



CHARLOTTE

BUSINESS SUPPORT SERVICES

Sustaining Government Effectiveness Through Visual Analytics

Jim Raper

Manager of Data Administration

October 13, 2010

Sustaining Government Effectiveness Through Visual Analytics

Jim Raper
Manager Data
Administration
@VOUC
October 13, 2010



The views and opinions presented in this paper are solely those of the Author and do not necessarily reflect those of Business Support Services Information Technology Division or of the City of Charlotte. This material is provided for informational purposes only. City of Charlotte assumes no responsibility for accuracy of the information in this presentation or from damages caused by implemented the techniques or methodologies presented herein.

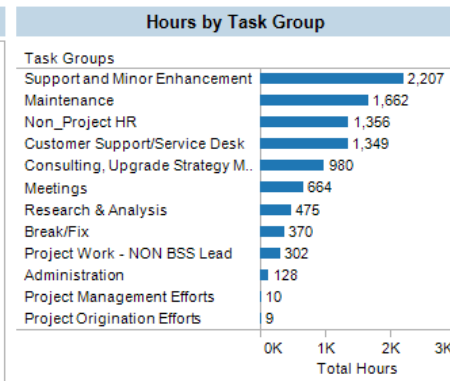
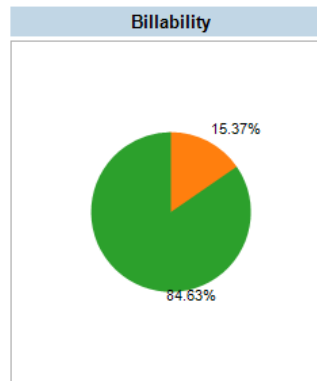
- Charlotte Faces:
 - Growing Population
 - Static to Declining Revenue
- Working Smarter vital to service delivery
 - Using Visual Analytics proven to be a 5 - 20x performance boost for department's analysts
 - IT push of new analytic techniques not effective
- Needed a better way to 'sell' the business units

Textual Financial Report

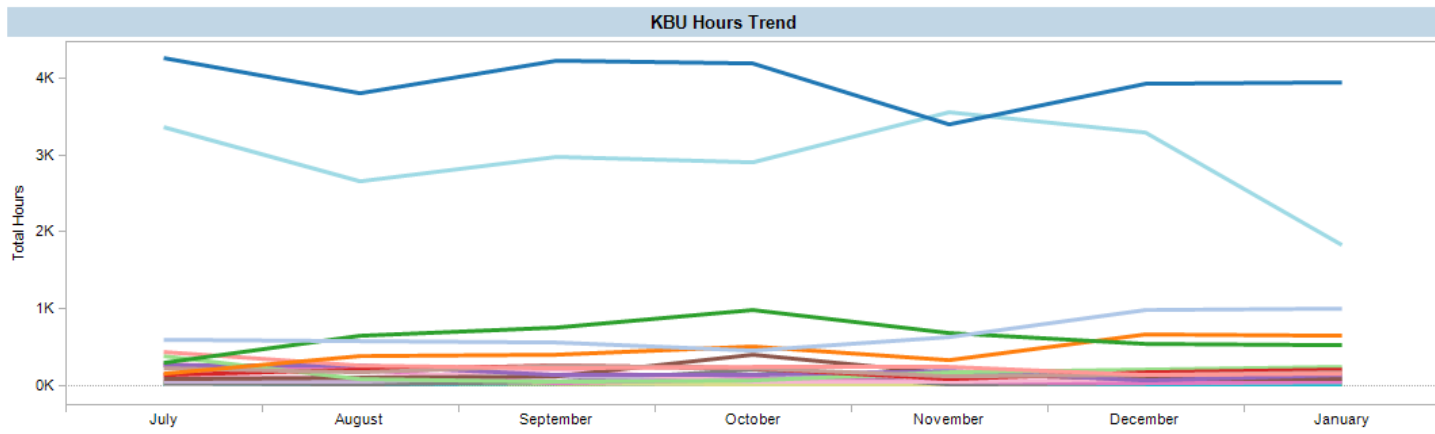
0101 GENERAL FUND BUSINESS SUPPORT 310XX - CONSOLIDATED		FUND AVAILABILITY EMR FNM16010			FOR 02/16/2010	PAGE TIME ISSUED	21:18:11 02/16/2010
OBJ	DESCRIPTION	APPROPRIATION	CURRENT MONTH EXPENDITURE	YEAR TO DATE EXPENDITURE	OUTSTANDING ENCUMBRANCE	UNENCUMBERED BALANCE	PERCENT XP&ENC
	0101 LVL A20 0031001						
	PERSONAL SERVICES:						
011	SALARY AND WAGE - REGULAR	13,353,753.79	479,888.63	7,994,228.63	0.00	5,359,525.16	59.87
012	SALARY AND WAGE - OVERTIME	222,094.00	44,463.89	158,115.10	0.00	63,978.90	71.19
013	SALARY AND WAGE - TEMP	0.00	489.26	15,593.93	0.00	15,593.93	300.00
083	RETIREE INSURANCE PREMIUM	445,445.00	0.00	445,445.00	0.00	0.00	100.00
084	UNEMPLOYMENT COMPENSATION	0.00	0.00	17,174.19	0.00	17,174.19	900.00
085	SOCIAL SECURITY TAX	1,032,187.92	37,608.33	577,646.88	0.00	454,541.04	55.96
086	EMPLOYEES INSURANCE PREMIUM	1,253,504.00	0.00	1,253,504.00	0.00	0.00	100.00
087	EMPLOYEES RETIREMENT EXPENSE	750,200.98	25,177.63	386,683.30	0.00	363,517.68	51.54
089	OTHER EMPLOYEE FRINGE BENEFITS	7,414.61	184.60	11,256.56	0.00	3,841.95	151.82
097	401K RETIREMENT EXPENSE	404,780.11	15,286.72	229,807.10	0.00	174,973.01	56.77
	TOTAL PERSONAL SERVICES	17,469,380.41	603,099.06	11,089,454.69	0.00	6,379,925.72	63.48
	OPERATING EXPENSES:						
	NON-PERSONAL CONTRACTUAL SERVICES:						
	SERVICE FEES:						
111	TELECOMMUNICATIONS	49,455.00	0.00	49,451.65	0.00	3.35	99.99
112	KBU TELECOMMUNICATIONS	1,193,030.00	112,063.66	728,480.80	0.00	464,549.20	61.06
113	POSTAGE	7,765.00	713.80	8,491.33	0.00	726.33	109.35
131	PRINTING AND PUBLISHING	45,377.00	4,725.93	34,794.95	0.00	10,582.05	76.68
136	TECHNOLOGY SUPPLY/SERVICE	1,695,277.00	3,506.12	1,276,796.16	91,410.20	327,070.64	80.71
137	ADVERTISING	17,633.00	255.36	8,345.36	0.00	9,287.64	47.33
138	ADVERTISING MEDIA	750.00	0.00	300.00	0.00	450.00	40.00
141	RENTAL OF EQUIPMENT	602,206.00	14,764.35	395,187.55	57,060.00	149,958.45	75.10
142	RENTAL OF LAND & BUILDINGS	250,516.00	0.00	227,794.00	0.00	22,722.00	90.93
143	RENTAL UNIFORMS	49,414.00	1,204.50	31,592.23	0.00	17,821.77	63.93
146	AUTOMOBILE & OTHER ALLOWANCES	16,406.00	238.14	6,955.71	0.00	9,450.29	42.40
147	UTILITIES	330,152.00	25,518.19	218,196.76	0.00	111,955.24	66.09
	TOTAL SERVICE FEES	4,257,981.00	162,990.05	2,986,386.50	148,470.20	1,123,124.30	73.62
	MAINTENANCE AND REPAIRS:						
150	M&R-AUTO/EQUIP-MOTORIZED-EXTERNAL	0.00	0.00	1,043.50	0.00	1,043.50	0.00
151	M&R-EQPT-NON-SELF-PROPELLE	6,047.00	277.31	9,724.40	0.00	3,677.40	160.81
152	M&R-EQPT-MOTORIZED	50,181.00	340.08	29,358.39	0.00	20,822.61	58.50
154	M&R-LAND & WATER AREAS	20,450.00	0.00	20,450.00	0.00	0.00	100.00
156	M&R-BUILDING RENOV & CONST	150,502.00	0.00	150,808.60	0.00	306.60	100.20
158	M&R-OTHER	13,950.00	0.00	6,896.61	0.00	7,053.39	49.44
	TOTAL MAINTENANCE AND REPAIRS	241,130.00	617.39	218,281.50	0.00	22,848.50	90.52
	TRAVEL, MEETINGS, & SCHOOLS:						
161	TRAVEL AND MEETINGS	65,748.88	86.63	11,774.58	0.00	53,974.30	17.91
163	EMPLOYEE REIM, TRAINING EXP	15,996.00	319.29	9,463.83	0.00	6,532.17	59.16
	0101 GENERAL FUND BUSINESS SUPPORT 310XX - CONSOLIDATED						
	0101 LVL A20 0031001						
	PERSONAL SERVICES:						
164	TRAINING CONF & MEETINGS	183,716.45	5,158.37	40,814.95	0.00	142,901.50	22.22
165	KBU RENTAL OF LAND & BLDGS	391,590.00	5,016.47	384,127.30	10,032.94	2,570.24	100.66
166	KBU M&R-LAND & WATER AREA	0.00	0.00	4,060.00	0.00	4,060.00	0.00
167	KBU M&R-COMMUNICATIONS	50,000.00	7,068.31	45,460.86	0.00	4,539.14	90.92
168	KBU M&R-BLDG RENOV & CONS	1,600.00	0.00	0.00	0.00	1,600.00	0.00
	TOTAL TRAVEL, MEETINGS, & SCHOOLS	708,651.33	7,332.33	495,701.52	10,032.94	202,916.87	71.37
	PROFESSIONAL FEES:						
170	PROFESSIONAL & TECH SRVCS	3,750.00	0.00	55.00	0.00	3,695.00	1.47
173	PROF FEES-MANAGEMENT	0.00	0.00	59.83	0.00	59.83	300.00
176	PROF FEES-TEMPORARY HELP	19,307.00	300.00	600.00	0.00	18,707.00	3.11
177	PROF FEES-CONTRACT MAINT SERVICES	4,157,692.80	186,760.39	1,848,767.23	392,277.51	1,916,648.06	53.90
179	PROF FEES-OTHER	24,286.00	1,475.68	32,223.26	0.00	7,937.26	132.68
	TOTAL PROFESSIONAL FEES	4,205,035.80	188,536.07	1,881,705.32	392,277.51	1,931,052.97	54.08

