



Analytics Everywhere – Using Data to Improve Customer Compliance

Ted London, Vice President, CGI
Dr. Satheesh Ramachandran, Elite Analytics

August 4, 2010



_experience the commitment™

Agenda

- Analytics at Tax Agencies: a historical perspective
- Opportunities for Analytics at Tax Agencies
- Data Analytics Methods and Applications
- Usage of Data in Analytics

Analytics in Tax Administration

- Analytics has been a part of Tax and Revenue since its inception
 - Audit Selection
 - Thresholds on return validation
 - Collection Strategies and assignments
- Dramatic explosion in the amount of data available at a relatively low cost
- Modeling tools and techniques have reduced effort to build models
- However, while the world has embraced analytics, revenue agencies have been slow to follow...

Tax agencies change slowly

- Do you select field audits in a manner similar to 10 or even 20 years ago?
- Do you use data to identify opportunities improve customer service channels?
- Private Sector is generally way ahead of the Government – using data to:
 - Changing their web sites based on usage
 - Select customers for loans (including rates), payment agreements terms
 - Customer segmentation – one size does not fit all
 - Proactively identify potential fraud
 - Identify opportunities to move customers to lower cost channels



Fairness...

- Fairness is of critical important to tax agencies
- Does that mean treating all taxpayers the same?
 - Fairness to the public
 - Fairness to groups of taxpayers
 - Fairness to the taxpayer
- Do all taxpayers need to have the same sequence and timing of responses?
- Do all taxpayers need to receive the same letter?

Why Analytics now?

- Staff constraints are likely to only grow
- The cost of analytics continues to go down
- Many more tax agencies have significant data stores available to them
 - Modelers will tell you there is never too much data
- Strong pressure to increase revenues and decrease costs



Agenda

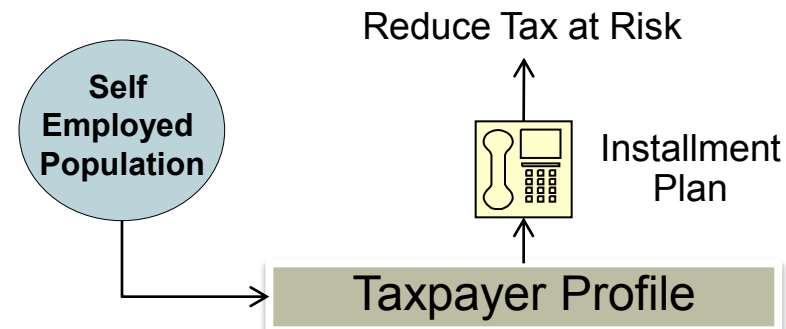
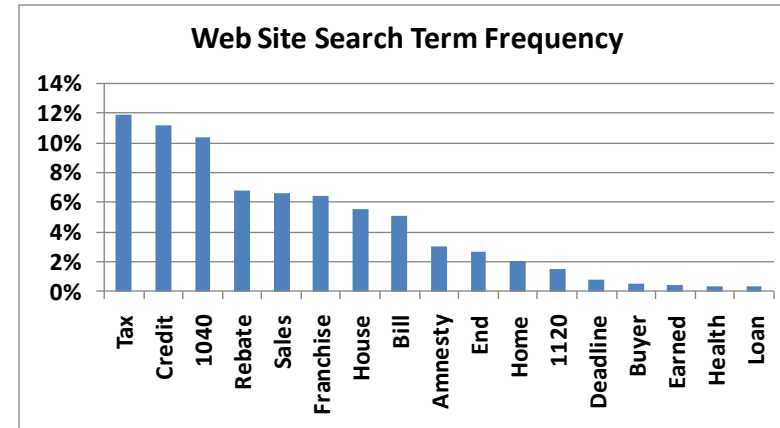
- Analytics at Tax Agencies: a historical perspective
- Opportunities for Analytics at Tax Agencies
- Data Analytics Methods and Applications
- Usage of Data in Analytics

Opportunities for Analytics are Everywhere

- Customer Service
- Collections
- Audit
- Filing Enforcement/Tax Discovery
- Fraud Detection
- Strategic Planning

Customer Service

- Which segment of the population will benefit from education/outreach?
- Which taxpayers could benefit from proactive education?
- Voluntary Compliance – What is the effect of changes to text on notices?
- Are taxpayers getting the right information?
- Are we updating our website based on usage statistics?
- Customer segments – Do certain customers react better to certain approaches/channels?



Collections

- Managing diverse debt portfolios requires **prioritization** of cases:

- How many and what type of scarce resources do I allocate?
- At what point in the collection lifecycle do I execute a given collection strategy?

