ROLTA ONE End-to-End Solutions

TRANSPORTATION DATA SYMPOSIUM

Integrating Data Sources and Analytics for MAP-21 Initiatives

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Florida Transportation Data Symposium 2015

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Rolta

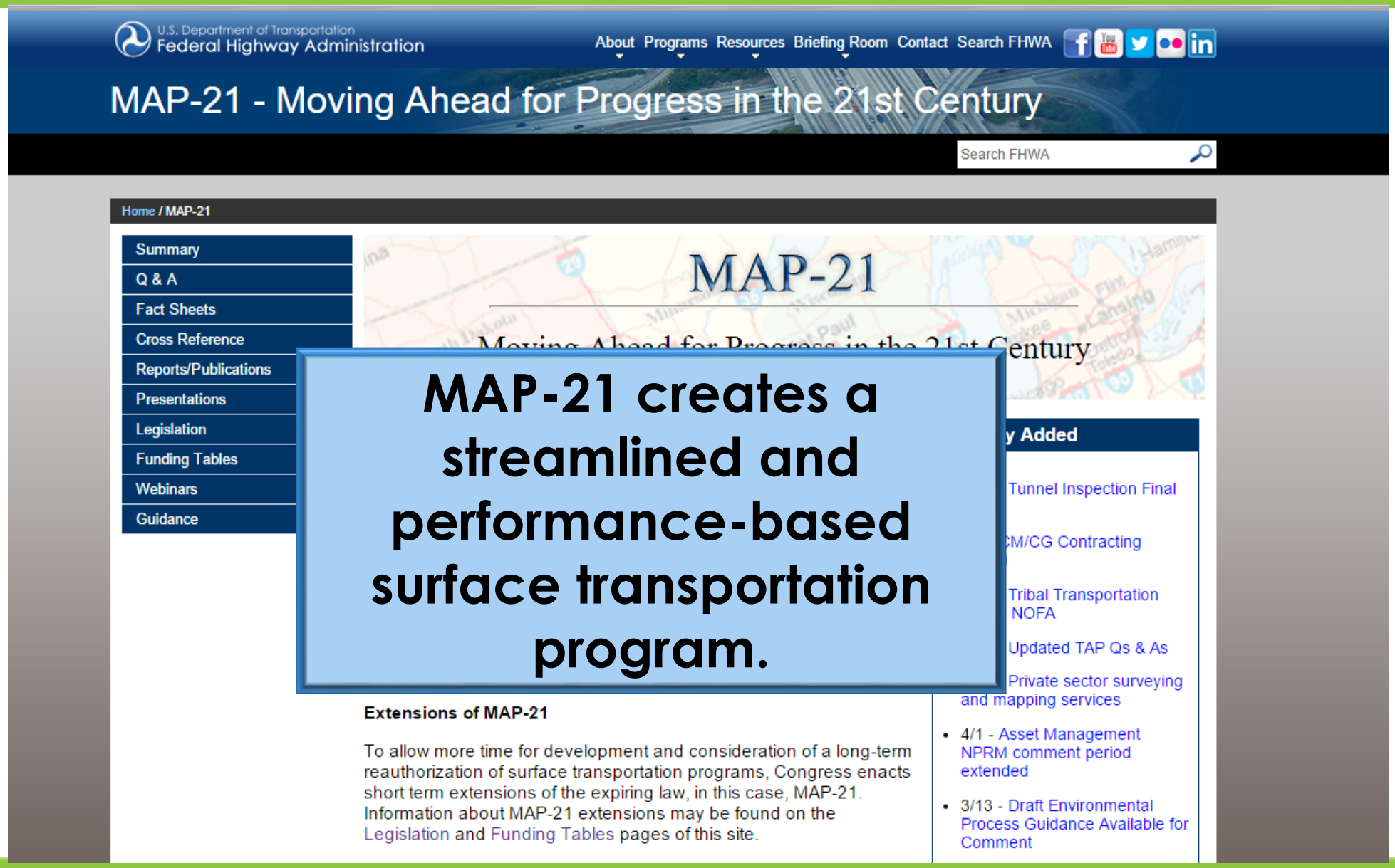
- Over 20 years of Transportation and Solutions Experience
- Lead Rolta Transportation BI Practice
  - Solution Architect and Software Developer
  - Transportation Planner

Rolta Corporate Profile

- 30+ years of experience
- Global company (offices in 9 countries), 4,000 employees & growing
- Annual Revenue of $580M
- 35% annual growth rate
- Strategic Offering:
  - Industry Solutions in Business Intelligence
  - Geospatial Solutions
  - Systems Integration and Data Services
  - ERP, EAM, EPM, IS and MS
- Focused Industries: Government, Transportation, Utilities, O&G

Outline

1. MAP 21—Moving from activities to outcomes
2. Importance of Data for MAP 21
3. What questions are DOTs trying to answer?
4. Emerging Analytics Landscape
5. Typical DOT stakeholders and their needs
6. How it all fits together


U.S. Department of Transportation
Federal Highway Administration
About Programs Resources Briefing Room Contact Search FHWA
MAP-21 - Moving Ahead for Progress in the 21st Century
Search FHWA
Home / MAP-21
Summary
Q & A
Fact Sheets
Cross Reference
Reports/Publications
Presentations
Legislation
Funding Tables
Webinars
Guidance
MAP-21
Moving Ahead for Progress in the 21st Century
MAP-21 creates a streamlined and performance-based surface transportation program.
Extensions of MAP-21
To allow more time for development and consideration of a long-term reauthorization of surface transportation programs, Congress enacts short term extensions of the expiring law, in this case, MAP-21. Information about MAP-21 extensions may be found on the Legislation and Funding Tables pages of this site.
Tunnel Inspection Final
CM/CG Contracting
Tribal Transportation NOFA
Updated TAP Qs & As
Private sector surveying and mapping services
4/1 - Asset Management NPRM comment period extended
3/13 - Draft Environmental Process Guidance Available for Comment

MAP 21: The Changing Focus

Activities → Leads To → Outcomes

MAP-21 Questions

- Where is the state with respect to MAP-21 goals?
- Does the state have a full inventory of assets and their condition?
- Which areas of the network need project funding based on MAP-21 goals?
- Did the projects executed have the desired impact?
- Can all of the above be proven with data and consistent analysis?