BSS/IT Performance Dashboard

Weekly Hours/KBU					
KBU	Week 27	Week 28	Week 29	Week 30	Week 31
Enterprise W..	4	1,013	1,100	799	1,020
Business Su..	438	260	237	658	238
Finance		271	292	190	245
HR	1	165	167	135	168
City Manage..		157	116	99	154
CDOT		53	68	41	69
Solid Waste ..		33	42	86	64
Utilities		41	81	23	57
CATS		49	25	43	45
	0 1500	0 1500	0 1500	0 1500	0 1500
	Total Hours	Total Hours	Total Hours	Total Hours	Total Hours

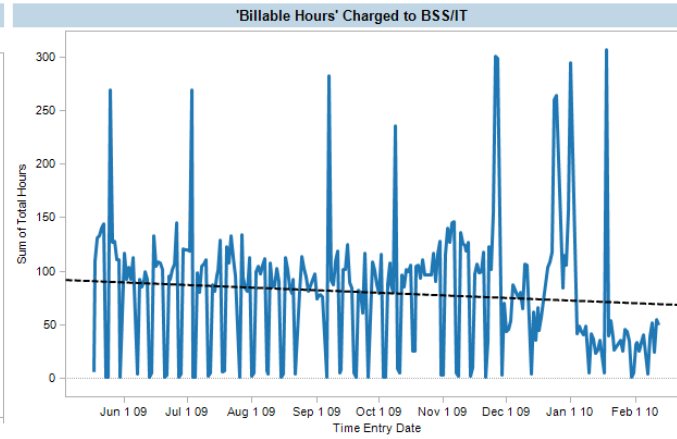
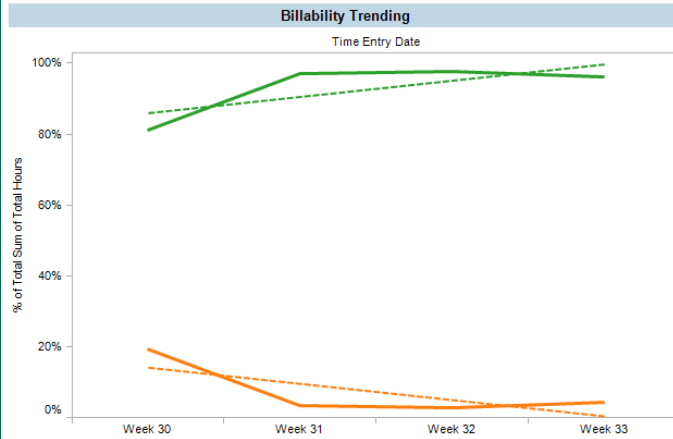


- KBU**
- Enterprise Wide Support
 - Business Support Services
 - Finance
 - City Manager's Office
 - HR
 - CFD
 - CATS
 - Utilities
 - CDOT
 - CMPD
 - Engineering
 - Solid Waste Services
 - Mecklenburg County
 - Neighborhood Business Servic.
 - Aviation
 - City Clerk
 - Budget
 - Planning
 - City Attorney

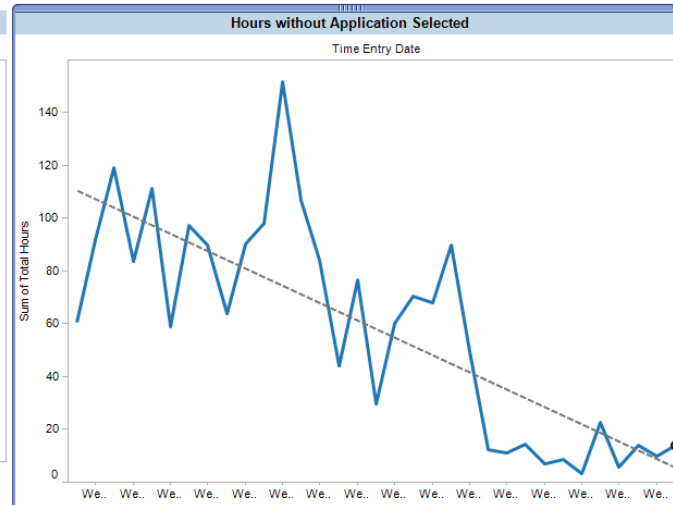
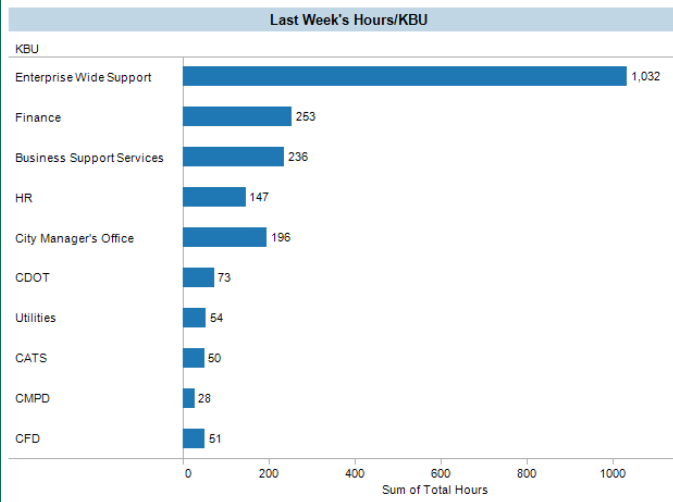


As of Date
January 29, 2010

Time Entry QC Dashboard



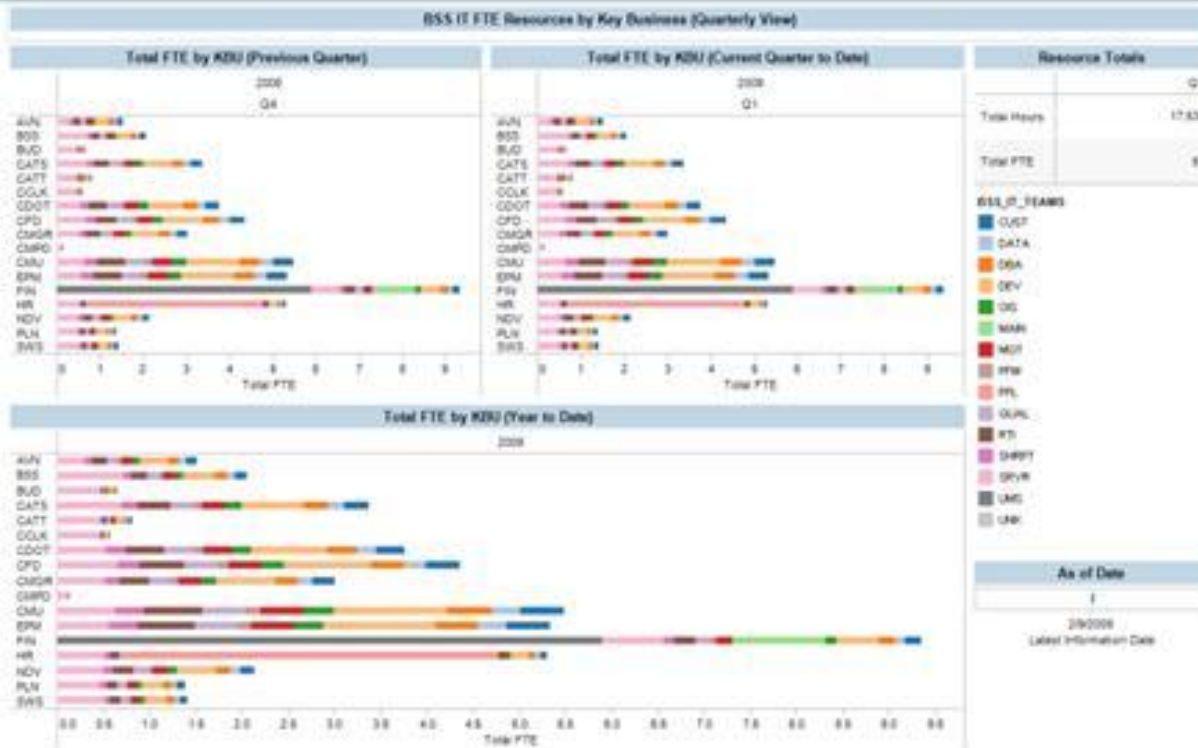
- Color
- Workgroup Name
- (All)
 - IT Administration
 - IT Client Support
 - IT Compatibility and Technology Intr...
 - IT Customer Experience Management
 - IT Customer Service Systems
 - IT Data Administration
 - IT DBA
 - IT Operations
 - IT Process and QA
 - IT Project Portfolio Management Offl...
 - IT Service Improvement
 - IT Sharepoint Technology
 - IT Voice and Data Communications



