test
- Tukey's studentized range test (HSD)
- Duncan's multiple-range test
- Dunnett's t test
- Fisher's least significant-difference test
- Gabriel's multiple-comparison procedure
- Student-Newman-Keuls multiple range test
- Waller-Duncan k-ratio t test
- Scheffe's multiple comparison procedure
- Ryan-Einot-Gabriel-Welsch multiple-range test

Confidence level: 95%

Determines the multiple-comparison tests for the main effect (that is, the independent variable) that you want in the output data set. Fisher's least-significant-difference test performs pairwise t tests for all means. This test controls the
Results display in Worksheet

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Enterprise Guide

- Can use either menu interface or programming language (SAS or SQL)
- Access to local data and data on servers
- Run and create canned reports (Stored Processes) for use in other clients
- Construct projects in steps
- Save project for later use and/or modification
Enterprise Guide
Queries and Joins
Queries and Joins
Queries and Joins
Stored Processes

• Programs that can be created by Enterprise Guide, but invoked from:
  – Add-In for Microsoft Office
  – Enterprise Guide
  – Web Report Studio
  – Information Delivery Portal

• Can customize to accept parameters set by the user
Web Report Studio

Welcome to SAS Web Report Studio

SAS Web Report Studio lets you create, view, and save reports from your Web browser. Enter your user name and password to log on to SAS Web Report Studio.

User name: [blank]
Password: [blank]

Log On

Copyright © 2005 by SAS Institute Inc., Cary, NC USA. All Rights Reserved.
Welcome to SAS Web Report Studio

Please click Report→New to create a report or Report→Open to open an existing report.
### Web Report Studio

#### Search for Reports

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Welcome John Taylor

SAS Web Report Studio  TFFC Visitation Report

Please answer the prompts below and click the View Report button to continue.

* Select a beginning date  
  7/1/2008  
  HINT: Specify a date using the format MM/dd/yyyy.

* Select an ending date  
  7/31/2008  
  HINT: Specify a date using the format MM/dd/yyyy.

View Report  Reset to Defaults
Information Delivery Portal
Benefits we are seeing

- Biologists are able to perform analyses without having to beg time from a programmer.
- Biologists have access to better graphing tools, and they are spending more time visualizing their data.
- These tools are helping us extract new value from the data we have collected and broaden access to it.
Benefits we are seeing

- Made data more accessible to end users across the agency
- Empowered owners of data, who best understand their data and the processes that generate it
- Streamlined process of generating reports
- Stimulated innovation among staff
Other BI Vendors

Source: Gartner (February 2012)
Dr. John Barry Taylor
Inland Fisheries Division

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