Moving from Activities to Outcomes

- Lead Indicators vs. Lag Indicators
- Data-driven decision making
- Growth in data volumes
- Technology to store, manage and access data
- Data governance to the fore

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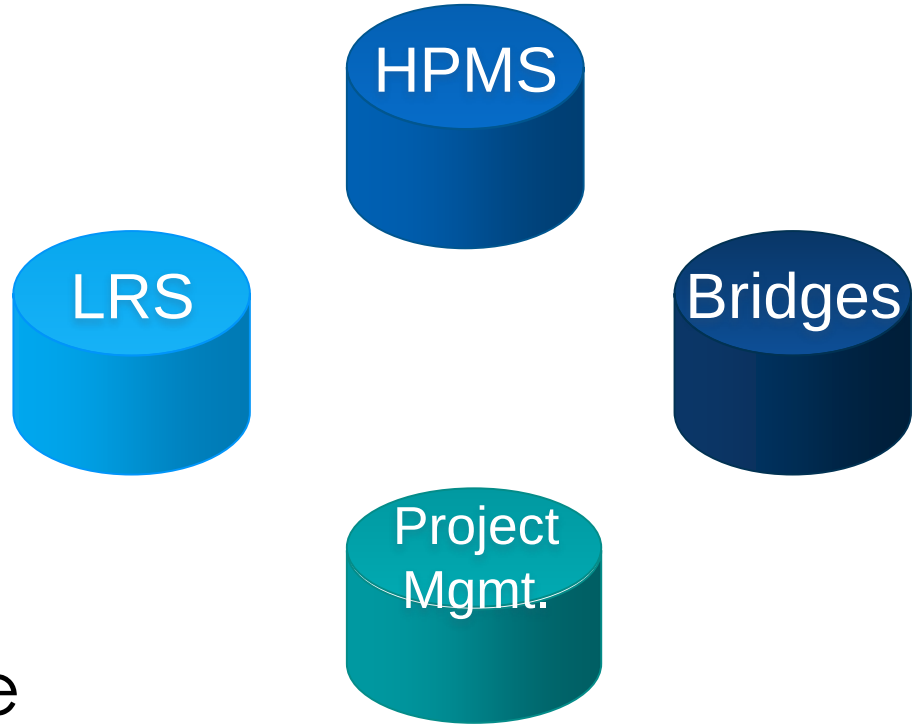
Data is Crucial Because…

- MAP-21 requires proof through data
- Data will dictate funding for DOTs
  - Is the data reliable, consistent and up to date?
  - Is the data understood and accessible to the people in the organization making decisions?

But utilizing current datasets for MAP 21 is hard

- Can data across data systems be related?

- Transport dataset differentiators:
  - Data types – Linear, Spatial
  - Multiple definitions of terms
  - Data at different grains
  - Impact of time on all of the above

