



*Michigan Department of*  
**TREASURY**

# Establishing a Data Analytics Governance Team

JUNE 2019

# Presenting

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# About Treasury



Michigan Treasury will become the best operated treasury department in the United States and the State's thought leader on all tax and revenue issues



Culture of  
Taxpayer  
Service



Continuous  
Improvement



Engaged  
Employees

100



# Enterprise Information Management (EIM)



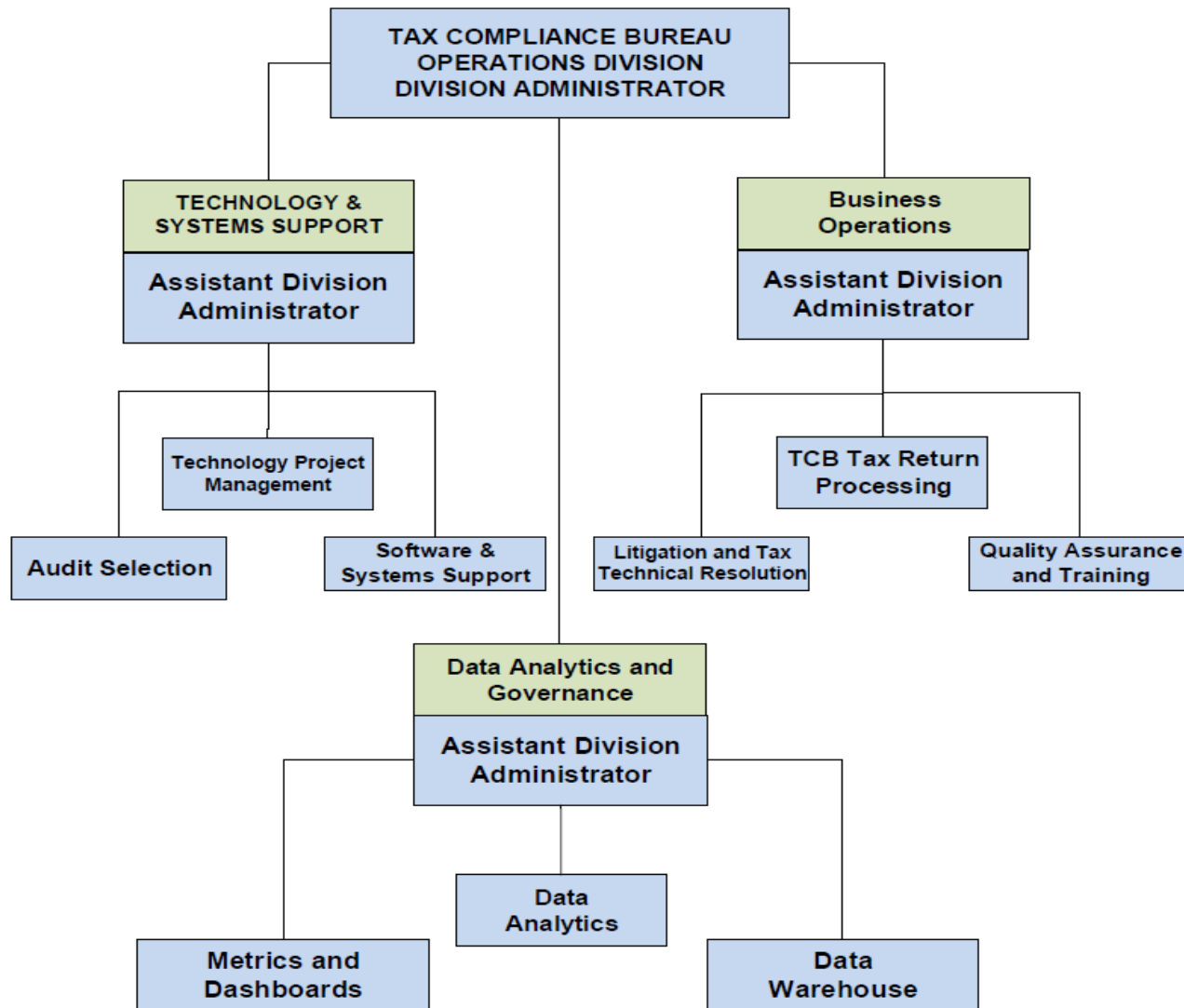


# Dashboards and Metrics



# Moving EIM To Dept Level

- ▶ Tax Compliance Bureau (TCB) is the primary user of the Data Warehouse (DW)
- ▶ DW houses all of the Tax Processing data that is the primary data source for Audit selection and Discovery projects
- ▶ TCB housed the Chief Data Steward (CDS) for all of Treasury. Because data impacts all Bureaus (Revenue Forecasting, Collections, etc.) it was recommended to move the CDS role to the Department level.





