Optimization: Going beyond modeling

To enhance your Collections and Audit Programs

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Agenda

- What is Optimization?
- Optimization Success Stories
- Optimization Opportunities: Collections
- Optimization Opportunities: Audit

ANALYTICS MATURITY CURVE

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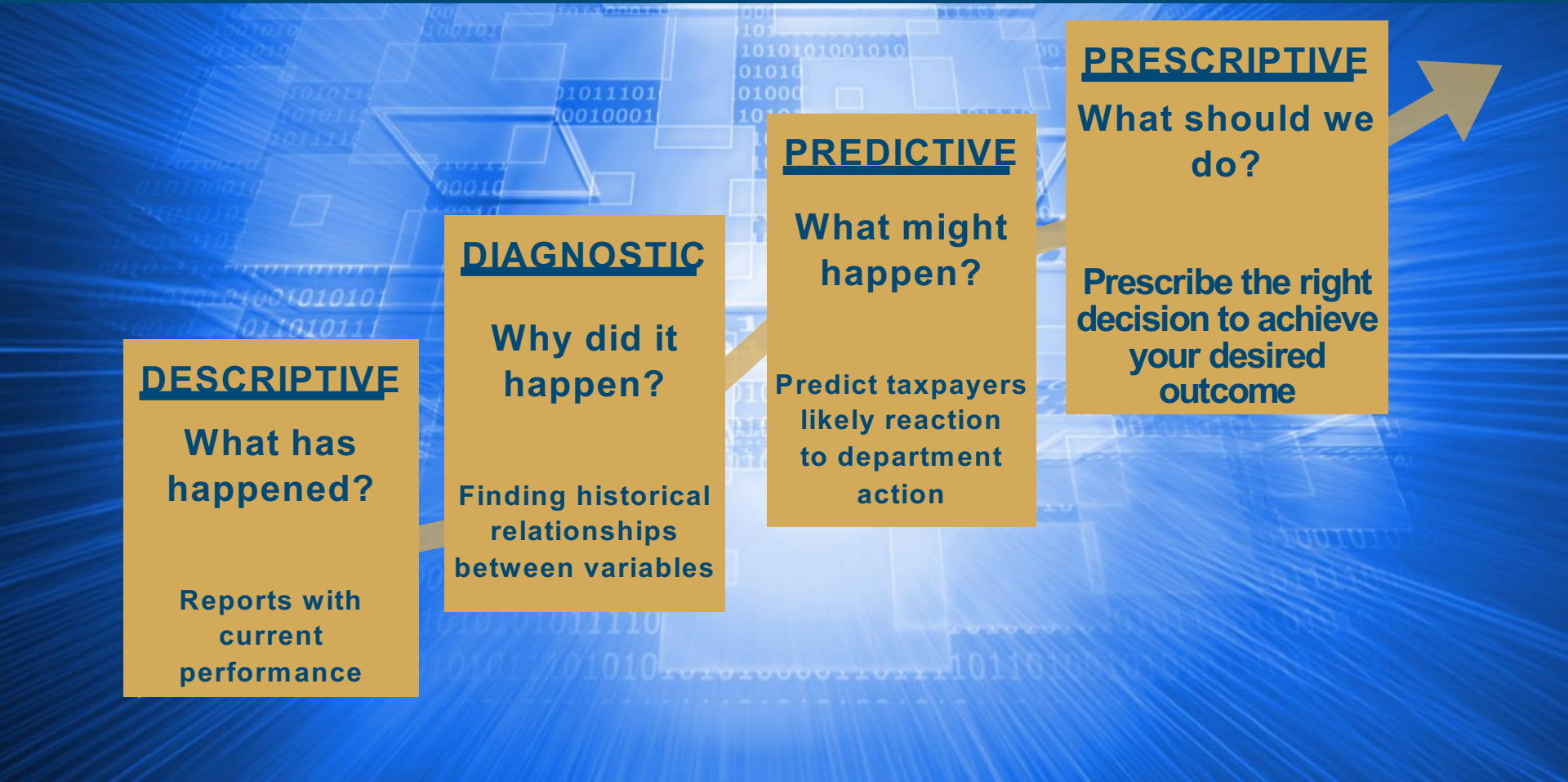