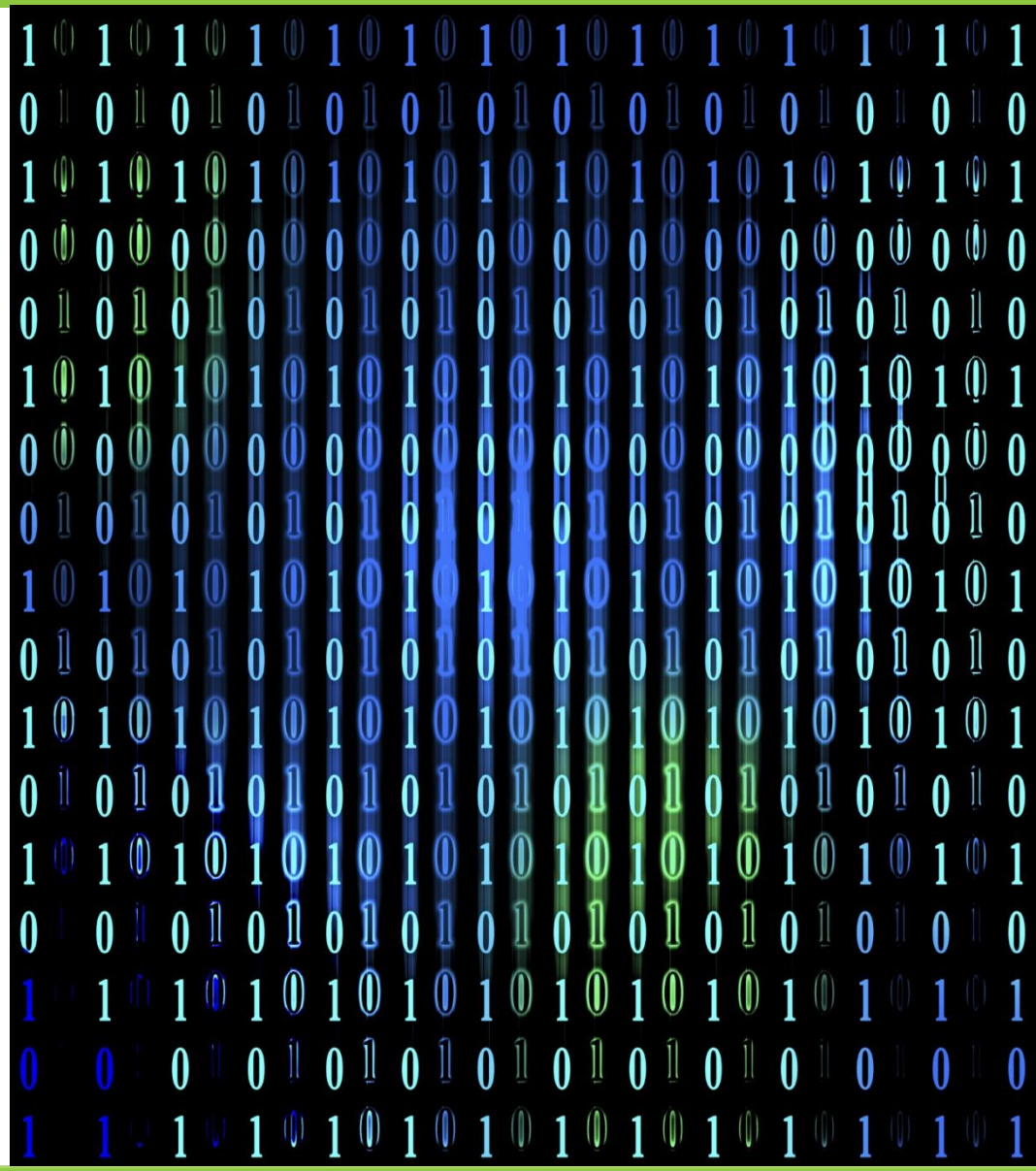


Data needs change based on question being asked…

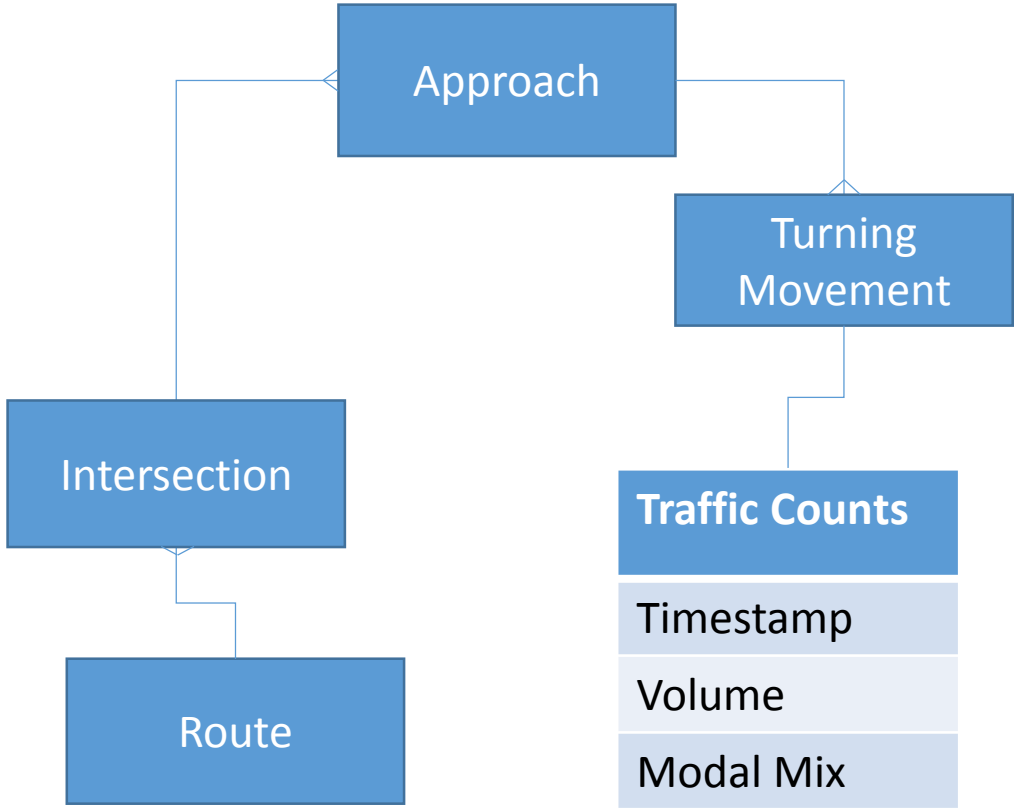
- Types of questions
  - What happened? What does the trend show? - **Descriptive**
  - What is likely to happen? - **Predictive**
  - What is the best course of action? - **Prescriptive**
  - Can we make sense of real time data? - **Real time**
- How should the answer be presented (visualization)
  - How do you want to present the answer? - **Explanatory vs. Exploratory**

Dimensional Data Warehouse models

- Built for performance and analysis optimization
