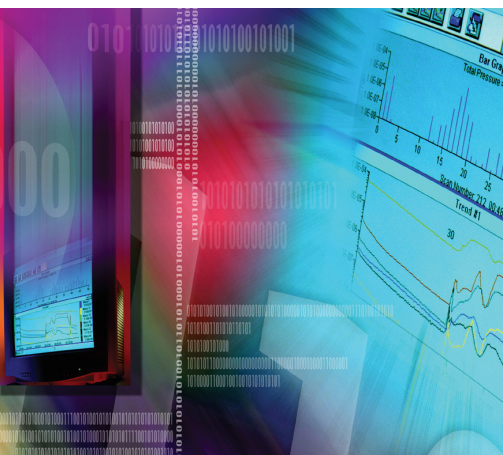


alteryx



# Mastering Survey Analytics with Alteryx and Tableau

**Brian Dirking**, Director of Product Marketing at Alteryx  
**Dustin Smith**, Product Marketing Manager at Tableau  
**Gene Rinas**, Solutions Engineer at Alteryx

## Take survey analytics further, faster by combining Alteryx and Tableau to:

- Radically reduce the time necessary to prepare and process raw data for survey visualization without relying on a data scientist or programming.
- Work with virtually any data source or type (whether structured or unstructured) and output it in a format Tableau can easily visualize.
- Automate and hand off repetitive data processing – freeing you and your team to tackle new challenges.
- Enrich survey data with third party data sources and metadata, adding even more insight to your surveys.
- Easily refine survey analytics, working back and forth between Alteryx and Tableau and leveraging the strengths of both for industry-leading processing, preparation, visualization and interactivity.

## Introduction

Indispensable to politicians, marketers, healthcare professionals, researchers and more, surveys are the best source of insight into the thoughts, opinions and feelings of an audience. Yet for all their potential worth, historically, surveys have been underleveraged due to the complexity, time and expense of processing the raw data. As a result, the best stories ‘behind the data’ remained elusive to analysts, who were stymied by the lack of processing power to prepare, process and ultimately make sense of the survey data on a timely basis.

With the advent of Alteryx and Tableau, analysts are now equipped to digest and visualize the full scope of a survey dataset, no matter how complex or varied, quickly and cost effectively.

Exploring game changing features of both products, this white paper explores how Tableau and Alteryx when used together, can provide timely, unparalleled survey analytics.

## The problem with most raw survey data – it’s raw.

The average Tableau user knows that Tableau can make short work of virtually any complex prepared dataset, rendering a beautiful, interactive visualization in minutes. And while this is true of normalized datasets, raw survey data typically requires specific data shaping and cleaning before it can be properly dimensioned in Tableau. This is because un-normalized raw data:

- Often comes from multiple data sources or types that, structured or unstructured, require extensive shaping, blending and/or cleaning to be easily understood in Tableau.
- Very often is represented in one (or more) record rows with many, many columns for questions. This structure makes sense to the human eye when reading raw survey results, but poses challenges for tools submitting queries.

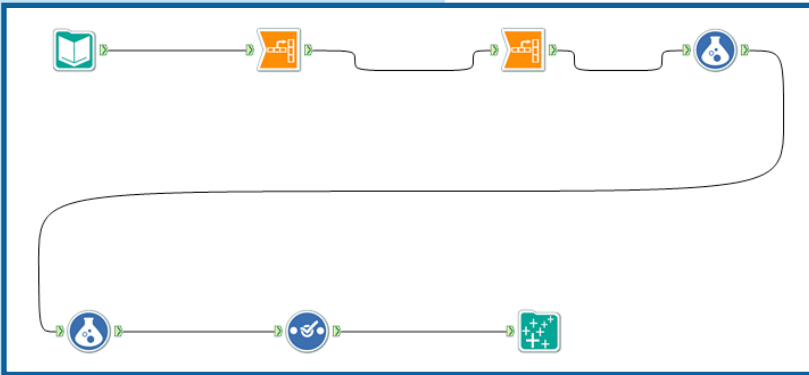
Until this survey data is reshaped, cleaned and normalized so that every question in the survey is a separate row with unique identifiers (for example, ID, User Level, Age, Gender, Retail Location, etc.) repeated for each survey respondent, the survey results will prove challenging to easily visualize within Tableau.

