



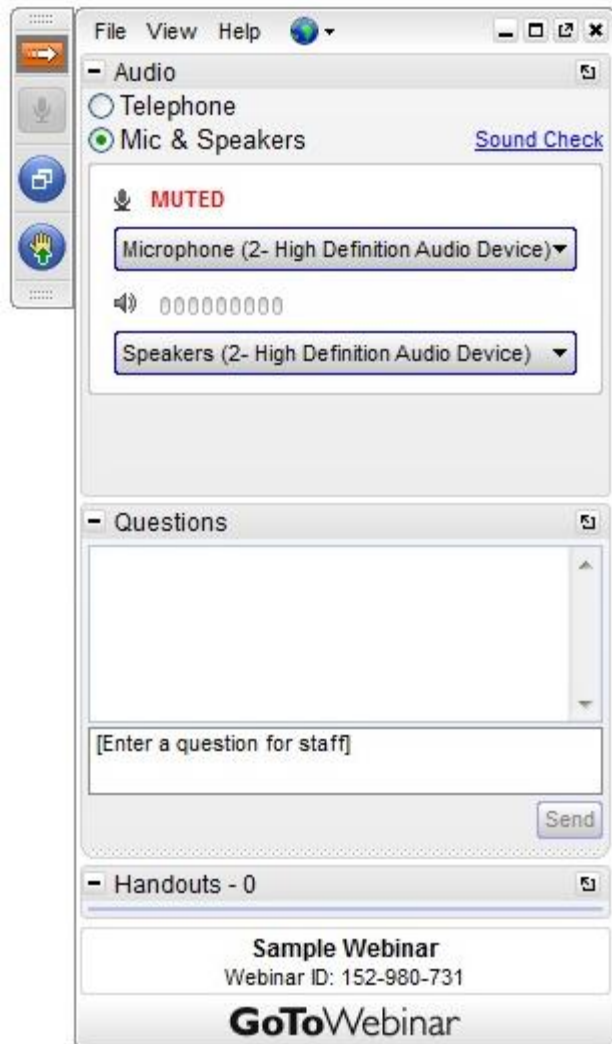
**SENTURUS**

# **ANALYST ALERT: DATA MODELING IS A REQUIRED SKILL**

**Flawed Data and Bad Decisions Result From  
Poor Data Models**



# GoToWebinar Control Panel



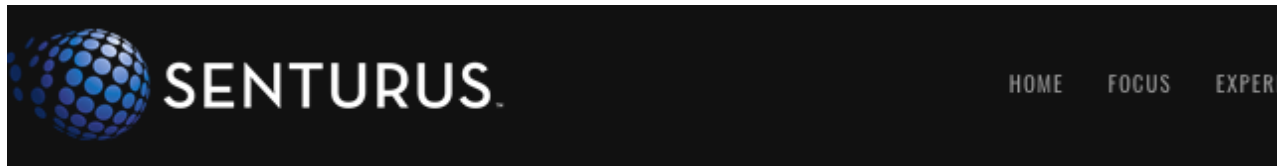
Click arrow to restore full control panel



Submit questions here

# Presentation Slide Deck

[www.senturus.com/resources/](http://www.senturus.com/resources/)



## RESOURCE LIBRARY




Welcome to our extensive, free library of past webinars, demos, whitepapers, presentations and helpful hints. Use the topic boxes to the right to filter through and easily locate content. We are constantly adding new materials, so please check back often to see our latest content. Enjoy!

SEARCH RESOURCES

SORT BY

RESOURCE TITLE	TYPE	GO	
USE VISUAL ANALYTICS TOOLS WITH TRUSTED COGNOS DATA Senturus Analytics Connector Enables BiModal BI	 FEATURES	→	<input type="checkbox"/> BUDGETING FORECASTING & STRATEGIC PLANNING (2) <input type="checkbox"/> COGNOS (1) <input type="checkbox"/> COGNOS ANALYTICS (0)
GREAT BI: IT'S NOT ABOUT THE TOOLS! How to Lead Your Team to BI Success	 BUSINESS STRATEGY	→	<input type="checkbox"/> DASHBOARDS REPORTING AND VISUALIZATIONS (17) <input type="checkbox"/> DATA ARCHITECTURE (6) <input type="checkbox"/> DATA PREPARATION (8)
A COMPARISON OF POWER BI, TABLEAU & COGNOS Differentiators Demo'd	 FEATURES	→	<input type="checkbox"/> PREDICTIVE ANALYTICS (12) <input type="checkbox"/> REPORTING AND VISUALIZATIONS (1)

# Agenda

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- Introductions
- Quick poll #1
- Quick poll #2
- What do we mean by data modeling?
- Data modeling fundamentals
- How BI tools exploit data models
- Is this the same thing as data prep?
- Why is this more important now?
- Senturus overview
- Additional resources
- Q&A



# Introducing...Today's Presenter

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**Albert Valdez, III**  
Vice-President of Learning Solutions  
Senturus, Inc.

# Poll #1: BI Tool(s) of Choice

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What BI tools are currently prevalent in your organization?

- Tableau
- IBM Cognos
- Microsoft (Power BI)
- Qlik Sense/QlikView
- Other

## Poll #2: Rate Your Data Modeling Skills

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How would you describe your comfort/experience with data modeling?

- Data WHAAAA???
- I understand data structures (tables/columns), not so sure about the modeling part
- I know why joins are important and can model visually
- I've designed extensive data models and I can spell SQL
- I'm a data architect, what am I doing here?



