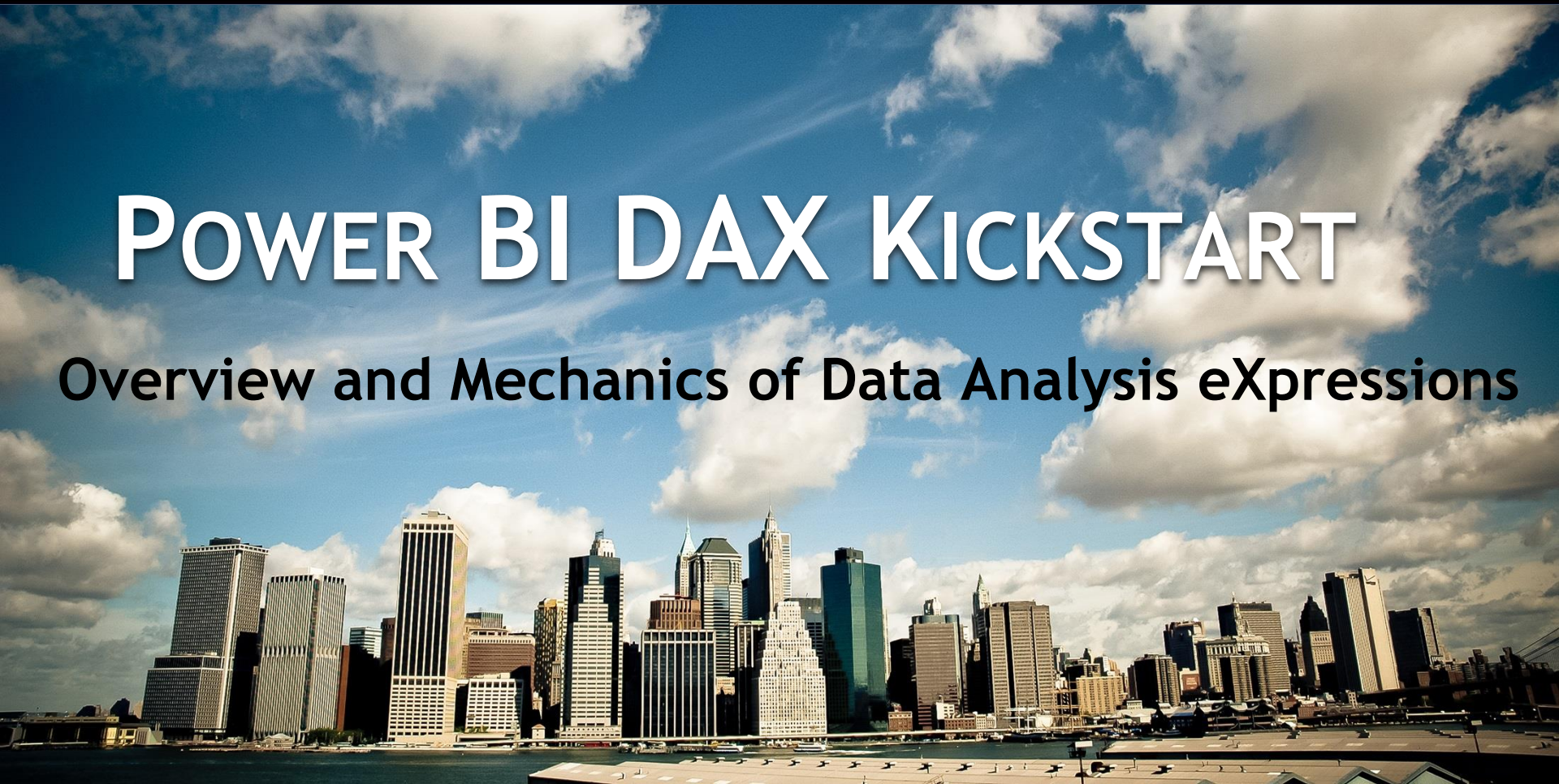# POWER BI DAX KICKSTART

Overview and Mechanics of Data Analysis eXpressions

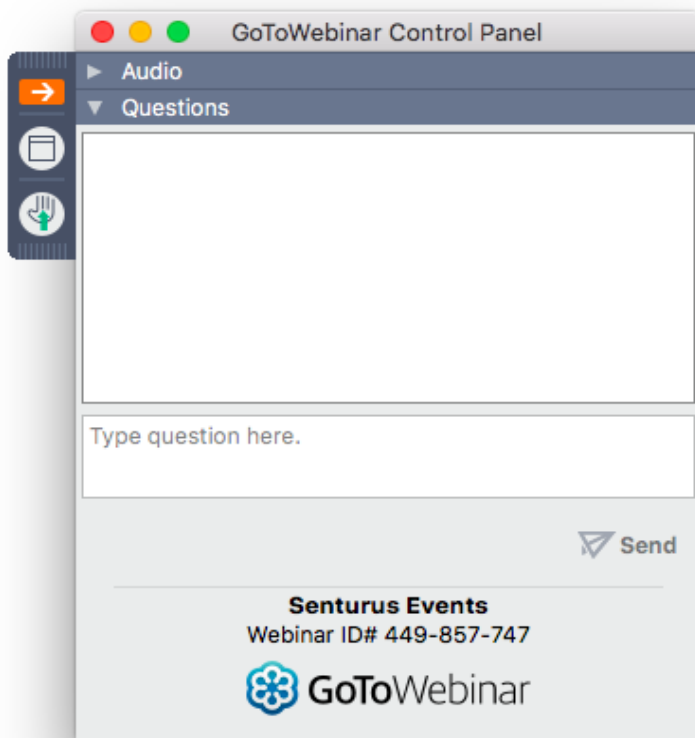# GoToWebinar Control Panel

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Agenda

- Introductions
- Introducing Data Analysis eXpressions (DAX)
- Vehicles of delivery: calculation types
  - Calculated columns
  - Measures
- Functions: groups and examples
- Summary
- Additional resources
- Q&A

Introducing...Today's Presenters

Bill Pearson

Microsoft Business
Intelligence Architect

Senturus, Inc.

Michael Weinhauer

Practice Area Director
Solutions Architect

Senturus, Inc.

Poll

How would you describe your experience level with Data Analysis eXpressions (DAX)?

- **None**—this is my first exposure to DAX.

- **Aware and Interested**—I know DAX is a query language.

- **Beginner**—I write basic DAX queries.

- **Intermediate**—I create calculations.

- **Advanced**—I can meet 1+ business requirements with DAX.

INTRODUCING DATA ANALYSIS EXPRESSIONS

Data Analysis eXpressions Language

- DAX serves as the language of:
  - Power BI
  - Excel Power Pivot
  - SQL Server Analysis Services Tabular

- Initially seems simple, but the learning curve can increase dramatically – *and at the worst possible times*

- DAX comprises programming concepts that will be unfamiliar to many who have worked with SQL and other query languages

- We'll discuss tips in easing the effort required to get to know DAX from the first glimpse

DAX Is an Expression Language

- Function calls drive execution
- Elements of DAX are derived from:
  - Excel functions
  - SQL
  - MDX
- Example of a simple formula

```
UniqueCustomerCount =
    COUNT(Customer[CustomerKey])
```

DAX Syntax for Columns

- The general format
  - **'TableName'[ColumnName]**

- Quotes can be omitted
  - If TableName does not contain spaces
  - BEST PRACTICE: Don't use spaces

- TableName can be omitted
  - Current table is searched for ColumnName
  - BEST PRACTICE: Always use complete TableName / ColumnName to avoid ambiguity

- Brackets for column name cannot be omitted

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Primary Vehicles for DAX: Calculation types

DAX can be employed in Power BI through a couple of mechanisms:

- Calculated columns
- Measures

Calculated Column Creation

Example: Calculated column in the Product table that computes the "Gross Profit Margin" for each product

```
Intro_CalCol_Product_Margin =
'Product'[ListPrice]-'Product'[StandardCost]
```

