Deloitte.

Technology Summit 2013
Georgia Technology Authority

May 6, 2013

Today's Agenda

- Introductions
- Data-Driven Decision Making
- Four Stages of Analytics Journey
  - Management reporting in legacy systems
  - Business intelligence and data warehousing
    - **Examples of Deloitte Public Sector Experience**
      - ✓ Georgia Governor's Office of Student Achievement (GOSA)
      - ✓ Georgia Division of Child Support Services (DCSS)
      - ✓ Pennsylvania Department of Public Welfare (DPW) Executive Dashboard
  - Business optimization
  - Predictive analytics
- Trends in analytics
- Conclusion and Q&A

Introductions

Introductions

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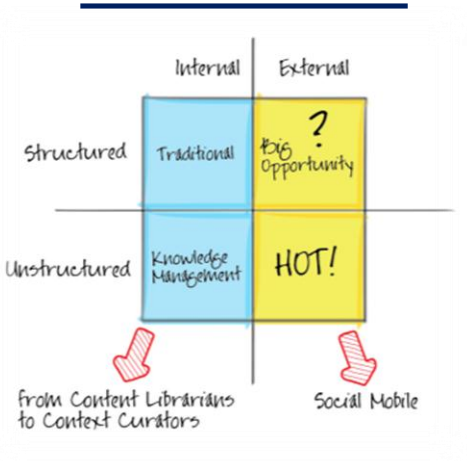
cloud
Predictive
statistics
talent
Analytics
analysis
MapReduce
real-time
hindsight
Data
inform
Cleansing
Prescriptive
Social
Immediacy
machine-learning
governance
foresight
innovation
Data Scientist
Transparency
mobil
Big Data
ETL
Hadoop
Correlation
Descriptive
decision
insight