Medium Risk Case Strategy

Assign these cases earlier in the process, especially justified by the yield

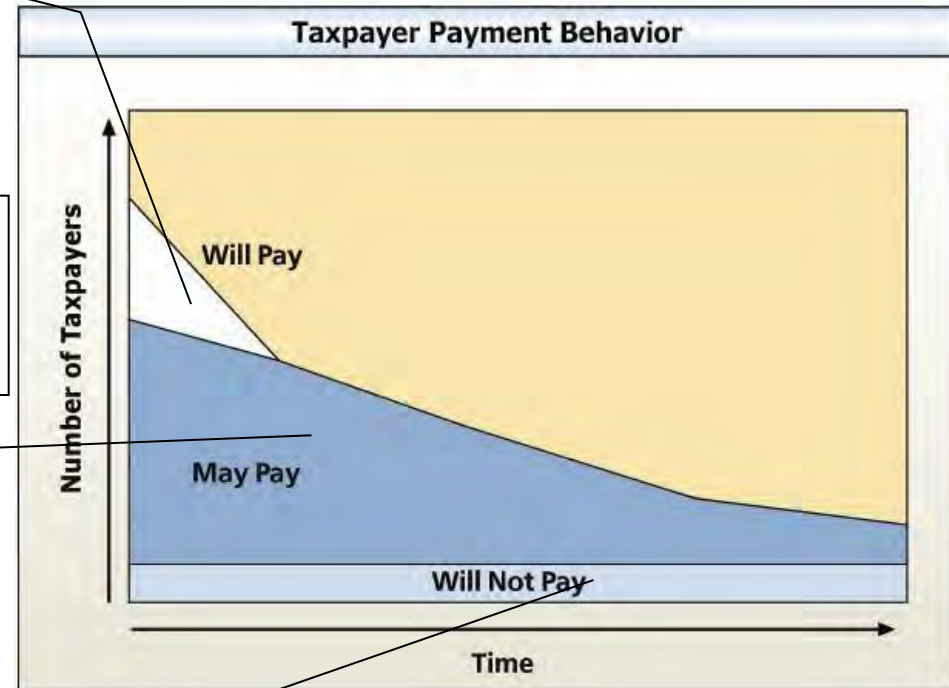
- The answer is based on the perceived debtor **“risk”**

- Identify opportunities to reducing postage costs

- “Bill often” can be expensive
- Identify the right balance to maximize next revenues

