



# Creating Effective Business Intelligence Solutions for Tax Agencies

Presented by:

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# Introduction



- **Aaron Stibel**

- With RSI since 2001
- 10 years in industry, 8 years focusing on Data Warehousing and Business Intelligence for State Agencies
- Developed or Developing DW/BI solutions for 8 states in Tax and Child Support Enforcement



## Mission Statement

“Assist revenue agencies to maximize collections, increase compliance, improve customer service and streamline operations through the use of enabling technologies, in particular, integrated tax and tax data warehouse solutions”



[www.RevenueSolutionsInc.com](http://www.RevenueSolutionsInc.com)

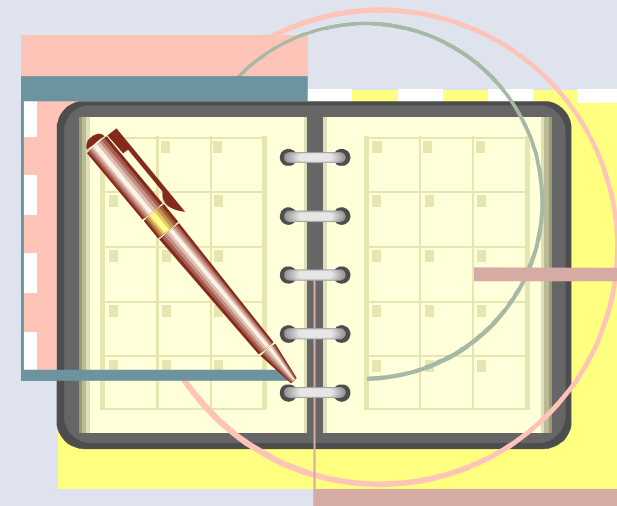
- Incorporated in May 1996
- Headquartered in Pembroke, MA with Solution Centers in Roseville, CA and Charlotte, NC
- Dedicated exclusively to providing products & services to tax agencies
- Over 200 tax professionals with 1000 combined years of revenue systems consulting
- Deep tax administration domain expertise
- Software Solutions for Integrated Tax and Integrated Compliance Management (Data Warehousing, Audit, Collections, Fraud...)
- Committed to client partnerships in delivery of projects



# Agenda



- Business Intelligence
  - Introduction
  - Definitions & Delivery Methods
  - Success Requirements
  - OLAP
- Revenue Agency Examples
  - Audit
  - Collections
  - Processing
  - Policy/Legislation
- Successful Implementation Steps



# Business Intelligence - Definition



Business Intelligence (BI) is the use of technology, data, and resources to support deeper understanding of a business

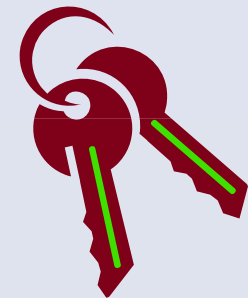
- Reporting on current activity
- Predictive modeling of future activity
- Management Performance Analysis
- Support Key Decision Makers

Successful BI is a top down implementation: start with the questions before defining a technology solution.

# Primary BI Products



- **Key Performance Indicators (KPIs)**
  - Single evaluation of a specific goal – e.g. average time from return processed to refund processed



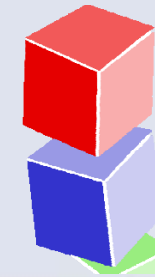
- **Reports**
  - Pre-defined analysis of a specific context



- **Dashboard**
  - Grouping of several KPIs and Reports to support quick understanding of general performance



- **OLAP Cube**
  - On-Line Analytical Processing
  - Multi-dimensional analysis of complex data



# BI Solution Matrix



# What is OLAP?



- On-Line Analytical Processing enables real-time retrieval and analysis of business data to reveal trends and statistics not readily visible in static reports.
  - Enables viewing data in many dimensions where reports are limited to two
  - Enables end users to slice and dice data into their own reports, without relying on IT resources
  - Enables users to visually see facts and trends that may have been otherwise unknown

# OLAP Example – Returns Proc. Cube



**Selected Items:**

- Rows
  - Federal AGI Ranges
  - In Out State
- Columns
  - Number Of Returns
  - Federal AGI
  - Refunds Amount
  - Balance Due Amount

Add Remove

**Available Items:**

- Return\_Processing\_V2
  - Tax Return
    - Tax Return File Indicator
    - Status Code
    - Error Codes
  - Federal AGI Ranges
  - Filing Status
  - Region