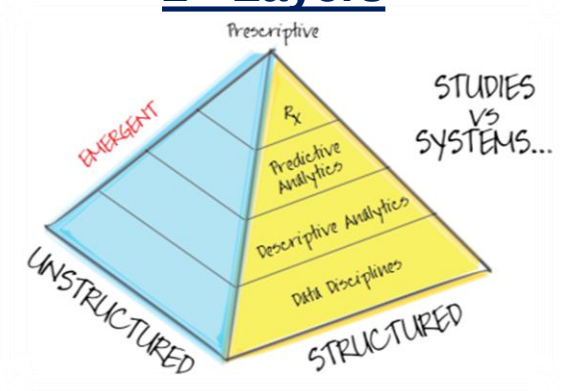
. . . confusion

The Goal of Analytics is Getting to Data-Driven Decision Making

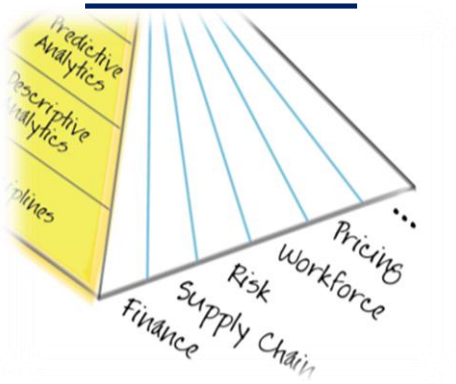
1- Data Assets



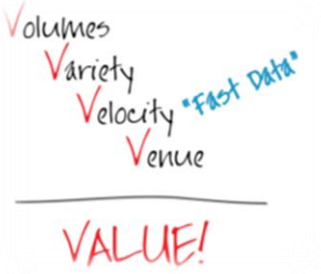
2 - Layers

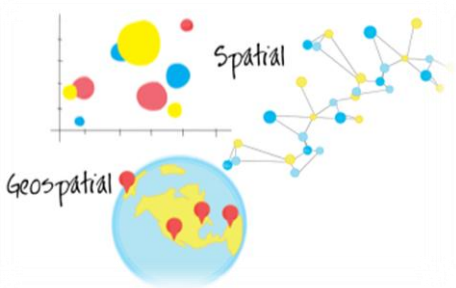


3 - Domains

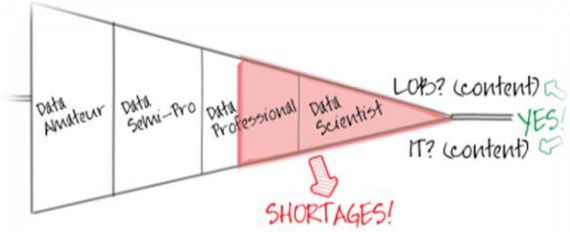


4 – Big Data

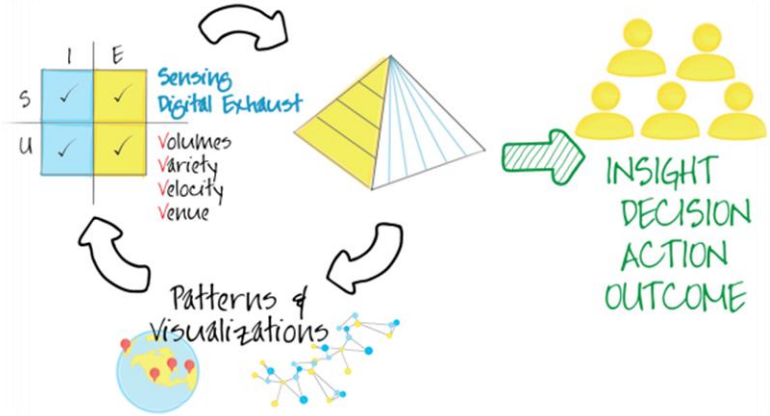




5 - Visualization



6 –Capabilities



7 - Discovery

Data-Driven Decision Making is a Journey…

Started with basic management reporting in the 1990s and builds upon technologies like business intelligence and advanced analytics driving

Management Reports

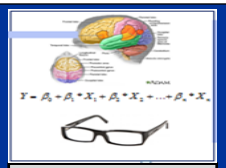
- Provide static reports to executives
- Primarily focused on complying with state and federal regulations

Business Intelligence

- Provide trends, slicing and dicing and drill-down capabilities
- Deloitte clients include the States of Pennsylvania and Georgia

Predictive Analytics

- Uses data to develop statistical models and predict future outcomes
- Deloitte clients include the States of Kentucky and Georgia and New York City



Optimized Outcomes

- Allow policy makers to make policies to help reach a desired outcome
- Deloitte clients include GA, PA, KY, NYC, and other government and commercial clients

Business Intelligence

Business Intelligence and Data Warehousing

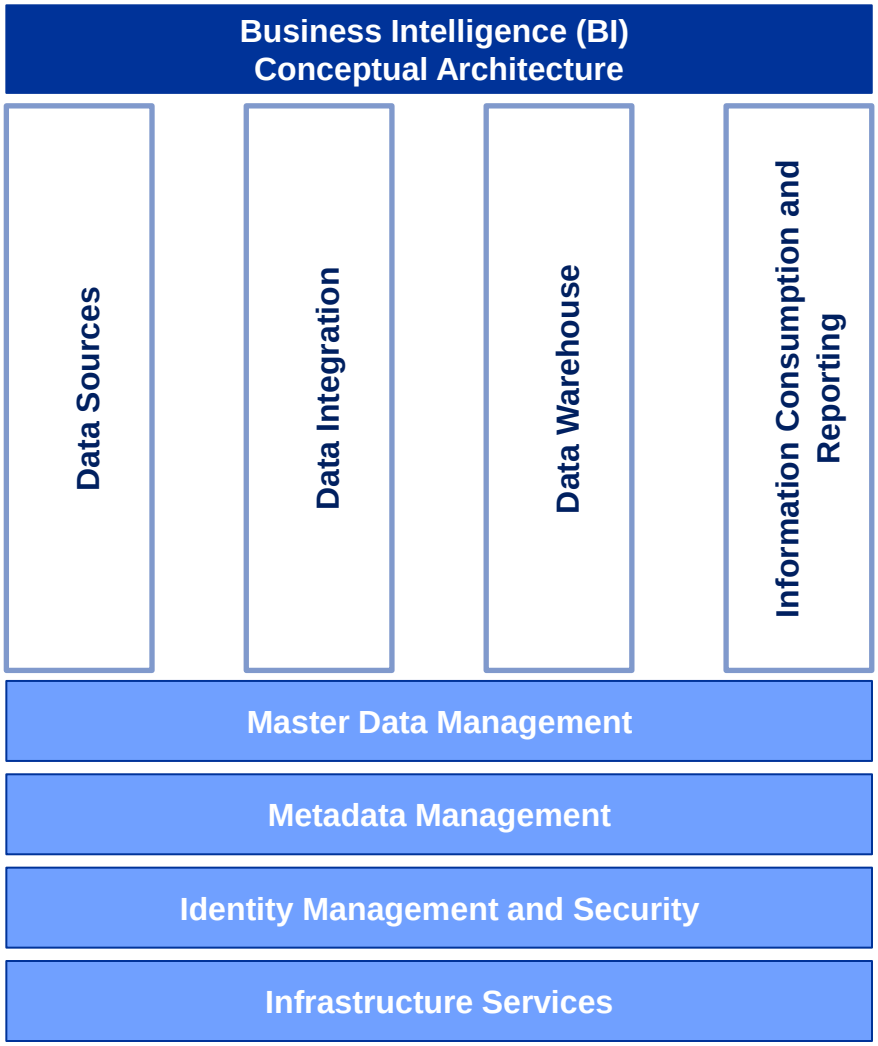
A solid foundation of Master Data Management, Identity Management and Security, and Metadata Management form the essential foundation of a successful Business Intelligence solution.