Low Risk Case Strategy

Give them more time to Self-Cure before assigning them to a collector

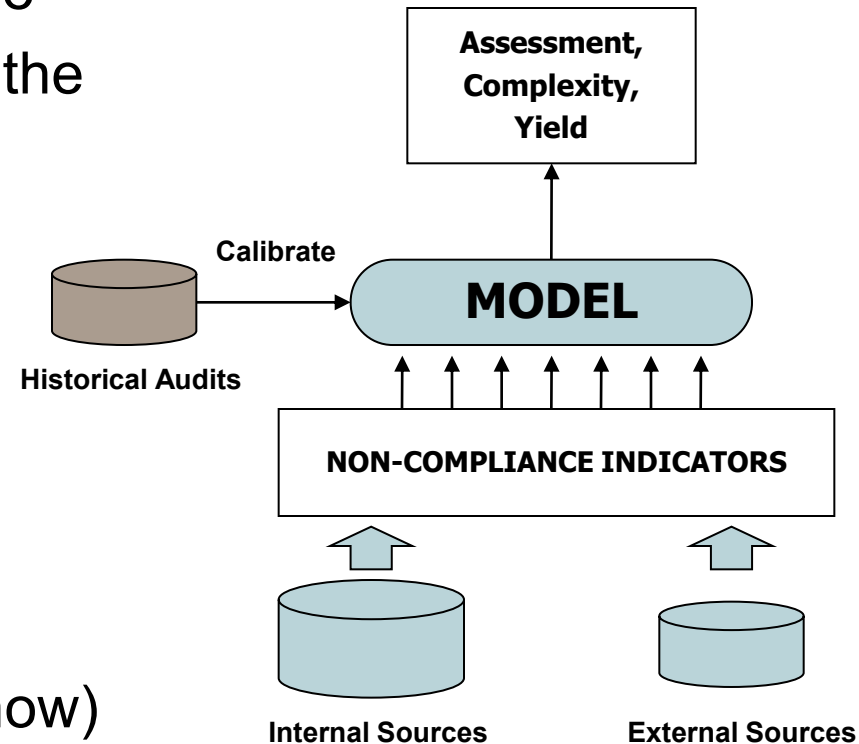


High Risk Case Strategy

Don't assign these to collectors unless balance amount requires it

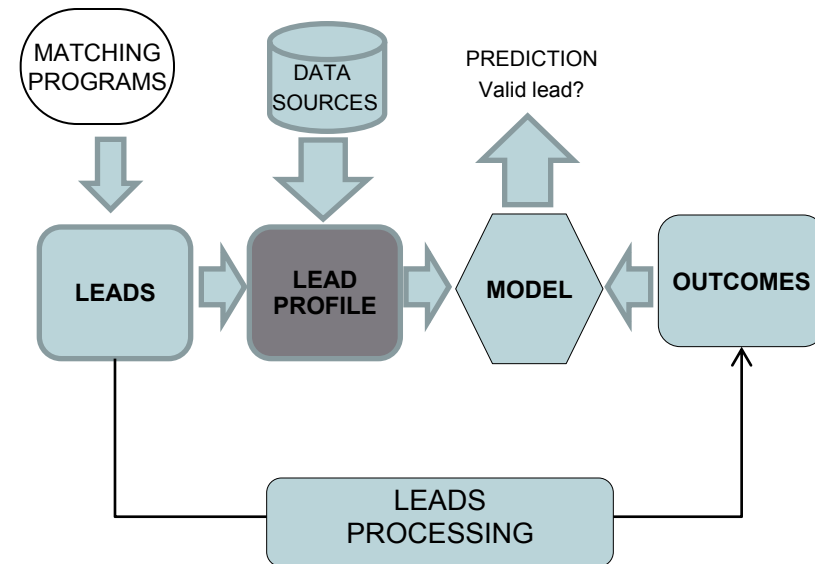
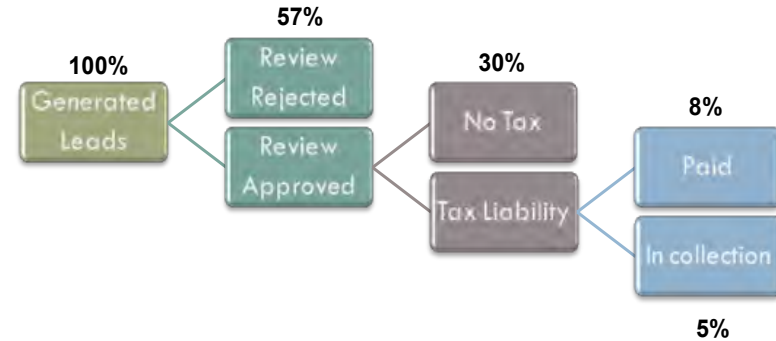
Audit

- There will always be more cases that can be selected than audit hours available
- The goal is to maximize the value of the audits: Compliance, Coverage and Revenues
- Models – if an audit is performed, what is the expected Revenue, Complexity and Yield
- Challenges
 - Modeling requires an initial sample of leads with outcome (you don't know what you don't know)
- Don't forget that change management may be more difficult than the technology



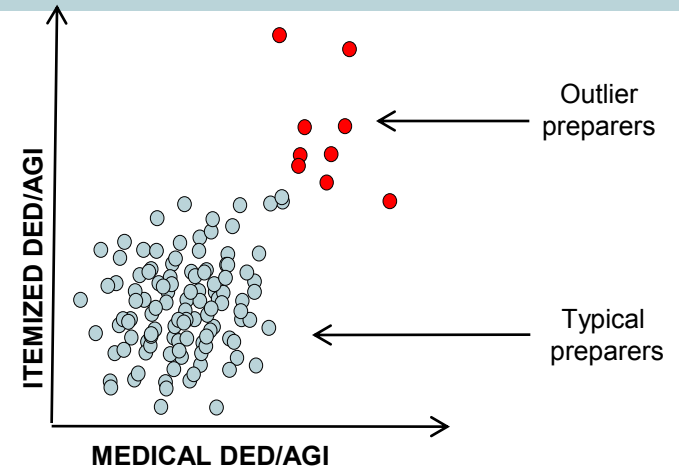
Filing Enforcement/Tax Discovery

- While Non-Filer programs generate significant revenue – they also generate
 - Large workloads
 - High false positive rates
- The goal is to maximize compliance
 - Maximum revenue
 - Minimum leads
 - Least impact on staffing



