EclipseCon 2014
Introduction to BIRT Report Development
(Otherwise known as BIRT, Basics, and Beyond)

John Ward
BIRT and Us – Who am I? Who are you?

- **Who am I?**
  - John Ward, BIRT user
  - Actuate OEM BIRT Engineer - Expert
  - Author: Practical Data Analysis and Reporting with BIRT
  - [http://digiassn.blogspot.com](http://digiassn.blogspot.com)
  - jward@actuate.com

- **Who are you?**
  - Name, Company, technical background (C, SQL, Java, reporting...)
  - Experience with BIRT
  - What are you hoping to get out of today’s presentation?
Please Do the Following Survey

• https://www.surveymonkey.com/s/ PXFC56C
• Or the URL Shortened
  • http://goo.gl/UEW90s
• Helps us to improve the product
Evaluate This Session

1. Sign-in: www.eclipsecon.org

2. Select session from schedule

3. Evaluate: +1  0  -1
Other BIRT Talks

- BEST PRACTICES WITH BIRT
  - 18 March 11:15 - 11:50
  - John Ward (that’s me =D)

- Integrating BIRT – Choose Your Own Adventure
  - 19 March 16:15 - 16:50
  - Senior Kristopher Clark – Esq.

- Creating Data Driven Web Apps with BIRT
  - 18 March 16:15 - 16:50
  - Michael Williams

- ECLIPSE M2M TECHNOLOGIES IN ACTION – IOT SYSTEMS FOR PEOPLE COUNTING WITH ECLIPSE KURA AND ECLIPSE BIRT
  - March 19, 2014 - 16:15 to 16:50
  - Marco Carrer [Eurotech]
Shameless Plug

**Practical Data Analysis and Reporting with BIRT**

Use the open-source Eclipse-based Business Intelligence and Reporting Tools system to design and create reports quickly

**John Ward**

**BIRT 2.6 Data Analysis and Reporting**

Create, design, format, and deploy reports with the world's most popular Eclipse-based Business Intelligence and Reporting Tool

**John Ward**
... and those other guys books...

This Book Rocks!!
Just like BIRT!!!
Agenda
Outline of class

• BIRT
  • History
  • Guided Tour
  • The Report Perspective
  • Building Reports
    • Components
  • Exercise
• Data
  • Exercise
• Charts and Layouts
  • Exercise
• Q&A
What is BIRT

• Brief history and background
• Whos Behind It
• Who uses it
The BIRT Community at a Glance

- Project Committers
  - Actuate (http://www.actuate.com)
  - IBM (http://www.ibm.com)
  - Inetsoft (http://www.inetsoft.com)

- BIRT pages on Eclipse web site
  - http://www.eclipse.org/birt
  - Download BIRT and walk through a tutorial

- BIRT Help
  - http://developer.actuate.com
  - Legacy: http://www.birt-exchange.org
High Level BIRT Architecture

Report Designer:
- Eclipse Report Designer
- Eclipse DTP ODA
- Chart Designer
- Custom Designer
- Report Design Engine

Report Engine:
- Data Transform. Services
- Charting Engine
- Generation Services
- Presentation Services
- HTML
- PDF
- Print

XML Report Design

Data

Report Document
Report Perspective

• Areas of Reporting perspective
Report Designer

- Area where report layout is designed, previews of the report are seen, scripts and events are coded, and XML source for report can be viewed.
Palette

- Contains a number of visual elements used in BIRT report designs
- Similar to Toolboxes in MS Visual Studio and other visual IDE
Data Explorer

- Contains.
  - Data Sources: Connections to database.
  - Data Sets: Same as a Record set. Allows users to navigate through Query Results.
  - Report Parameters: Used as the interface for report parameters that will be passed to a Data Set.
Navigator

- Navigates through Eclipse projects and files under those projects
- Allows user to run report inside of BIRT
Outline

- Provides hierarchy of current report
- Allows for easy navigation of report elements to change properties in the property pane
- When selecting libraries, use the outline to copy non-visual components such as data sources and sets
Property Editor

- Properties Pane.
  - Properties for BIRT objects can be modified, such as Data Set Binding, Font information, formatting for Data Set returns such as Row Highlighting and Color Alternation.
The Guided Tour
Elements of a Report Design

- Data Sources
- Data Sets
- Body
- Master Page
- Header
- Design
- Containers
- Report Items
- Footer
Containers

Grid
Label
Data
Image
# Tables/Lists

- **Slots**
  - **Header**
  - **Detail**
  - **Footer**
- **Data Binding**
  - Makes table/list aware of values in Data Set
- **Grouping**
  - Group on value in Data Set
- **Sorting**
  - Sort on value in Data Set

## Rows
- **Columns**
- **Cells**

![Diagram](image-url)
Report Items

- Label
  - Dumb, static
- Text
  - HTML, RTF
- Data
  - Smart, can be Dynamic, Expression Driven
- Chart
  - Graphics for the small words and pictures crowd (management)
- Aggregation
  - Total, Sum, Avg
Expressions