Goals and Success Factors

Business intelligence solutions are designed to leverage enterprise data to provide **hindsight and insight** into organizational performance and trends

A successful BI solution is **dependent on quality data**, which is governed by a solid foundation of Master Data and Metadata Management principles

Flexible and scalable integration between data sources into a data warehouse is critical to enabling **information consumption and reporting** capabilities



The Deloitte Experience

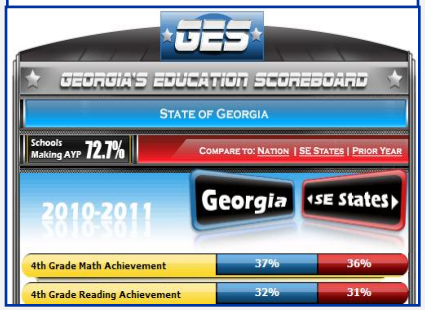
The purpose of today's presentation is to highlight Deloitte's experience designing, developing and implementing Business Intelligence (BI) solutions at State Government clients.

The Deloitte Experience

Georgia Governor's Office of Student Achievement (GOSA)

THE GOVERNOR'S OFFICE of STUDENT ACHIEVEMENT

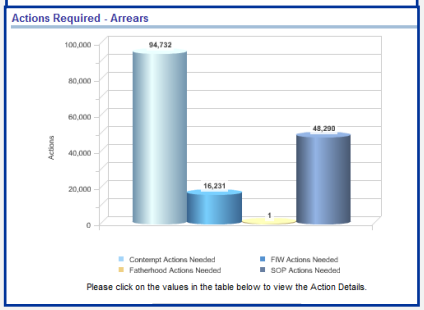
- Established a foundation for a single data repository and model containing all student records from Pre-K through age 20.
- Implemented an EDW across 7 source systems



Georgia Division of Child Support Services (DCSS)

DHS Division of Child Support Services

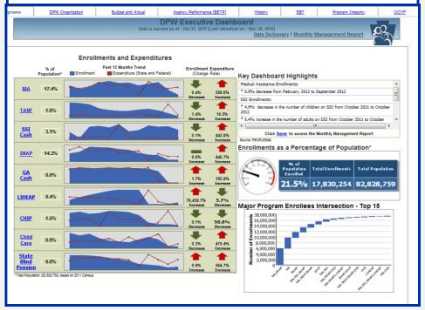
- Increased case agent productivity through the use of data-driven decision-making tools
- Implemented the Oracle BI Suite



Pennsylvania Department of Public Welfare (DPW)

pennsylvania DEPARTMENT OF PUBLIC WELFARE

- Facilitated enhanced access to timely metrics that show an "at a glance" view of DPW business trends and metrics
- Implemented the IBM Cognos BI Suite



THE GOVERNOR'S OFFICE of STUDENT ACHIEVEMENT

State of Georgia
Governor's Office of Student Achievement (GOSA)
GA AWARDS Project

Project Background and Business Drivers

The Georgia Governor's Office of Student Achievement (GOSA) partnered with Deloitte to support its mission of increasing student achievement and school completion across the state.