Fraud Detection

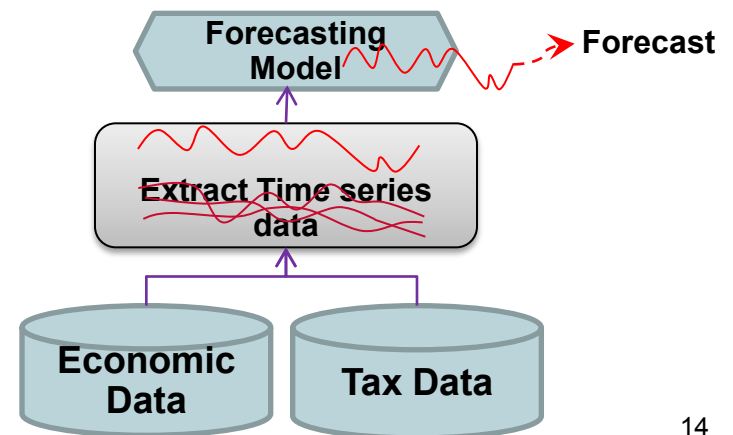
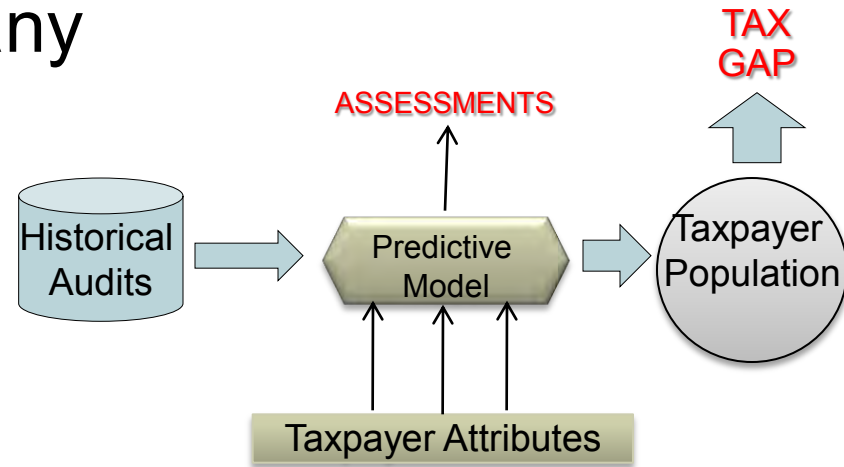
- Many types of fraud
 - W2 fraud, Preparer fraud, Refund Fraud, EITC Fraud
- Primary approaches
 - Rule Based - Identifying taxpayers with suspicious entries
 - Predictive Models - Matching taxpayers who statistically resemble known frauds
 - Outlier, Link Analysis – Identifying taxpayers/patterns that are dissimilar to the norm
- Must be done quickly (to not delay most refunds)
- Fraud schemes change rapidly



	RULE BASED	PREDICTIVE MODELS	OUTLIER BASED, LINK ANALYSIS
FRAUD TYPES	KNOWN & WELL DEFINED FRAUD	COMPLEX, KNOWN STATISTICAL PATTERNS	COMPLEX, UNKNOWN TYPES OF FRAUD
NEEDED	DOMAIN KNOWLEDGE	PAST PROCESSED LEADS	FILINGS DATA
STRENGTHS, WEAKNESSES	STATIC, CAN BE EVADED	NEEDS OUTCOME DATA	HARD TO VALIDATE

Strategic Planning

- Tax administrators make many strategic decisions
 - Staffing & budgets
 - Broad compliance/revenue enhancement initiatives
 - Taxpayer education and outreach initiatives
 - Technology and infrastructure investments
 - Study impact of new tax laws
- Analytics can provide insights that drive strategic decision making



