



2015 AIS Student Chapter Leadership Conference

Track: QVC Analytics Challenge

Prizes

- 1st \$2000
- 2nd \$1250
- 3rd \$750
- Honorable Mentions (2) \$500

Background

Big Data Analytics is a critical skill, touching fields as diverse as medicine, chemistry, linguistics, and business. New fields such as “data journalism” and “big humanities” reflect the transformative potential of large, widely available, and trans-disciplinary data sets. Good visualizations are a cornerstone of this new field, as they communicate complex ideas and reveal patterns difficult to see. Proficiency in the visual communication of data will give students a competitive edge; by 2015, analysts predict 4.4 million new jobs will support this emerging area.

Goals

- To provide students an accessible entry point into data analytics.
- To create the opportunity for students to work on real-world problems.
- To emphasize critical thinking, visual communication, and oral presentation skills.

Task

Student teams choose one of four problems and data sets donated by the participating companies. Create a graphic that addresses one or more of the questions in the problem description, using the data given by the company. Students create a visualization that provides insight into the data, addressing the key issues of the problem. Teams submit their graphic and a one page description highlighting its key features. Students can use any tool to create their entries.

Participating Companies

This year’s participating companies are QVC, NBCUniversal, Lockheed Martin, and Merck.

Preliminary Round

For the preliminary round judges from the industry will score each entry. The ten top-scoring teams will present their work at the AIS Student Chapter Competition in Tuscaloosa, Alabama. Travel support is available for finalist teams based on need.

Final Round

At the Student Chapter Leadership Conference in Alabama, each team will make a 10 minute presentation before a panel of industry judges. Winning entries receive cash prizes divided among team members and will be featured in a gallery on the AIS Student Chapter Conference site.

Scoring

- Clarity (how well the graphic stands on its own without additional explanation)
- Novelty/creativity (originality of thought; surprising way of approaching the data)
- Provides meaningful insight into the data
- Integration of multiple data sets to yield new insights
- Utility of the visualization in aiding decision making

(based on criteria by dataviz.challenge.gov)



What you should submit

- The graphic. It can be a static image or interactive (such as Flash).
- A description, less than one single-spaced page, describing what's great about your graphic. Make sure it's clear which one of the four challenges you're addressing.

How you should submit

- Email your entry to **analyticschallenge@temple.edu** by 11:59 P.M. on February 15, 2015.
- Attach the graphic and the description as separate files to a single email message with the subject "Entry for QVC Analytics Challenge".
- Convert static graphics to PDF format. The one-page description must also be in PDF format. There are free tools that do this, such as PDF Creator.
- Interactive visualizations must run without special software on any PC running Windows 7.
- The name of the challenge, the team members' names and email addresses, and the name of their school must be clearly displayed on the graphic and the one-page description.

What happens after you submit

- You will receive a confirmation email acknowledging your entry.
- Finalists will be notified by email by February 24, 2015.
- Finalists will present their work at the AIS Student Chapter Conference April 9-11, 2015.

Deadlines

- November 15, 2014 Challenge starts. Students given data set and rules.
- February 15, 2015 Challenge ends. Submissions due.
- February 24, 2015 Finalists announced.
- April 9-11, 2015 Final Judging and Awards Event

Prizes

- 1st \$2000
- 2nd \$1250
- 3rd \$750
- Honorable Mentions (2) \$500

Other Rules

- Each team's submissions must entirely be the work of the team. Faculty may review the submission, but may not contribute to the content of the policy solution.
- Late submissions will not be accepted.
- Your entry will be disqualified if...
 - It is submitted after the deadline.
 - The attachments won't open or are in the wrong file format.
 - Your interactive visualization won't run.
 - You don't specify the challenge you are addressing.
 - Team member information (see above) is not included on both the graphic and the description.



Eligibility:

- Undergraduate and graduate students enrolled in an AIS student chapter are eligible and encouraged to participate. Start a new AIS chapter and participate in the competition!

Materials Availability and Submission:

- Materials for each of the tracks are accessible for open viewing. Multiple submissions for each school are allowed, however, a maximum of two teams from each school for each track will be selected to participate in the onsite competition.

Competition Author: David Schuff, Associate Professor of Management Information Systems, Fox School of Business
David.Schuff@temple.edu | 215-204-3078 | community.mis.temple.edu/dschuff

The AIS Analytics Challenge is Powered by the Institute for Business and Information Technology at Temple University and the Association for Information Systems





“Programming” Better Product Sales

QVC Challenge

Problem

QVC is the **world’s leading video and e-commerce retailer**, reaching nearly 300 million homes worldwide with a live broadcast 24 hours a day, 364 days a year. Our vision is to **change the way the world shops** by re-imagining shopping, entertainment, and social as one. To do so, QVC analyzes our customers’ experience to make sure we are providing them the products and services they want.

For this challenge, QVC would like to use this data to better understand and anticipate our customer’s buying behavior. However, airtime is a finite resource, and therefore QVC needs to choose the best airtimes for their products and product categories.

Specifically, QVC would like to better understand:

- What is the next product a customer will buy in the next month given their previous buying behavior and product airtime?
- In what product category is a customer likely to buy their next product, given their previous buying behavior and product airtime?
- What are the products and product categories that sell better in a particular geographic, time zone, and customer segment?
- Is there a best time of day to sell a particular product or product category?
- What is the brand affinity (personal connection with the brands QVC sells) for QVC’s different customer segments?

Develop a visualization (static or interactive) that reflects your customer analysis based upon the consideration of product airtime and customer buying behavior. In addition to customer orders, your analysis should include customer geography, customer segment, and product air time.