Done natively in Tableau via scripting or at the source, the average user could spend many frustrating hours or even days reshaping the raw data to be usable. The pressure and complexity is compounded if the survey results are required quickly, if there are multiple surveys required in short order (e.g. Polling), or if the processing is ongoing (e.g. Longitudinal surveys). In all those cases, Alteryx provides a decisive advantage for rapid ETL (extract, transform, and load) and is strongly recommended as part of the Tableau pipeline for survey analytics.

## Reshaping survey data in minutes with Alteryx

A common challenge Tableau users face when dealing with survey analytics is that their raw data is not appropriately structured or ‘shaped’ for analysis. Alteryx makes short work of this. Here, we’ll walk you through six easy steps to show you some tricks that you can use to reshape your own datasets to ready them for Tableau visualization. Along the way, we’ll touch on a few of Alteryx’s more powerful features, which will offer more experienced users additional ways to reshape data quickly.

**NOTE:** The sample data and Alteryx workflow described here are free in the Alteryx Visual Analytics Kit for Tableau, visit: [www.alteryx.com/kit](http://www.alteryx.com/kit).



The workflow in Alteryx.

- Step 1:** Create a separate row for every survey answer containing numerical information.
- Step 2:** A second Transpose tool is used to create a separate row for every survey answer containing non-numerical information.
- Step 3:** New fields are created, and the data is cleaned and/or prepped for parsing.
- Step 4:** Parse the data from the 'Question' field to populate 3 new columns of information.
- Step 5:** Remove and/or rename fields within the data stream.
- Step 6:** Output the data into a Tableau workbook.

## 1 Create a separate row for every survey answer containing numerical information

Raw survey data is often represented as a single row with numerous columns for questions. For data to be serviceable to Tableau, it needs to be transformed so that each question is its own row. While you can use advanced methods in Tableau or at the source (for example within a spreadsheet) to reshape this data, this is well outside of the comfort zone of most Tableau users and can be quite onerous to quality check as well.

In our sample Alteryx workflow, the sample data has a number of fields such as User Level, Age, Gender, and Visit Retail Location:

	A	B	C	D	E	F
1	Identifier	1a_User_Level	1b_Age	1d_Gender	1c_Visit_Retail_Location	2_Describes_
2		1 Ambivalent Athlete	6 to 13	Female	Visited but never purchase	Not Selected
3		2 Healthy Beginner	6 to 13	Male	Visited but never purchase	Not Selected

In Alteryx, the heavy lifting is done with the Transpose tool. The Transpose tool allows you to pivot the orientation of the data table. It transforms the data so you can view horizontal data fields on a vertical axis. This is useful for extracting non-conforming data, and there's no



limit to the amount of records or fields that can be transposed.

The Transpose tool is used to create a separate row for every survey answer containing numerical information. When you click on the Transpose tool, you select which fields to reorient.

After the first pivot, the data looks like this:

**Properties - Configuration - Transpose**

**Key Fields**

- Identifier
- 1a\_User\_Level
- 1b\_Age
- 1d\_Gender
- 1c\_Visit\_Retail\_Location
- 2\_Describes\_Brand\_Active
- 2\_Describes\_Brand\_Competitive

**Data Fields**

- Identifier
- 1a\_User\_Level
- 1b\_Age
- 1d\_Gender
- 1c\_Visit\_Retail\_Location
- 2\_Describes\_Brand\_Active
- 2\_Describes\_Brand\_Competitive

	A	B	C	D	E	F	G	H	I
1	Identifier	1a_User_Level	1b_Age	1d_Gender	1c_Visit_Retail_Location	2_Describes_Brand_Active	2_Describes_Brand_Competitive	2_Describes_Brand_Active	2_Describes_Brand_Competitive
2		1 Ambivalent Athlete	6 to 13	Female	Visited but never purchase	Not Selected	Not Selected	Not Selected	Not Selected
3		1 Ambivalent Athlete	6 to 13	Female	Visited but never purchase	Not Selected	Not Selected	Not Selected	Not Selected
4		1 Ambivalent Athlete	6 to 13	Female	Visited but never purchase	Not Selected	Not Selected	Not Selected	Not Selected
5		1 Ambivalent Athlete	6 to 13	Female	Visited but never purchase	Not Selected	Not Selected	Not Selected	Not Selected
6		1 Ambivalent Athlete	6 to 13	Female	Visited but never purchase	Not Selected	Not Selected	Not Selected	Not Selected

**2** A second Transpose tool is used to create a separate row for every survey answer containing non-numerical information.

