DS501: Business Intelligence

Hi!

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Announcements

- Presentations today for Case study 1!
- Case study 2 out next week.

Learning objectives for today

- Our main focus will be on the discussion of case studies and business examples to provide context for business decision makers. These will include:

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Learning objectives for today

• We will define several terms used in the BI domain including:

- ETL
- OLAP
- OLTP
- SCM
- ERP
- DSS
- ROI
- KPP
- KPI
- CRM
- BPM
- Etc.

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Definition

Improve processes
Forecasting demand

What do you think Business Intelligence is?

Supplies - which is better
how are your customers
who are your users
snapshot in time of
company Help Decision
makers make
decisions

Definition

Business Intelligence is a user-oriented process of gathering, exploring, interpreting and analyzing of data, which leads to the streamlining and rationalization of the *decision-making* process. Those systems support managers in business *decision-making* in order to create economy value growth of an enterprise.

- Business Intelligence: Making Decisions through Data Analytics

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Making ideas precise: BI vs CI vs BA

Sometimes the words BI, Competitive Intelligence (CI) and Business Analytics (BA) are used in overlapping and perhaps confusing ways. For me:

- Business Intelligence is the overall discipline that is focused on using data for decision making.
- Competitive Intelligence is the sub-discipline that focuses on gathering information about competitors.
- Business Analytics is more focused on statistics for explaining and predicting data.

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http://en.wikipedia.org/wiki/Business_intelligence

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Our three main topics for each case study

- To keep things simple, we will focus on three important parts of business intelligence.
  - Measurements and data gathering
  - Data analysis and exploration
  - Distribution, reporting and data visualization.
- In particular, we will show how different types of businesses go through these stages and make business decisions.

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To know where you are going you need to know where you have been…

A short history of business intelligence (BI)

- Definitely not a new idea!
- Term was originally coined in 1865 by Richard Miller Devens.
  - In some ways the questions were the same even back then, though the methods we use to answer them are perhaps much different now.
- It was also used in 1958 by IBM researcher Hans Peter Luhn in his paper “A Business Intelligence System”.
  - This paper talked a lot about document systems.
- The development of decision support systems (DSS) started in the 1960s.
  - Computer-aided models created to assist in decision making.

http://en.wikipedia.org/wiki/Business_intelligence

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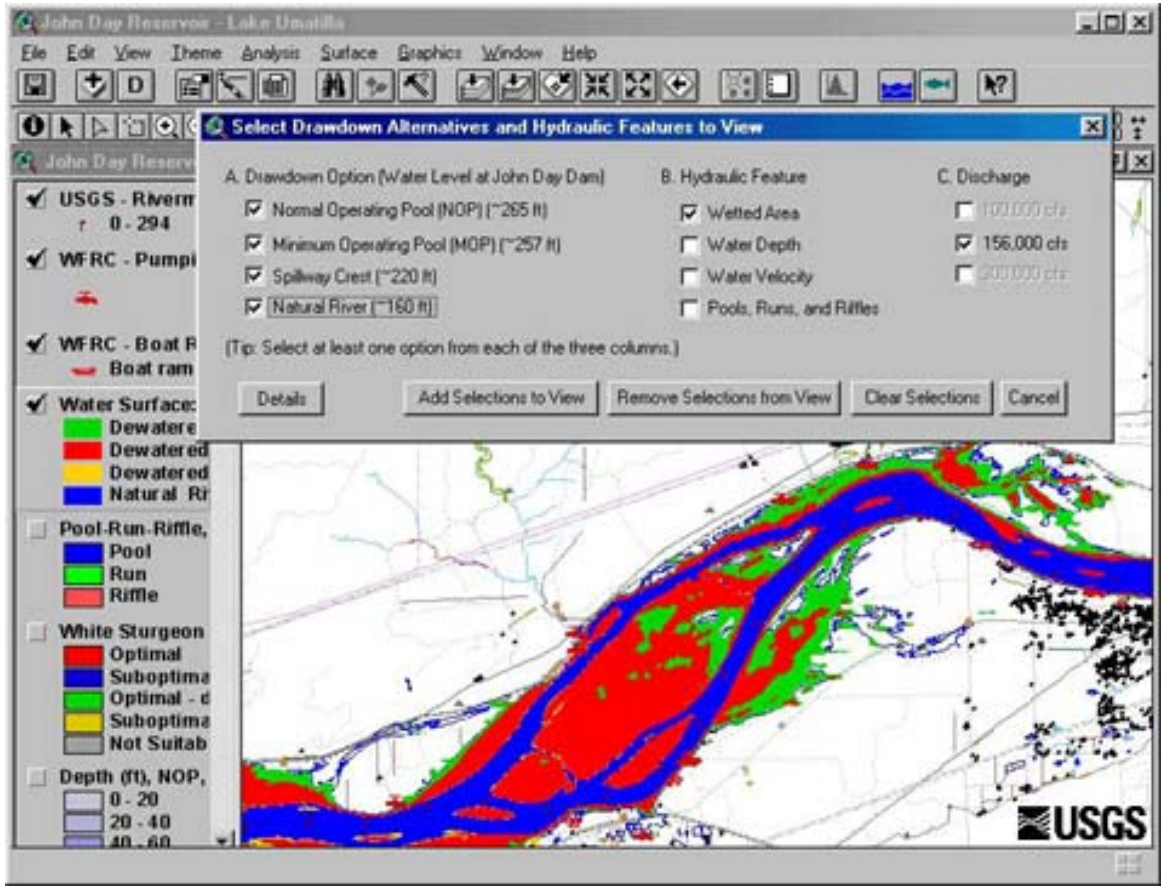
Example of a DSS