DEMO: Create Calculated Column

```
1 Intro_CalCol_Product_Margin = 'Product'[ListPrice]-'Product'[StandardCost]
```

ProductKey	ListPrice	StandardCost	Product_Margin
310	$3,578.27	$2,171.29	$1,406.98
311	$3,578.27	$2,171.29	$1,406.98
312	$3,578.27	$2,171.29	$1,406.98
313	$3,578.27	$2,171.29	$1,406.98
314	$3,578.27	$2,171.29	$1,406.98
344	$3,399.99	$1,912.15	$1,487.84
345	$3,399.99	$1,912.15	$1,487.84
346	$3,399.99	$1,912.15	$1,487.84
347	$3,399.99	$1,912.15	$1,487.84
348	$3,374.99	$1,898.09	$1,476.90
349	$3,374.99	$1,898.09	$1,476.90
350	$3,374.99	$1,898.09	$1,476.90
351	$3,374.99	$1,898.09	$1,476.90
368	$2,443.35	$1,518.79	$924.56
369	$2,443.35	$1,518.79	$924.56
370	$2,443.35	$1,518.79	$924.56
372	$2,443.35	$1,554.95	$888.40
374	$2,443.35	$1,554.95	$888.40
376	$2,443.35	$1,554.95	$888.40
378	$2,443.35	$1,554.95	$888.40
380	$2,443.35	$1,554.95	$888.40

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Measures Creation

Example: Measure in the Product table that computes the Total Quantity (based on Order Quantity in the related Internet Sales table)

```
Intro_Measure_Product_TotalQty =
    SUM(InternetSales[OrderQuantity])
```

DEMO: Create Measure

Calculated Columns vs. Measures

- Calculated columns are best when we need to
  - Slice or filter on the value

- Measures are best when we need to
  - Calculate percentages
  - Calculate ratios
  - Perform complex aggregations
  - Fully take advantage of filter context

- Space and CPU utilization
  - Columns consume memory
  - Measures consume CPU

DAX Functions: Primary Groups with Examples

A great way to think of DAX functions (approx. 200 as of 4-2019) are as members of working groups. This is my take on those "primary groups:"

Primary Group	Examples
Text	LEFT(), CONCATENATE(), VALUE()
Aggregate	AVERAGE(), COUNT(), MAX()
Math / Trig	CEILING(), INT(), ROUND()
Date and Time	DATE(), DATEVALUE(), YEAR()
Time Intelligence	TOTALQTD(), TOTALYTD(), DATESBETWEEN()
Foundation	CALCULATE(), ALL(), RELATED(), FILTER()

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Let's Take a Look …

Demo / Walkthrough
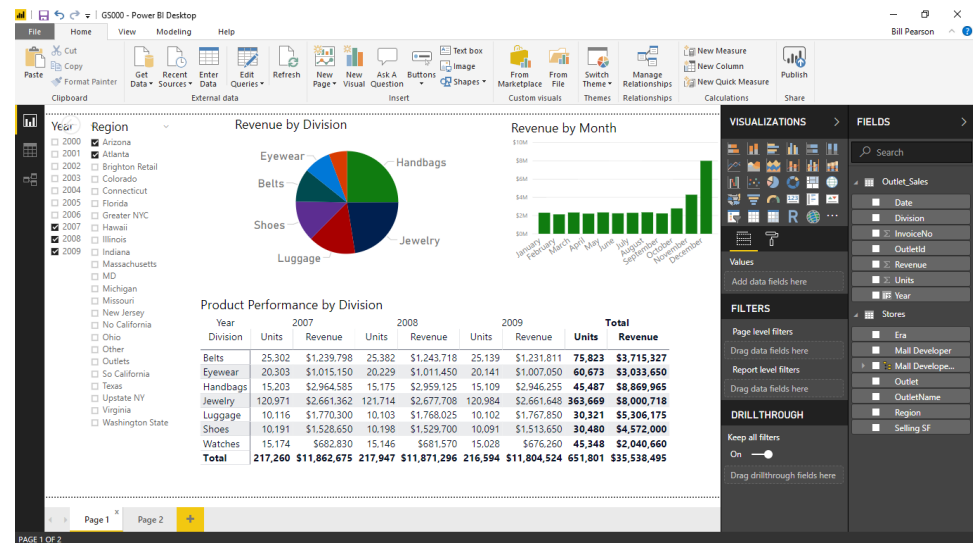
Power BI Design Stages: *Where Does DAX Fit In?*