As of Date
February 12, 2010



ALL KBU's

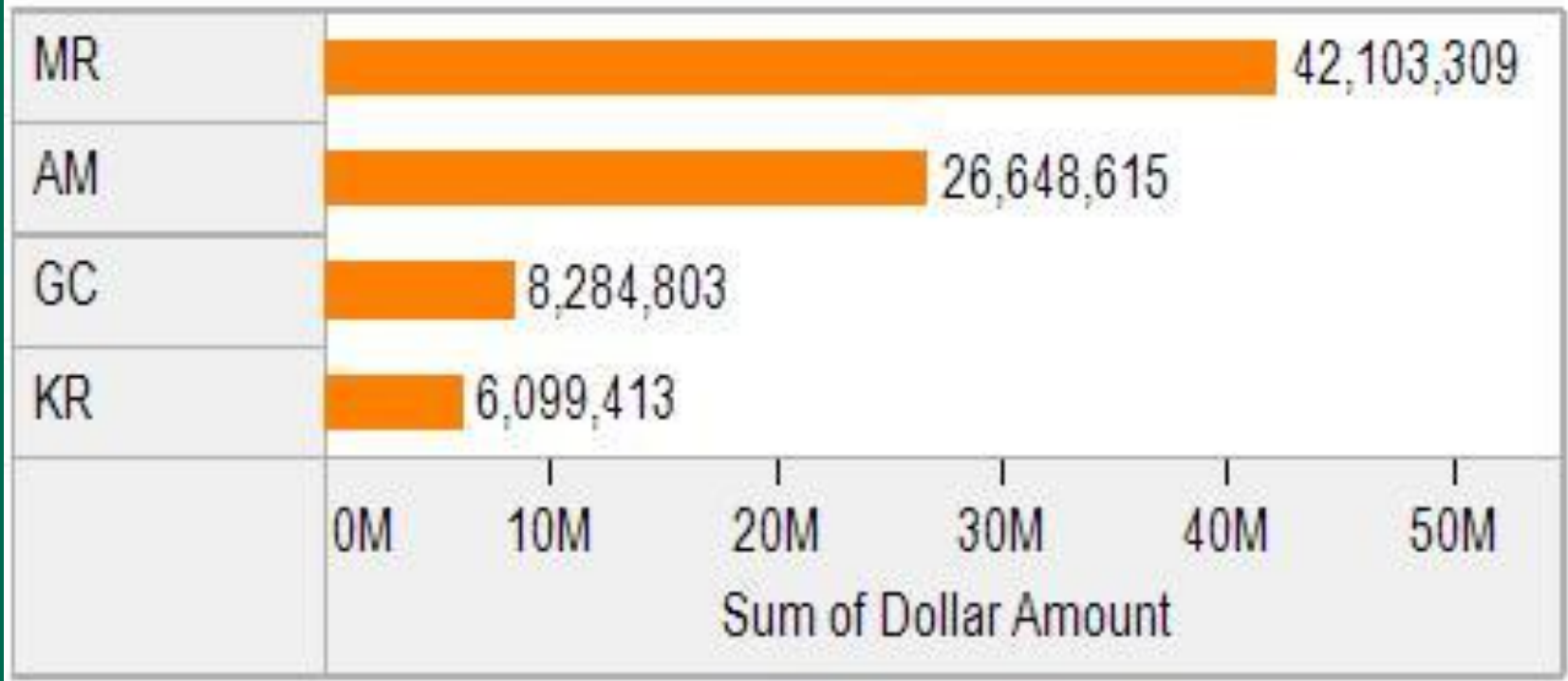


IT Metrics Pages

- Name
- [Metrics Home](#)
- [Exchange Metrics](#)
- [IT Dashboards](#)
- [IT Resources](#)
- [IT Resources Team](#)
- [IT Resources FTE Quarterly](#)
- [IT Resources Hours Quarterly](#)
- [IT Support AVN](#)
- [IT Support BSS](#)
- [IT Support BUD](#)
- [IT Support CATS](#)
- [IT Support CATT](#)
- [IT Support CCLX](#)
- [IT Support CDOT](#)
- [IT Support CFO](#)
- [IT Support CMGR](#)
- [IT Support CMPO](#)
- [IT Support CMU](#)
- [IT Support EPM](#)
- [IT Support FDI](#)
- [IT Support HR](#)
- [IT Support NDV](#)
- [IT Support PLN](#)
- [IT Support SWS](#)
- [Service Desk Metrics](#)
- [SLA Metrics](#)

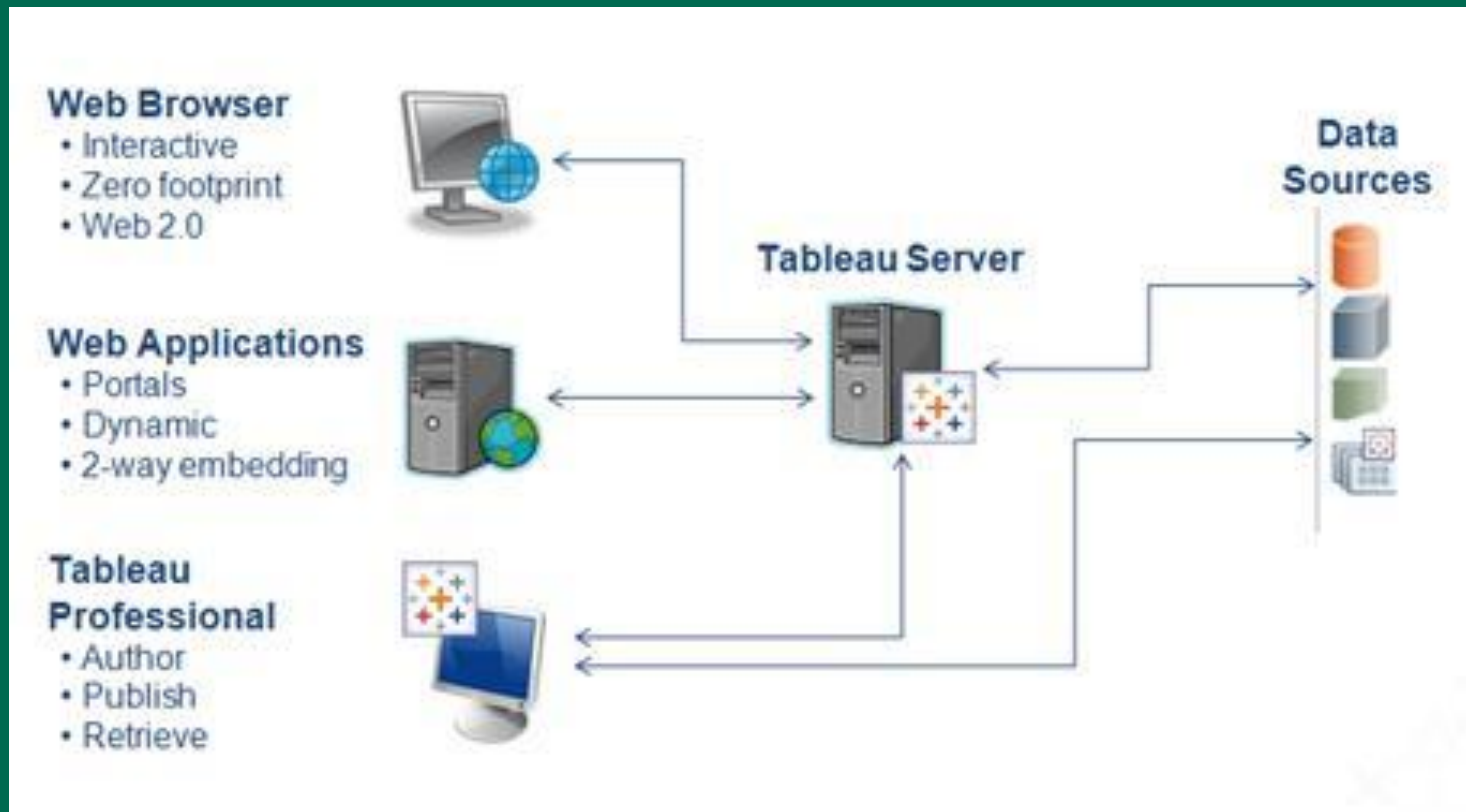


Total PO Value by Agent





Web Delivery of Results



- Business Managers need clear, timely information
- BI Tools are broader and deeper
- Incorporation into standard business practice is

Lacking

BI Project Schedule

Calendar Year Quarter	2006		2007				2008		09		
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Phase 1 BSS Use											
Product Evaluation	→										
Add Purchasing Dept				→							
BSS Use Expansion					→						
Phase 2 Demand and Delivery Model											
Tableau Server								→			
Olympiad Planning							→				
Olympiad Event										◆	
Phase 3 Expansion											
Early Adopters											→

- BI Expansion Required Management Culture Shift
- Normal excuses for Change
 - ‘Everyone is too busy’
 - ‘Nothing in the Budget for this year’
- Precursors of Success
 - Senior Management buy in and groundswell of interest
 - Commitment of business, university and vendor
 - Something in it for the business
 - Something in it for the participants
 - Communications

- Joint partnership with:
 - University of North Carolina – Charlotte
 - Tableau Software
 - Charlotte’s Business Support Services / IT
- Analysts in all 14 Key Business Units Invited
- Support to Olympiad
 - Tableau furnished Teams loaner licenses
 - IT provided tool and best practices training
 - UNCC and IT crafted the problem set and judging criteria
- Prizes:
 - IT supplied winning teams with Tableau Licenses
 - Tableau funded ‘dinners for two’ at local steak house for winning team



Don't Wait Too Late to Analyze Your Business!