Agenda

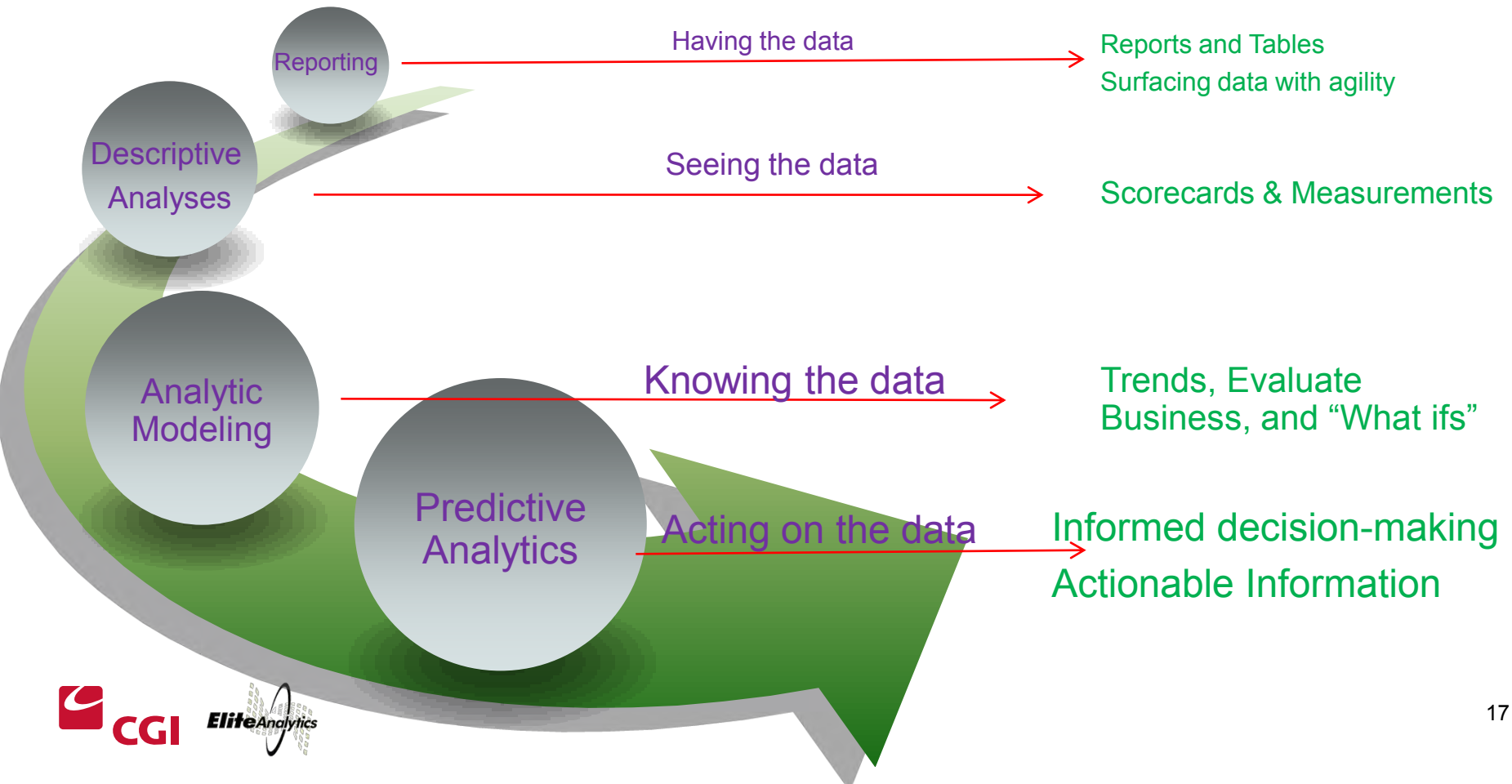
- Analytics at Tax Agencies: a historical perspective
- Opportunities for Analytics at Tax Agencies
- Data Analytics Methods and Applications
- Usage of Data in Analytics

Data Analytics Methods and Applications

- Data Analytics Continuum
- Test and Learn vs. Analytics
- Predictive Models Applications

Data Analytics Continuum

Analytics encompass all data analysis functions which enable decision support



Test and Learn

- Tax agencies are filled with smart people with many ideas for improvement
- Tax agencies must be good stewards of the public's money and trust
- Test and Learn allows agencies to validate new approaches with minimum risk
- In some cases, it is okay that not everyone is treated the same

Test and Learn Vs. Analytics

- Analytics can answer the what “did happen” and the what “will happen” questions
- Analytics in general cannot answer the what “might happen” questions:
 - How will taxpayers respond to this new strategy?
 - How productive will this (previously untapped) non filer population segment will be?
- Analytics can help analyze the outcomes of experiments and predict future outcomes

Test and Learn Vs. Analytics

- Reporting and research level

- 35% of debts resolve in <60 days
- 50% of service industry audits are non-productive
- 45% of 1099 non-filer leads result are no tax-due

- Data mining analysis level:

- New debts with “profile A” will resolve in <60 days
- Audits with “profile B” will be productive

- Automated decision support:

- New debts are automatically matched to profiles A and B and assigned different treatment strategies

- First time debtors
- Balance < \$1,000
- Self Employed
- ...