Get Data	Transform	Model	Visualize & Analyze	Publish & Collaborate
- Connect - Import - Refresh - Stream	- Shape - Cleanse - Rename - Merge - Filter	- Relate - Calculate - Hide - Format - Sort	- Filter - Slice - Interact - Drill	- Configure - Pin - Embed - Collaborate - Export - Analyze

DAX

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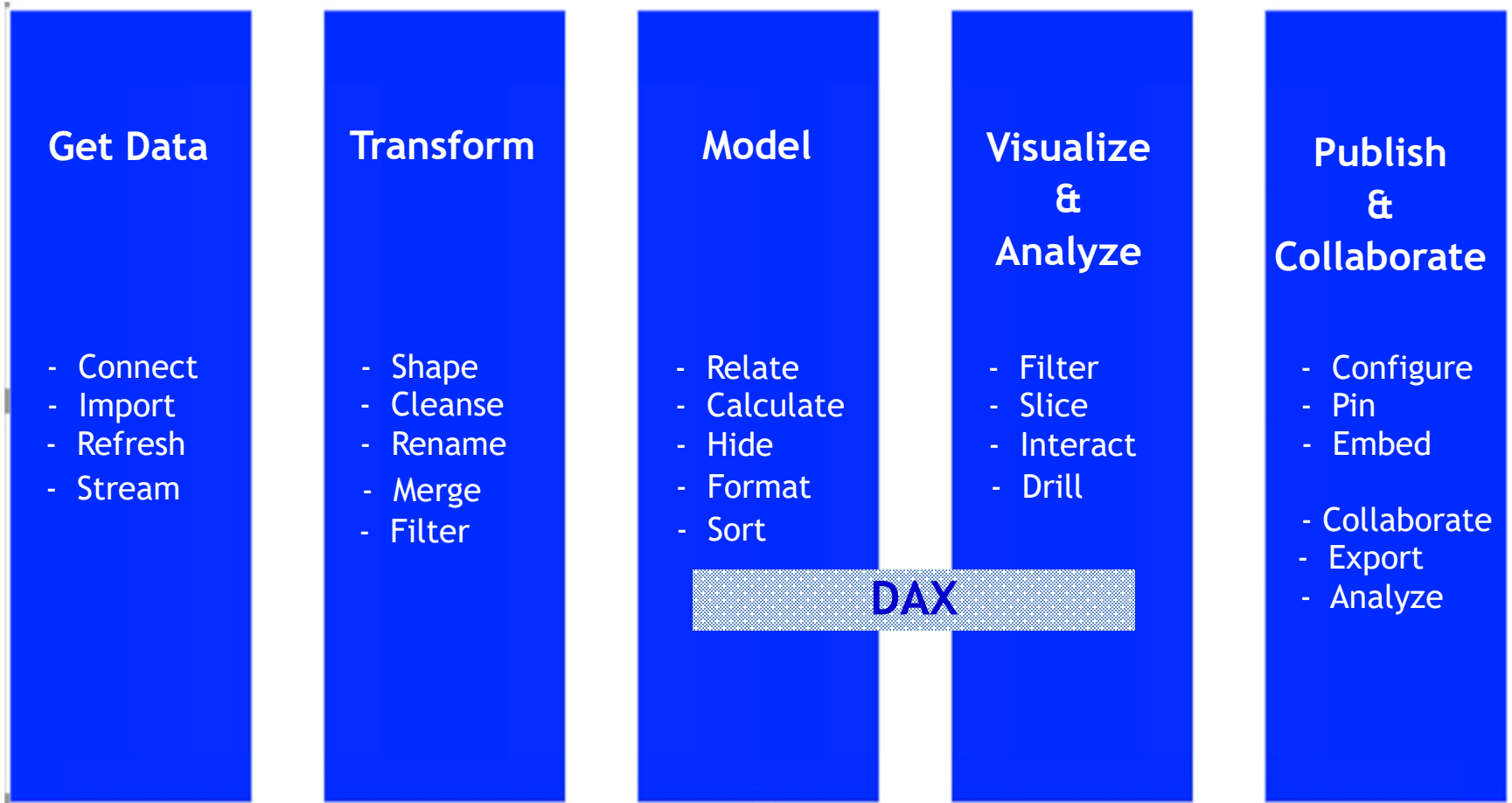
As You Learn DAX, a Few Pointers …

