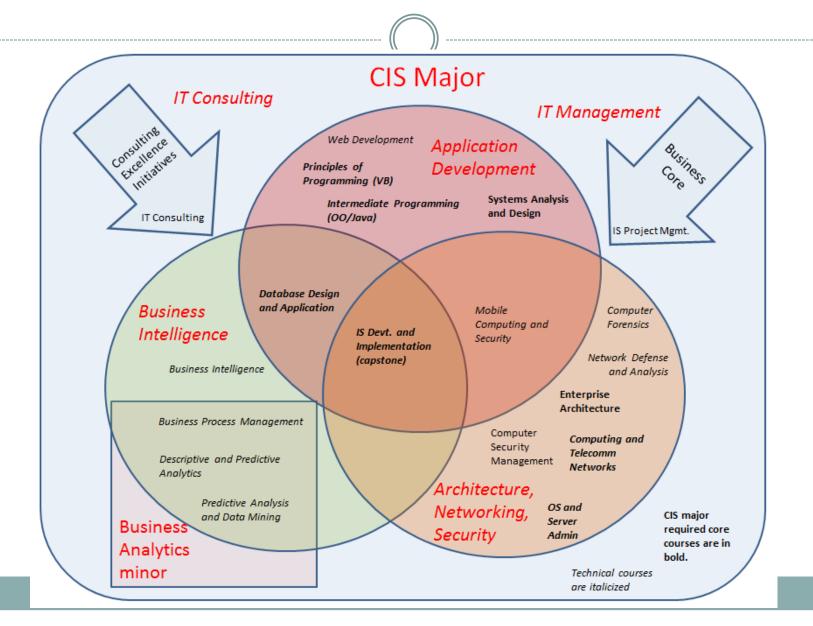
Business Intelligence at JMU CIS&BSAN Programs

CIS&BSAN Curriculum

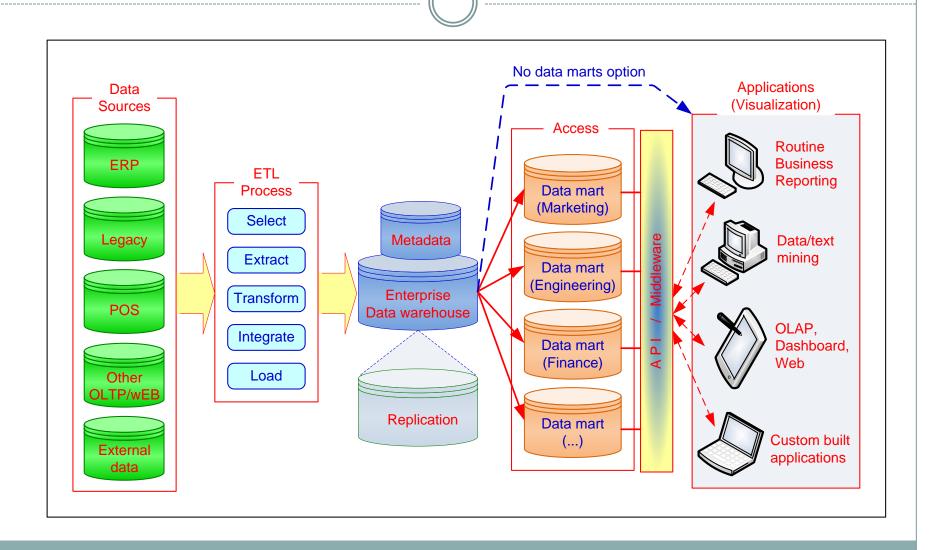


BI = BII + BSI + BMI

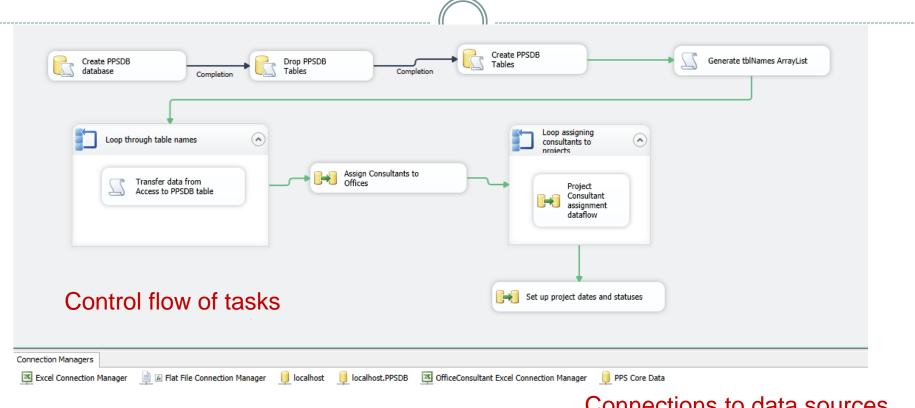
A convergence of disciplines:

- BII = Business Information Intelligence (information systems and computer science, databases, reporting and OLAP)
- BSI = Business Statistical Intelligence (quantitative methods, data mining, descriptive and predictive analytics)
- BMI = Business Modeling Intelligence (operations research, optimization and simulation, prescriptive analytics)