Client Background

The Georgia Governor's Office of Student Achievement (GOSA) is an entity of the State of Georgia that strives to:

- Increase student achievement and school completion across Georgia
- Provide policy support to the Governor and the citizens of Georgia
- Indicate the effectiveness of Georgia's education institutions by publishing an education scoreboard

Project Background

GOSA engaged Deloitte Consulting to conduct the following activities:

- Help consolidate information from across Georgia's education agencies
- Implement an Enterprise Data Warehouse (EDW)
- Enable Business Intelligence (BI) capabilities on the EDW for enhanced reporting

GOSA Project Goals

- Consolidate and link together all teacher and student information from Georgia's seven education agencies
- Provide the capability to consistently and accurately identify a person (student or teacher) uniquely across multiple data sources and roles allowing the state to link student performance from Pre-K-20

GA AWARDS Solution

Deloitte built a solution that leverages data from multiple source systems to enable both standard and ad-hoc reports through the GA AWARDS BI solution.

GA AWARDS Solution

Pre-K

K-12

USG

TCSG

SAT / ACT / AP Data

Teacher Certification

Student Clearinghouse

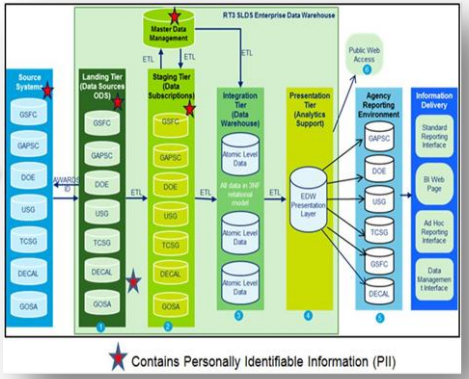
Master Data Management

Workforce

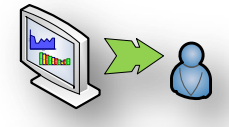
Independent Colleges

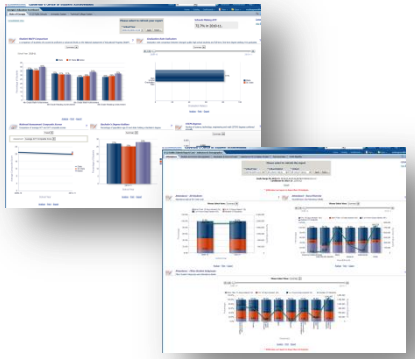
Human Services

In-Progress Enhancements



Ability for researchers to develop Ad hoc reports to answer research questions





Implemented a Master Data Management Solution to uniquely identify students through their education lifecycle and manage a single version of truth.

Flexible architecture to expand the data warehouse to include Workforce, Independent Colleges, and Human Services Data in future

Pre-built reports for Georgia residents to view and compare school performance on test scores and graduation rates

Division of
CHILD SUPPORT SERVICES
DHS GEORGIA DEPARTMENT OF HUMAN SERVICES

State of Georgia
Division of Child Support Services

Project Background and Business Drivers

The Georgia Division of Child Support Services (DCSS) worked with Deloitte to support its mission through the implementation of a Business Intelligence (BI) solution.