Apply Restore

**Drill Path:**

**Applied Filters:**

View Data Properties

		Number Of Returns	Federal AGI	Refunds Amount	Balance Due Amount
AGI_Range	In_Out_State				
Under \$30,000	In-State	245,700	\$2,905,650,318	\$52,050,926	\$6,493,472
	Out-State	43,336	\$-138,629,061	\$7,933,984	\$7,894,158
\$30,000 Under \$50,000	In-State	87,117	\$3,408,910,815	\$26,245,524	\$5,052,114
	Out-State	16,731	\$661,875,036	\$4,840,977	\$531,358
\$50,000 Under \$75,000	In-State	68,116	\$4,196,599,791	\$28,898,770	\$7,431,071
	Out-State	16,085	\$997,740,823	\$6,289,004	\$786,272
\$75,000 Under \$100,000	In-State	42,074	\$3,636,921,917	\$20,737,011	\$7,749,497
	Out-State	12,103	\$1,051,593,594	\$5,598,245	\$890,183
\$100,000 Under \$200,000	In-State	46,660	\$6,153,043,577	\$27,103,515	\$18,671,116
	Out-State	17,566	\$2,375,796,266	\$11,041,130	\$2,560,369
\$200,000 or More	In-State	13,180	\$7,171,825,931	\$30,414,487	\$26,219,472
	Out-State	11,740	\$36,245,935,942	\$24,721,540	\$4,651,283
<b>Total</b>		<b>620,408</b>	<b>\$68,667,264,948</b>	<b>\$245,875,113</b>	<b>\$88,930,364</b>

End Users select from toolbox of measures and facts

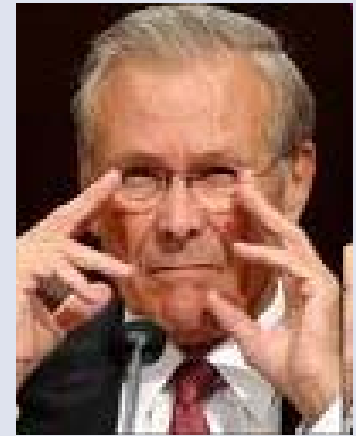
Drill In | Slice n Dice

N-Dimensions

# Donald Rumsfeld – BI's Yoda



- "...there are known knowns"
  - ...there are things we know we know.
- ...there are known unknowns
  - ...that is to say we know there are some things we do not know.
- ...there are also unknown unknowns
  - ...the ones we don't know we don't know."



# Business Intelligence for Revenue



	Audit	Collections	Processing	Legal/Legislation	Commissioner's Office
Reports	<ul style="list-style-type: none"> <li>Auditor Performance</li> <li>Audit Case Performance</li> <li>Department Statistics</li> <li>Audit Work Lists</li> <li>Compliance Revenue</li> </ul>	<ul style="list-style-type: none"> <li>Collector Performance</li> <li>Collection Case Performance</li> <li>Department Statistics</li> <li>Work Lists</li> <li>Aging Receivables</li> </ul>	<ul style="list-style-type: none"> <li>Processing Statistics</li> <li>Filing Season Statistics</li> <li>KPIs (e.g. Avg. Refund times)</li> </ul>	<ul style="list-style-type: none"> <li>Statistics of Income Reports</li> <li>Credits Taken Reports</li> <li>Public Reports</li> </ul>	<ul style="list-style-type: none"> <li>Departmental Statistics</li> <li>KPI Goals</li> <li>Revenue Reports</li> </ul>
Analysis	<ul style="list-style-type: none"> <li>Audit Lifespan Analysis</li> <li>Zero Change Audit Analysis</li> <li>Prioritization of Audits</li> </ul>	<ul style="list-style-type: none"> <li>Prioritization of Cases</li> <li>Aging Receivable Analysis</li> <li>Responsible Persons</li> </ul>	<ul style="list-style-type: none"> <li>Trend Analysis</li> <li>Filing Frequency Analysis</li> </ul>	<ul style="list-style-type: none"> <li>Credit Success Analysis</li> <li>Tax Policy Analysis</li> <li>Tax Change Forecasting</li> </ul>	<ul style="list-style-type: none"> <li>Department Dashboards</li> </ul>



## ■ Key Business Questions

- What is the performance of the department, supervisor, auditor?
- What are successful audits? What are zero-dollar audits?
- What is the ROI of each new auditor?

### Stakeholders

- Audit Supervisors
- Auditors
- Management

### Report Examples

- Auditor Performance
- Case Lists
- Revenue Performance

### Cube Examples

- Case Statistics
- Cradle to Grave

# Department: Audit Example



## “Cradle to Grave Cube”

- **Purpose:** Analyze the downstream revenue results of the audit beyond initial assessment amounts and collections
- **Improvement:** Enables the department to include abatements appeals and other measures to review audits against more comprehensive measures along a variety of more demonstrative dimensions

## Example Dimensions

- Appeal Status
- Tax Type
- Audit Issue Code
- Audit Period

## Example Facts

- Collected Amount
- Assessment Amount
- Compliant Tax Prior To Audit
- Compliant Tax Post Audit
- Audit Case Count

# Department: Collections



## ■ Key Business Questions

- What is the performance of the department, supervisor, agent?
- What are the current receivables?
- Where are good and bad receivables coming from?
- What taxpayers are more likely to pay?
- How do you treat different types of debts/taxpayers?