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# **DATA MODELING**

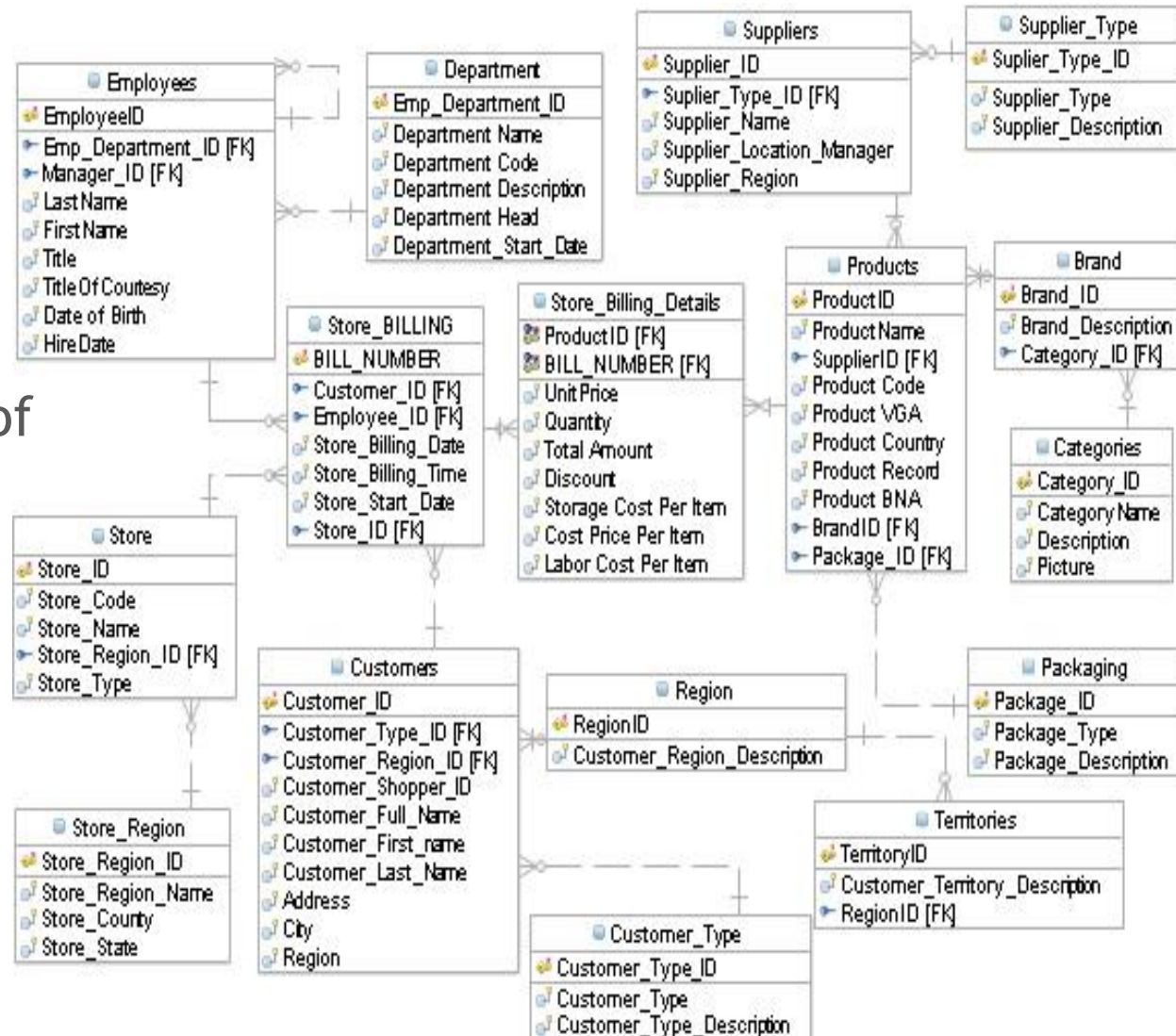
## **THE BASICS**



# Fundamentals of Data Modeling

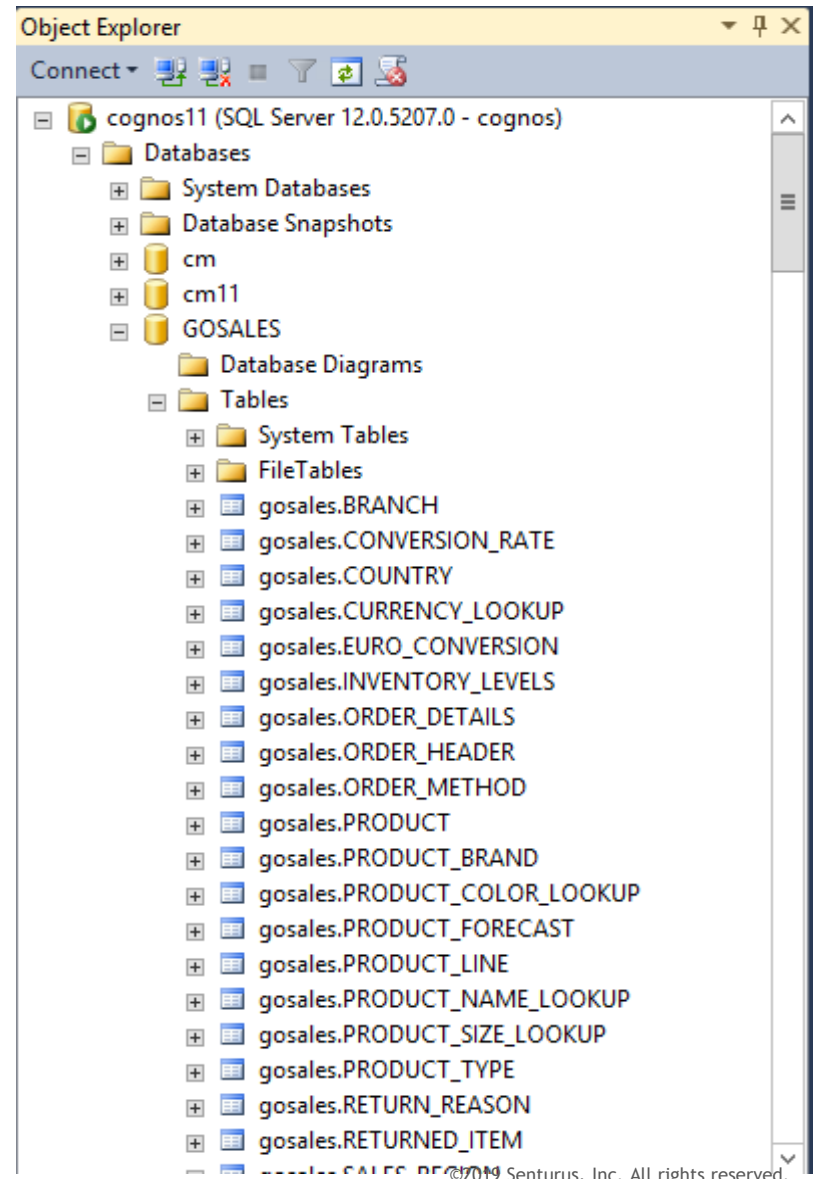
What is this?