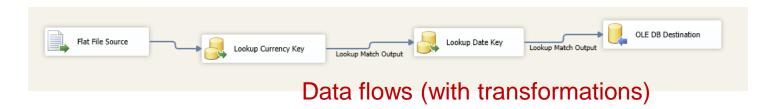
Data Integration and Warehousing



Data Integration with Microsoft SSIS



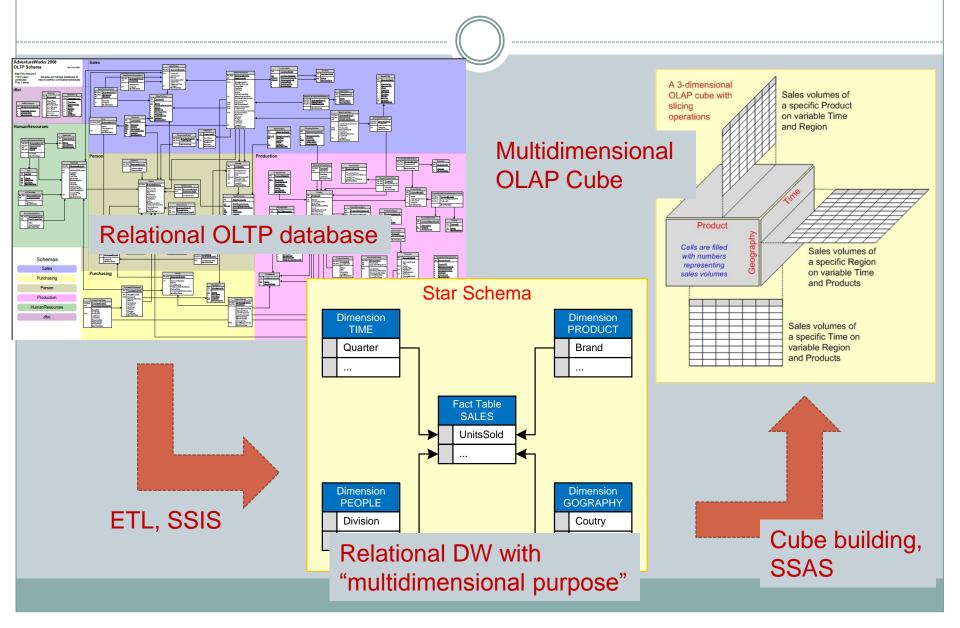
Connections to data sources



Emerging Trends in Data Integration

- Traditionally, DW data is not current (snapshot)
- Closer to real-time data access
 - Federated the "virtual" warehouse (no physical database, rather a view)
 - Enterprise information integration
 - Active Data Warehouse concept more frequent ETL
- Increased use of text/web analytics for unstructured data ("big data")