- Don't try to memorize DAX functions

- Keep working DAX samples in a reference .pbix

- Name calculations intuitively

- Maintain "support" environments
  - Development
  - Testing
  - Learning (especially samples .pbix file)

- Collect articles and references

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Summary

Introducing Data Analysis eXpressions (DAX)

Vehicles of delivery: Calculation types

    Calculated columns

    Measures

Functions: Groups and examples

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POWER BI	FUNDAMENTALS	MAR 25

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Power BI Mentoring

- Extends formal training into your real-world environment by using your own data/application

- Can work through actual report and data modeling challenges (co-development)

- Taught on-site or online

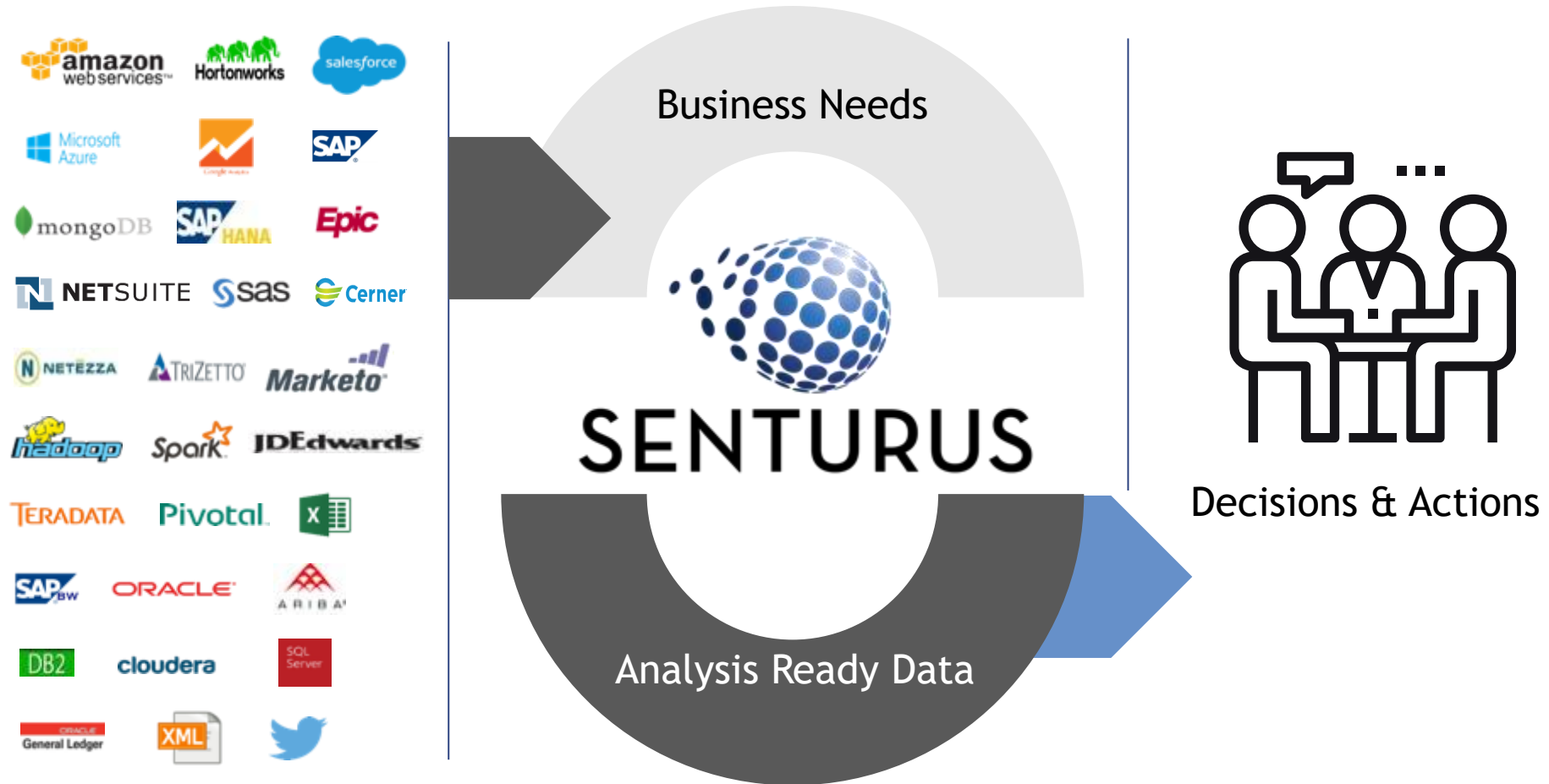- Small groups or individuals

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Bridging the Gap between Data & Decision Making

Business Needs

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Analysis Ready Data

Decisions & Actions

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- Data preparation and modern data warehousing