- Entity Relationship Diagram (ERD)
- Describes the logical model of our data



# Fundamentals of Data Modeling

What's in a database?



# Fundamentals of Data Modeling

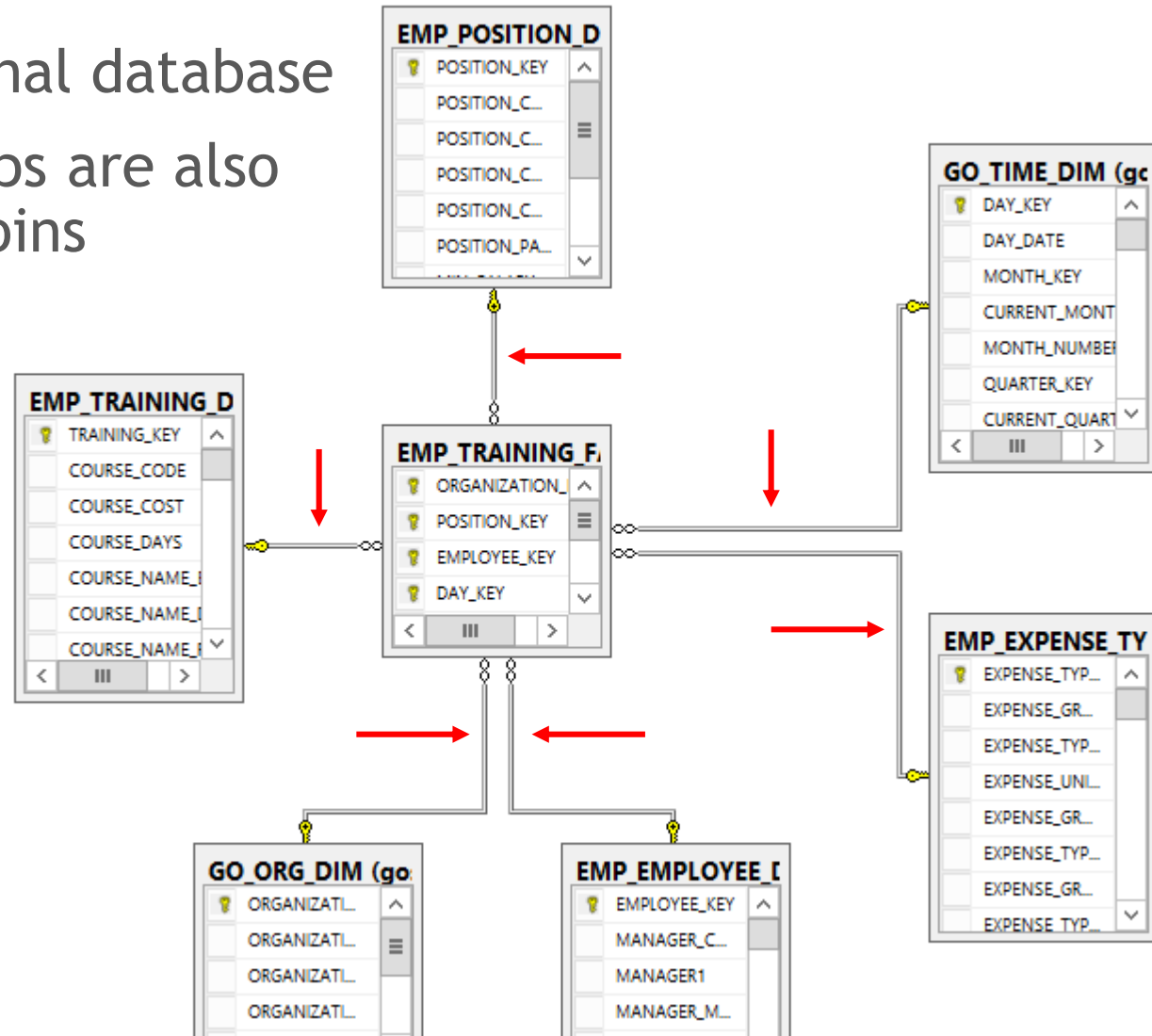
What's in a table?