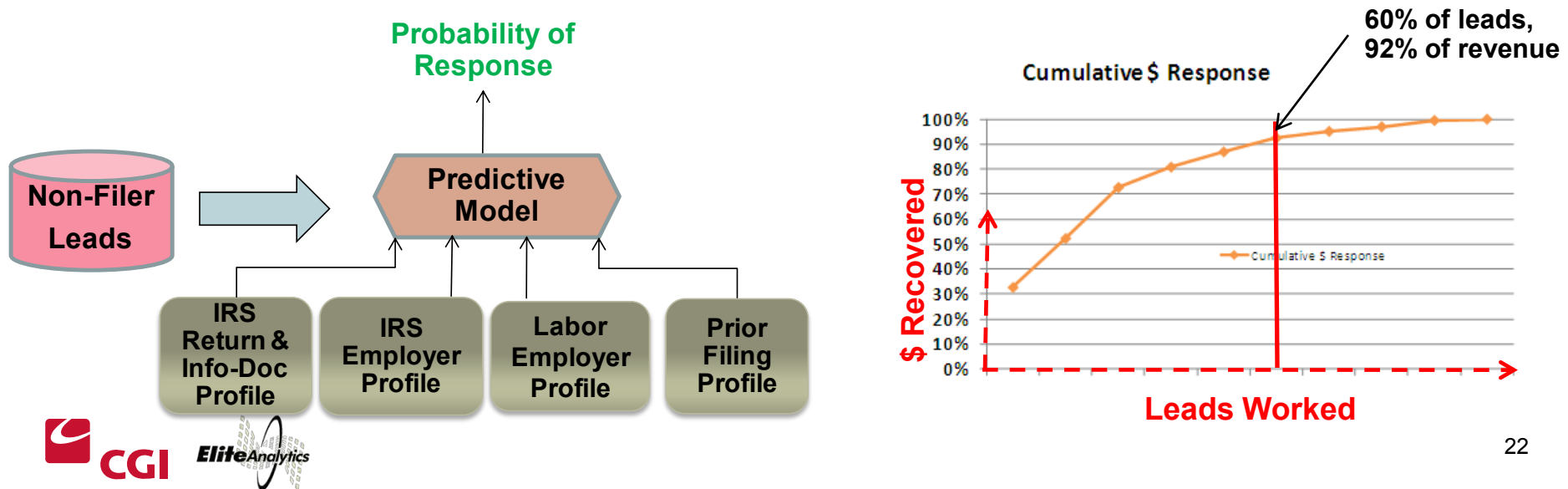
Test & Learn Example: Collection strategies

- “Profile B” taxpayers have been matched to strategy “X” and now resolve in <90 days
- Can a new a strategy “Y” improve over this?
- Only experimentation can provide the answer:
 - Treat 10% of Profile B cases with the new strategy
- Use analytics to interpret results:
 - Strategy Y, in general, works only marginally better that strategy X, however
 - It works much better for a subgroup of “Profile B”, which we call “Profile B1”

Predictive Model – Non-Filer Case Study

■ Non-Filer example

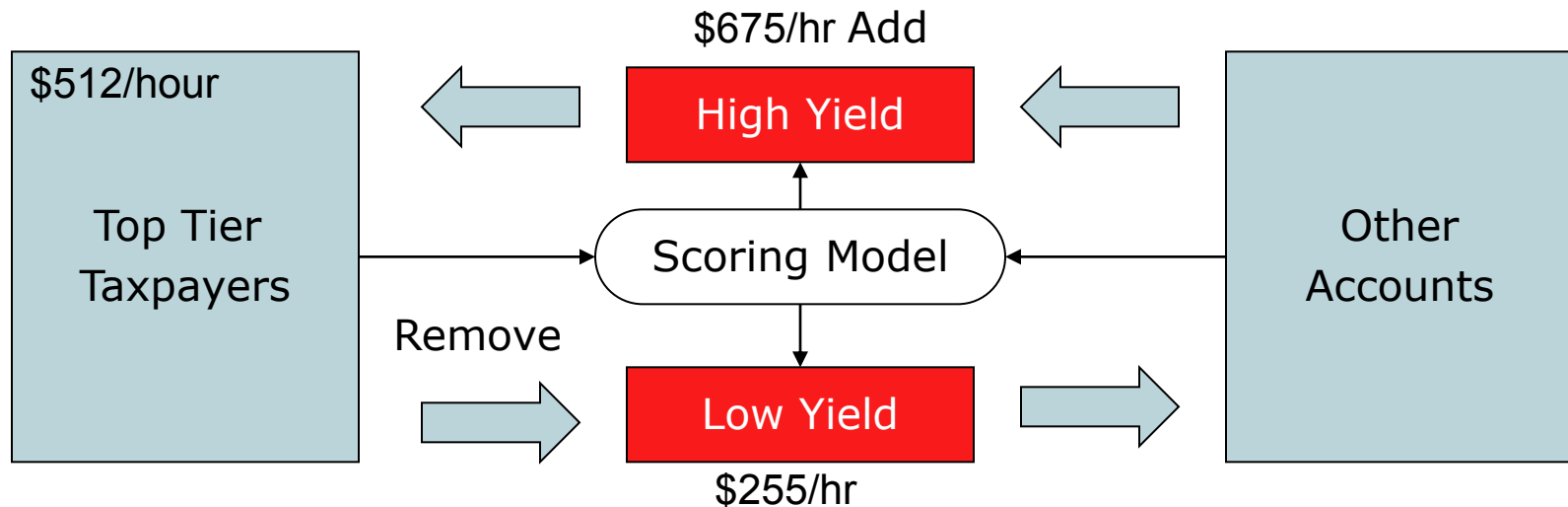
- Common matching program – match IRS 1099 against state filings, generate leads that haven't filed state return
- Typical response rate – 15%, Average payments ~ \$ 5000
- Build a Comprehensive Lead Profile, Correlate Profile to Lead Outcomes