City of Charlotte Business Analysis Olympiad

Collaborate! Learn Visual Analysis! Have Fun! Win Prizes!

Show Your Analysts a Way to Work Smarter!

- Data Set Criteria
 - Senior Management
 - Non-controversial
 - Business neutral
 - Contest Team
 - Interesting
 - Illustrative of the value of Visualization
 - Show real world impact
 - Room for innovation by teams
- Titanic Decision



HYDROGRAPHIC OFFICE,
WASHINGTON, D. C.

DAILY MEMORANDUM

M-8.

No. 1013.

April 15, 1912.

N O R T H A T L A N T I C O C E A N

OBSTRUCTIONS OFF THE AMERICAN COAST.

Mar. 28 - Lat 24° 20', lon 80° 02', passed a broken spar projecting about 3 feet out of water, apparently attached to sunken wreckage.--EVELYN (SS) Wright.

OBSTRUCTIONS ALONG THE OVER-SEA ROUTES.

Apr 7 - Lat 35° 20', lon 59° 40', saw a lowermast covered with marine growth.--ADRIATICO (It. ss), Cevascu.

ICE REPORTS.

Apr 7 - Lat 45° 10', lon 56° 40', ran into a strip of field ice about 3 or 4 miles wide extending north and south as far as could be seen. Some very heavy pans were seen.--ROSAJIND (Br ss), Williams.

Apr 10 - Lat 41° 50', lon 50° 25', passed a large ice field a few hundred feet wide and 15 miles long extending in a NNE direction.--EXCELSION (Ger ss). (New York Herald)

COLLISION WITH ICEBERG - Apr 14 - Lat 41° 46', lon 50° 14', the British steamer TITANIC collided with an iceberg seriously damaging her bow; extent not definitely known.

Apr 14 - The German steamer AMERIKA reported by radio telegraph passing two large icebergs in lat 41° 27', lon 50° 08',--TITANIC (Br ss).

Apr 14 - Lat 42° 06', lon 49° 43', encountered extensive field ice and saw seven icebergs of considerable size.--PISA (Ger ss).

J. J. K N A P P

Captain, U. S. Navy.



Titanic Iceberg (Wikipedia)

THE TITANIC SINKS WITH 1,800 ON BOARD; ONLY 675, MOSTLY WOMEN AND CHILDREN, SAVED



MOST APPALLING DISASTER IN MARINE HISTORY OCCURS WHEN WORLD'S LARGEST STEAMSHIP STRIKES GIGANTIC ICEBERG AT NIGHT

Scores of World's Most Widely Known Persons, Including Colonel John Jacob Astor and His Wife, William T. Stead and Isidor Straus Among Those Whose Fate Is in Doubt.

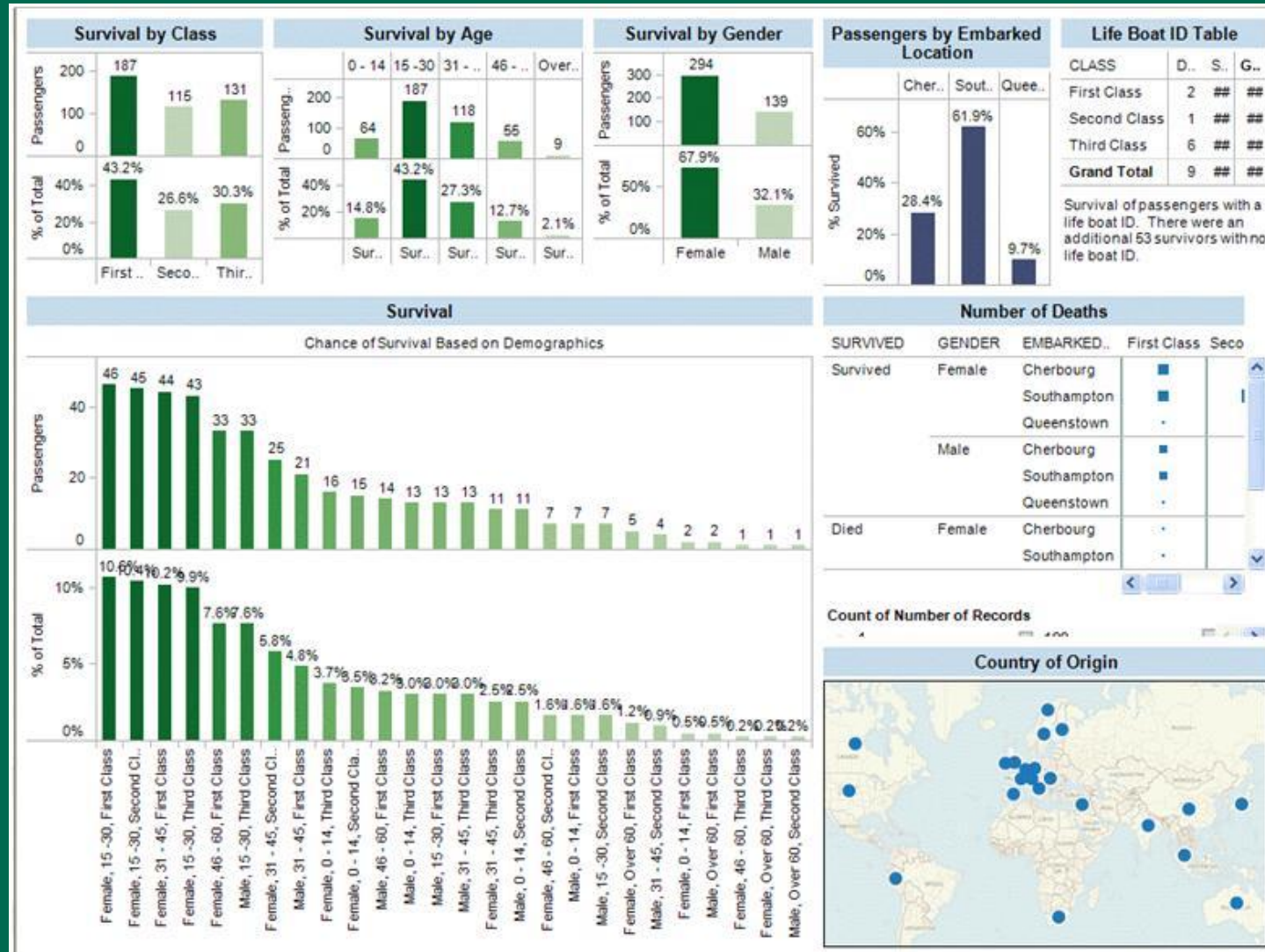
The Captain's Statement



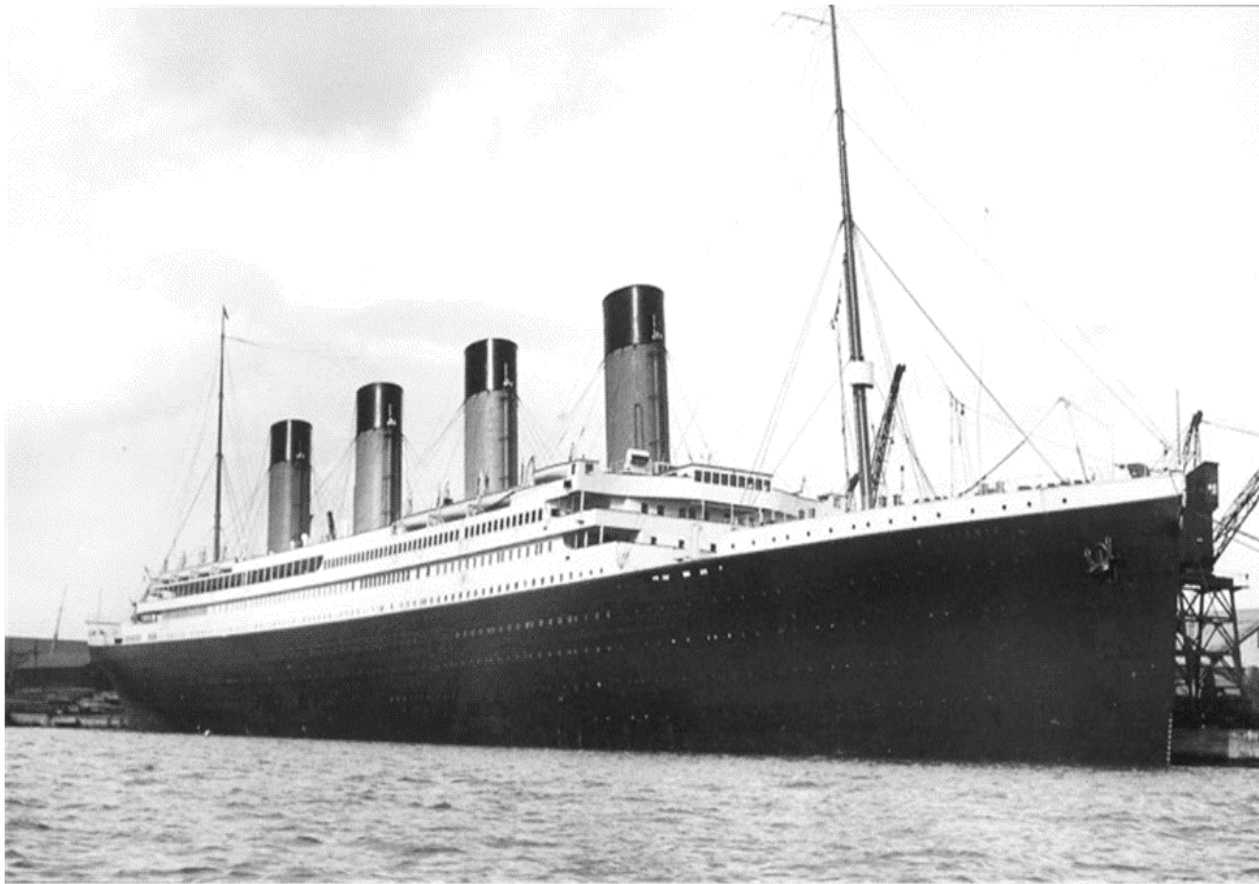
News Release (Titanic Nautical Society and Resource Center / Wikipedia)