  - vs. Storage and redundancy in a normalized model
- Built to track history
- Built around dimensional modeling rather than Entity relationship modeling



Analytics Models are Different
Entity Relationship Approach



Analytics Models are Different
Entity Relationship Approach

Show me the left turning traffic on Hanson Road along all intersections in traffic moving towards East direction between Hwy 6 and SH 92 during the PM peak on a Wednesday looking at last 3 months data

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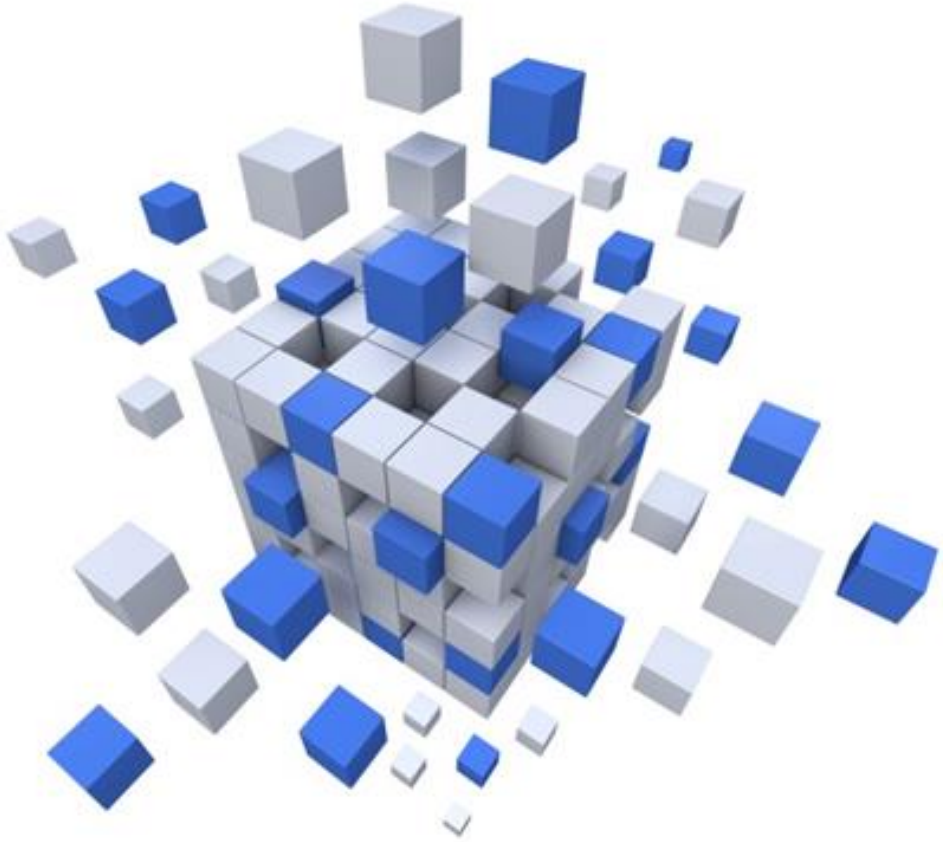
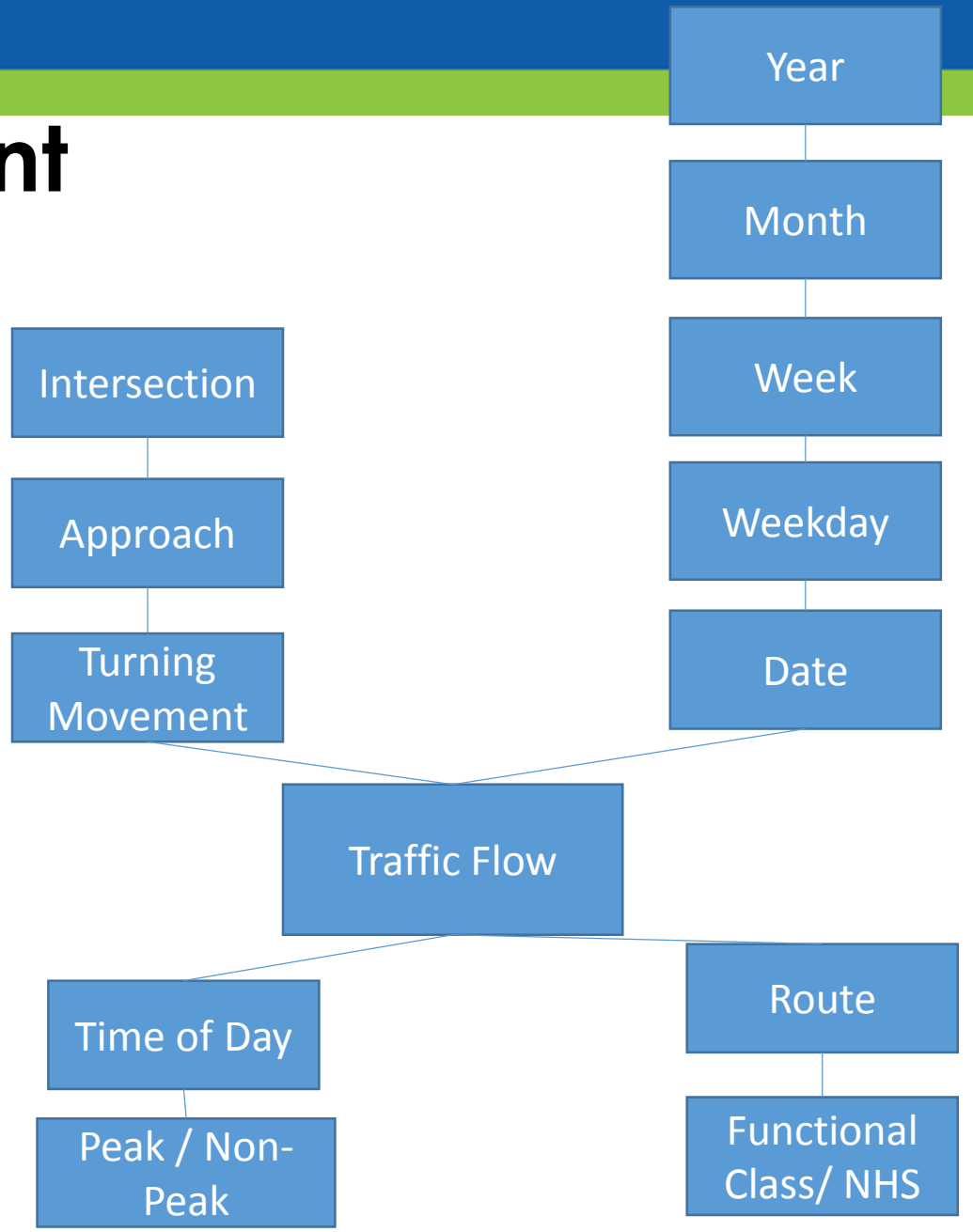
Dimensional Models 101