	Column Name	Data Type	Allow Nulls
🔑	PRODUCT_NUMBER	int	<input type="checkbox"/>
	BASE_PRODUCT_NUMBER	int	<input checked="" type="checkbox"/>
	INTRODUCTION_DATE	datetime	<input checked="" type="checkbox"/>
	DISCONTINUED_DATE	datetime	<input checked="" type="checkbox"/>
	PRODUCT_TYPE_CODE	int	<input type="checkbox"/>
	PRODUCT_COLOR_CODE	int	<input checked="" type="checkbox"/>
	PRODUCT_SIZE_CODE	int	<input checked="" type="checkbox"/>
	PRODUCT_BRAND_CODE	int	<input checked="" type="checkbox"/>
	PRODUCT_IMAGE	nvarchar(20)	<input checked="" type="checkbox"/>

	PRODUCT_NUMBER	BASE_PRODUCT_NUMBER	INTRODUCTION_DATE	DISCONTINUED_DATE	PRODUCT_TYPE_CODE	PRODUCT_COLOR_CODE	PRODUCT_SIZE_CODE	PRODUCT_BRAND_CODE	PRODUCT_IMAGE
1	3110	3	2001-02-15 00:00:00.000	NULL	951	924	825	701	P03CE1CG1.jpg
2	20110	20	2003-03-05 00:00:00.000	NULL	953	903	820	704	P20CE1SB3.jpg
3	92110	92	2001-02-15 00:00:00.000	NULL	966	925	803	717	P91OP4SS16.jpg
4	4110	4	2001-02-15 00:00:00.000	NULL	951	923	804	701	P04CE1CG1.jpg
5	16110	16	2003-03-05 00:00:00.000	NULL	952	923	815	702	P16CE1TN2.jpg
6	5110	5	2001-02-15 00:00:00.000	NULL	951	923	823	701	P05CE1CG1.jpg
7	6110	6	2003-03-05 00:00:00.000	NULL	951	923	824	701	P06CE1CG1.jpg
8	9110	9	2003-03-05 00:00:00.000	NULL	951	900	806	701	P09CE1CG1.jpg
9	7110	7	2001-02-15 00:00:00.000	NULL	951	923	845	701	P07CE1CG1.jpg
10	8110	8	2003-03-05 00:00:00.000	NULL	951	912	846	701	P08CE1CG1.jpg
11	131110	131	2010-05-01 00:00:00.000	NULL	962	922	811	757	P75PA3KV12.jpg
12	90110	90	2001-02-15 00:00:00.000	NULL	965	908	802	706	P86OP4IR15.jpg
13	101110	101	2009-12-15 00:00:00.000	NULL	968	923	851	719	P101GE5IR18.jpg
14	115110	115	2009-12-27 00:00:00.000	NULL	971	922	839	718	P115GE5GA21.jpg
15	91110	91	2001-02-15 00:00:00.000	NULL	966	925	804	717	P91OP4SS16.jpg
16	109110	109	2009-12-10 00:00:00.000	NULL	970	904	853	718	P109GE5PT20.jpg
17	103110	103	2009-12-10 00:00:00.000	NULL	968	923	852	719	P101GE5IR18.jpg
18	32110	32	2001-02-15 00:00:00.000	NULL	955	923	849	705	P32CE1LT5.jpg

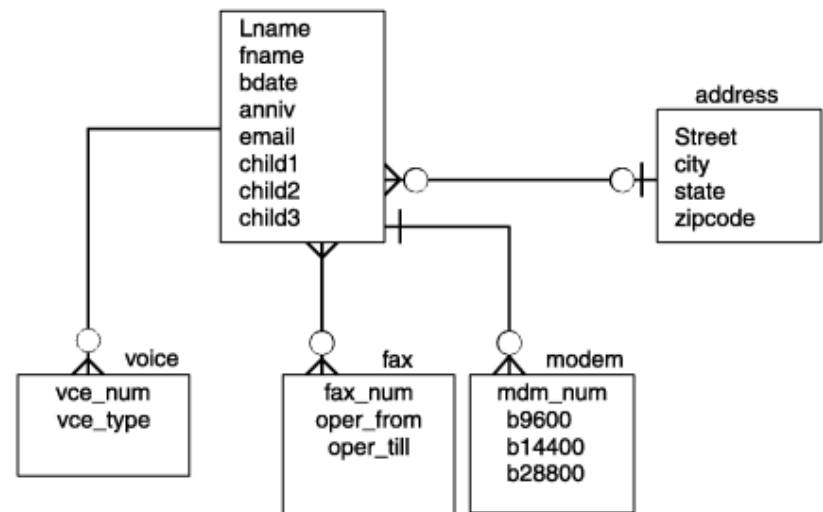
# Fundamentals of Data Modeling

- The relational database
- Relationships are also known as joins



# Fundamentals of Data Modeling

- Breaking complex systems of data into smaller pieces is the most efficient way to store and retrieve data (in most cases)
- Even relatively simple systems require entity relationships to be defined:



- Without the relationships, we have trouble

# Fundamentals of Data Modeling

Order method type	Product number	Quantity	Unit sale price	Revenue
E-mail	1110	177,931	\$5.76	\$941,367.96
Fax	1110	95,580	\$6.03	\$547,789.65
Mail	1110	58,823	\$5.30	\$279,701.63
Sales visit	1110	510,230	\$5.78	\$2,730,543.97
Special	1110	53,550	\$5.94	\$295,368.95
Telephone	1110	456,263	\$5.62	\$2,322,804.44
Web	1110	2,956,451	\$5.82	\$15,939,564.86
E-mail	2110	55,724	\$11.56	\$624,991.27
Fax	2110	16,978	\$11.81	\$194,190.21
Mail	2110	14,169	\$11.46	\$157,088.10
Sales visit	2110	101,651	\$11.81	\$1,196,922.51

SELECT

"ORDER\_HEADER"."ORDER\_METHOD" AS "Order method type",  
 "ORDER\_DETAILS"."PRODUCT\_NUMBER" AS "Product number",  
 "ORDER\_DETAILS"."QUANTITY" AS "Quantity",  
 "ORDER\_DETAILS"."UNIT\_SALE\_PRICE" AS "Unit sale price",  
 "ORDER\_DETAILS"."QUANTITY" \* "ORDER\_DETAILS"."UNIT\_SALE\_PRICE" AS "Revenue"

FROM

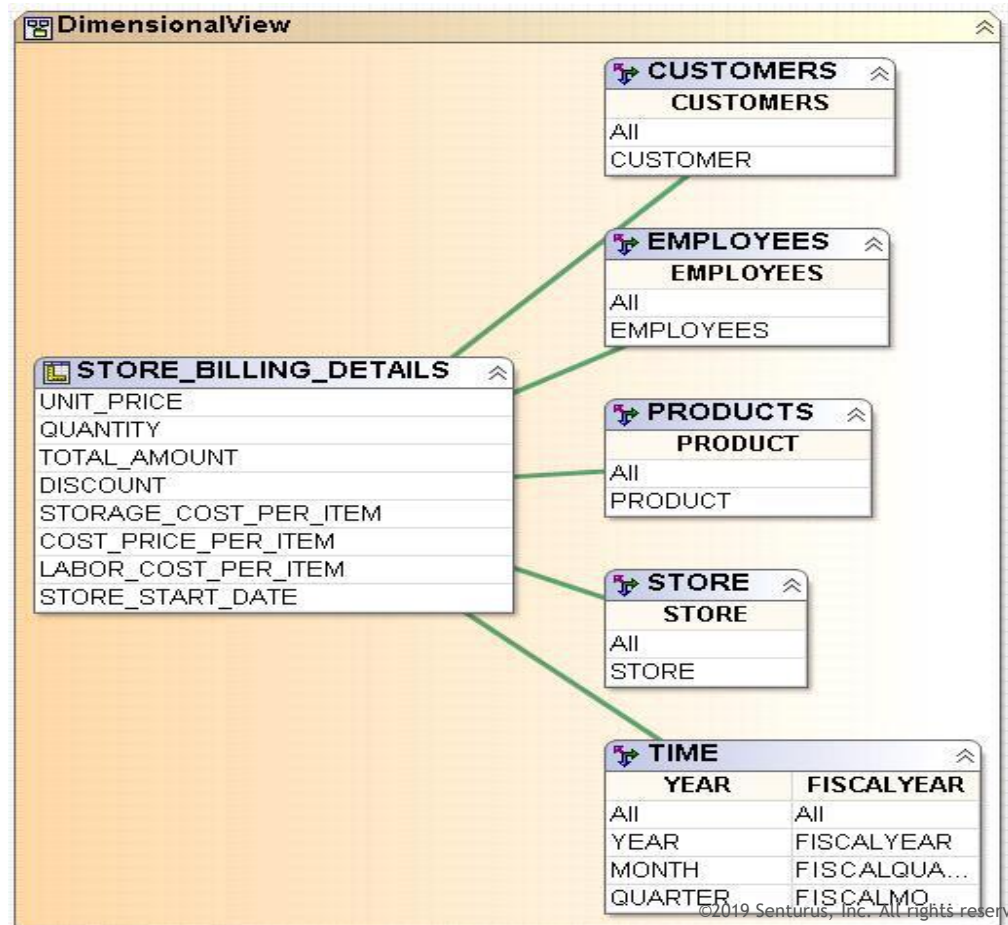
"GOSALES"."ORDER\_HEADER" "ORDER\_HEADER",  
 "GOSALES"."ORDER\_DETAILS" "ORDER\_DETAILS"

WHERE

"ORDER\_HEADER"."ORDER\_NUMBER" = "ORDER\_DETAILS"."ORDER\_NUMBER"

# Fundamentals of Data Modeling

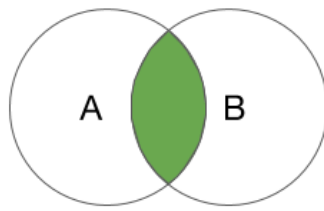
- Over joining objects can also have a negative impact
- One key to remember: you only need one join path between all objects