# The Operations Division

## ► *Business Operations Team*

- *Litigation and Tax Technical Issues Resolution*
- *TCB Audit/Discovery Processing*
- *Quality Assurance and Training*



# The Operations Division

## ► *Technology and Systems Support Team*

➤ *Audit Selection*

➤ *Technology Project Management*

➤ *Software and Systems Support*





# The Operations Division

- ▶ **Data Governance and Analytics Team (DAG)**

- *Data Analytics*

- *Reporting, Metrics and Dashboards*

- *Data Warehouse*





# Need For Internal Data Team



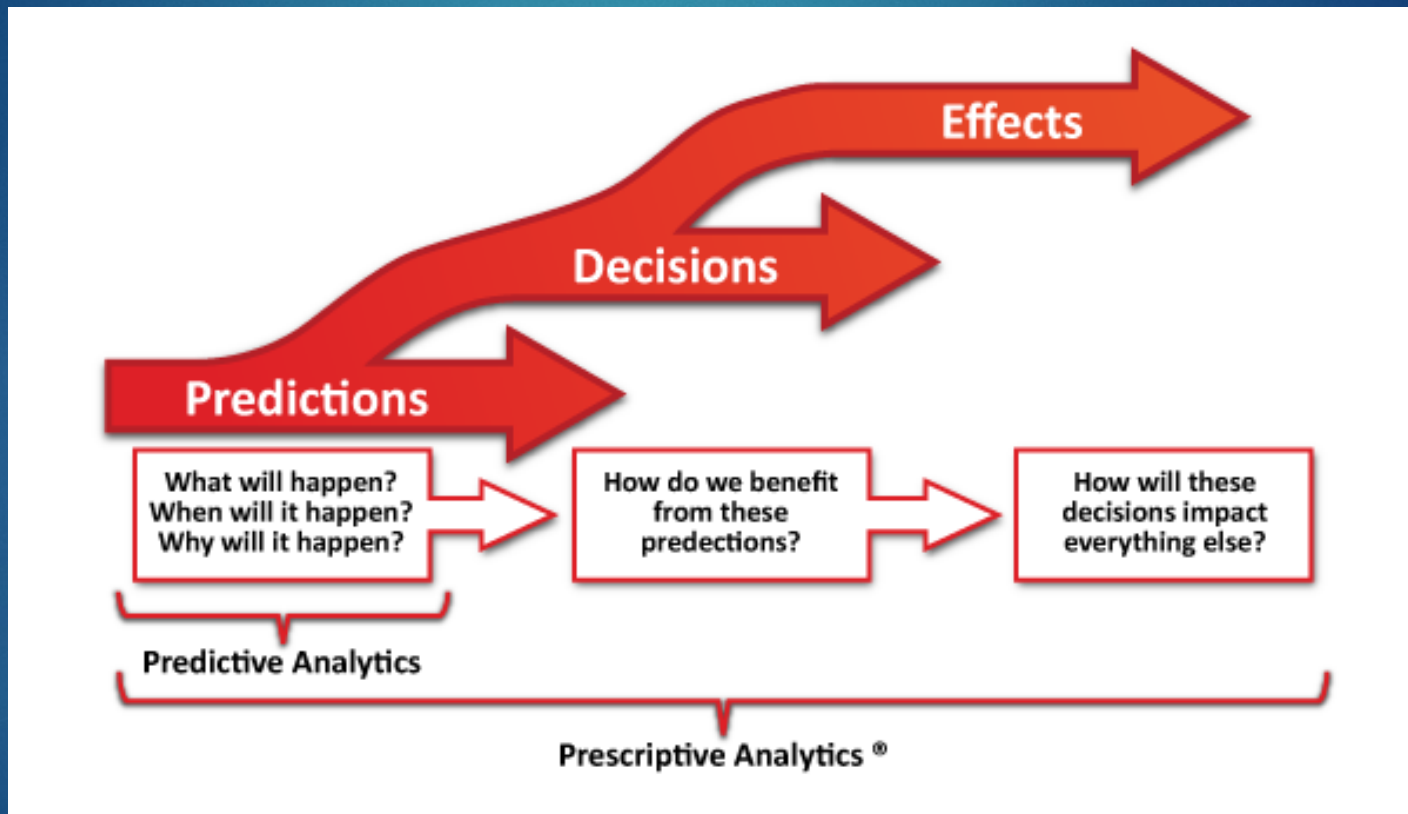
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- Predictive analytics is the priority for TCB