- Measures
- Facts
- Dimensions
- Conformed Dimensions
- Dimensional Hierarchy



Analytics Models are Different
Dimensional Modeling Approach



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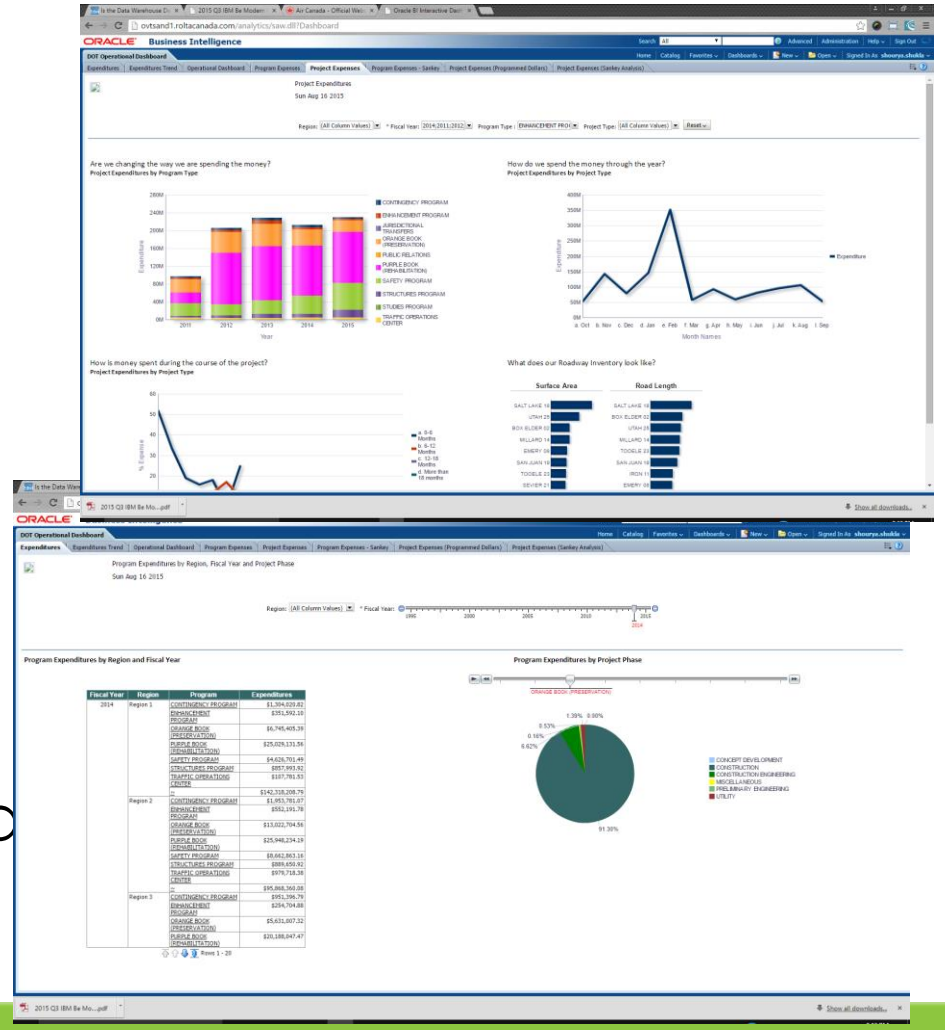
What questions do DOT executives need to answer?
Case Study: UDOT

- Are we changing the way we spend our money?
- Are we getting better on how we deliver on our outcomes?
- Is there a consensus in the organization on how we should prioritize our spending?
- Did we spend all the dollars we received/ allocated/ obligated?
- If we had one more dollar to spend on our assets, where should we spend it?
- What is the typical cash flow for a project of a certain type and certain value?