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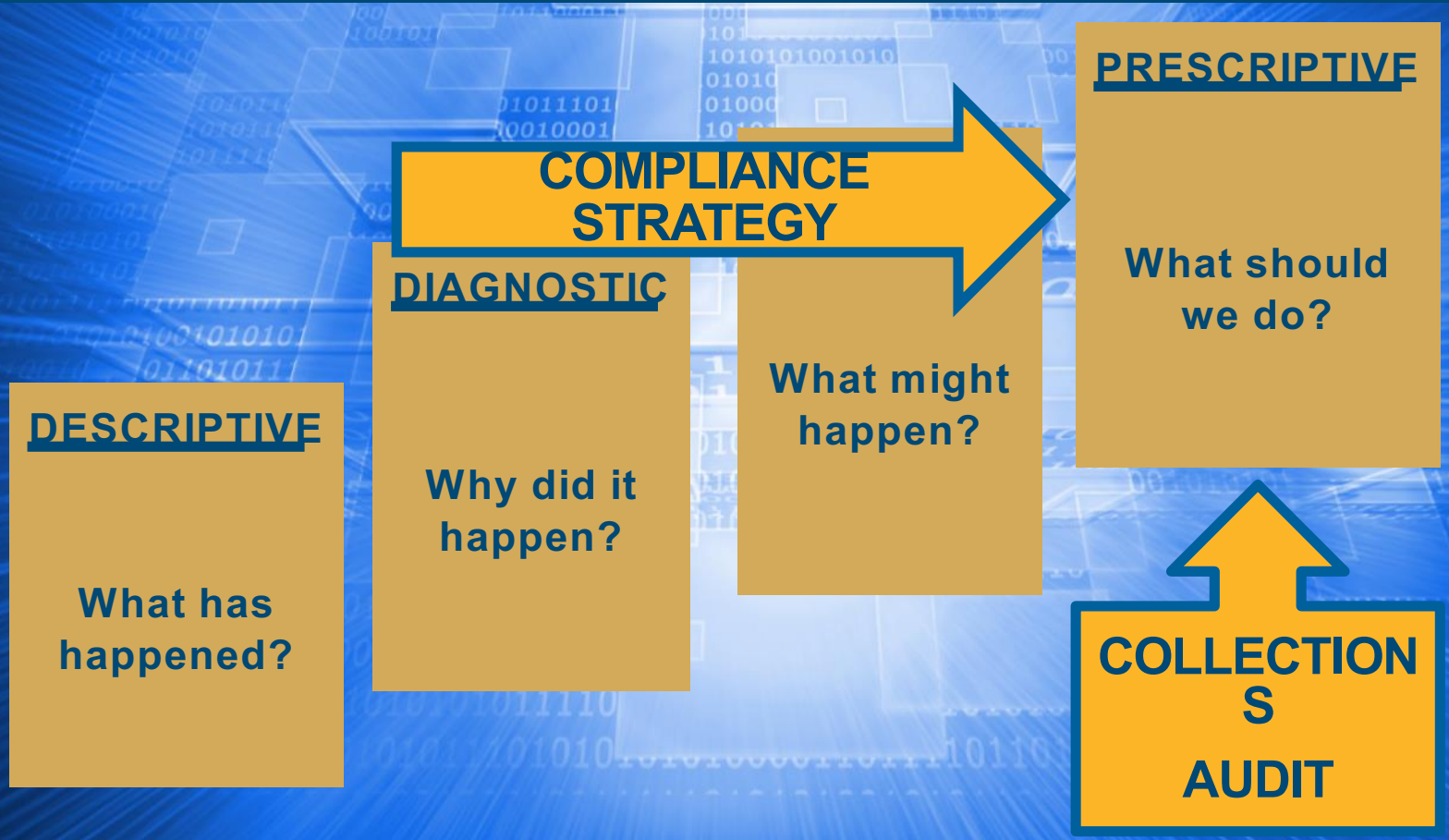