- Titanic Passenger List
 - Open Source File
 - Used in a UNCC graduate visual analytics class
 - Cleaned and spatially enhanced
 - Emailed to participants after orientation class
- The Challenge
 - Four business questions
 - One day to research, prepare, and deliver product
 - Five minutes to present results to judges

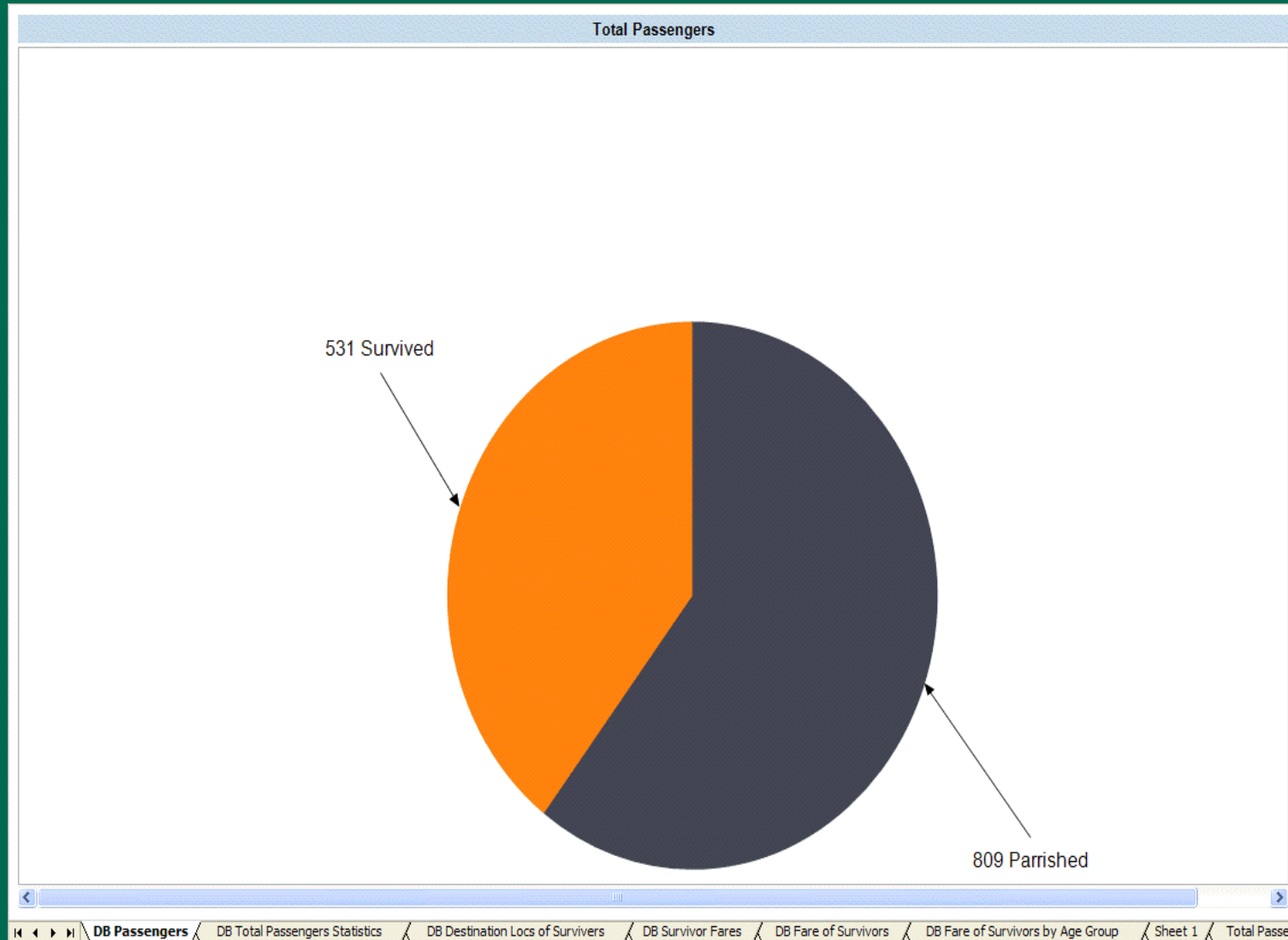
Seven Business Groups
Twelve Teams
Acclaimed Presentations!