# TCB Data Analysis Needs

- Predictive analytics improves selection processes



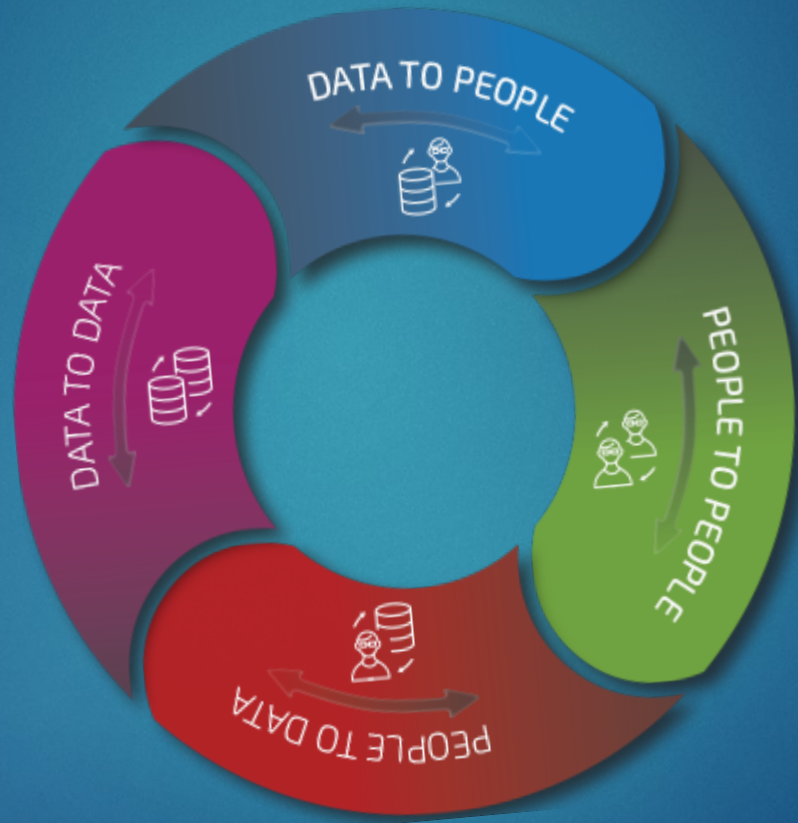


Audit & Discovery use the same data....

....establish a data team to leverage data tools and expertise to improve Audit selection and Discovery projects!



# Data Analytics Team Goal





# Staffing the Data Team

- ▶ Change cultural hiring practices
- ▶ Varying degrees enrich the team
- ▶ Varying previous work experience
- ▶ Analytics are used in every industry
- ▶ Hire staff knowing they may leave
- ▶ Flexibility
  - ▶ Alternative work schedules
  - ▶ Remote work capabilities
  - ▶ Training opportunities



# MODERN DATA SCIENTIST

Data Scientist, the sexiest job of 21st century requires a mixture of multidisciplinary skills ranging from an intersection of mathematics, statistics, computer science, communication and business. Finding a data scientist is hard. Finding people who understand who a data scientist is, is equally hard. So here is a little cheat sheet on who the modern data scientist really is.

## MATH & STATISTICS

- ☆ Machine learning
- ☆ Statistical modeling
- ☆ Experiment design
- ☆ Bayesian inference
- ☆ Supervised learning: decision trees, random forests, logistic regression
- ☆ Unsupervised learning: clustering, dimensionality reduction
- ☆ Optimization: gradient descent and variants

## PROGRAMMING & DATABASE

- ☆ Computer science fundamentals
- ☆ Scripting language e.g. Python
- ☆ Statistical computing package e.g. R
- ☆ Databases SQL and NoSQL
- ☆ Relational algebra
- ☆ Parallel databases and parallel query processing
- ☆ MapReduce concepts
- ☆ Hadoop and Hive/Pig
- ☆ Custom reducers
- ☆ Experience with xaaS like AWS

## DOMAIN KNOWLEDGE & SOFT SKILLS

- ☆ Passionate about the business
- ☆ Curious about data
- ☆ Influence without authority
- ☆ Hacker mindset
- ☆ Problem solver
- ☆ Strategic, proactive, creative, innovative and collaborative

## COMMUNICATION & VISUALIZATION

- ☆ Able to engage with senior management
- ☆ Story telling skills
- ☆ Translate data-driven insights into decisions and actions
- ☆ Visual art design
- ☆ R packages like ggplot or lattice
- ☆ Knowledge of any of visualization tools e.g. Flare, D3.js, Tableau





# Data Team Skill Sets Needed

## Top 5 Skills a Data Scientist Must Have!



Big Data Technologies



Programming



Analytics

?

Statistics/Mathematics



Business Intelligence





# Urgent Need For Data Analytics

- ▶ Need flexibility, look at new ways for the selection process
- ▶ Assist staff to navigate process changes, not people
- ▶ Need to roll with the inevitable changes in technology



# Questions?

- ▶ **How are you incorporating data analytics in your area?**
- ▶ **What is Enterprise Information Management?**
- ▶ **Where to get started?**
- ▶ **What is your data analytics game plan?**



# Thank You!

We appreciate spending time with  
you today!

[www.michigan.gov/treasury](http://www.michigan.gov/treasury)

A large, stylized 'Thank You!' in white cursive script on a green background. The text is written in a flowing, handwritten style with a large exclamation mark. The green background is a solid, vibrant color.