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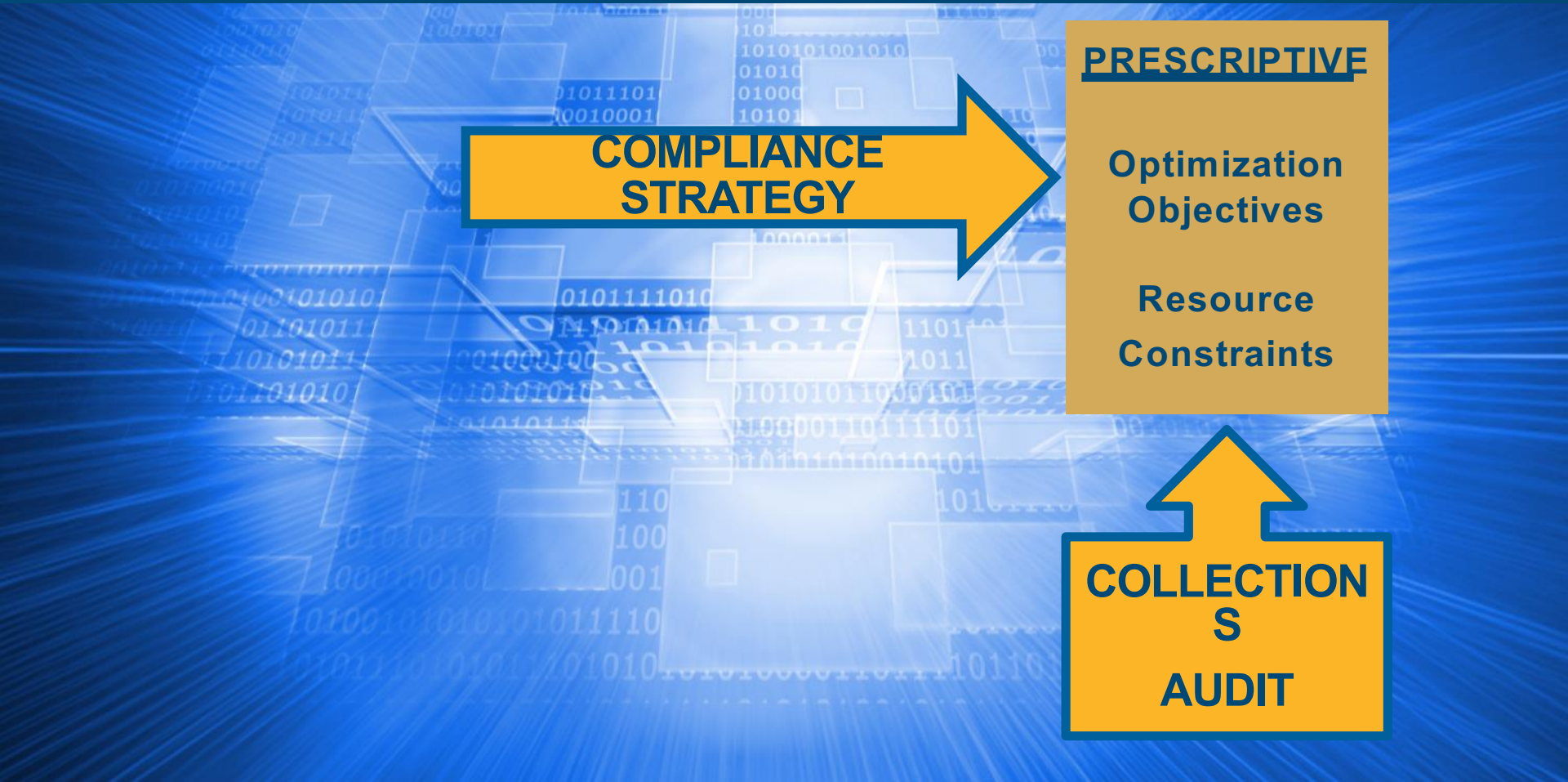

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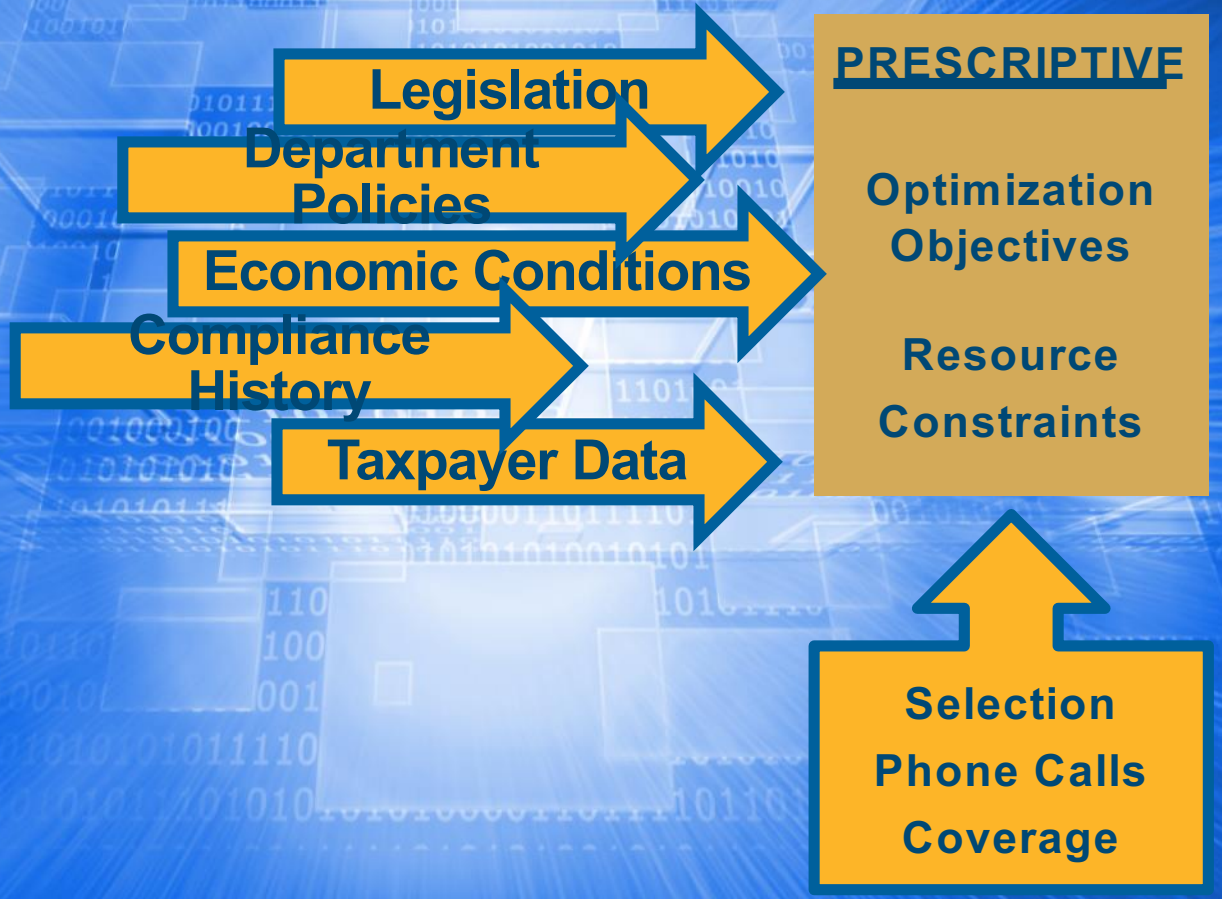