From Relational to Multidimensional



OLAP User Interface – Pivot Table

							(())			
	Α	В	С	D	Е	F	G	Н	A		
1	Sales Amount	Column Labels 🔻								PivotTable Fields	
2		⊕ Accessories	∃Bikes			Bikes Total	⊕ Clothing	Grand Total		Choose fields to add to report:	
3	Row Labels	▼	■ Mountain Bikes	⊞ Road Bikes	⊞Touring Bikes					Choose fields to add to report:	
4	⊕AU	\$138,690.63	\$2,853,819.45	\$5,004,548.42	\$993,682.14	\$8,852,050.00	\$70,259.95	\$9,061,000.58		Δ Σ Fact Internet Sales	
5	⊕CA	\$103,377.85	\$615,440.40	\$935,616.29	\$270,245.70	\$1,821,302.39	\$53,164.62	\$1,977,844.86		☐ Discount Amount	
6	⊕ DE	\$62,232.59	\$1,003,800.98	\$1,380,342.85	\$424,370.52	\$2,808,514.35	\$23,565.40	\$2,894,312.34		Extended Amount	
7	⊕FR	\$63,406.78	\$899,260.71	\$1,311,933.10	\$342,381.90	\$2,553,575.71	\$27,035.22	\$2,644,017.71		Fact Internet Sales Count	
8	 GB	\$76,630.04	\$1,162,980.29	\$1,598,217.48	\$521,644.89	\$3,282,842.66	\$32,239.51	\$3,391,712.21		Freight	
9	■US	\$256,422.07	\$3,417,457.74	\$4,289,925.90	\$1,292,475.90	\$8,999,859.53	\$133,507.91			Order Quantity	
10	⊟AL	\$37.29						\$37.29		Product Standard Cost	
11	■Birminghan	n \$37.29						\$37.29		✓ Sales Amount	
12	<u> </u>	<u> </u>						\$37.29			
13	⊕ AZ	\$32.60	\$2,071.42			\$2,071.42		\$2,104.02		☐ Tax Amt	
14	⊕ CA	\$144,910.19	\$2,067,183.88	\$2,569,200.43	\$858,303.57					☐ Total Product Cost	
15	⊕FL	\$88.95	\$4,391.41	\$782.99	\$2,384.07	\$7,558.47	\$113.49	\$7,760.91		☐ Unit Price	
16	⊞GA	\$31.96	\$769.49	\$782.99		\$1,552.48	\$74.48	\$1,658.92		Unit Price Discount Pct	
17	⊞IL	\$138.20	\$2,071.42	\$539.99		\$2,611.41	\$78.48	\$2,828.09		△ ■ Dim Customer	
18	⊞ KY	\$216.96						\$216.96		→ W Hierarchy	
19	⊞ MA		\$2,049.10			\$2,049.10		\$2,049.10	$ \sqcup$	D	
20	⊞MN	\$37.29					\$53.99				
21	⊞ MO	\$56.97					\$24.49	\$81.46		Dim Date	
22	⊞ MS	\$32.60					\$49.99	\$82.59		△ □ Dim Product	
23	⊞ MT	\$67.59					\$24.49	\$92.08		▶ ✓ Product Hierarchy	
24	⊕ NC	\$7.28	4	4		4		\$7.28		▷ 🛗 More Fields	
25	⊞NY	\$119.22	\$2,294.99	\$1,700.99		\$3,995.98	\$8.99	\$4,124.19			
26	⊕ OH	\$262.20	A 405 005 07	AFC4 007 C0	\$400 004 44	A 445 754 77	\$96.98	\$359.18	-		
27	⊕ OR	\$33,839.03	\$425,335.97	\$561,097.69	\$130,321.11		\$20,397.74			Drag fields between areas below:	
28	⊞SC	\$76.95	\$2,294.99	ć702 nn		\$2,294.99 \$1,552.48	\$62.98	\$2,434.92		▼ FILTERS	III COLUMNS
29 30	⊕TX ⊕UT	\$182.63 \$98.96	\$769.49	\$782.99 \$3,578.27	\$742.35	\$1,552.48	\$53.99	\$1,789.10 \$4,419.58			Product Hierarchy
31	⊕VA	\$98.96 \$39.98		33,370.27	\$142.35	\$4,520.02		\$4,419.58			riodactinciarcity
32	⊕WA	\$76,107.94	\$905,905.59	\$1,146,760.79	\$300,724.80	\$2,353,391.18	\$37.749.22				
33	⊕WY	\$37.28	\$2,319.99	\$4,698.76	\$300,124.00	\$7,018.75	\$58.98	\$7,115.01			
	Grand Total	\$700,759.96		\$14,520,584.04	\$3,844,801.05	\$28,318,144.65					
35		Ţ ,	, , , , , , , , , , , , , , , , , , , ,	, ,,,	, ,,,	, .,,	,,	,,			
36										■ ROWS	Σ VALUES
37										Hierarchy	▼ Sales Amount
38										Theorem	Jales Amount
20											

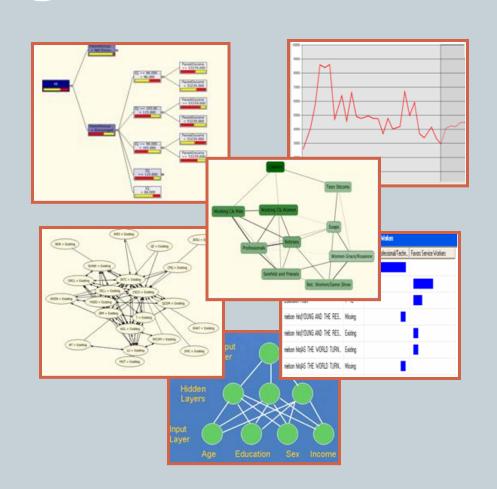
Data Mining

- Knowledge discovery in databases
- Using statistical, mathematical, AI, and machine learning techniques to extract useful information and subsequent knowledge from large databases
- Key point: identifying patterns in large data sets
- This is INDUCTIVE reasoning

Common Data Mining Algorithms

- Decision Trees
- Naïve Bayesian
- Clustering
- Association Rules
- Neural Network
- Time Series

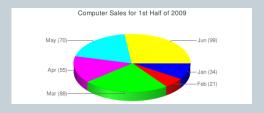
Microsoft SSAS includes several data mining engines



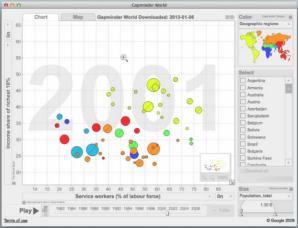
Data Visualization

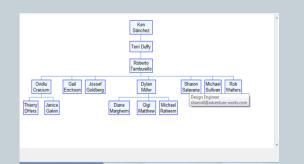


A picture tells a thousand words

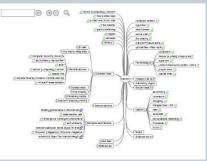














Applied BI Incubator

- JMU CIS&BSAN initiative
- Like an R&D lab
- Use the talents of faculty and students
- Prototypes, proofs of concept, BI applications
- Explore new BI-related technologies
- Apply technologies to practical business problem-solving tasks
- Projects focused on needs of the business community (JMU engagement)
- On-campus internship
- Faculty project sponsors

Interested? Contact Mike Mitri at mitrimx@jmu.edu
568-3019