Predictive Model – Audit Case Study

▪ Audit Example

- Most Agencies will audit a “Top 100” or “Top 200” list
- Is #99 is really better than #102?
- Predictive Models can look for other (hidden) factors that suggest a strong assessment



Predictive Model – Collections Case Study

■ Goals

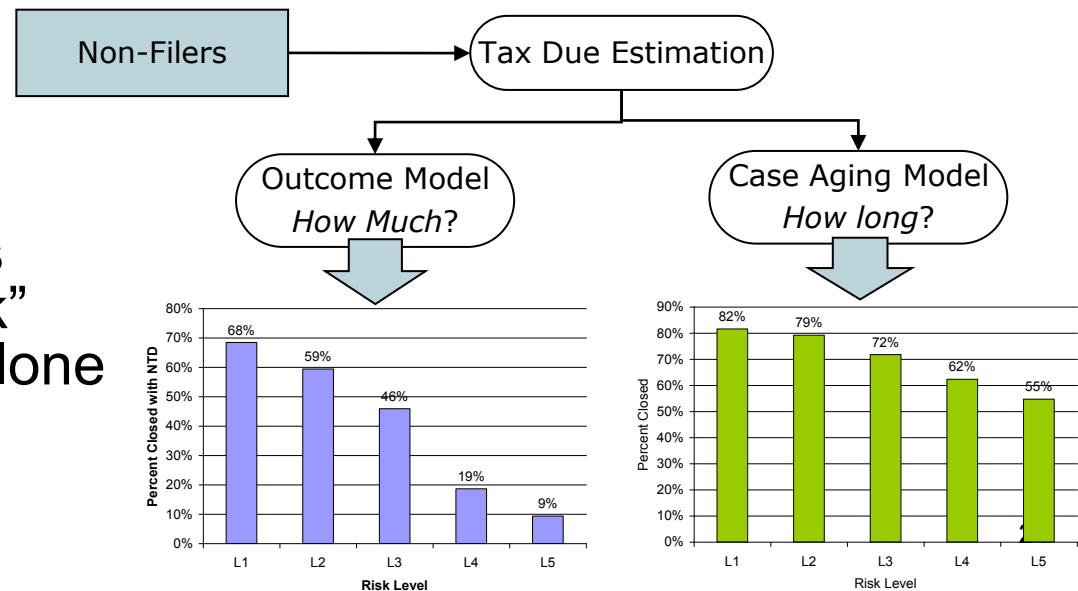
- Maximize recovery in automated stage
- Limit high risk cases for manual intervention, high risk low value to external collections agency

■ Models

- Risk model – likelihood to pay/ Self cure
- Value model – likely value of the case

■ Business Process Change

- Collection effectiveness metrics – “dollars at risk” as opposed to dollars alone



Agenda

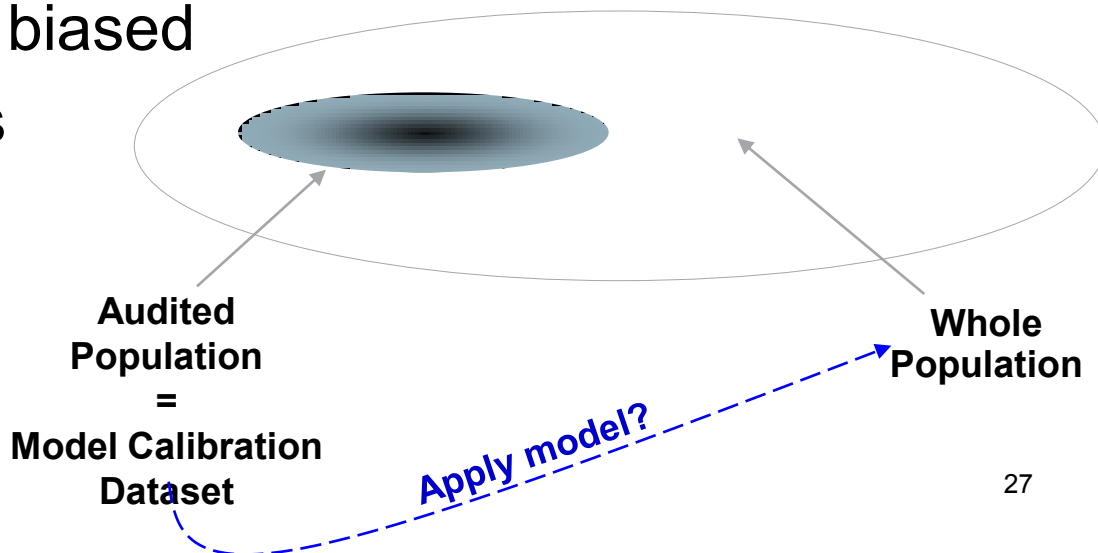
- Analytics at Tax Agencies: a historical perspective
- Opportunities for Analytics at Tax Agencies
- Data Analytics Methods and Applications
- Usage of Data in Analytics