Client Background

The Georgia **Division of Child Support Services** is an entity of the Georgia Department of Human Services that strives to:

- Enhance the well-being of children by assuring that support, including financial and medical, is available to children
- Locate parents, establish paternity, establish support obligations, and monitor and enforce support obligations
- Support the goals of the Georgia Department of Human Services through means taken from the Social Security Act

Project Background

DCCS engaged Deloitte Consulting to conduct the following activities:

- Develop an enterprise infrastructure for Business Intelligence using Oracle BI technology
- Establish a real-time data extract from legacy mainframe applications with close collaboration from multiple departments and integration vendors

DCSS Project Goals

- Enable case agents to become more productive while reducing manual work
- Help DCSS leadership better evaluate current services to identify new opportunities and improve services to clients
- Improve overall agency performance by using Federal and State funding more effectively

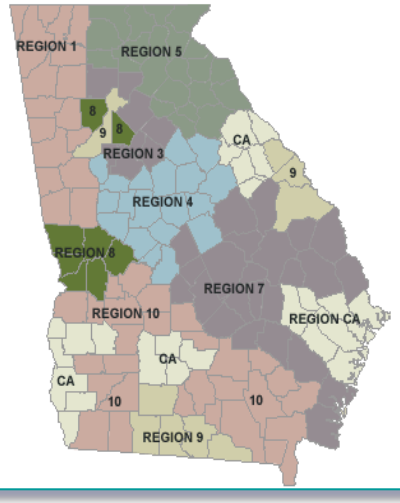
Solution Overview – Executive Dashboard

- As a compliment to the Overview page, the Statewide details report allows executives to compare the performance of regions and offices to their respective goals

Help

Calendar Type	Year	Month	
Federal	2010	September	Go

Statewide Details By Region



Region	IV-D PEP Ratio	IV-D PEP Goal	Arrears %	Arrears Goal	Current Support %	Current Support Goal	Support Order %	Support Goal
REGION 1	107.39%	96.40%	80.85%	88.40%	63.63%	63.78%	86.64%	90.47%
REGION 10	102.25%	97.57%	75.14%	87.37%	64.18%	64.45%	92.75%	94.42%
REGION 3	106.08%	94.54%	81.36%	82.75%	64.50%	63.19%	82.64%	86.89%
REGION 4	101.29%	96.86%	76.42%	88.85%	65.76%	67.12%	90.07%	93.12%
REGION 5	105.49%	96.35%	78.10%	86.26%	60.04%	59.58%	87.45%	89.49%
REGION 7	102.83%	96.33%	75.46%	85.04%	62.62%	62.71%	88.40%	91.08%
REGION 8	96.48%	93.00%	72.91%	77.00%	61.55%	62.70%	79.19%	85.00%
REGION 9	91.90%	92.00%	69.06%	71.00%	55.80%	58.21%	75.19%	83.00%
REGION CA	98.77%	91.64%	79.13%	85.97%	63.75%	63.74%	82.36%	86.59%
STATE OFF								

Region 7

Office	IV-D PEP Ratio	IV-D PEP Goal	Arrears %	Arrears Goal	Current Support %	Current Support Goal	Support Order %	Support Goal
BRUNSWICK OFFICE	100.11%	92.80%	74.62%	79.60%	60.14%	59.50%	83.68%	84.30%
BRUNSWICK-JESUP OFFICE	101.65%	95.82%	77.55%	85.75%	62.62%	59.00%	86.71%	88.60%
DUBLIN OFFICE	104.48%	96.59%	76.65%	85.00%	61.07%	61.31%	91.66%	93.90%
MIDDLE-SANDERSVILLE OFFICE	104.86%	97.82%	77.70%	91.33%	63.67%	64.00%	92.78%	96.54%
MIDDLE-SWAINSBORO OFFICE	105.19%	97.27%	73.36%	87.20%	66.89%	65.70%	89.42%	92.50%
OCONEE OFFICE	105.45%	98.48%	73.90%	85.00%	64.56%	66.54%	92.72%	96.00%
OGEECHEE-STATESBORO OFFICE	100.32%	95.52%	75.37%	81.40%	62.13%	61.50%	85.76%	85.70%
REGION 07 OFFICE	96.00%		50.00%		5.52%		93.33%	

Commonwealth of Pennsylvania Department of Public Welfare Executive Dashboard

Project Background and Business Drivers

The Pennsylvania Department of Public Welfare (DPW) worked with Deloitte to develop an executive dashboard that provides an “at a glance” view of current DPW business trends and metrics.