CDOT - Safety Dudes

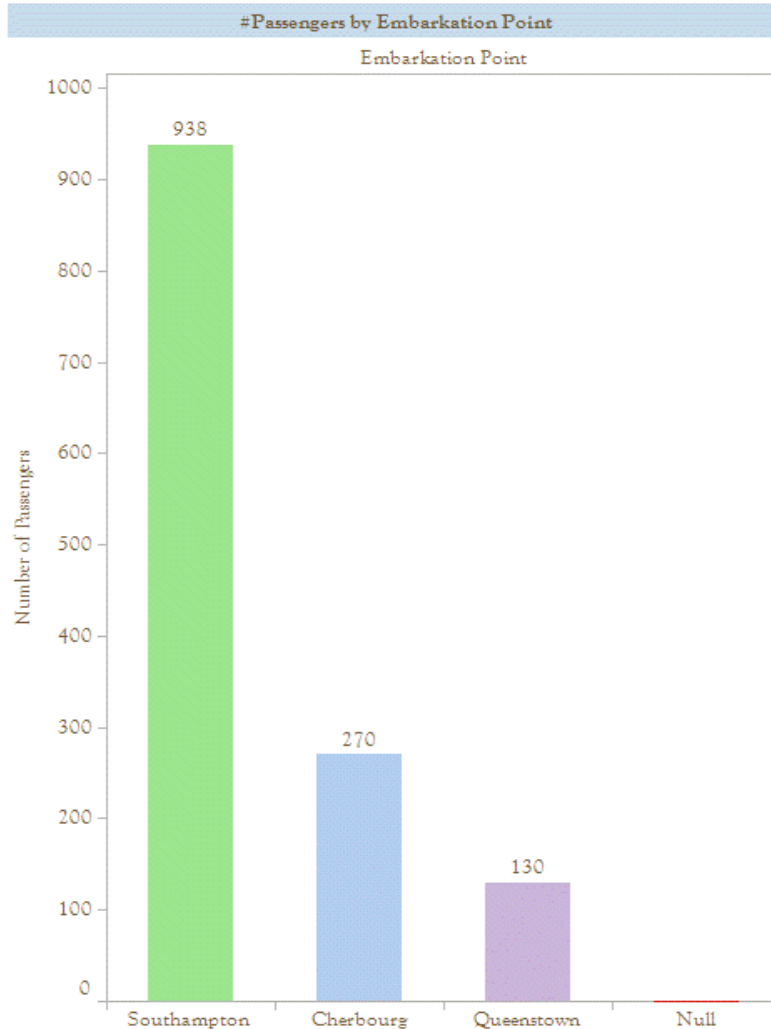


E&PM - Raging Rapids





Introduction



RMS TITANIC Ship of Dreams

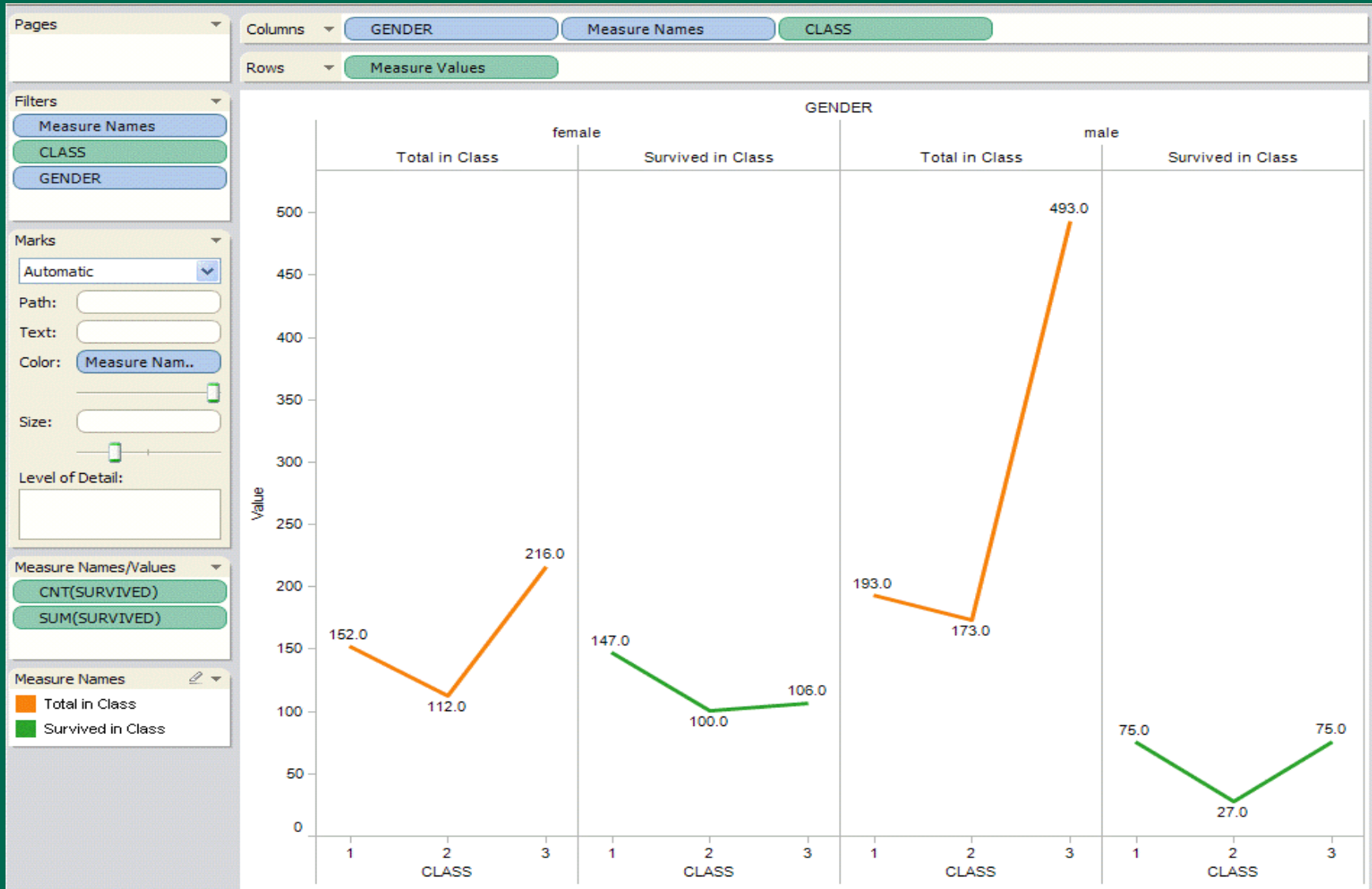
[1. How it Began](#) [2. Construction](#) [3. I](#)

[6. British Enquiry](#) [7. Discovery](#) [8](#)

[11. Shop](#) [12. Mummy on board](#) [1](#)