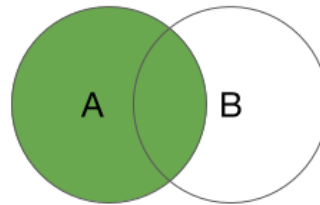


# Free First Lesson on Joins

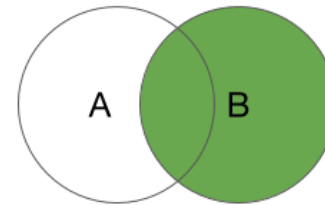
## Inner vs. outer join



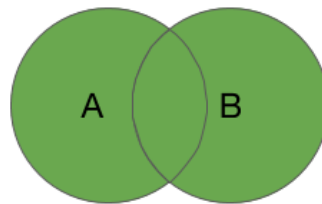
INNER JOIN



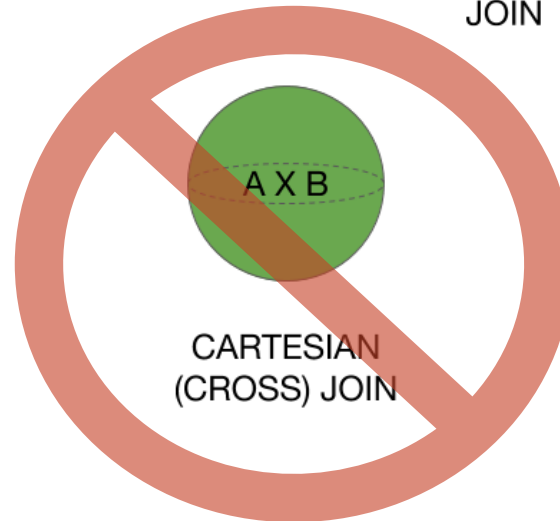
LEFT OUTER JOIN



RIGHT OUTER JOIN



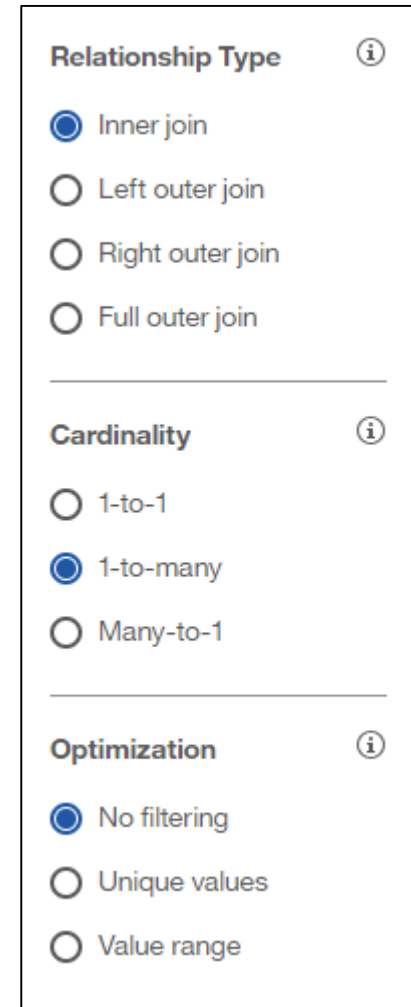
FULL OUTER JOIN



CARTESIAN  
(CROSS) JOIN

# Joining Data Sources - Other Considerations

- Certain tools also offer control of additional join behaviors
  - From IBM Cognos data modules:
- Remember:
  - Join behavior is driven by business requirements!



The image shows a configuration window for a join operation, divided into three sections: Relationship Type, Cardinality, and Optimization. Each section has a title and an information icon (i). The Relationship Type section has four radio buttons: Inner join (selected), Left outer join, Right outer join, and Full outer join. The Cardinality section has three radio buttons: 1-to-1, 1-to-many (selected), and Many-to-1. The Optimization section has three radio buttons: No filtering (selected), Unique values, and Value range.

Section	Option	Status
Relationship Type	Inner join	Selected
	Left outer join	Not Selected
	Right outer join	Not Selected
	Full outer join	Not Selected
Cardinality	1-to-1	Not Selected
	1-to-many	Selected
	Many-to-1	Not Selected
Optimization	No filtering	Selected
	Unique values	Not Selected
	Value range	Not Selected

# Fundamentals of Data Modeling

The second fundamental is controlling how measures, facts or numbers are treated

Properties

General

LabelForecast revenue

ExpressionForecast\_revenue >

UsageMeasure

Aggregate

Total

None

Average

Count

Count Distinct

Maximum

Minimum

Total

Data type

Comments

Order ID (Returns)

Returned

Measure Names

Measures

Discount

Profit

Quantity

Sales

Latitude (generated)

Longitude (generated)

Number of Records

Measure Values

Default Properties

Group by

Folders

Replace References...

Describe...

Comment...

Color...

Number Format...

Aggregation

Total using

Sum

Average

Median

Count

Count (Distinct)

Minimum

Maximum

Percentile

Std. Dev

Std. Dev (Pop.)

Variance

Variance (Pop.)