LINESHOP
NE SHOPPING SITE
HOME
PRODUCTS
SERVICES
BLOG
CONTACT
Lorem ipsum dolor sit amet, consectetur adipisicing elit
PRODUCTS
What we have for you
SERVICES
Things we do
BLOG
Follow our updates
READ MORE
READ MORE
READ MORE

ADAPTIVE CONTROL: MEASURE & IMPROVE

What is Optimization?

- **In the next 5 minutes you will learn what Optimization is.**
- **You will *not* be able to un-learn it.**
- **You will start seeing Optimization problems everywhere.**

How Can We Identify Optimization Problems?

Every problem is an optimization problem:

- We have objectives or goals.
- We have limited resources such as time, staff, supplies.
- We have some options and we need to decide which one(s) to pursue.
- We need to understand the likely consequences of our decisions

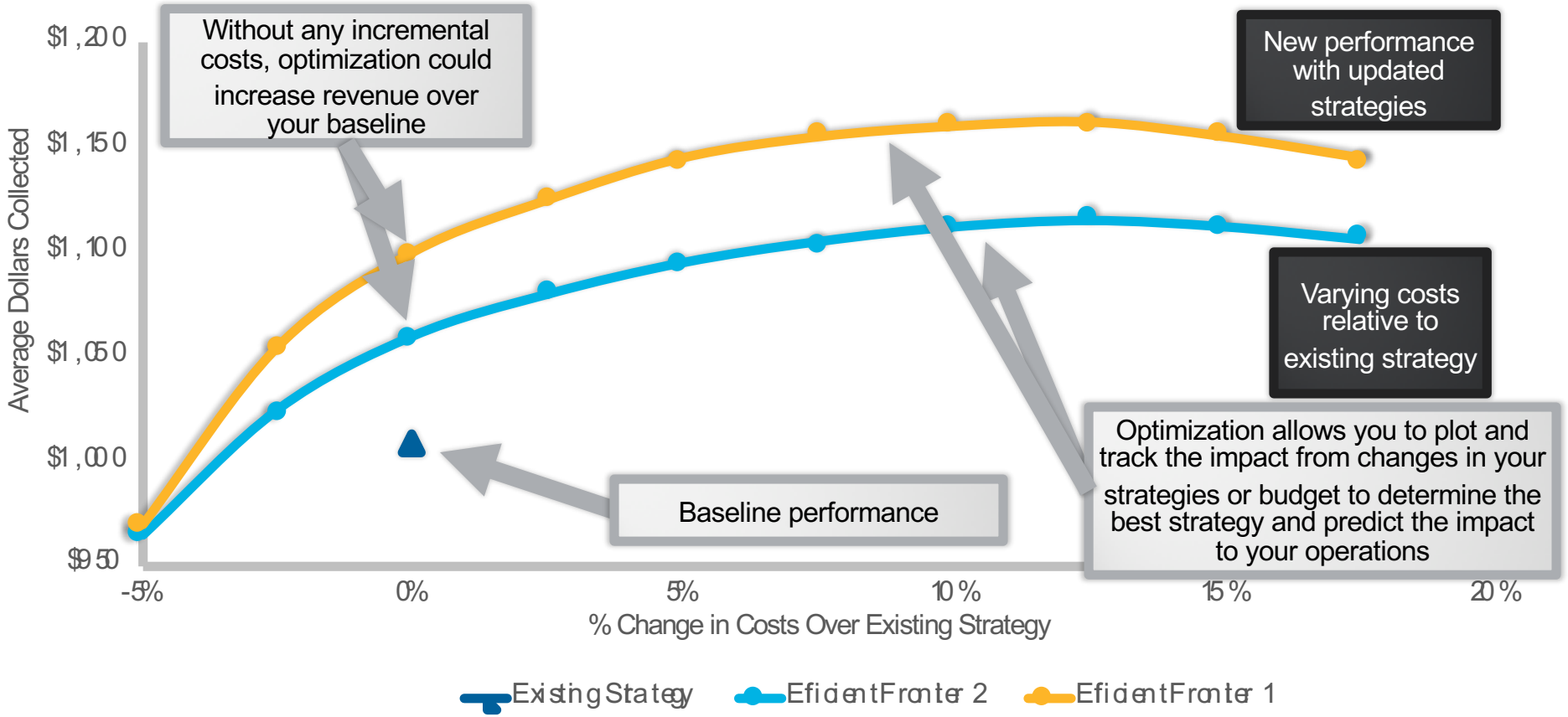
Whenever we try to decide what to do with our time or resources,

we are optimizing.