Data

- [Customer master](#) (customer number, customer state, customer zip, customer segmentation code)
- [Product master](#) (product number, product description, product category, product brand)
- [6 month history of customer orders](#) (order date, order time, customer number, product number)
- [Product airtime](#) (date, total time on air, product number, time on, time off)

Finding “Hot Spots” for Election Spending

NBCUniversal Challenge

Problem

The 2014 Federal midterm elections may deliver a new record for midterm spending. Messaging and engagement of voters in crucial races will take priority. NBCUniversal (NBCU) would like to better understand the distribution of spending across Congressional Districts and Nielsen® DMAs (Designated Market Areas), as well as how they relate to markets with NBC owned-and-operated (O&O) and affiliate stations.

NBCU would like to use this data to better understand:

- Which key markets (DMA) present the greatest opportunities for engagement through advertising spending (e.g. – “tight-races”, “highest ratios of funds raised vs. funds spent in key races”, etc.)?
- What demographics are represented in those key markets (DMA) and how they relate to NBCU’s audience segments?
- Based on understanding the fundraising and spending patterns of the mid-term elections and the subsequent results, how best should NBCU posture for the upcoming mid-term and Presidential elections (2016)?

Develop a visualization (static or interactive) that reflects campaign spending, as provided the Federal Election Commission (FEC), by Committee, Candidate, and total Contributions by Individual for each Congressional District of the 113th Congress. This information should be triangulated with Nielsen® DMA and local station information.

Potentially relevant information for individual candidates may include:

- Spending by PAC (Political Action Committee)
- Party, PAC affiliation
- Individual contributions
- Ratio of funds raised and spent by PAC, Party
- Demographic data for candidates’ respective Congressional District

Data

- NBCU’s Owned & Operated (O&O) and Affiliates Stations by Designated Market Area: [[NBCU-Provided File](#)]
- Zip Codes by Market: [[NBCU-Provided File](#)]
 - Note 10/3/14: In the file, Philadelphia is misspelled as “Philadeplphia”
- The Federal Election Commission provides [detailed information about candidates, parties, and committees](#).
- The United States Census Bureau provides [Congressional Districts Relationship Files by ZIP Code](#) .
- The United States Census Bureau provides demographic information by Congressional District [based on the on-going American Community Survey \(ACS\)](#).

Reducing Employee Insider Threats

Lockheed Martin Challenge

Problem

Theft of intellectual property is an increasing threat to organizations, and can go unnoticed for months or even years. Additionally, there are increased incidents of employees taking proprietary information when they believe they will be, or are, searching for a new job.

Congress has continually expanded and strengthened criminal penalties for violations of intellectual property rights to protect innovation and ensure that egregious or persistent intellectual property violations do not merely become a standard cost of doing business.

A domestic or foreign business competitor or foreign government intent on illegally acquiring a company's proprietary information and trade secrets may wish to place a spy into a company in order to gain access to non-public information. Alternatively, they may try to recruit an existing employee.

Your challenge is to visualize the risk posture of the employee base and identify top potential insider threats based on predictive analysis of data sets and the use of publicly available risk indicators:

- Patterns and/or inconsistencies in travel & phone records
- Inconsistencies regarding actual versus planned physical location
- Personal stressors such as poor performance reviews or demotion
- Birth country and/or citizenship in high risk countries

Additionally, the presence of abnormalities or the absence of normality should weigh into your analysis.

Data

The data sets you have been provided have been generated for the purposes of this competition and do not represent actual Lockheed Martin data or employee personal records. They are as follows:

- Employee personal and contact information
- Employee travel records
- Employee phone records
- Employee performance records
- Employee citizenship records
- Server access logs

Data Set (single Excel workbook with multiple tabs) [[Lockheed Martin-provided file](#)]

The following resources can also inform your analysis

FBI Publication: [The Insider Threat: An introduction to detecting and deterring an insider spy](#)

Software Engineering Institute Publication: [Common Sense Guide to Mitigating Insider Threats 4th Edition](#)

Understanding A Corporate Move's Impact

Merck Challenge

Problem

When a corporation decides to move the location of a major site, the impact on employees is not always completely understood. Often the total impact on the quality of life and commute time for employees to travel to a new location is not always taken into consideration.

Merck recently decided to move its corporate headquarters from Whitehouse Station, New Jersey to Kenilworth, New Jersey. Leadership wanted to understand the impact on the commute experience for the over 2,400 employees who worked at that site and whether certain organizations were more affected than others. Beyond this, there are also larger environmental impacts of such a change, caused by shifts in driving patterns, increased traffic at the new location, and potential impacts on public transit.

Your challenge is to characterize, quantify, and visualize the impact of a change of location for those 2,400 Merck employees to a new location. Specifically, your analysis should address one or more of the following questions:

- What was the impact of relocating from Whitehouse Station, NJ to Kenilworth, NJ?
- How does this compare to the impact of relocating instead to West Point, PA?
- For either option, are certain organizations more negatively impacted than others?
- If the commute experience were the only factor in making a decision and Merck could move anywhere, is there a different location that would be ideal for most employees? For the surrounding communities?

Data

- An anonymized list of 2,453 employees that currently commute to the Whitehouse Station site. The data set includes their divisions, their home zip codes, and the organization code in which the employee works (Microsoft Excel). [[Merck-provided file](#)]
- A list of valid US zip codes, including a tool embedded in the sheet that allows you to compute the distance between two zip codes (Microsoft Excel). [[Supplemental File](#)]
- The zip code of Whitehouse Station, NJ is 08889.
- The zip code of Kenilworth, NJ is 07033.
- The zip code of West Point, PA is 19486.