



New York State Department of Taxation and Finance



New York State Capital Building  
Albany, New York

## Predictive Modeling and Earned Income Tax Credit

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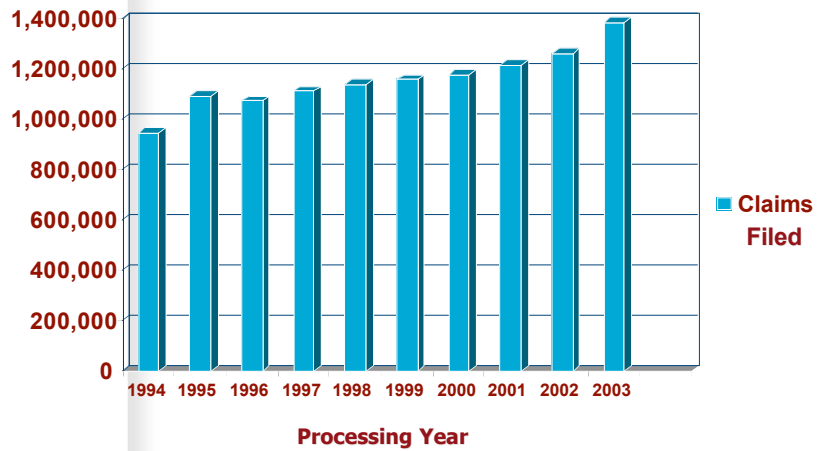
### A Brief History

- First Enacted For Tax Year 1994
- New York State Credit Is Based On A Percentage Of The Federal Earned Income Tax Credit (EITC)
  - Phased In From 7.5% Of The Federal EITC In 1994 To The Current 30%
- New York EITC Is Fully Refundable To New York State Residents
  - Tax Offset Only For Non-residents



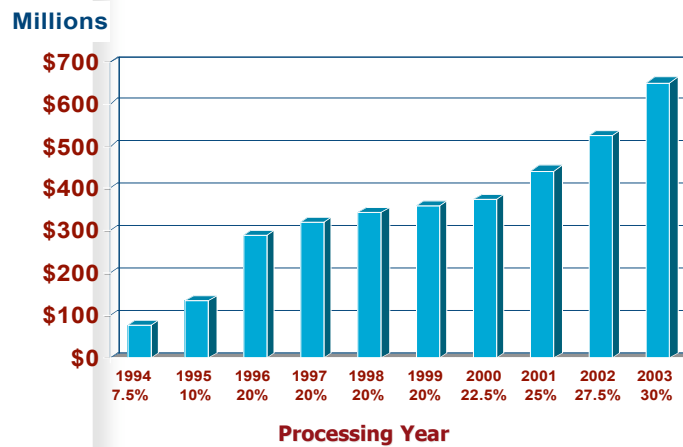
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### # Of Claims Filed Per Year



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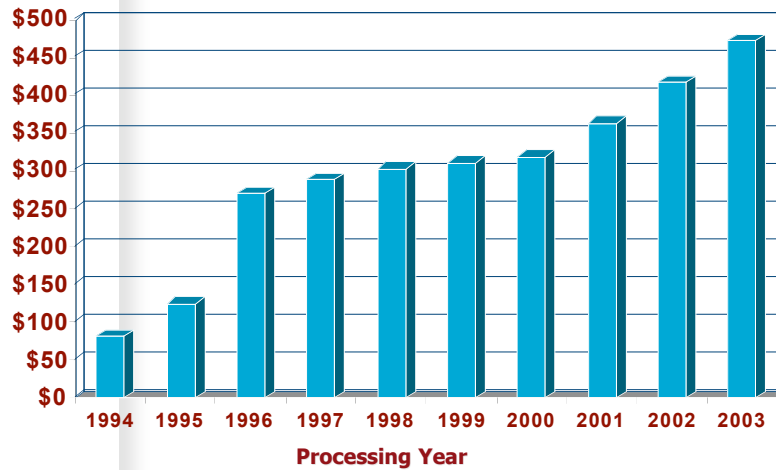
### \$ Value of NY Processed Claims