What is Optimization?

- Optimization is a mathematical process of finding the *best* set of decisions for a given business problem
- By *best* we usually mean a combination of goals:
  - Most Revenue (this year)
  - Voluntary Compliance (next year)
  - Least Intrusive
  - Lowest cost
- Optimization has a defined set of ***conflicting*** constraints and objectives, and satisfying *all* stakeholders' viewpoints

Optimization Allows you to Evaluate Against all Options



How does Optimization differ from Modeling

- Modeling priorities individual work queues
  - Models evaluate and prioritize one outcome at a time
  - “Next Best Case”
- The challenge is balancing competing workloads with a predefined staffing levels and budget
- Optimization allows you to evaluate, prioritize and assign actions based on simultaneous evaluation of multiple outcomes
  - Works even with competing goals
  - Looks across your entire business process (or department)
  - Balances resources, factoring in constraints (staff, budget, policy)
- Optimization can work with your existing systems and models (if you have them) to predict outcomes and maximize results

Case Study – Toyota Financial Services

Decision Optimization for Debt Collection

TOYOTA FINANCIAL SERVICES

Challenge

- Reduce collection delinquencies and repossessions by providing payment options that are profitable to the business and address customer preferences
- Minimize losses and maximize payments in early stage collections (< 60 days past due)
- Keeping internal and external staffing requirements and operational costs constant

Solution

- Risk Models
- Optimization Analytics
- Enhanced Decision Analytics

"Working with delinquent customers to keep them in their cars while working out payment options has helped Toyota avoid millions of dollars in losses."

Jim Bander
National Manager for Decision Science
Toyota Financial Services

Results

- Improved collections strategies helped over 1,600 customers stay in their cars—cars that would otherwise have been repossessed.
- Helped over 10,000 customers avoid reaching a stage of delinquency that would have required a derogatory marker on their credit report
- **Achieved Millions in reduced losses** over champion strategy with **no increased operational costs**

Case Study – Southwest Airlines

Decision Optimization

Southwest

Challenge

- Improve customer experience
- Enhance employee engagement
- Streamline operations
- Maximize revenue as the company grows and expands into new markets
- Better usage of staff to manage 100 million passengers a year and 3,900 flights per day

Solution

- Risk Models
- Optimization Analytics
- Enhanced Decision Analytics

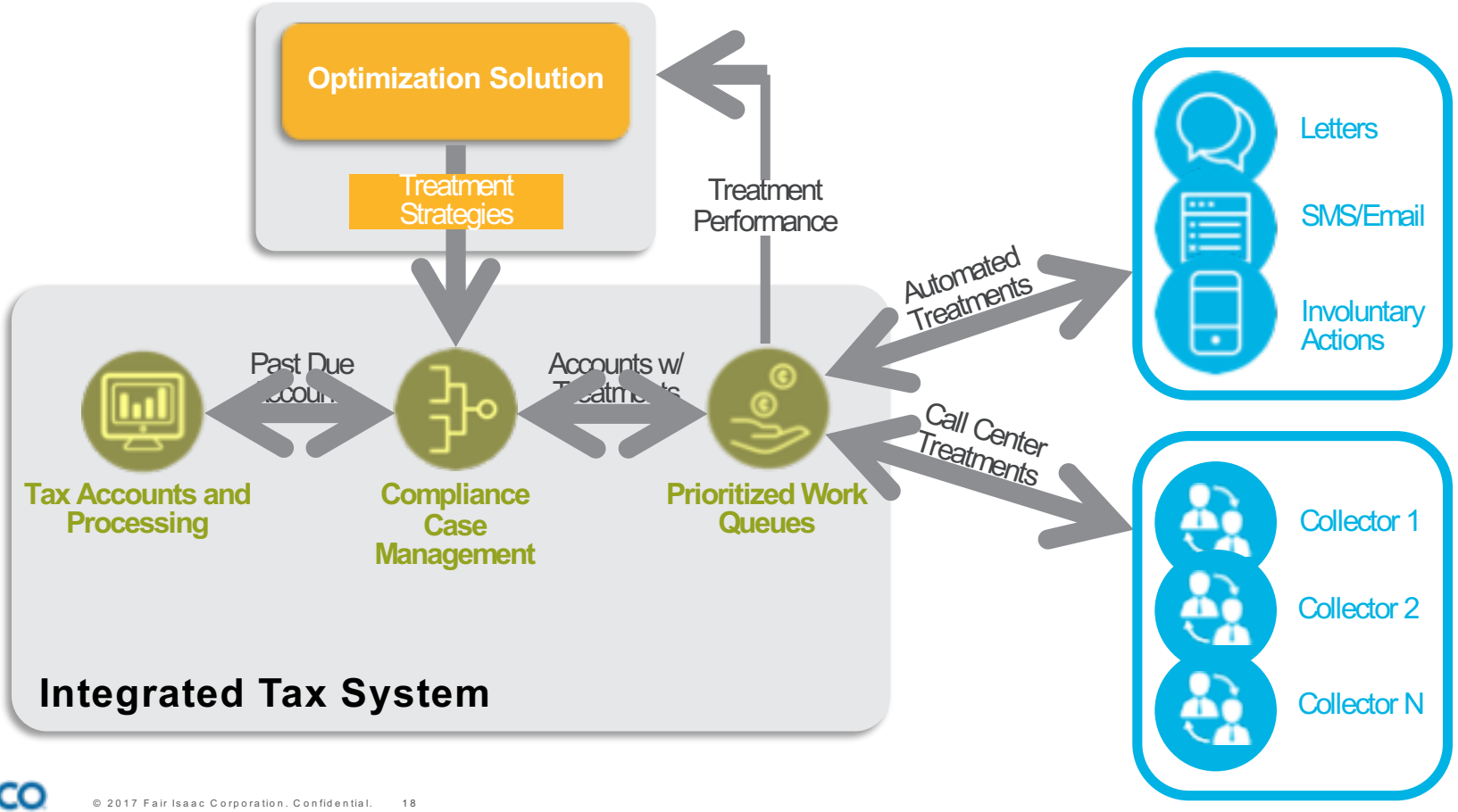
"Optimization underlies some of the biggest, most expensive problems that we solve at the airline."