"Decision Support System for John Day Reservoir" by USGS: Project contact Michael J. Parsley, U.S. Geological Survey - http://wfrc.usgs.gov/research/geospatial%20studies/STGeospat4.htm. Licensed under Public domain via Wikimedia Commons - http://commons.wikimedia.org/wiki/File:Decision_Support_System_for_John_Day_Reservoir.jpg#mediaviewer/File:Decision_Support_System_for_John_Day_Reservoir.jpg

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Small case study: The humble apple pie seller!

- Business statistics
  - Number of stores: 1
  - Number of employees: 2
  - Yearly revenue: Too embarrassed to say…
- Let's start with one simple question…
  - How many apple pies should I make today?

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How many pies to make? Expectations

- Measurements and data gathering

Yester Day - How many sales?

weather - snow

user trends

Holidays competitors
- lower price
- higher quality
- niche

customers - demographic

Location advertisement word of mouth

supply cost of Apples

Promotion

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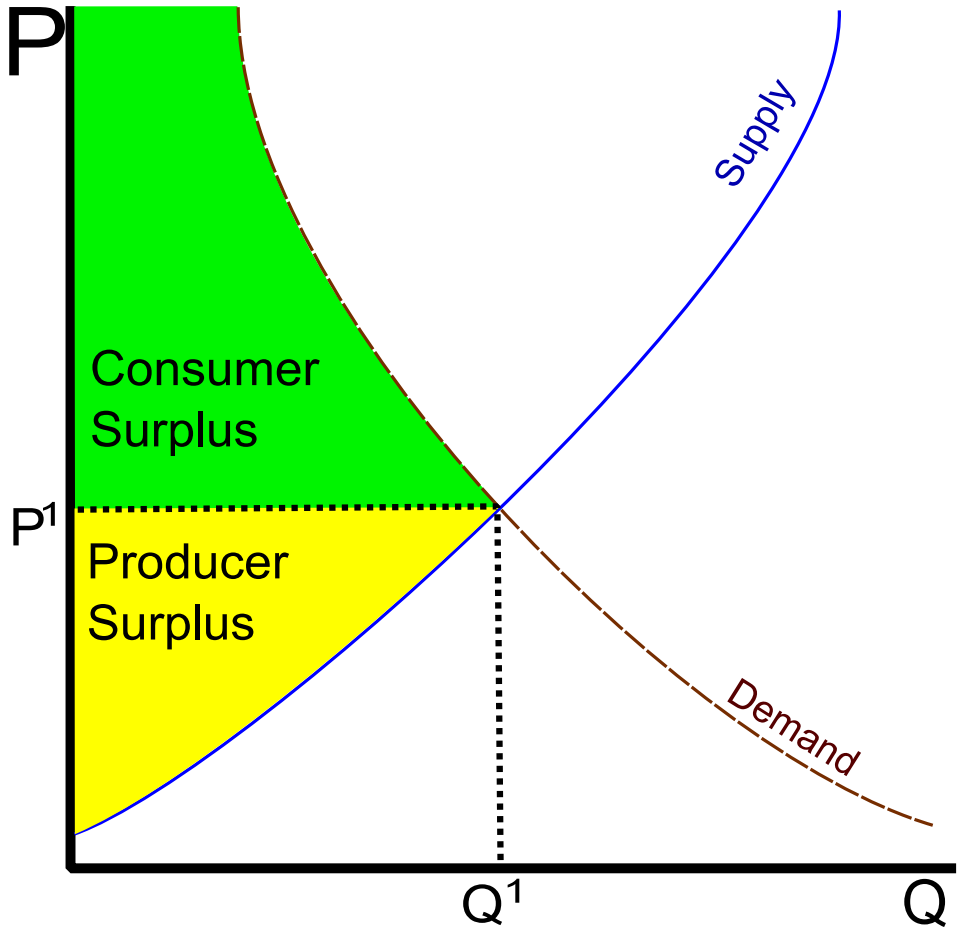
Supply and demand