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### Average Value of Claim



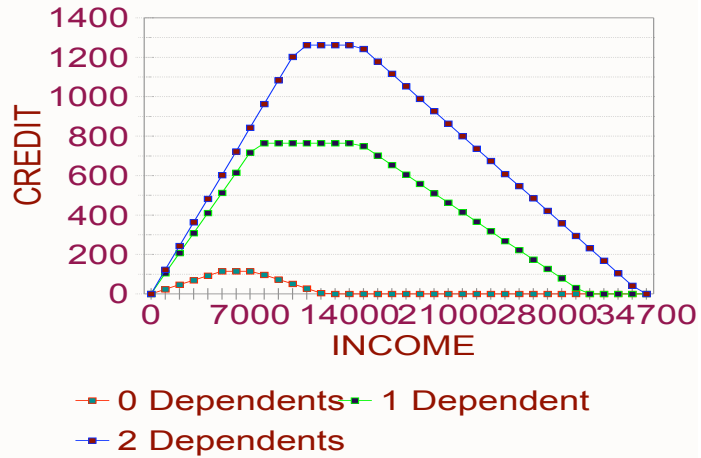
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### Filing Requirements

- Must Be Eligible For And Claim A Federal EITC
- Must File A New York State Personal Income Tax Return
- Taxpayers With No Qualifying Dependents Are Still Eligible To Receive The Refundable Credit



### How the EITC Works



### Maximum EITC 2003

Income Range	Qualifying Dependents	Federal EITC	New York EITC	Total
\$4,950 – \$7,250	0	\$382	\$115	\$497
\$7,450 – \$14,450	1	\$2,547	\$764	\$3,311
\$10,500 – \$14,750	2	\$4,204	\$1,261	\$5,465



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## **Audit Issues**

- **Improper Claims – Maximizing the EIC Claim**
  - Questionable Business Income – Schedule C
  - Questionable Wages And Withholdings
  - Identity Theft
  - Preparer Fraud
  - Multiple Claims
  - Questionable Business Losses
  
- **Domestic Issues**
  - Custody Disputes
  - Duplicate Claims
  - Math Errors
  - Social Security Number Verification



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## **THE AUDIT RESPONSE 1995 - PRESENT**



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## **Audit Past**

- 1994 – 1998
  - Up-front Processing Edits
  - Manual Review Of All Cases
  - Manual Issuance Of Inquiry Letters
  - Focus On Domestic Issues
    - Custody Disputes
    - Duplicate Claims
    - Social Security Number Verification
    - Math Errors



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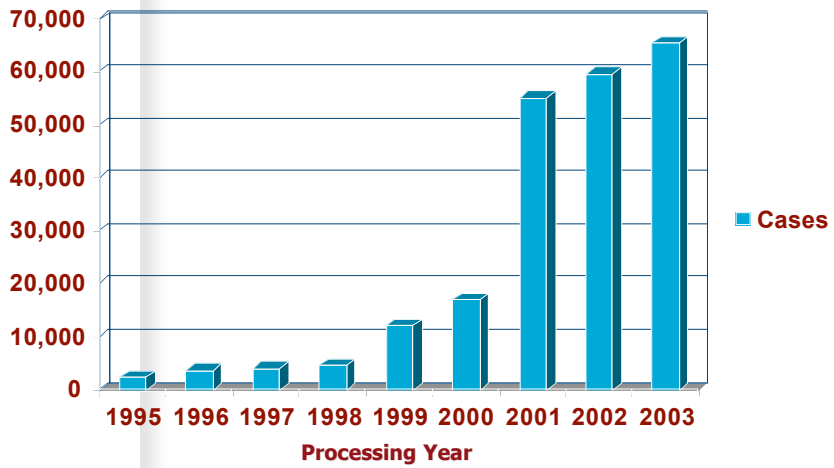
## **Audit Past (Continued)**

- 1999 – 2003
  - Development Of New Edits Focusing On Suspicious Activity
    - Schedule C Issues
    - Identity Theft
    - Preparer Fraud
  - Automated Case Selection
  - Automated Issuance Of Inquiry Letters



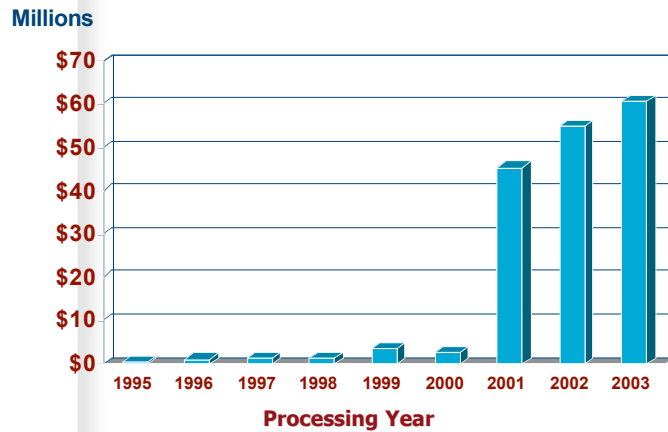
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### Audits 1995 - 2003