Rusty Burlingame
Principal
Operations Research Advisor
Southwest Airlines

Results

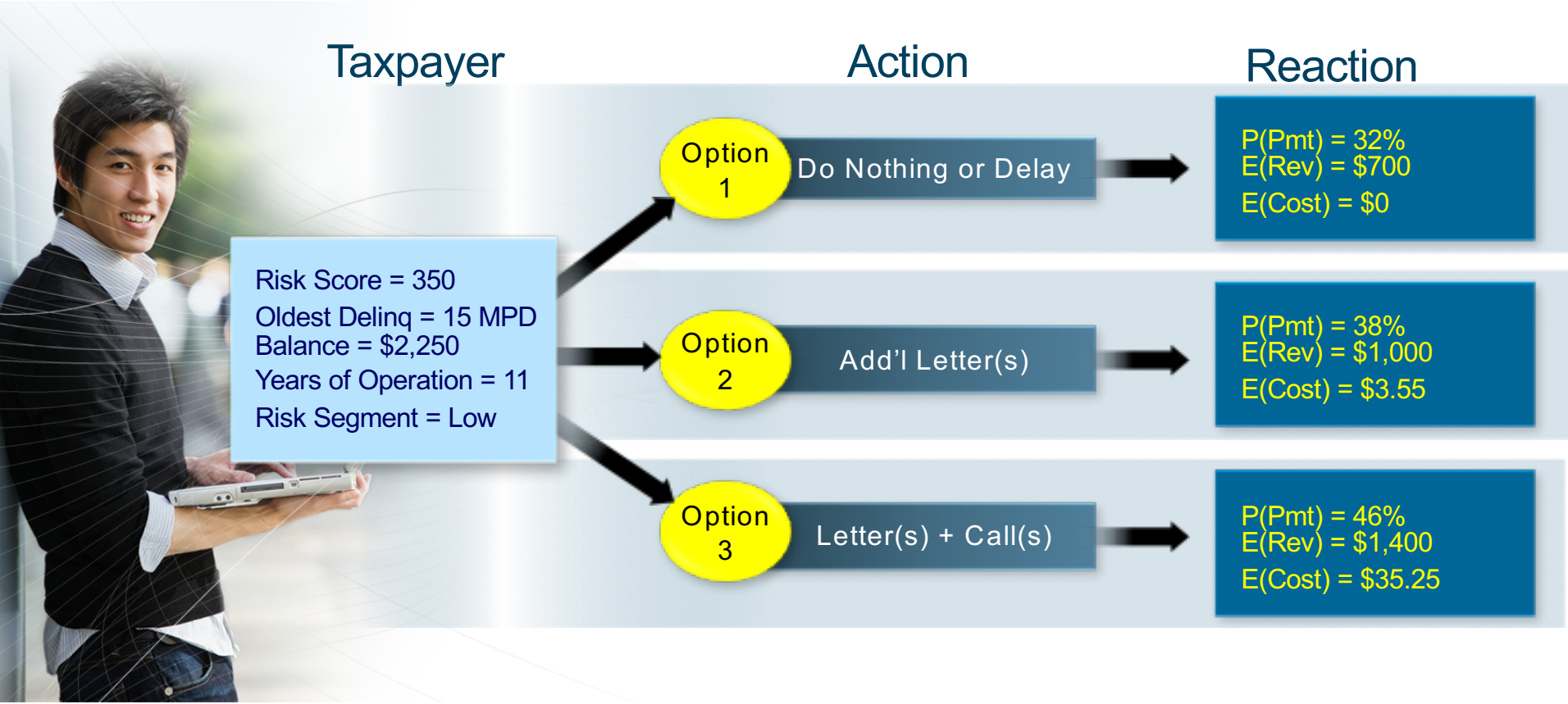
- Decreased salary expenses by $10 MM/year by reducing unearned/overtime pay for pilots and flight attendants
- Reduced average connection time by five minutes by reducing the walking distance required by passengers and crew
- Increased the number of consistent phone lines for pilots by 15%, which increased crew satisfaction
- Increased overall on-time flight performance by 2%
- Reduced fuel costs by ~$40 MM/yr by optimizing fuel tinkering and contracting