Usage of Data

- Data Collection – Recognizing biases in data
- Expert vs. Statistical Models
- Refreshing Models from Data

Data Collection – Recognizing Biases in Data

- Predictive models “learn” from historical data – gathered for operational reasons
- Source of audit records
 - Random audits: expensive, often unfeasible
 - Operational audits: available, yet “biased”
- Collections risk behavior
 - Operational data biased by current treatment strategies
- Resulting models will be biased
- Needs to address biases in data



Expert vs. Statistical Data

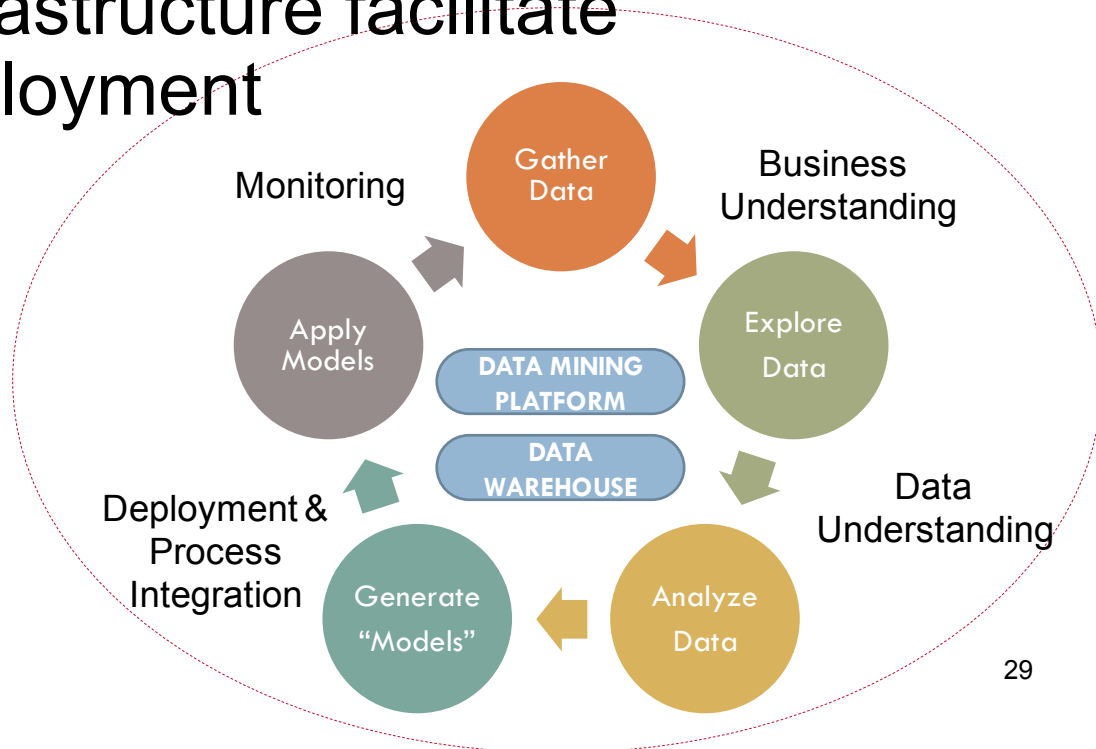
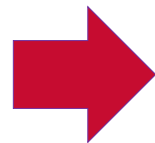
- Expert Models
 - Can add a lift
 - Limited by user biases
 - You don't know what you don't know

- Statistical Models
 - Leverages patterns from data
 - Wide array of approaches
 - Can incorporate expert knowledge
 - Leverages agency specific data
 - Patterns don't necessarily generalize

Refreshing models

- Models degrade/grow stale over time
- Model effectiveness can be measured
- Significant departmental changes (to data or process) can cause bigger impacts
- Modern analytics infrastructure facilitate recalibration and deployment

CLOSED LOOP ANALYTICS



Possible Next Steps

- Assess how you might leverage Analytics in your organization
 - Likely that a strong business case could be made
 - Consider an outside operational review to assess the opportunity and benefits
- Do some of your own research
 - Talk with States that are currently using analytics
 - Texas
 - California Franchise Tax Board
 - California Board of Equalization
 - Virginia
 - Iowa
 - Find out what analytic tools are in the market today

Contact Information

ISO 9001 Certified



Ted London

Vice President
Tax, Revenue and
Collections Solutions

(916) 284-7277
Ted.London@cgi.com
www.cgi.com/tax



**Dr. Satheesh
Ramachandran**

Consulting Partner

(512) 293-8717
satheesh@eliteanalytics.com