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Even with such a simple business there are interesting questions: Metadata

- Data about data
- *Metadata assists in resource discovery by "allowing resources to be found by relevant criteria, identifying resources, bringing similar resources together, distinguishing dissimilar resources, and giving location information."* -National Information Standards Organization; Rebecca Guenther and Jaqueline Radebaugh (2004). . Bethesda, MD: NISO Press. .

http://en.wikipedia.org/wiki/Metadata

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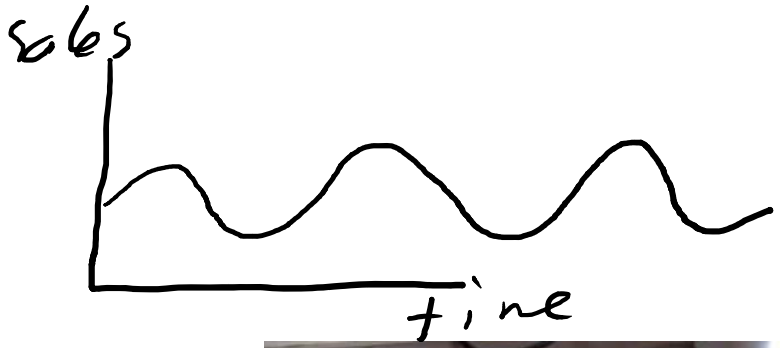
How many pies to make?



- Data analysis and exploration

explore

profitusing

PCA

Regression

Plotting

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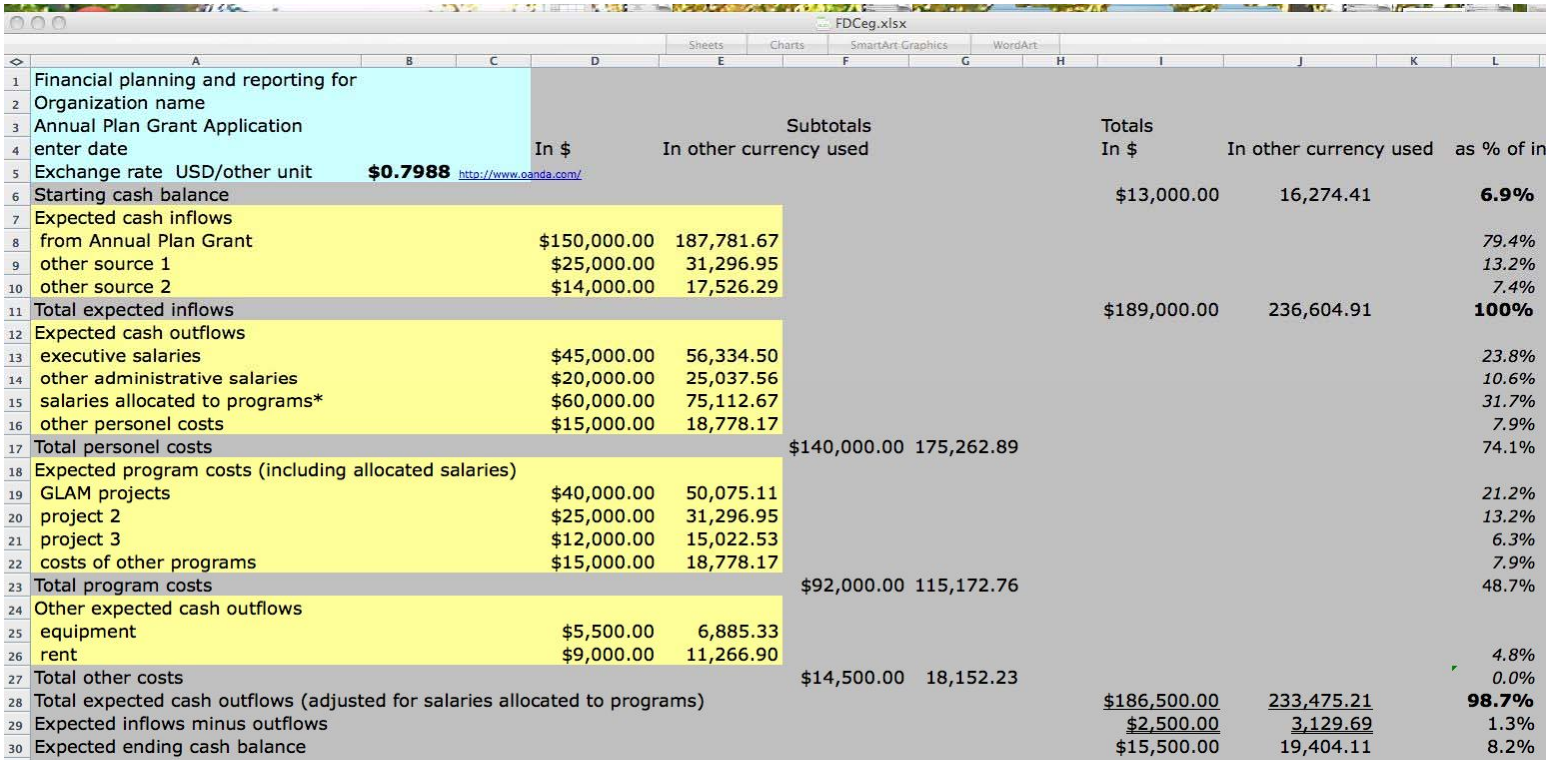
comparing products