Client Background

The Pennsylvania Department of Public Welfare aims to provide care and support to the state’s most vulnerable citizens by:

- Purchasing health care for more than 2.3 million PA residents and enrolling Medical Assistance Providers who administer care
- Providing support services and care for people with cognitive disabilities
- Serving children and families through a nationally recognized child support enforcement program

Project Background

DPW engaged Deloitte Consulting to conduct the following activities:

- Provide DPW users with a snapshot of trends and metrics from across the Department
- Bring together data from disparate bureaus that allows executive staff the ability to effortlessly monitor and manage programs
- Employ the IBM Cognos BI suite to present the data in a user-friendly front end interface

DPW Executive Dashboard Project Goals

- Increase transparency and operational effectiveness of core Department of Public Welfare programs
- Facilitate enhanced access to timely metrics that show an “at a glance” view of department business trends and metrics

Solution Overview – DPW Organizational Metrics Dashboard

The DPW Organizational Metrics Dashboard provides executives with a view into performance metrics, such as expenditures, for each DPW program office.

Programs | DPW Organization | Budget and Actual | Agency Performance (BETP) | History | EBT | Program Integrity | OCYF

DPW Executive Dashboard

Data is current as of : Oct 31, 2012 (Last refreshed on : Nov 28, 2012)

Data Dictionary | Monthly Management Report

Operations (Monthly)

Compass

		Change
Reapplications	8.5%	0.0%
Applications	24.0%	3.9%

Licenses

Overdue	381	214

Accuracy

MA	285.85%	(Apr-12)	285.85%
TANF	282.08%	(Jul-12)	63.58%
SNAP	287.04%	(Aug-12)	75.25%
GA Cash	257.14%	(Jul-12)	64.57%

Timeliness

MA	283.19%	68.25%
TANF	270.22%	63.66%
SSI Cash	281.59%	65.75%
SNAP	250.24%	57.87%
GA Cash	256.97%	58.68%
SBP	290%	70%

Avg App Processing Time

MA	53.6 days	13.7 days
TANF	42.2 days	11.4 days
SSI Cash	41.7 days	11.8 days
SNAP	47.9 days	13.4 days
GA Cash	51.3 days	13.1 days
SBP	26.1 days	26.1 days

Enrollments (Monthly)

Program	Enrollments
MA	14,402,187
TANF	1,349,199
SSI Cash	2,559,382
SNAP	11,857,417
GA Cash	2,392
LIHEAP	308,451
CHIP	1,253,902
Child Care	753,032
SBP	1,521

Expenditure (Monthly)

Program	Expenditures
MA	$1,604,881,637
TANF	$54,228,708
SSI Cash	$11,495,023
SNAP	$298,423,972
GA Cash	$77,647
LIHEAP	$401,403
CHIP	$167,252
Child Care	$50,670,230
SBP	$23,022

Program Office	Expenditures	
	State	Federal
OA	$34,886,826	$35,255,396
OCDEL	$213,577,054	$130,411,440
OCYF	$63,762,271	$14,000,901
ODP	$360,624,570	$408,629,446
OIM	$171,413,403	$165,833,372
OLTL	$637,975,785	$756,845,207
OMAP	$1,331,631,889	$1,408,450,459
OMHSAS	$19,140,000	$46,177,474
SF	$418,267	
% of Total	48.9%	51.1%

Agency Performance (BETP)

(Monthly)

Client Throughput

Number of Clients Enrolled	25,001
Number of Clients Employed	3,118
Time to find Employment (In Days)	158

Clients Meeting Retention

Number of Clients meeting Retention	386

Program Integrity

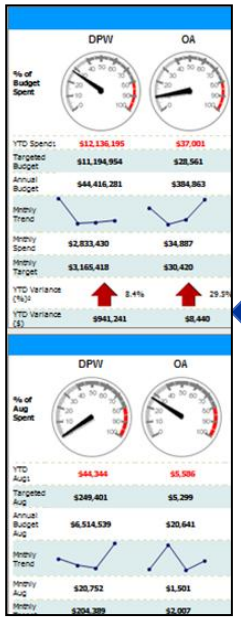
% of funds compared to 4yr average

	Recovery	Savings	Avoidance
YTD Funds	$222,222,222	$95,238,095	$133,333,333
4yr Average	$533,333,333	$228,571,429	$320,000,000
Monthly Dollars	$17,777,778	$7,619,048	$10,666,667