An optimization solution can easily integrate with existing systems



Optimization Opportunities: Collections

Model Taxpayer Reactions to Your Actions



All Possible Actions with Constraints – Optimize

Decision Model

Taxpayer	Action	Reaction
	Do Nothing or Delayed Action	E(Pmt) = $700
	Additional “Reminder” Letter(s)	E(Pmt) = $1,000
	Letter + “Urgent” Call	E(Pmt) = $1,400

Optimized Solver

Portfolio	Action	Reaction
	Delayed Activity for Low Risk	$5M Incremental Collections
	Add Letters for Low Risk	$5.2M Incremental Collections
	High Risk Focus for Calls	$5.6M Incremental Collections

Optimization of Treatments

Score Taxpayers → Select Contact Method/Approach → Perform Contact(s) → Measure Outcomes

Analytics

- Risk scores
- Historical performance
- New collection data

Considerations

- Staff capacity and availability
- Historical data of prior results with similar taxpayers
- Loss from potential non-compliance
- Political/Policy considerations
- Statutory requirements

Action

Decide which accounts

- Allow to self-cure
- Send different interventions:
  - Contact via mail
  - Contact via predictive dialler
  - Send for levy/ garnishment
  - Assign to a collector

Bottom Line

Learning Loop

Collections Opportunities for Optimization

- Re-deploying staff between workloads
  - Inbound calls, Outbound calls, Assigned Cases
- Updating Notice frequency, timings and channels
- Changing options on installment agreements based on the likelihood of repayment
- Changing the strategy for case assignment
  - Timing, criteria for assigned for field or office staff
- Enhancing Collection Agency Assignment rules

Optimization Opportunities: Audit

Field Audit Opportunities for Optimization

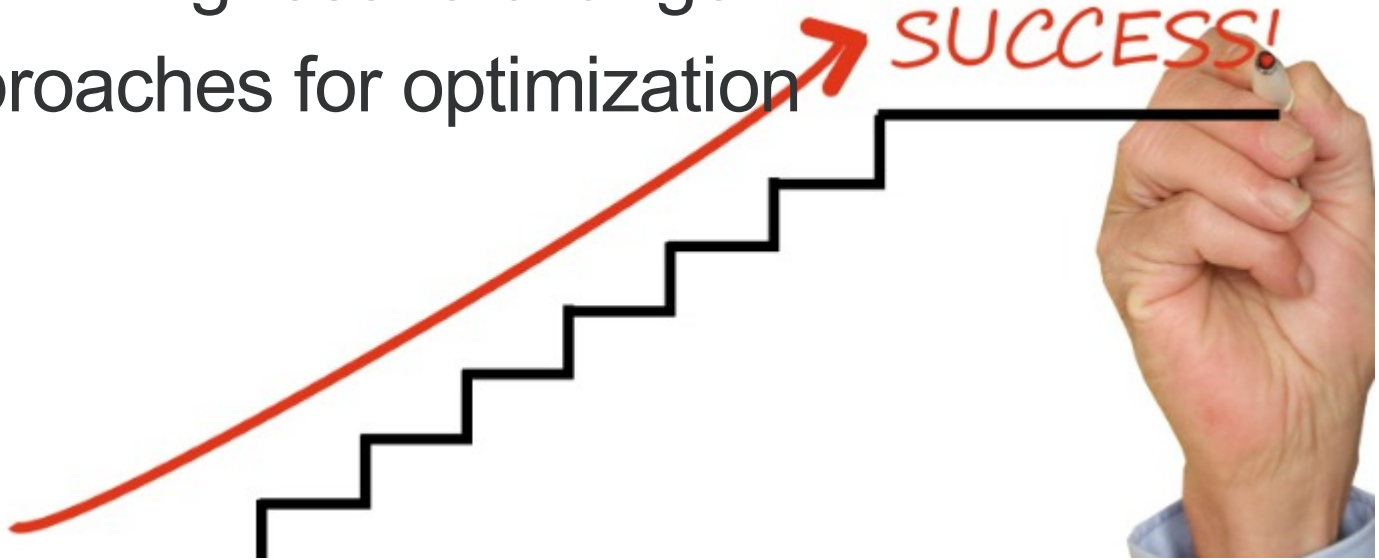
- Distribution of staff
  - Tax types
  - Program issues
  - Geographies
- Balancing short-term and long-term goals
  - Maximizing revenue for the current tax year
  - Providing a breadth of exposure to maximize long term voluntary compliance
- Balancing selection between pre-defined expert models (e.g., largest tax filers) and predictive model selected cases
- Balancing in house audit cases with contract audit cases