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### Audit Value 1995 - 2003





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### **Process Concerns**

- Edit Flexibility
  - Limited In Scope
    - Small Universe Of Cases
  - Inability To Effectively Control Volume
    - Required The Selection Of Every Case That Failed The Edit
  - Difficult To Modify
    - Programming Request Required In Order To Modify Or Add New Edits
    - Not Always Able To Add New Edits During A Fiscal Year



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### **Process Concerns (Continued)**

- Program Management
  - Limited Capability To Analyze The Effectiveness Of The Edits
    - Limited Report Generation Capabilities
  - Limited Capability To Analyze For And Predict Potential New Areas Of Abuse
    - Edits Are Developed From Only Known Patterns of Abuse
    - Revenue Dollars Lost Before Edit Can Be Put In Place





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## **THE ANSWER... Our Partnership with IBM**



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### **Project Objective**

- Build A System To Enhance Current Audit Case Selection Methods For Suspicious Filing Detection Of Pre-processed Returns
  - Leveraging Investments In Data Warehousing And Business Intelligence Technologies
  - Scientifically Predicting Good Audit Candidates Utilizing Return Filing Patterns, Case History, And Other External Indicators



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### **Existing Infrastructure**

- NYS DTF Had An Established Data Warehouse Containing Data From Internal, As Well As, External Sources
  - NYS Tax Return Filing History
  - Audit Closed Case History
  - Accounts Receivable And Collections History
  - IRS Tax Return Filing History
  - Family Tree & Relationship Data
  - Taxpayer & Business Demographics
  - Various Other State And Private Files



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### **Existing Business Intelligence Tools**

- Utilizing The Data Warehouse And IBM's Tax Audit And Compliance System (TACS), Auditors Are Performing Post Processing Audit Selection By:
  - Discovering Information, Trends, And Patterns About Taxpayers And/Or Returns
  - Identifying Tax Returns For Audit Selection Based On A Returns Deviating From The "Norm"
  - Displaying Data In Graphical Two And Three Dimensional Formats That Readily Identify Returns That Fall Outside The Norms



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## **Existing Business Intelligence Tools (Cont'd)**

- Drilling Down Into Detailed Database Information On Taxpayers Return And Audit History Data
- Building Suspicion Indices (Scores) Based On Features (Data Elements) Identified By The Audit Selector
- Reporting Which Area Of The Return Or Specific Ratio Drove The Selection Of The Return
- Provide Further Detail Of The Taxpayer Being Audited



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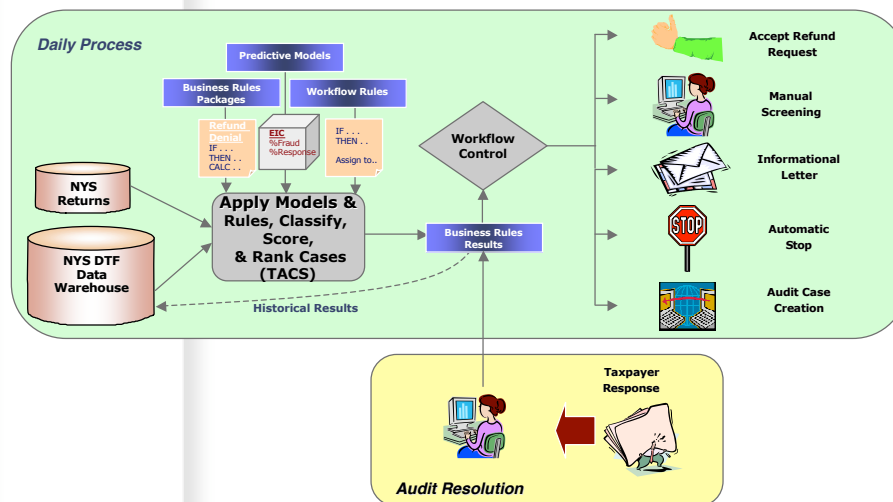
## **THE SOLUTION...**