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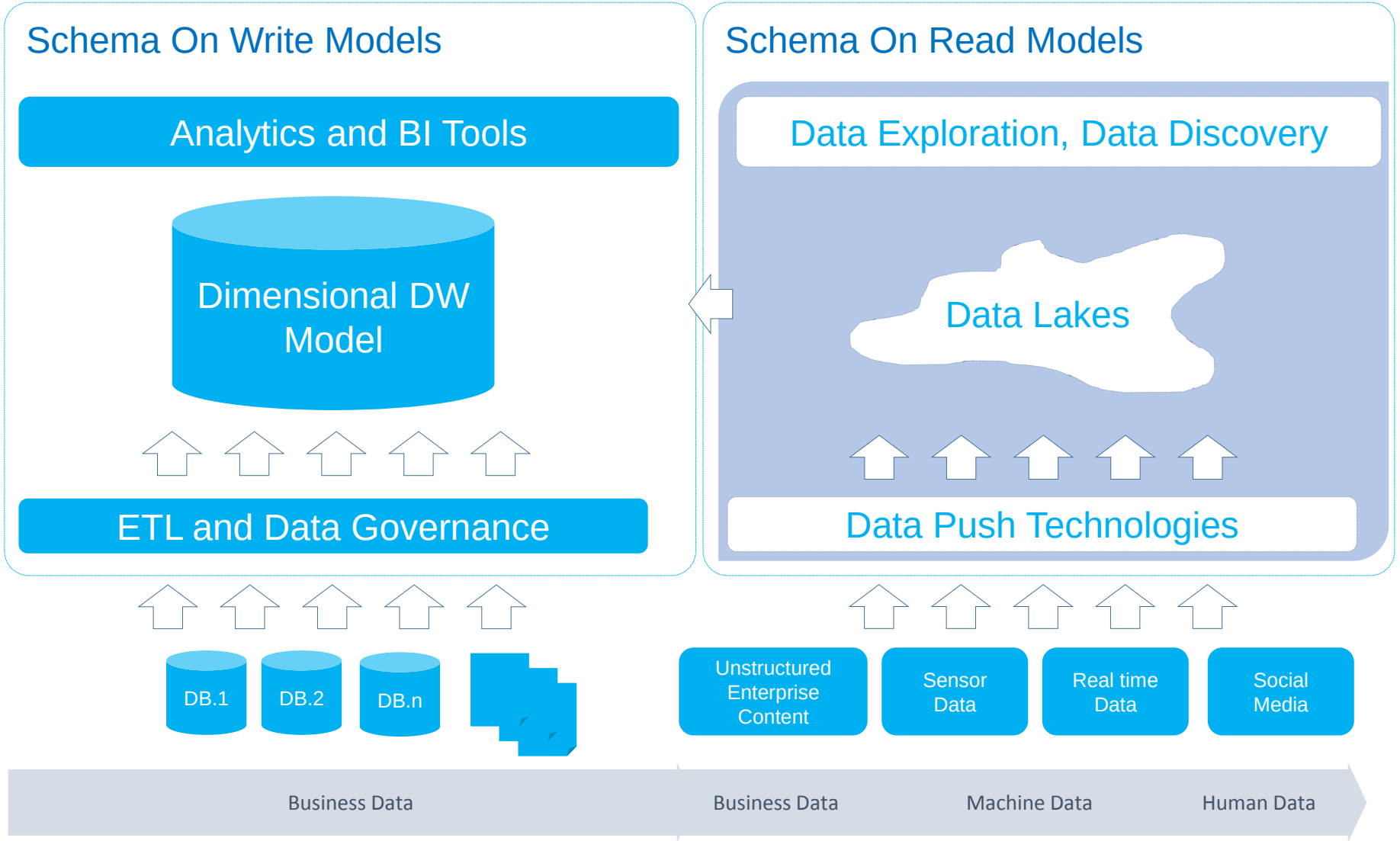
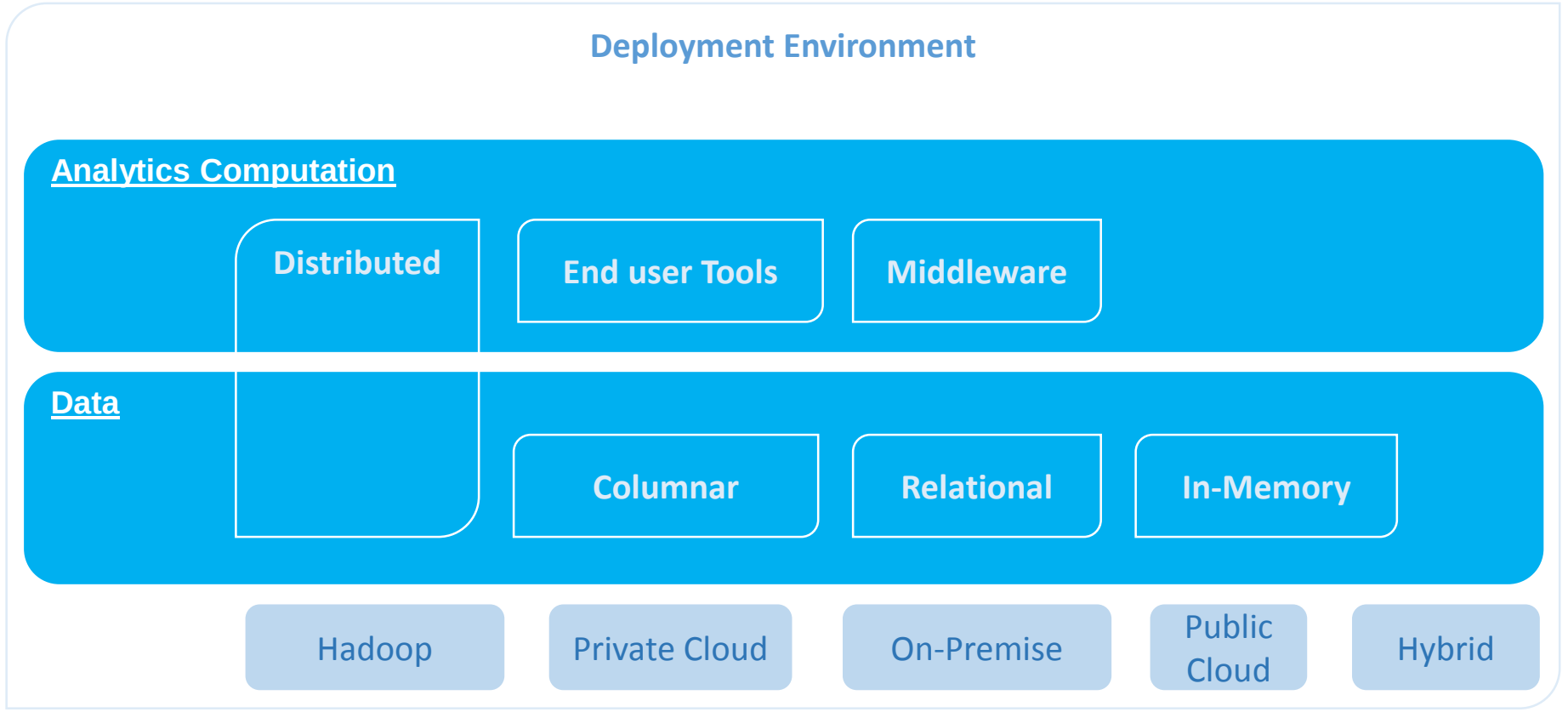
Changing analytics landscape