Data Source: EDW (Timeliness), EDW (Avg App Processing Time), QCMIS (Accuracy), EDW (Overdue Licenses),Recoveries Savings Avoidance Tracker (Program Integrity)

Project Results and Value Delivered

The DCSS BI solution provides Department case workers and executives with cross-functional views of enterprise data in dynamic reports and dashboards.



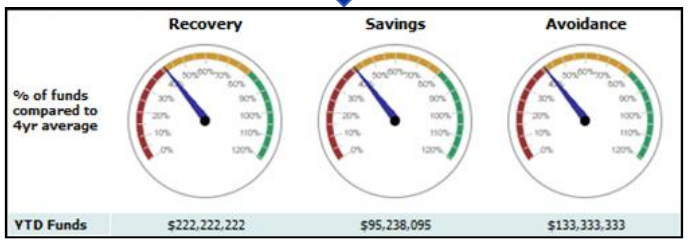
Project Benefits

Provides operational metrics from across the enterprise in a common location

Supports administrators in understanding the health of their programs and optimizing their expenditures

Increases transparency into programs that promote Pennsylvanians' welfare and citizens' self-sufficiency

Provides users the analytics to analyze program information for 220 operational metrics across DPW.



Business Optimization

Business Optimization

Analytics to optimize performance is more than just predicting the future. Focus should be on business strategy and asking *the right questions*, performing analysis with *the right data points*, to drive the *right actions.*

Foresight

Prescriptive

- Machine learning
- Dynamic rule optimization

Customer Centric Offers
What loyalty offers will our best customers take advantage of next year? What programs should we drop?

Insight

Predictive

- Simulation and modeling
- Quantitative analyses
- Advanced forecasting

Attrition / Retention Analytics
Which customers are most likely to attrite in the next year?

What actions should I be taking to retain my most profitable customers?

Hindsight

Descriptive

- Real-time exception and alerts
- Role-based performance metrics
- Management reporting with drill downs
- Enterprise data management

Product Bundling
How are many product bundles were sold last period? How did they performing

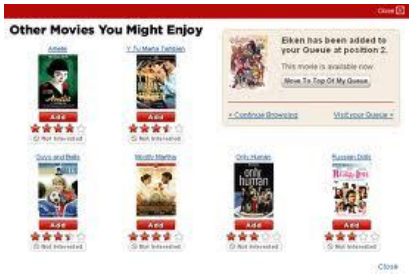
Predictive Analytics is Cutting Edge

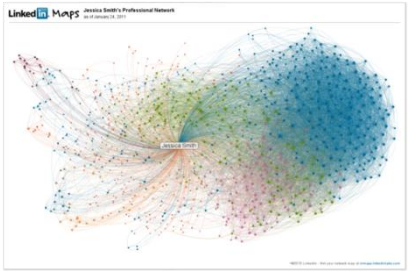
The explosion of data about every aspect of our world and the rise of applied math gurus who know how to use it."

-- Chris Anderson, editor-in-chief of Wired

The analysis of data affects:

- What we buy
- What we read
- What we watch
- How we network
- How we socialize
- The opinions we form
- Whom we date and marry