### **Case Identification And Selection System (CISS)**



## What is CISS?

- CISS Is A Tool That:
  - Applies Business Rules And Predictive Models To Categorize And Score Returns Received Nightly
  - Identifies The "Next Best Case" For Pre-processing Audit Selection
  - Provides A Web Based Application For Screening And Resolving Cases
    - Accept Refund Request
    - Automatic Stop
    - Audit Case Creation
    - Informational Letter
    - Manual Screening





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## **What is Predictive Modeling?**

- Predictive Modeling
  - Uses Historical Taxpayer And Return Attributes With Known Outcomes To Determine A Probability Value
- CISS Predictive Models:
  1. Probability Of Fraud
  2. Probability Of Taxpayer Response



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## **What are Business Rules?**

- Business Rules
  - Business Logic That Evaluates Data From Each Current Tax Return, Previous Returns, Audit History And Other Sources To Make A Determination About The Action To Be Taken By The Department Regarding Each Return
- Business Rules Engine
  - A Means Of Applying The Business Logic, Predictive Models, Scores, And Workflow Controls Expressed As IF / THEN Rules



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### **CISS Benefits**

- **Advanced Analytics Takes Detection To The Next Level**
  - **Augments Return Data With Comprehensive Indicators And Scores To Be Used In Rules Engine**
  - **Utilizes Predictive Modeling To Discover Patterns In Historical Data For Application To Current Returns**
  - **Utilizes Profile Modeling To Identify New Patterns And Relationships In Current Returns**



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### **CISS Benefits (Continued)**

- **Identify "Next Best Case"**
  - **Selection Of The Best Case Based On All Returns Received Not On A Batch Or Daily Basis**
  - **Dynamic Re-ranking Of All Potential Cases Nightly**
  - **Browser Based Front End Which Provides A Single Point Of Entry For Case Identification, Screening, Analysis, Selection, Creation, And Reporting**



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### **CISS Benefits (Continued)**

- Increased Staff Production
  - Enhanced System Screens
    - Placing Needed Case Information In One Spot
    - Quick Access To Other System Screens
    - Reduced Clerical Support
  - Automation Of Screening And Case Closing Functions
  - Improved Taxpayer Correspondence
    - Taxpayer Inquiry Letters Now Target The Specific Audit Issues
    - Utilized By Call Center For Refund Status Inquiries



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### **CISS Benefits (Continued)**

- Improved Program Management
  - Management Of Selection Thresholds
  - Accurate And Flexible Report Generation Capabilities Needs
  - Current Year Case Analysis Capabilities To Identify New Areas Of Fraud With Immediate Implementation
  - Externalized Business Rules Provide Greater Flexibility
  - Post-year Analysis Of System Edits



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## **CISS Analysis (How is it Performing?)**

	<u>2003</u>	<u>2004*</u>
▪ Inquiry Letters Issued	55,776	78,000
▪ Response Rate (%)	41%	22%
▪ Refund Denials (%)	80%	80%
▪ Cases Completed Per Day Per Auditor	8	8
▪ Denied Refunds (\$)	\$56 Million	\$80 Million
▪ *Projected To 12/31/04		



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## **CISS... Future Enhancements**

- Post Year Analysis & Process Improvements
  - Edit Analysis & Development
  - Scanning Of All Responses
    - Fully Paper-less Audit
  - Automated Letter Construction
    - Making The Letter Unique To Address The Individual Case
  - Case Update Feature
  - Enhancements To Workflow
    - Better Case Tracking
    - Better Report Generation
    - Better Interaction With Other Systems





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## **CISS...Future Enhancements (Cont'd)**

- Improved Staff Production
  - Additional Enhancements To Viewing Screens
  - Line By Line Adjustment Capability
  - Expanded Access To Taxpayer & Preparer History
  - Enhanced Links To Other State Software
  - Dual Monitors



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## **CISS... Future Enhancements (Cont'd)**

- Expansion Of The Data Warehouse
  - Department Of Social Services
  - Internal Revenue Service
  - Development Of Family Tree
  - Link To Preparer Information
  - Capture & Access To All Return & W-2 Information
  - Better Interaction Between NYS Systems
    - Having The Most Up-to-date Information
- Expansion To Other Audit Programs
  - Non-resident
  - Tax Shelters



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**QUESTIONS?**