Various approaches and models to mix and match



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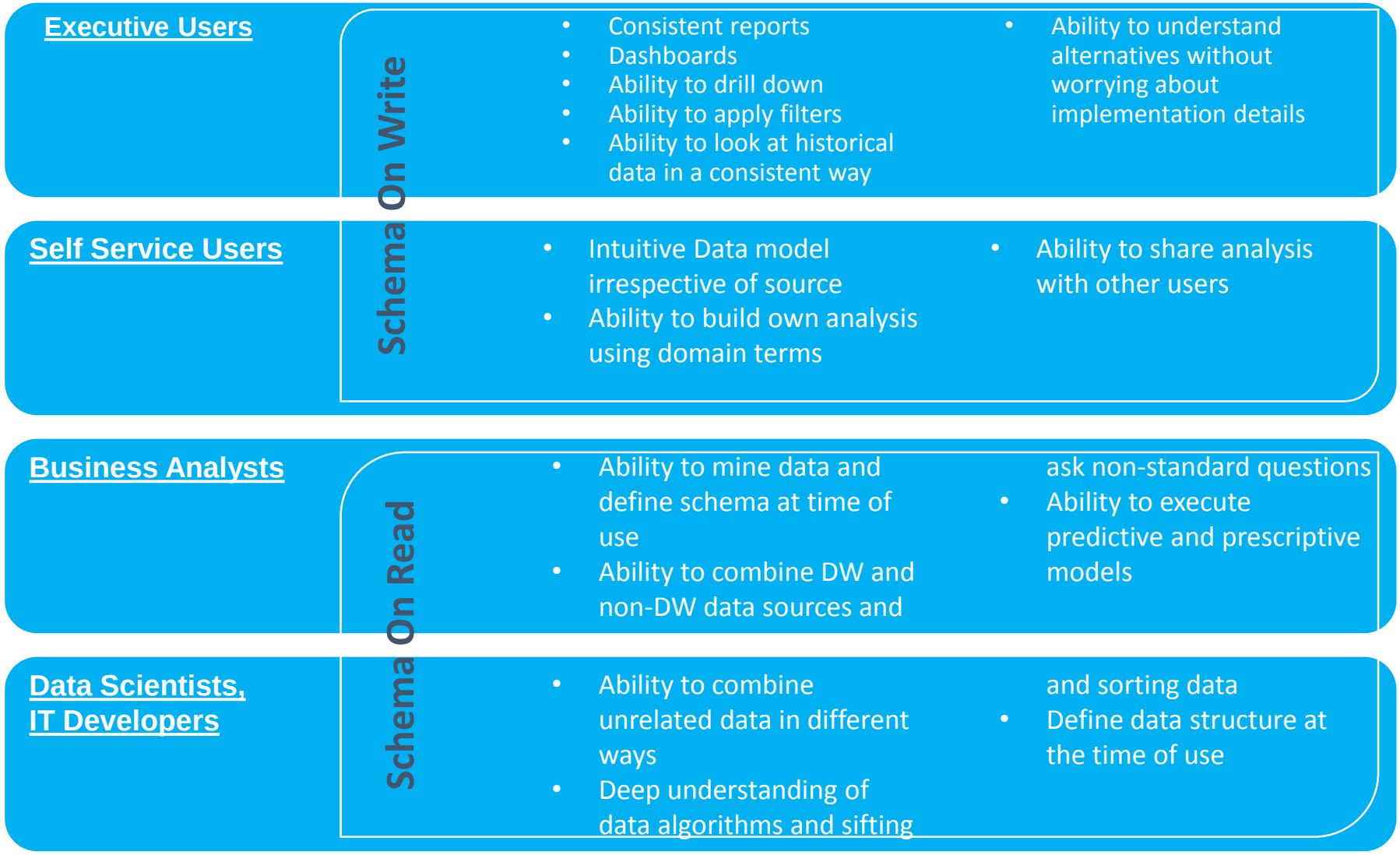
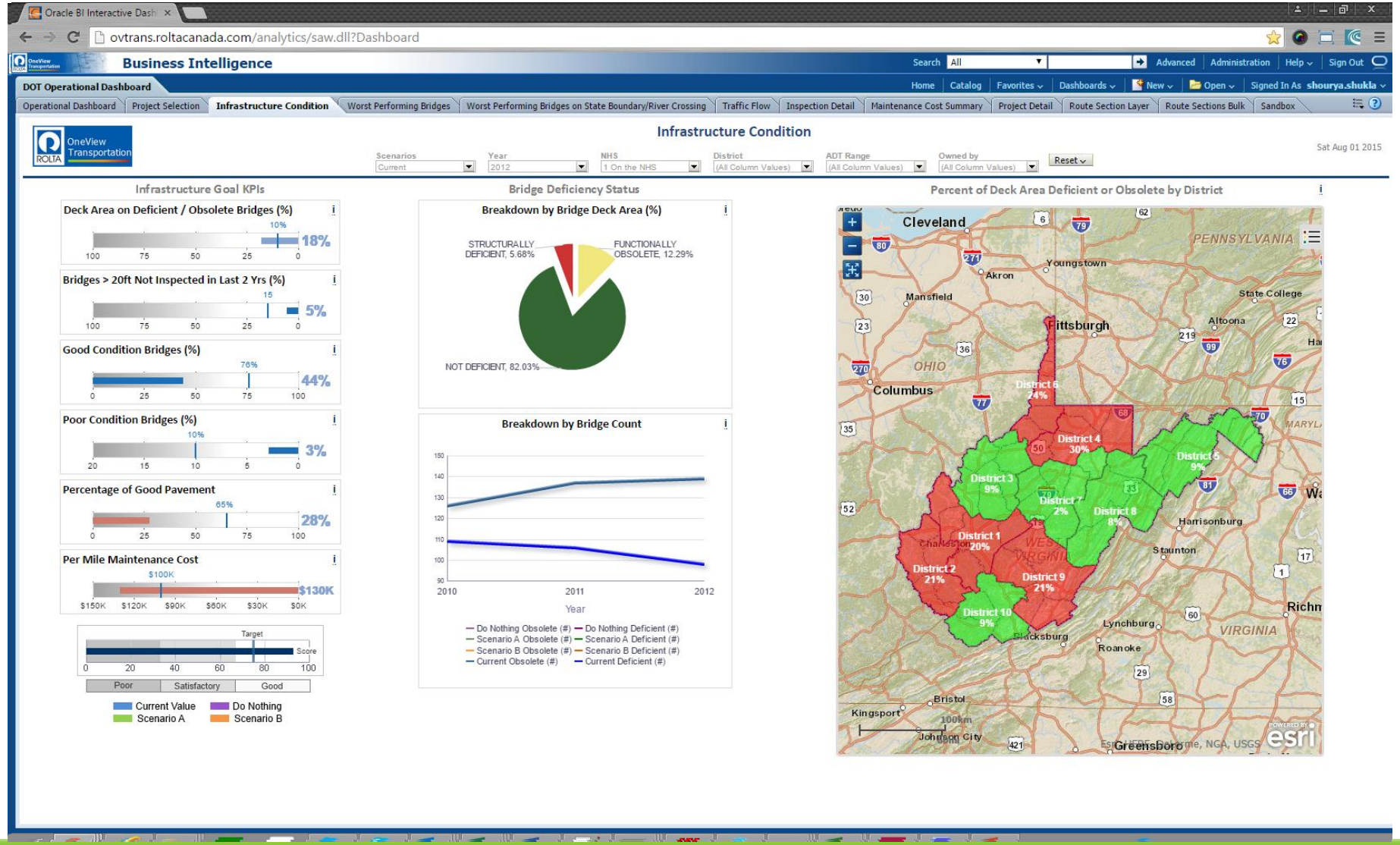
Different user segments have different needs