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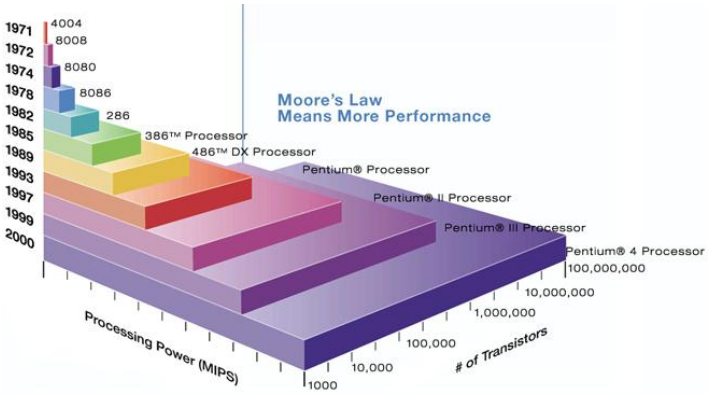
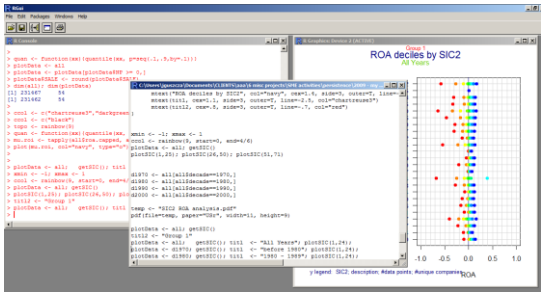
One Reason Why Predictive is growing: Moore's Law

- Technology
  - Cost of storage and computing power has decreased exponentially



- Data
  - Big data: data exhaust captured from purchase behavior, RFID tags, GPS, internet surfing, unstructured text… is growing exponentially.
  - Companies are learning to do more with their internal data

- Software and algorithms
  - Great analytic ideas keep coming from statistics, economics, machine learning, marketing, …
  - Open-source analytics tools



Trends in Analytics

Five key trends in the market for analytics (1 of 2)

Data Volumes & Technology Capacity

Data volume continues to grow exponentially. New computing capacity and analytical tools can meet the challenge

Regulations

Regulators are demanding deeper insight into risk, exposure, and public responsiveness from financial, health care, and many other sectors

Profitable Growth

The need to remain competitive compels investments in analytics to improve insight

Five key trends in analytics (2 of 2)

New Signals

Holistic signal detection from traditional internal and external structured and unstructured (e.g., voice, e-mail, social networks, sensor enabled facilities)

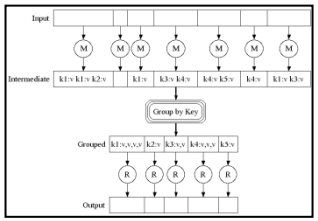
Hidden Insight

The growing complexity of global business has raised the stakes at all levels of decision-making

Emerging technology is beginning to address these trends

Aggregating Unstructured Data

Use of advanced analytics software to aggregate unstructured data, including call center reports, customer reviews, and social media mentions



Merging Structured and Unstructured Data

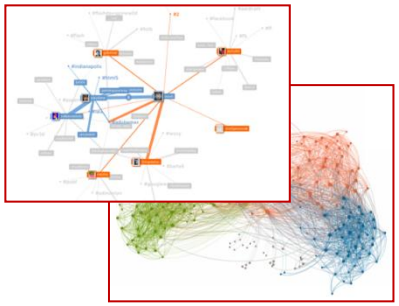
Warehousing customer data with unstructured data from multiple sources (website registration, keywords and sentiment in product reviews, social media commentary)

Self-Service Analytics

Self-service analytics with Just In Time data: flexible delivery of information to different internal partners (Marketing needs to access different data than Finance)

Self-service analytics image sourced from Scout Labs and accessed at http://www.dailybloggr.com/2010/03/social-media-monitoring-tools-analytics/

The retail industry is utilizing emerging analytics technology to make decisions based on big data



Social Influence Analytics

Dynamic network maps, such as those from mentionmapp (left, top) and LinkedIn (left, bottom), enable targeting based on network attributes and engagement of key influencers

Traffic Analytics

Mobile apps, in-store and window-mounted cameras, and emerging Kinect-enabled shopping carts track traffic patterns (path around store, time spent at a particular aisle or display). The data can used to optimize revenue by, e.g., modifying a trade promotion mid-campaign or redesigning store layout to optimize revenue

Some Parting Thoughts…

> **If I waited for perfection,**
> **I would never write a word.**
> —Margaret Atwood, novelist and poet

Stop waiting for perfection

Let your guard down (A little)

Identify crunchy questions

If it's not the heart of the business, it doesn't count

No adoption, no value

Good is good enough

Yes, you need a rocket scientist

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