### Stakeholders

- Supervisors
- Collections Agents
- Management

### Report Examples

- Agent Performance
- Agent work lists
- Total Performance

### Cube Examples

- Case Statistics
- Aging Receivables

# Department: Collections Example



## “Aging Receivables”

- **Purpose:** To analyze all outstanding balance due amounts and combine into receivable aging “groups” to present an accurate picture of tax debt
- **Improvement:** Enhances the department’s ability to explain AR facts and trends; e.g. why have receivables gone up or down?

## Example Dimensions

- Age of Case
- Tax Type
- Assessment Code (Source)
- Prior Payments

## Example Facts

- Assessment Count
- Balance Due Amount
- Modeling Scores

# Department: Processing



## ■ Key Business Questions

- What are the filing seasons statistics – return count, filing methods, revenue, errors, suspense, etc?
- How long is it taking to: mail refunds, correct errors, move suspended returns?
- What are the filing trends year over year?

### Stakeholders

- Div. Managers
- Analysts
- Tax Type Managers

### Report Examples

- Div. Performance
- System Speed/Error
- Filing Methods

### Cube Examples

- Returns Processing
- Filing Season Facts
- Filing Season Trend

# Department: Processing Example



## “Returns Processing”

- **Purpose:** Analyze Personal Income Tax returns processed in a specific tax
- **Improvement:** Enables the ability to discover refund speed, revenue, errors and other statistics over several key return facts

## Example Dimensions

- AGI Range
- Location
- Days to Refund
- Credits Taken

## Example Facts

- Number of Returns
- AGI, Net Tax, Refund, Balance
- Error Codes
- Form Types
- Filing Methods



## ■ Key Business Questions

- What credits are utilized, which ones are working?
- What would tax changes effect revenue?
- What is the forecasted collections for out years?
- What are potential tax dodge scenarios?

### Stakeholders

- Tax Policy
- Legislation
- Commissioner

### Report Examples

- Change Forecasting
- Credit Utilization
- Rev. Forecasting

### Cube Examples

- Top Company



## “Top Company”

- **Purpose:** Analyze the set of larger companies for sales, withholding, income tax, credits, and assets for a given tax year
- **Improvement:** Enables the department’s ability to find trends, understand payments & credits, demonstrate tax obligation shifts

## Example Dimensions

- Range of Assets
- Business Type
- Primary Business Code
- Form Type
- Range of Tax (Sales, WH)

## Example Facts

- Net Income Tax
- Credits Taken
- Number of Employees
- Gross Receivables
- Minimum Tax Paid

# Requirements for Successful Tax BI



- **Integrated Data Warehouse**
  - Internal Data: Tax Data, Audit, Collections
  - 3<sup>rd</sup> Party: IRS, DMV, Employers, SOS, Customs
  - Derived data: data analytics, scoring
  
- **Technology**
  - Data Warehouse, implement ETL and matching tools to integrate all data into single data architecture
  - Business Intelligence technology to implement enterprise reporting and OLAP analysis
  
- **The Right Resources**
  - Successful Tax BI requires people who know not only BI technology, but also the data and business problems of the revenue agency

# BI Implementation Steps



- Start with business questions, not technology
  - Assuming the end game – OLAP, Dashboard, etc – can paint the solution into a corner that does not fulfill the business need
  
- Successful BI starts with an integrated data warehouse solution that is 100% open
  - As business needs grow, it is paramount to have a growing data warehouse and unlimited access to data
  
- Identify key in-house resources or vendors that understand BI and tax
  - BI Tools are becoming ubiquitous, the knowledge is in the data
  - Installing MS Word is easy; writing a novel is difficult

# BI Implementation Steps (cont.)



- **Identify and Assemble the data**
  - Simple Data: those facts and measures that are easily available with the data warehouse (e.g., net tax, form type, location, etc.)
  - Derived Data: calculations, ratios, complex equations that rely on data manipulation and algorithms (e.g., time durations, revenue to auditor hours, etc.)
  
- **Develop BI Data Architectures to support OLAP**
  - May require intermediate steps using Data Marts
  - STAR, Snowflake, etc.
  
- **Implement and Configure End User Tool(s)**
  - Multiple tools and delivery methods may be used
  - From Cognos, SAS, & Business Objects to Excel, PDF, and HTML
  - “Do not shoot a hamster with a Howitzer”

# Questions and Discussion