Next - ALL THINGS TITANIC

CATS - Team Lynx

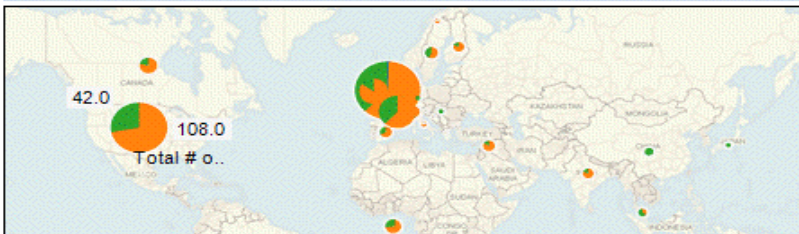


EDO - Mining Howlers

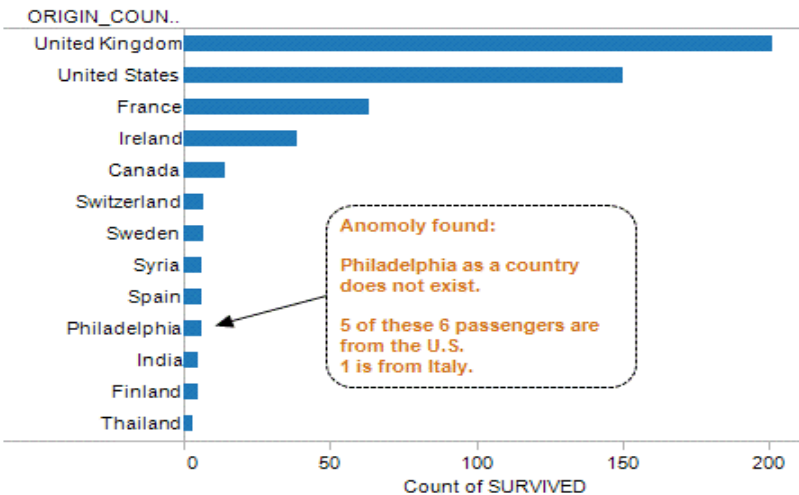
Survivors by Country Map



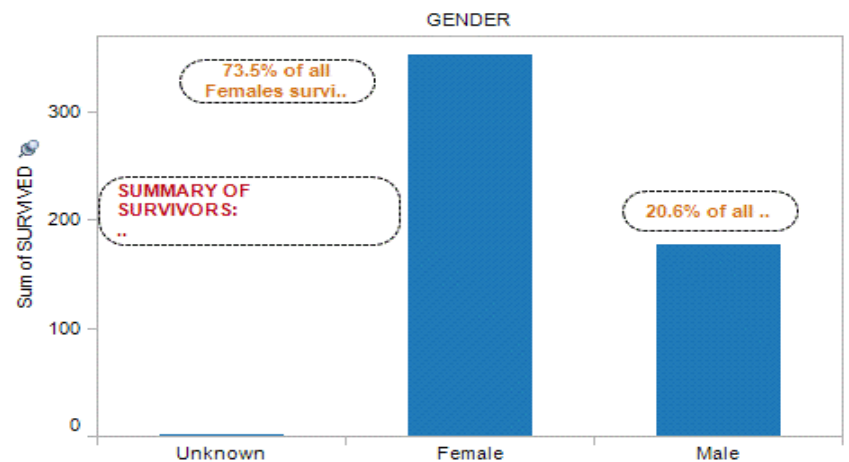
Survivors by Gender by Country



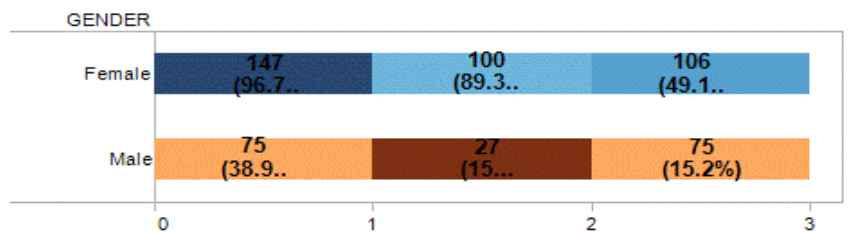
Survivors by Country



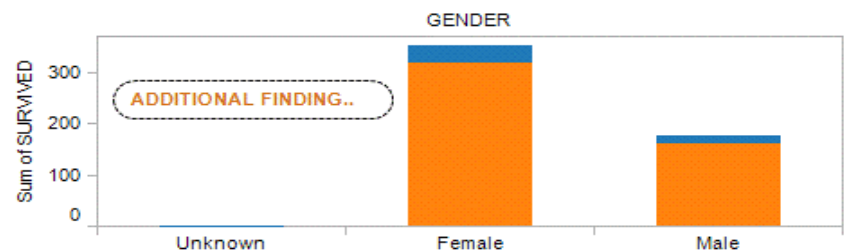
Survivors by Gender



Survivors by Class



Survivors in Lifeboat

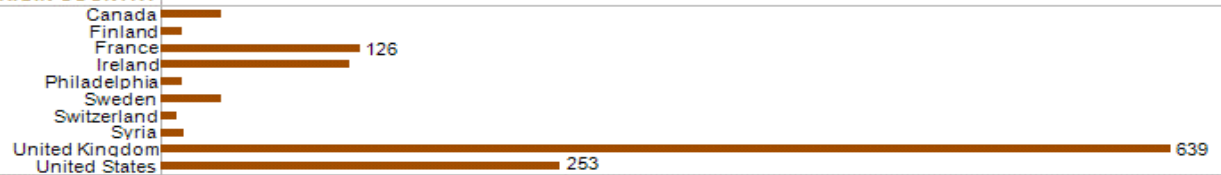




Titanic Passengers by Country of Origin



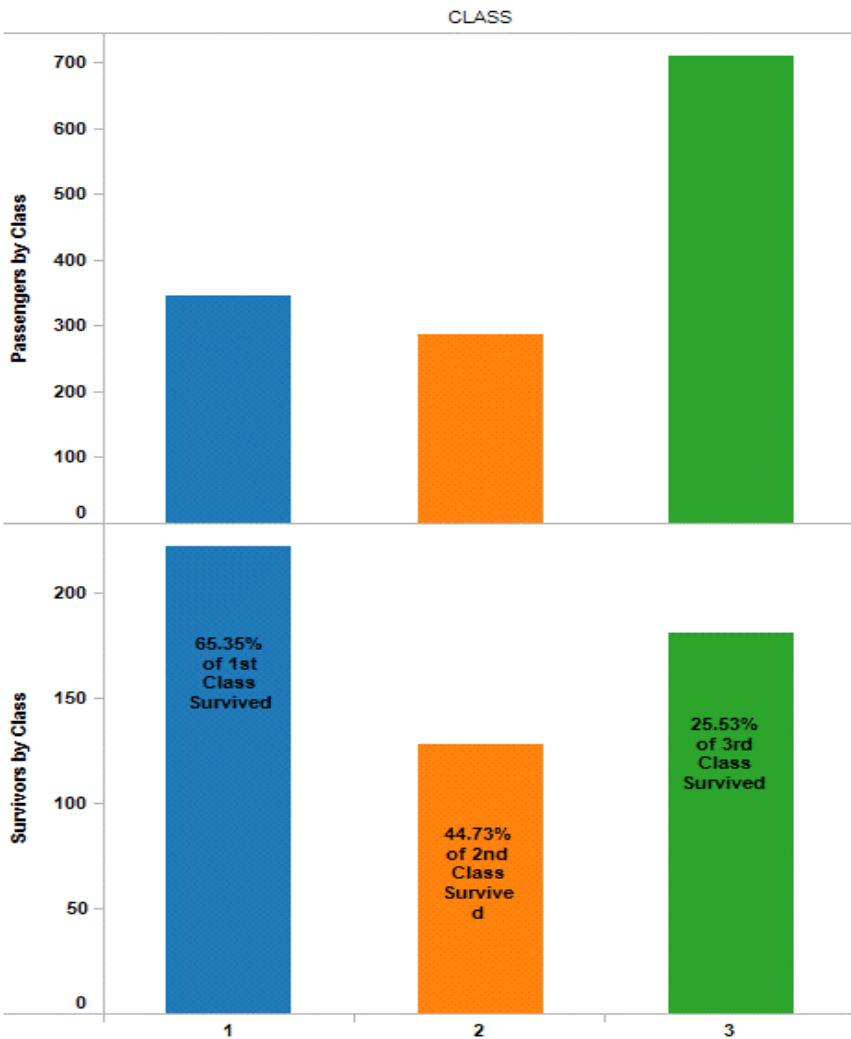
ORIGIN COUNTRY



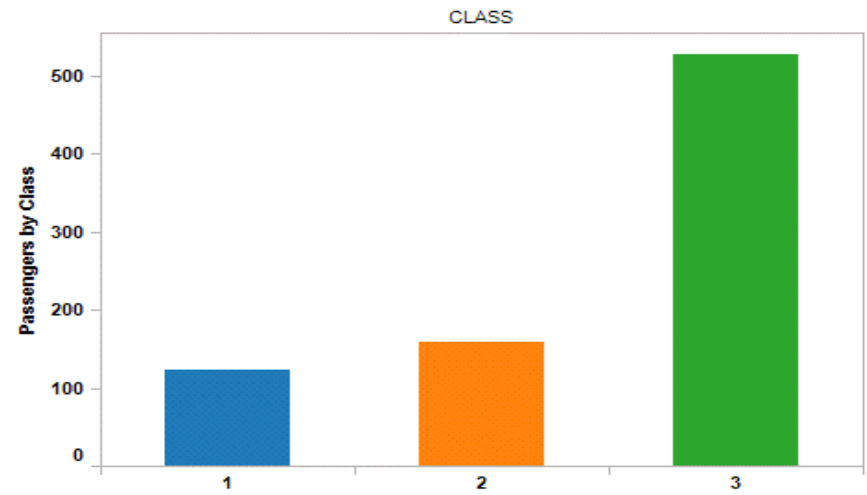
Number of Passengers

CFD - Fire's Dynamic Duo

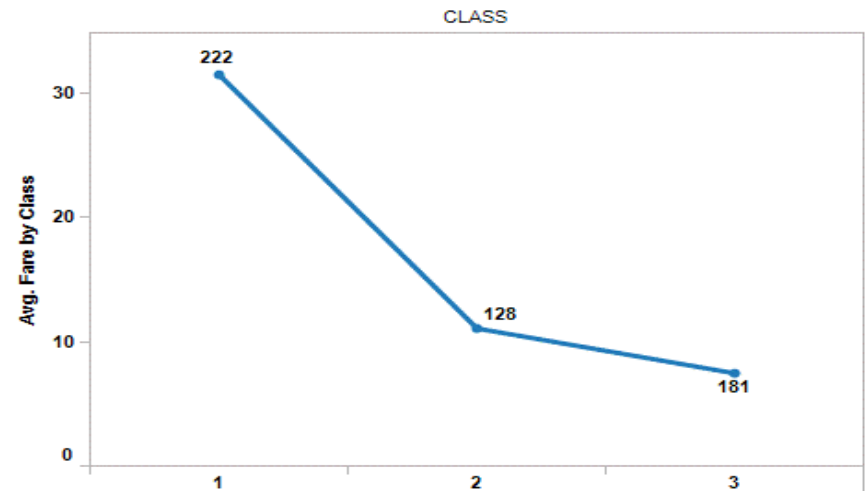
Comparison of Passenger by Class vs. Survivors by Class