Data Source

Sheet 1

marks

1 row by 2 columns

% of Total SUM(Sales): 100.00%



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## **DATA MODELING**

### **THE RISKS**

## Risks of Data Modeling

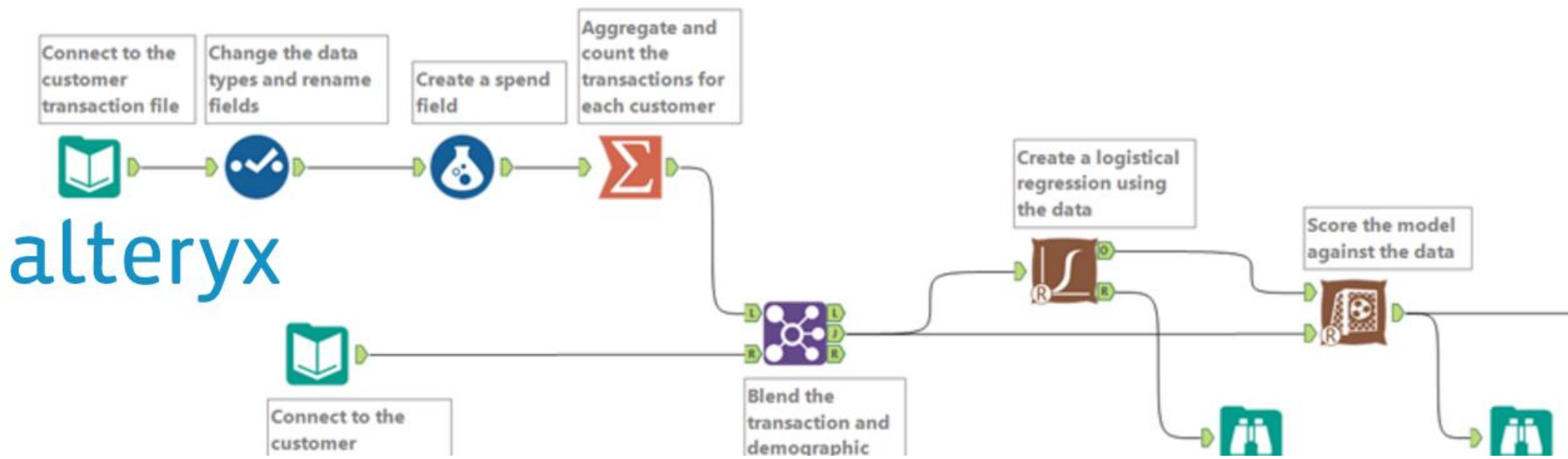
- 
- Who's in control?
  - Which model is correct?
  - Are we doing it right?
  - What are the best practices?
  - What is the impact on our business if we get it wrong?
  - AAAAAAAAAAAAAAHHHHHHHHHHHHH!!!!!!!!!!!!!!!!!!!!!!



# Data Modeling vs. Data Prep

These concepts do intersect, but data prep usually refers to the following activities:

- Data cleansing, transformations, binning/grouping, enhancement and yes:
  - Data integration



# Data Modeling: Why Now?

- BI is ubiquitous
- Role of IT has changed
- More data
- More data
- More data

**QlikView**

**Qlik**  | Sense®



**ORACLE®**



**MicroStrategy®**

**SAP BusinessObjects™**

**sas**



# Data Modeling: Why Now?

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# Data Modeling Assistance & More

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- Mentoring
  - Customized individual or small group learning on Tableau, Power BI and Cognos
  - <https://senturus.com/training/custom-training/>
- BI Concierge
  - Access to an entire team of BI experts to fill in a needed
  - <https://senturus.com/bi-concierge-service/>