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- BI support retainer (expertise on demand)

- Software to enable bimodal BI and platform migrations

- Training and mentoring

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Upcoming Events

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TABLEAU VIZZES: GOOD TO GREAT

STEPS FOR BUILDING BETTER LOOKING DASHBOARDS

December 12 - 11am PT (2pm ET) - 60 minutes

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Free Resources

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https://senturus.com/blog/power-bi-premium-demystified/

Creating and Publishing Paginated Reports in Power BI Service
https://senturus.com/blog/creating-and-publishing-paginated-reports-in-power-bi-service/

Power BI Gateway Explained
https://senturus.com/blog/power-bi-gateway-explained/

Training for Power BI, Tableau & Cognos

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CORPORATE TRAINING

SELF-PACED LEARNING
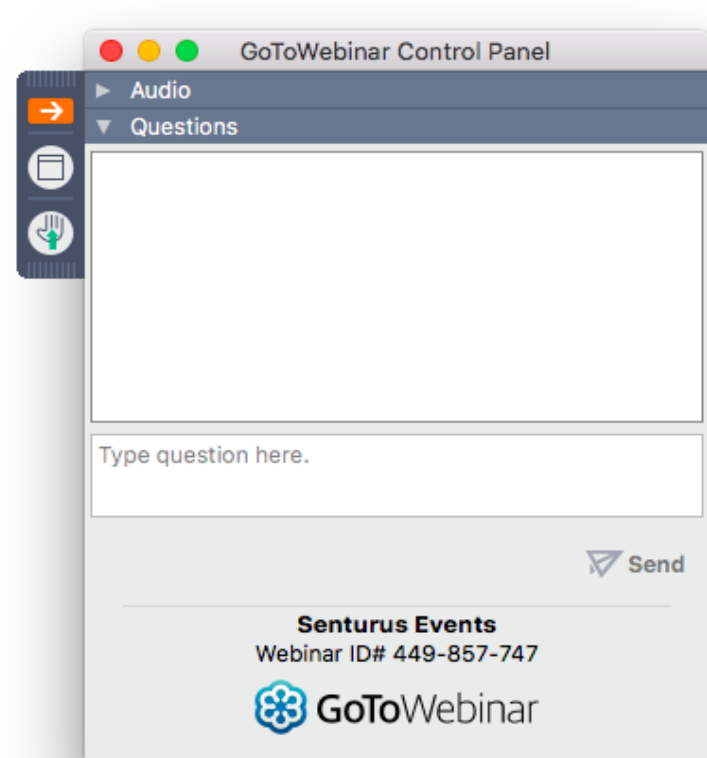

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Q&A

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

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and we will set up a free consultation.

Thank You!

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