prediction

Where to analyze the data? Excel



FDCeg.xlsx

1	Financial planning and reporting for										
2	Organization name										
3	Annual Plan Grant Application				Subtotals			Totals			
4	enter date		In $	In other currency used				In $	In other currency used		as % of in
5	Exchange rate USD/other unit	**$0.7988** http://www.oanda.com/									
6	Starting cash balance							$13,000.00	16,274.41		**6.9%**
7	Expected cash inflows										
8	from Annual Plan Grant		$150,000.00	187,781.67							*79.4%*
9	other source 1		$25,000.00	31,296.95							*13.2%*
10	other source 2		$14,000.00	17,526.29							*7.4%*
11	Total expected inflows							$189,000.00	236,604.91		**100%**
12	Expected cash outflows										
13	executive salaries		$45,000.00	56,334.50							*23.8%*
14	other administrative salaries		$20,000.00	25,037.56							*10.6%*
15	salaries allocated to programs*		$60,000.00	75,112.67							*31.7%*
16	other personel costs		$15,000.00	18,778.17							*7.9%*
17	Total personel costs				$140,000.00	175,262.89					74.1%
18	Expected program costs (including allocated salaries)										
19	GLAM projects		$40,000.00	50,075.11							*21.2%*
20	project 2		$25,000.00	31,296.95							*13.2%*
21	project 3		$12,000.00	15,022.53							*6.3%*
22	costs of other programs		$15,000.00	18,778.17							*7.9%*
23	Total program costs				$92,000.00	115,172.76					48.7%
24	Other expected cash outflows										
25	equipment		$5,500.00	6,885.33							
26	rent		$9,000.00	11,266.90							*4.8%*
27	Total other costs				$14,500.00	18,152.23					*0.0%*
28	Total expected cash outflows (adjusted for salaries allocated to programs)							$186,500.00	233,475.21		**98.7%**
29	Expected inflows minus outflows							$2,500.00	3,129.69		1.3%
30	Expected ending cash balance							$15,500.00	19,404.11		8.2%

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How many pies to make?

- Distribution, reporting and data visualization

prediction
present Results
simple
pictures & graphs
EASY

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Middle case study

•Business statistics

•Number of stores: None (online)
•Number of employees: ~2000 (full and part time)
•Yearly revenue: $4.37 billion (2013)
•Subscribers: More than 50 million (2014)

•Business question

•What should be the next original content I produce?

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Best practices for successful BI

- Get buy-in from management
  - Senior management needs to believe in and sponsor any BI initiative, for it to be successful.
  - You can provide all the data and beautiful insights you want, but it's all for naught if management ignores it.
- Business needs
  - Identify how your business can benefit from BI.
  - Perhaps it can't? (though I will guess that if you look hard enough it can… now you need to convince others!)
- Access to data
  - Without this the whole enterprise falls flat on its face.
  - You can't do Data Science without data!

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Some important terms

ROI: Return on investment

Pay $10 to earn $100 ✓ ☺

Pay $10 to earn $9 ☹

KPI: Key performance indicator

$ profit

Subscribers

customer satisfaction rating

hours of video watched

What original content should I make?

- Measurements and data gathering