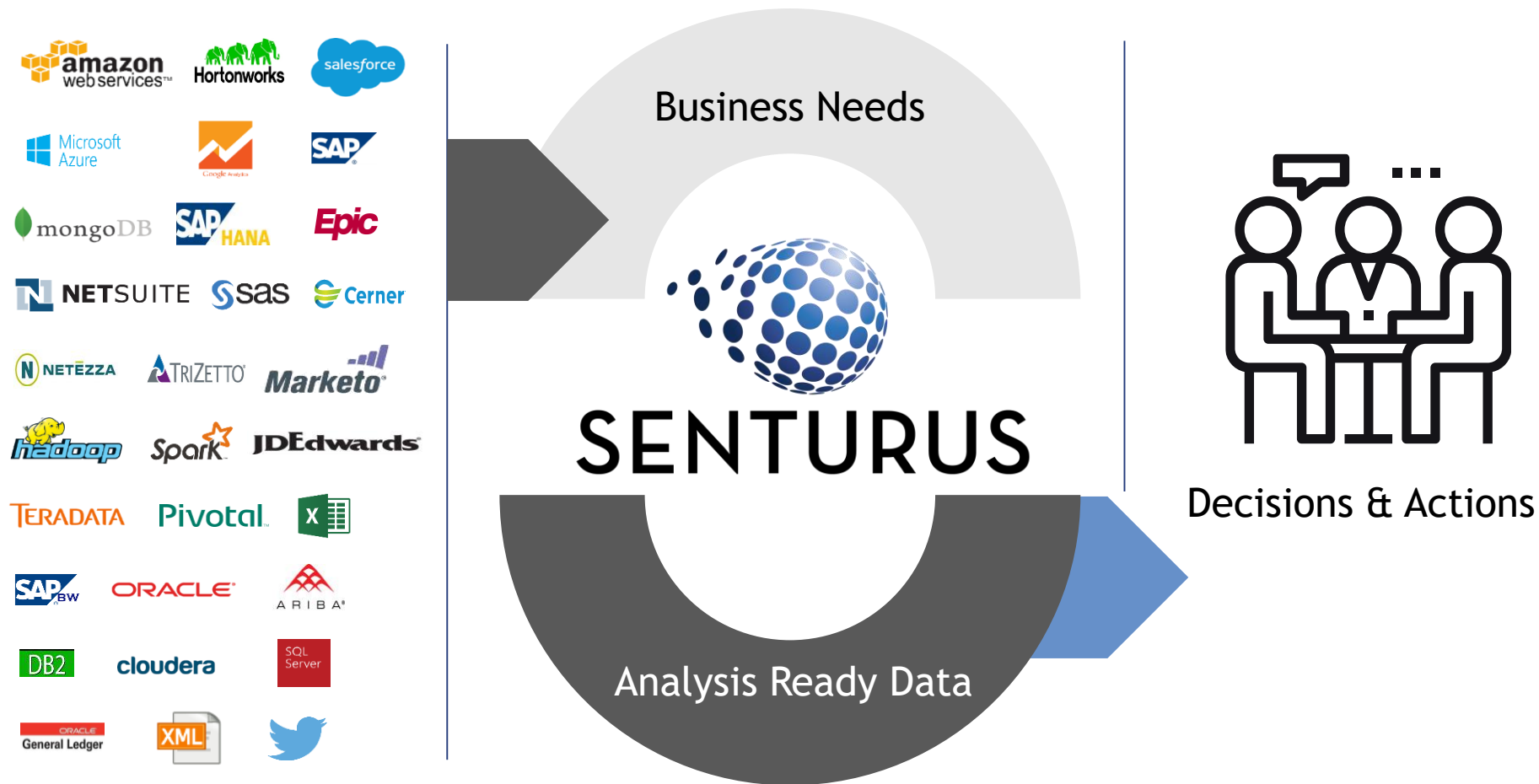


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**WHO WE ARE**

Business Analytics Consultants

# Bridging the Gap between Data & Decision Making



# Business Analytics Architects

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- Dashboards, reporting & visualizations
- Data preparation & modern data warehousing
- Self-service business analytics
- Salesforce reporting
- Proprietary software to enable bimodal BI and platform migrations



**IBM Cognos Analytics**

# 1200+ Clients, 2000+ Projects, 18+ Years

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## **ADDITIONAL RESOURCES**



# Upcoming Events

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[www.senturus.com/events](http://www.senturus.com/events)



## **MOVING BI TO THE CLOUD?**

PROS, CONS & CONSIDERATIONS

Thursday, April 11 - 11am PT (2pm ET) - 60 minutes

# Free Resources

[www.senturus.com/senturus-resources/](http://www.senturus.com/senturus-resources/)



**UPCOMING EVENTS**



**RESOURCE LIBRARY**



**BLOG**

# Training Options

<https://senturus.com/training/>



## REGULARLY SCHEDULED COURSES

We hold more than a dozen live, hands-on, interactive courses in our virtual classroom each month. Course topics cover the breadth of the skillset for Cognos Analytics and Tableau.



## LARGE GROUP AND PRIVATE INSTRUCTION

We offer many ways for your organization to access private Cognos, Tableau and Power BI training including onsite or online group courses and individual/small group mentoring.



## SELF-PACED LEARNING

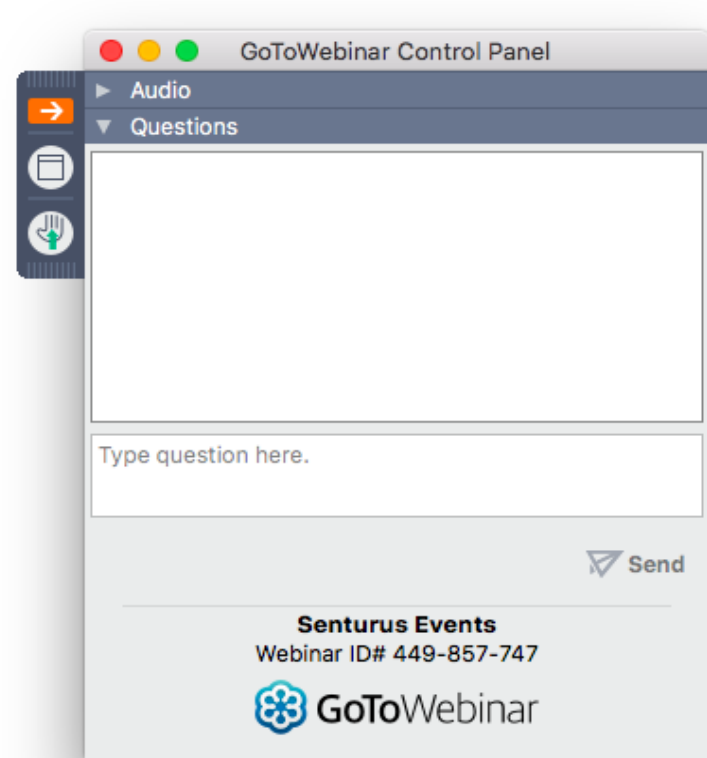
Highly cost effective approach to learning fundamental concepts and light technical skills with courses designed to address real-life applications.

# Q&A

If your question or issue is broader than what can be answered today, contact us at

[info@senturus.com](mailto:info@senturus.com)

and we will set up a free consultation.



# Thank You!

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www.senturus.com  
[info@senturus.com](mailto:info@senturus.com)  
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