• A lot of things in BIRT are based on them
  • Report Items
  • Properties
    • Outputs
    • Formatting
  • Small snippets of Javascript that return single values
  • You will see these everywhere
  • Anytime you start off with row[“ColumnName”], you are starting with an expression.
  • Anywhere there is an expression editor.
Exercise 1 – Introduction to BIRT Environment (30 minutes)

• What you will learn
  • Get familiar with the environment.
  • Learn basic report layout
  • Build basic report
Introduction to Data Elements

- What are the data elements?
- Where do you access them?
- How do they work?
Data Access

- **Data Sources**
  - Handled data connections

- **Data Sets**
  - Defined Data to be used in Report

- **Parameters**
  - Used for User Interaction to Filter Data
  - Cascading Parameters

- **Parameter Binding**
Data Source Types

- Out of the Box
  - JDBC
  - Web Service
  - Flat File
  - Scripted Data Source

- Extensions
  - Anything BIRT doesn’t do out of the box

- Data Cube
  - Analytics based on data sets
  - Lets you cut and slice data
Exercise 2 – Working with Data (30 minutes)

- Work with Data In a report
- Work with Flat File and Database driven reports
- Formatting Reports on a basic level
Charting in Reports

• Charts integrated with BIRT Report Designer

• Charts can be used standalone as a library

• Wide variety of chart types

• Many formatting options

• Charts are extensible to include more types
Pie Charts

- 2D, 2D with depth
- Ratio, Explode slices, Min Slice
Bar Charts

- Horizontal, Vertical
- 2D, 2D w/depth, 3D
- Stacked, Side-by-side
- Percent, Logarithmic
Cones – Tubes – Pyramids
Line Charts

- Horizontal, Vertical
- 2D, 3D
- Various types of markers
- Line styles, thicknesses
- Drawn as Line, Curve
Stock Charts

- CandleStick / Bar Stick
- Horizontal, Vertical
- 2D
- Formatting control
Scatter Charts

Scatter Chart

- Horizontal, Vertical
- 2D
- Various types of markers
- Line styles, thicknesses
- Drawn as Line, Curve
Area Charts

- Horizontal, Vertical
- 2D, 2D w/depth, 3D
- Stacked, Side-by-side
- Percent, Logarithmic
- Drawn as Line, Curve
Difference/Range Charts

- 2D. Curve or Straight lines.
- New Negative/Positive Fill also works for other types.
Meter Charts

- 2D, formatting control
- Regions, Needle styles, thicknesses
Gantt Charts

- 2D. Custom Bar width
- Custom Start/End Markers
- Data: Task ID / Start Date, End Date, Task Name

Gantt Chart

FAMS-S

ICDME

Compass

IP

Tasks progress
Bubble Charts

- 2D
- Custom Bubble shape – Square, triangle, diamond, star, icon...
3rd Party Visualizations
3rd Party Visualizations (cont)
Formatting

• Intrinsic Properties
  • At the level of the element itself
  • Overrides CSS

• CSS
  • Used for applying a global style to reports
  • Cascades down.
  • Lowest element wins
  • Similar to HTML CSS, but not exactly the same
Using styles

- Defined in
  - Report design
  - Library
  - Separate CSS text file
- Can use pre-defined element names or custom names
  - Ex.
    - .table { background : #FFFFFF }
    - Will apply to all tables in report
- Use to keep look and feel of multiple reports consistent
Using Intrinsic Properties

- Very tempting to use since it is the first way you learn to set styles
- Only do it in small reporting projects
- Tend to be more cumbersome to maintain
Order of Application

Table (Font-Size = 8pt, defined in style)

Row

Cell

Data (Style Defined Font Size: 7pt)

Data (Style Defined Font Size: 7pt, Intrinsic 10pt)
Exercise 3 – Charting and Advanced Formatting

- Build some real reports
- Work with charts
- Work with styles and layouts
Event handling

• Working with the Report Lifecycle
• Alters the flow of events
• Used to do things like dynamically add elements to a report, scripts data sources, and work with the chart engine
• Very advanced topic!!
Reuse and Teams

• How do you re-use components?
• What do you do when you work in a team so each member isn’t duplicating the same data sources, data sets, and report headers?
• How do you set up common starting points?
Templates

• A common starting point for report development.
• Is basically a report design that is registered with the New Report Wizard.
• Can contains as little or as much as needed in order to start a report
  • Data sources
  • Data sets
  • Report items and containers
  • Master page elements
Libraries

• Contains shared components
• When a library item is updated, all dependent reports are updated as well.
• Requires deployment with reports.
Deployment

• Complex topic
• Can deploy to J2EE containers, applications, or the BIRT Web Viewer
• Commercial Actuate has tools built in for handling this.
• Can integrate BIRT engine into your application. See “Integrating and Extending BIRT” for more information
• Later sessions at EclipseCon will discuss this more in depth as well.
Extensions

• Extremely complex topic
• See “Integrating and Extending BIRT” for information on this topic.
Q & A (10 minutes)