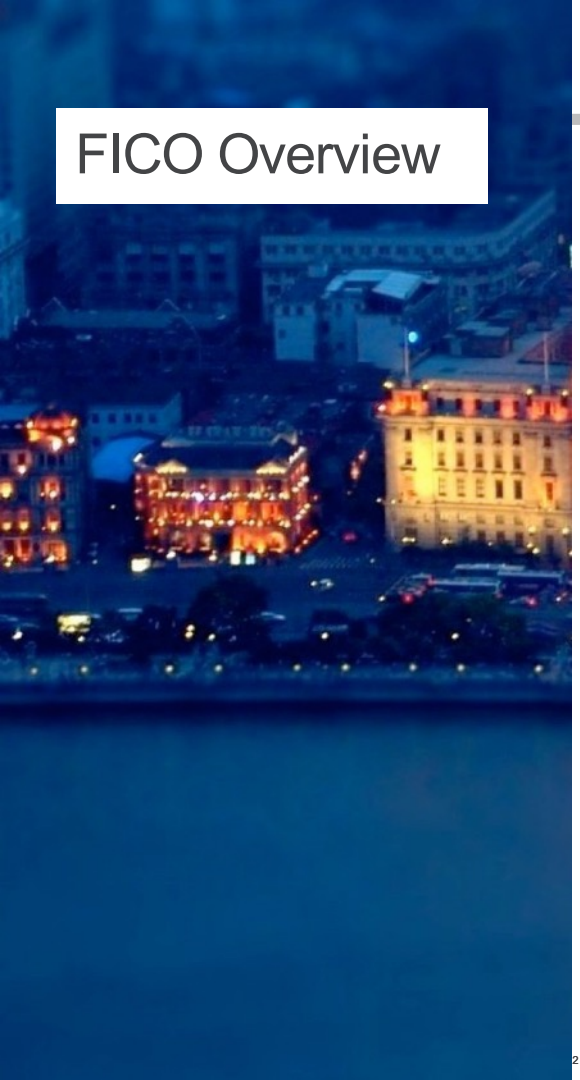
Desk Audit Opportunities for Optimization

- Distribution of staff
  - Desk audit programs
  - Tax types
  - Actively managed programs vs. Self-Audit programs
- Balancing short-term and long-term goals
  - Maximizing revenue for the current tax year
  - Providing a breadth of exposure to maximize long term voluntary compliance
- Changing the frequency and timing of notices
- Changing the mix of contact methods (e.g., letters, phone)

Next Steps

- Inventory your data
- Determine your different priorities
- Assess your willingness to change
- Discuss approaches for optimization





FICO Overview

Profile	The leader in analytic solutions for risk management, fraud, and customer engagement Founded: 1956 NYSE: FICO Revenues: $932 million (fiscal 2017)
Products and Services	Pioneers at transforming Data into insights to help organizations achieve their mission FICO® Score and other models for making decisions 130+ patents in analytic and decision management technology, with an additional 90+ patents pending Analytic applications for collections, fraud, customer service and cybersecurity
Clients and Markets	10,000+ clients in 90+ countries Industry focus: Banking, government, insurance, retail, health care
Recent Rankings	#1 in services operations analytics (IDC)* #4 in worldwide analytics software (IDC)* #8 in Business Intelligence, CPM and Analytic Applications (Gartner)** #26 in the FinTech 100 (*American Banker*)
Offices	20+ offices worldwide, HQ in San Jose, California 2,900 employees Regional Hubs: New York, San Diego, Fairfax, London, Birmingham (UK), Johannesburg, Milan, Moscow, Munich, Madrid, Istanbul, Sao Paulo, Bangalore, Beijing, Singapore

*IDC, *Worldwide Business Analytics Software 2013-2017 Forecast and Vendor Shares*, June 2013.
**Gartner, *Market Share Analysis: Business intelligence, Analytics and Performance Management, 2012,Dan* Sommer & Bhavish Sood, May 7, 2013.

About the Presenter

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- 25 Years working with Federal, State and Local government agencies
- Experience with more than 20 different tax agencies worldwide
- Skilled in enhancing collections, audit and fraud systems and business processes
- Experience with predictive modeling and behavioral science techniques to enhance collections

Thank you

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