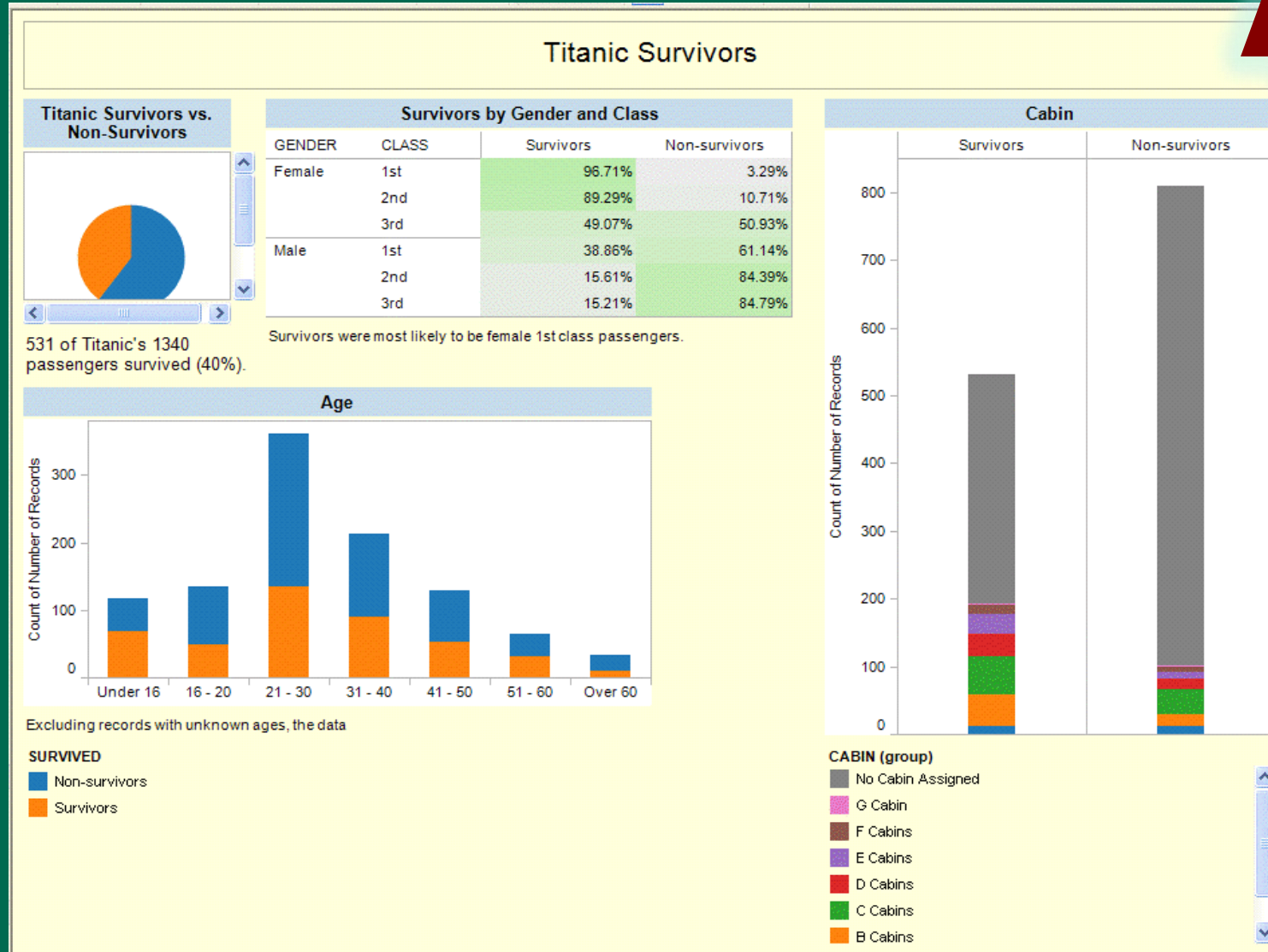


Comparison of Passengers by Class vs. Non-Survivors by Class



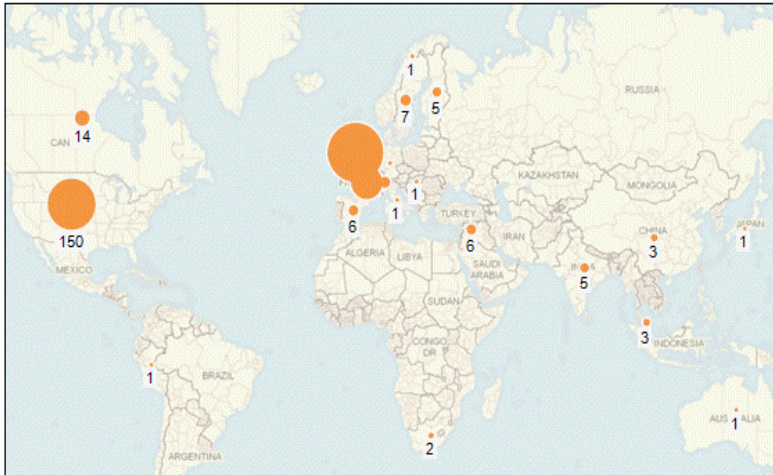
Return on Investment by Class







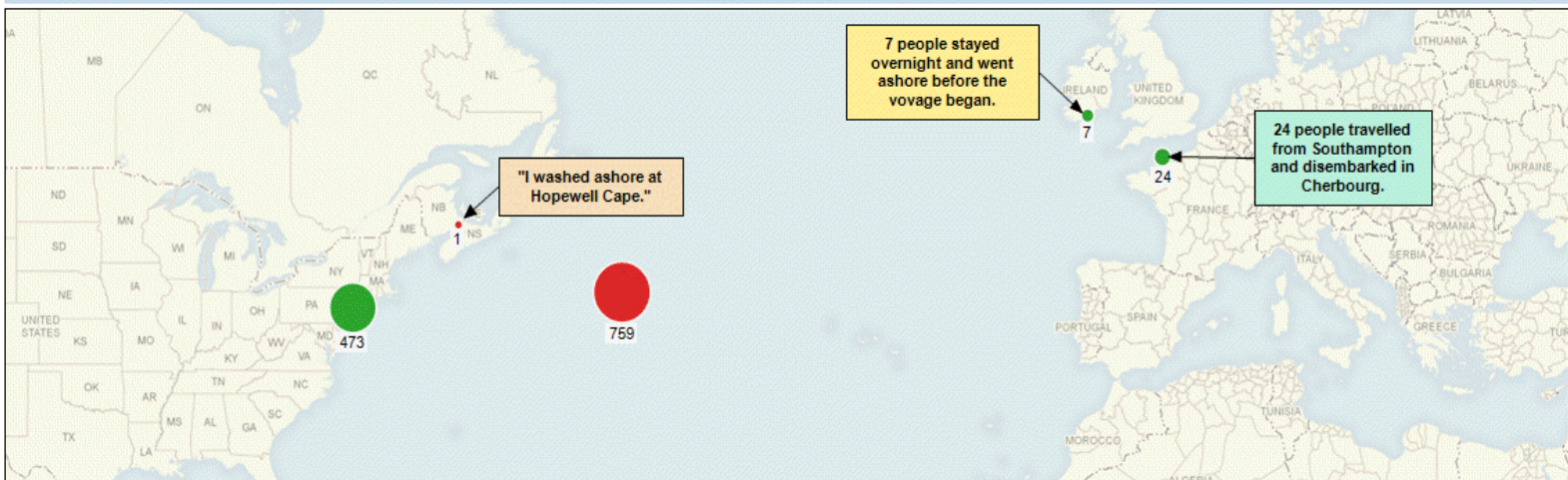
Origin Country

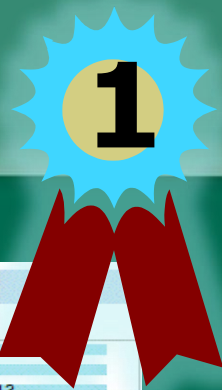


Destination Country

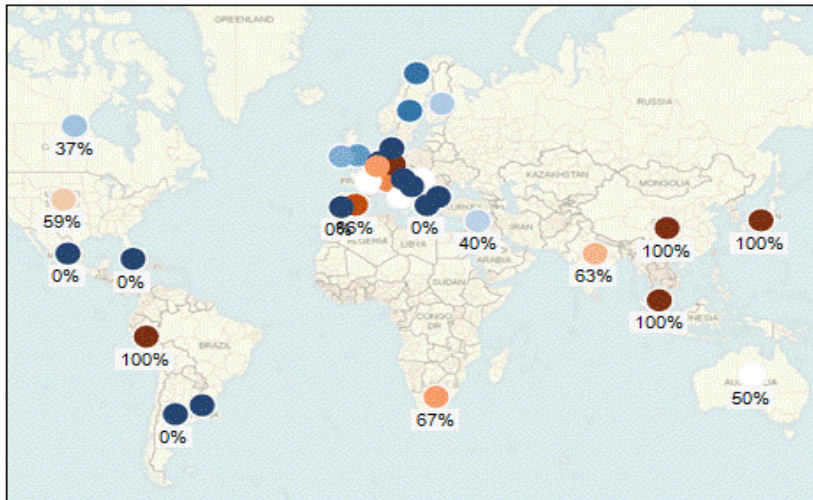


Last Known Location

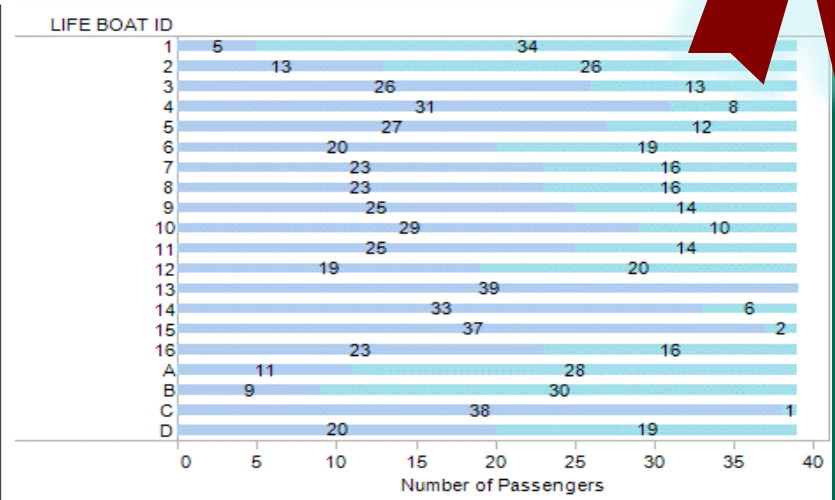




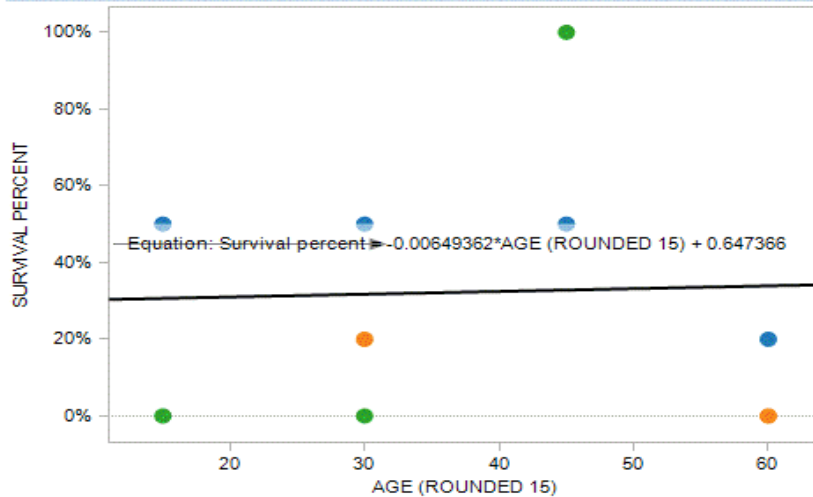
SURVIVAL PERCENTAGE BY COUNTRY OF ORIGIN



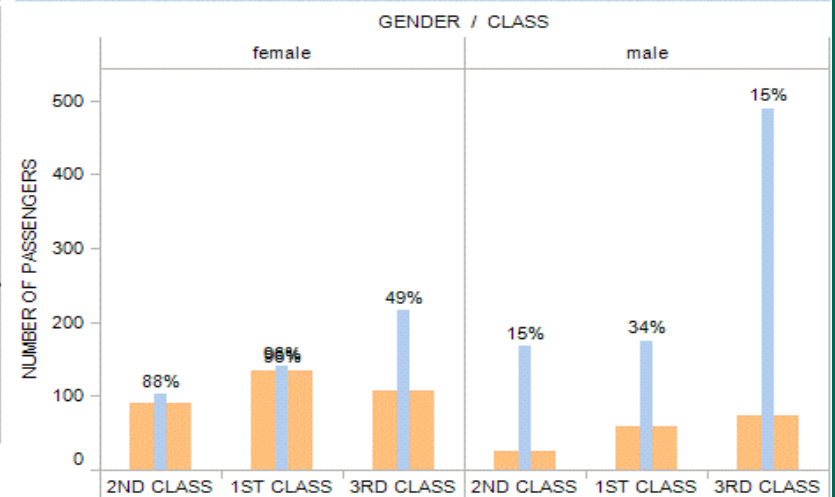
AVAILABLE AND OCCUPIED LIFEBOAT SEATS



CORRELATION BETWEEN SURVIVAL RATE AND AGE



TOTAL AND SURVIVED VS GENDER AND CLASS



Participants



- Visual Analytics use grown from 1 to 7 business units
 - Office of the City Manager
 - CATS
 - CDOT
 - Engineering
 - Planning
 - Solid Waste Services
 - Business Support Services (initial adopter)
- Concurrent with the economic crisis, business managers had the tools at hand to effectively plan soft landings

- Senior Management more aware of level of analytical talent in the businesses
- Business executives found ways to work smarter
- Analysts have formed their own Business Intelligence Community (BIC) which meets monthly
- Good model for other agencies to follow



BIC 2010

Register Online at: <http://cityspaces/communities/bic>
Participants must register by September 30th

For more information Contact: [Katie Templeton \(ktempleton@charlottenc.gov\)](mailto:ktempleton@charlottenc.gov)

Jim Raper
Manager

Data Administration

Charlotte Mecklenburg Government Center - 437

600 East 4th Street

Charlotte, North Carolina 28202

jraper@ci.charlotte.nc.us

Telephone 704-336-8068