Executive Dashboards

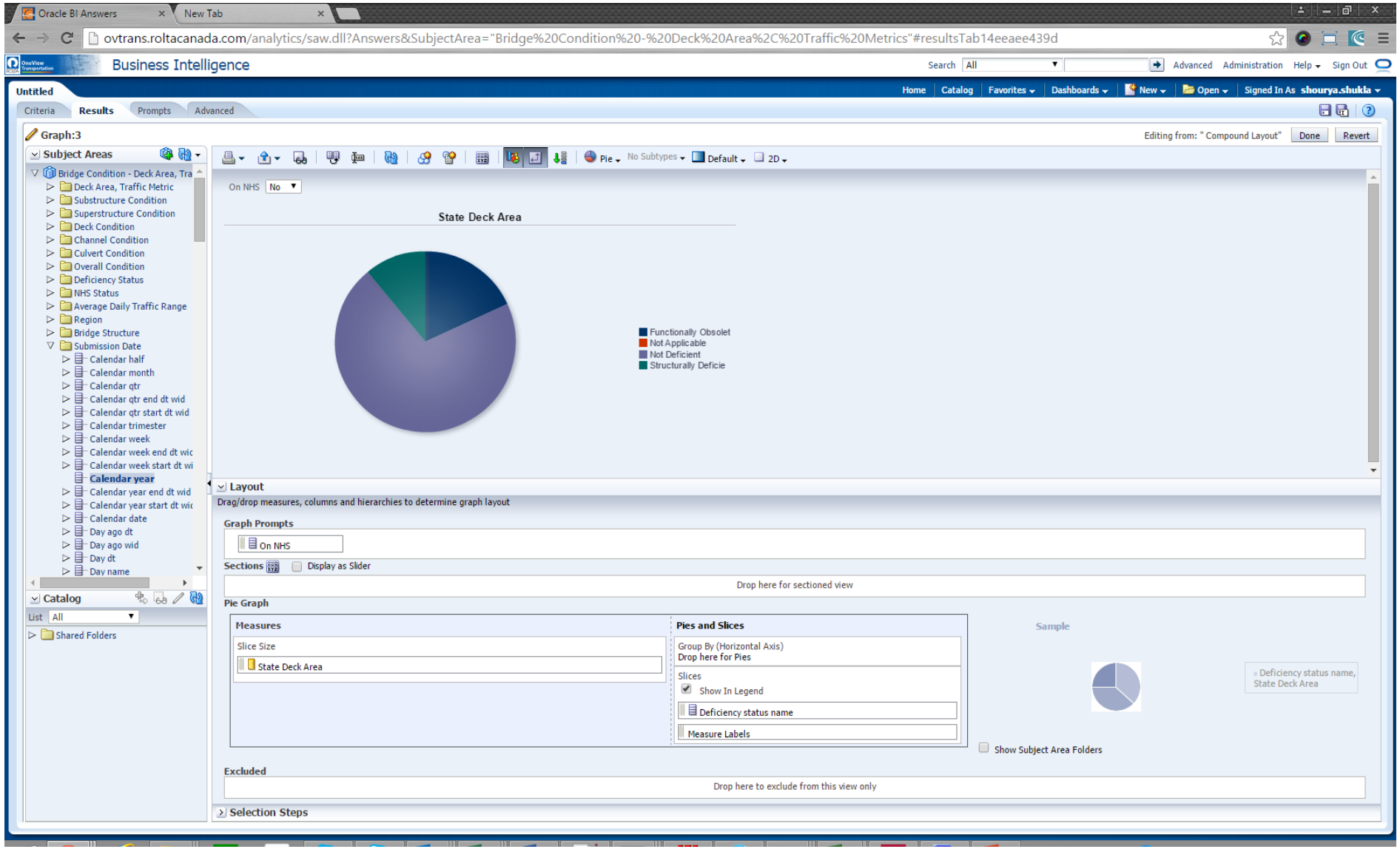
Everything that matters on one screen

Ability to drill down and across



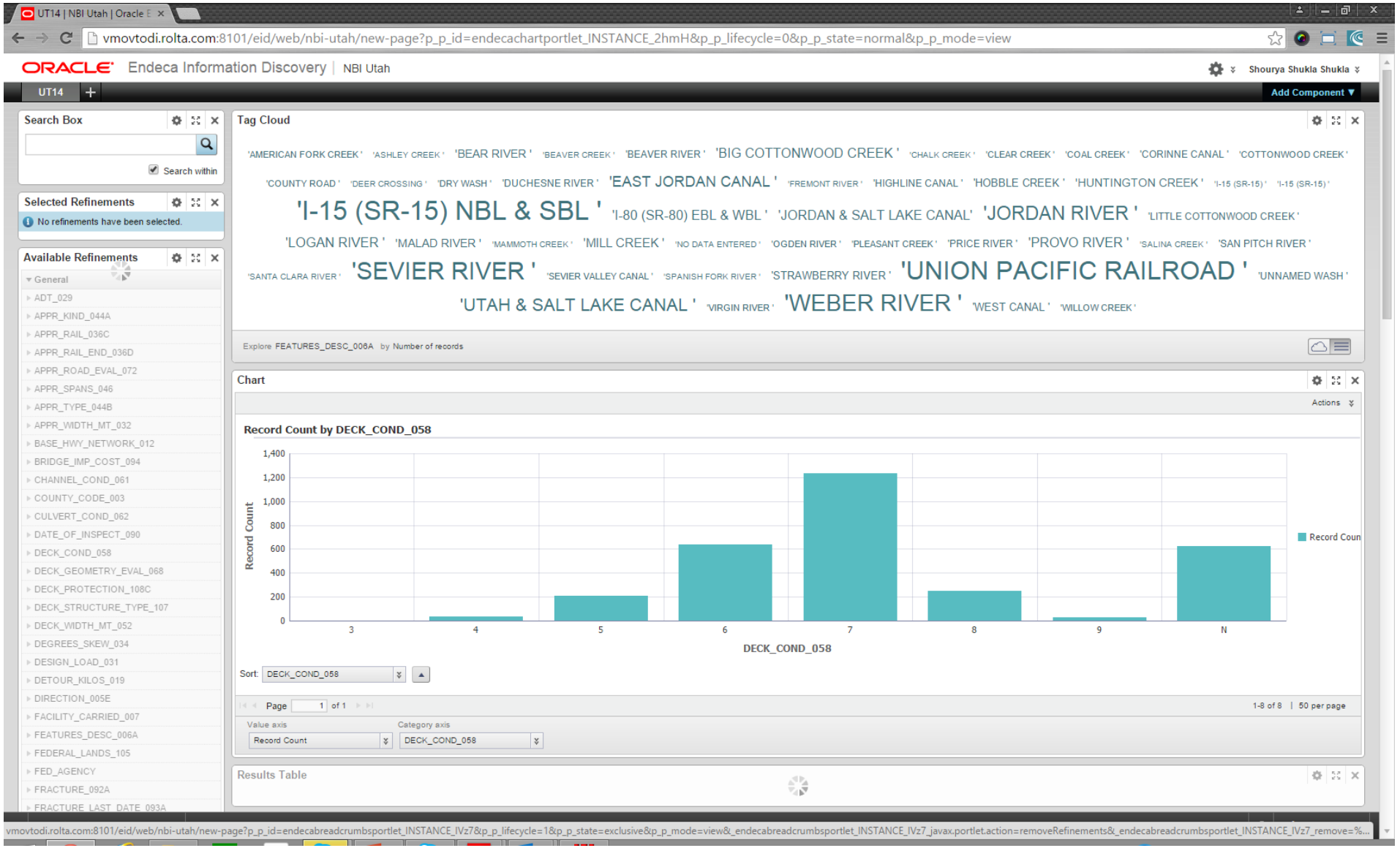
Self Service Analysis

Building dynamic analysis using a semantic model



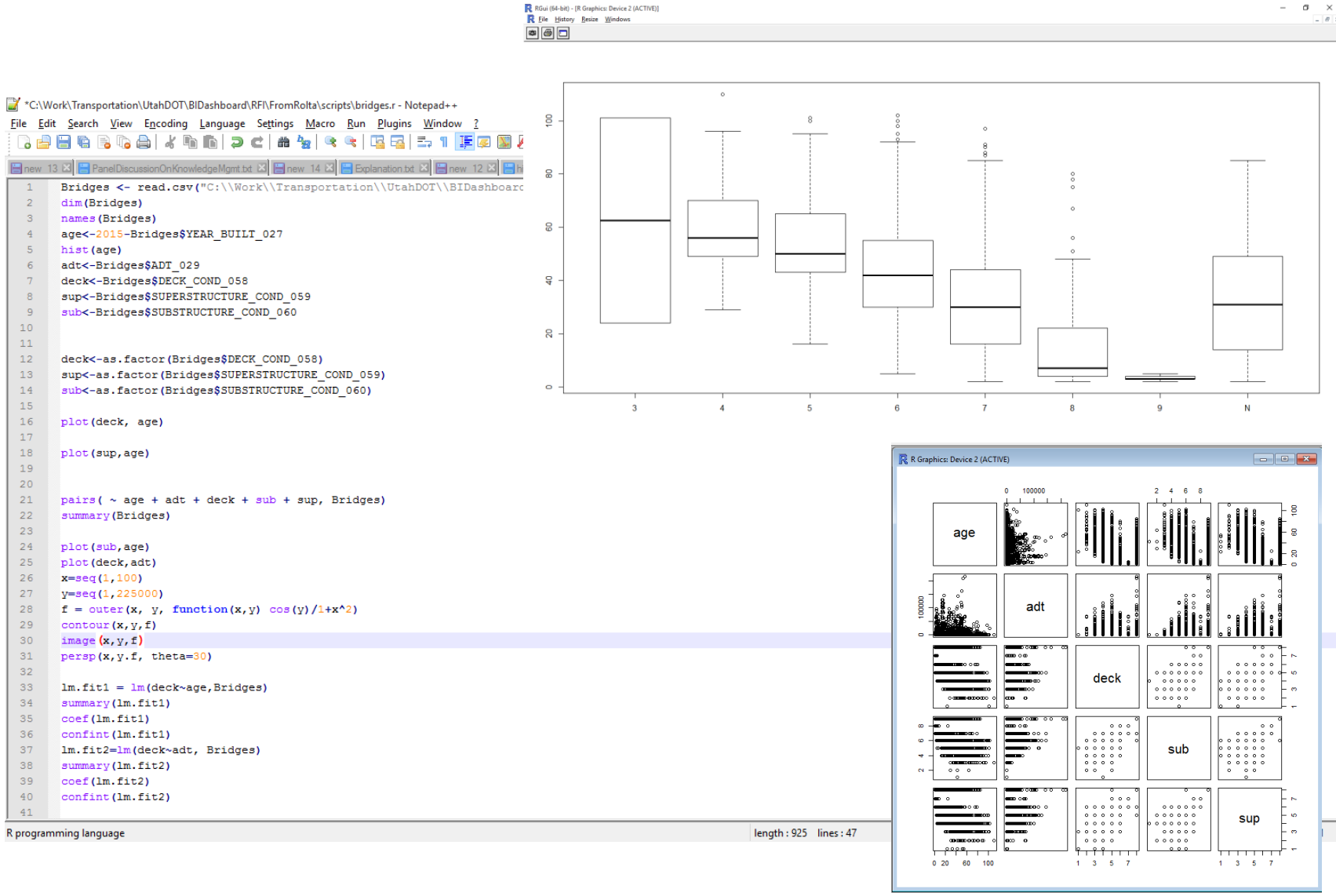
Data Discovery

Look for patterns in structured and unstructured data



R Statistical Programming

Powerful language for data scientists



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Gartner Recommendations for Analytics

Business analytics leaders should:

- Determine the BI and analytics use cases needed by your organization.
- Consider the skills level of the users when choosing a product or vendor.
- Provide a balanced BI and analytics portfolio. This may require expanding BI and analytics delivery and roles from a centralized, IT-driven approach to a more decentralized, agile process.
- Assess customer satisfaction measures in platform/ technology selection
  - Support quality, product quality, upgrade difficulty, sales experience, ease of use, user enablement programs and achievement of business benefits
  - Supplements an evaluation of functionality, integration and cost-of-ownership requirements.

Putting it all together for MAP 21

- Start with the questions that executives need to answer?
- What datasets are available in the organization to answer these questions?
- Are there better alternative datasets available in the market place that can answer the questions reliably?
- How will this data be acquired and where will it reside?
- How will you ensure data consistency and quality?
- Who needs to access this data and what are their skillsets?
- What resources exist to acquire the technology?
- What resources exist to sustain the technology?
- How will you let your data and analysis drive your business?

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