This renders the data table with numerical and non-numerical information:

	A	B	C	D	E	F	G	H	I
1	Identifier	1a_User_Level	1b_Age	1d_Gender	1c_Visit_Retail	Name	Value	Name2	Value2
2		1	Ambivale	6 to 13	Female	Visited but	6_Mins_Pr	0	2_Describ
3		1	Ambivale	6 to 13	Female	Visited but	6_Mins_Pr	0	2_Describ
4		1	Ambivale	6 to 13	Female	Visited but	6_Mins_Pr	0	2_Describ
5		1	Ambivale	6 to 13	Female	Visited but	6_Mins_Pr	0	2_Describ
6		1	Ambivale	6 to 13	Female	Visited but	6_Mins_Pr	0	2_Describ

**3** New fields are created, and the data is cleaned and/or prepped for parsing.

The formula tool is a powerful processor of data and formulas. Use it to add a field to an input table, to create new data fields based on an expression or data relationship, or to update an existing field based on the same idea. In contrast to Excel, where this may have to be done repeatedly, Alteryx allows you to build out a workflow once, use it multiple times and test the output for errors as you go.



In this step, we have created a number of RegEx statements to modify the text of the data. (RegEx stands for Regular Expressions. This standard string manipulation language, supported in Alteryx, allows us to make replacements without requiring more lengthy scripts). Here, we are replacing strings like “Question” with “Opinion.”

	Output Field	Type	Size	Expression
1	Question Number	V_String	64	REGEX_Replace([Name2], '(?=\_).*', '')
2	Question	V_String	150	REGEX_Replace([Name2], '.*?(.*)', '\$1')
3	Question	V_String	150	Replace([Question], '_.', '')
4	Question	V_String	150	REGEX_Replace([Question], ' Opinion ', '')
5	Question	V_String	150	Replace([Question], '#.', '')
6	Name2	String	44	Replace([Name2], '_.', '')
-		Double	8	

**4** Parse the data from the ‘Question’ field to populate 3 new columns of information.

We use the Formula tool again (by dragging a second Formula tool onto the workflow) to create new fields. We parse the data from the ‘Question’ field to populate 3 new columns of information:

	Output Field	Type	Size	Expression
1	Question 1.A	V_String	150	REGEX_Replace([Question], '(?=\s).*', '')
2	Question 1.B	V_String	150	REGEX_Replace([Question], '.*?(.*)\s.*', '\$1')
3	Question 1.C	V_String	150	Substring([Question], (FindString([Question], [Question 1.B])...

“Ingersoll Rand is using Alteryx to stream line survey data and market research, reducing 10+ hours of data manipulation per survey down to seconds. ...Any type of data you have, big or small, can be cleansed with Alteryx. Said another way, if you have a data process in Excel, move it to Alteryx.”

-Sean Otto, Senior Customer Satisfaction Analyst  
Ingersoll Rand/Trane

“We use Alteryx to make sense of massive amounts of data. We use Tableau to present that so that a CMO or somebody at an ad agency who is looking at the same definition of that customer can say, “Okay, I see what the CMO’s problem is and here’s how we’re going to solve it... it’s become an incredible tool. It’s revolutionizing the way things are being done.”

-Bill Engel, Chairman  
Consumer Orbit

## 5

### Remove and/or rename fields within the data stream.

Next, we use the Select tool to remove and/or rename fields within the data stream before outputting the data into a Tableau workbook. In our example, we use it to rename “Name” and “Value” into “Media Activity” and “Minutes.”



<input checked="" type="checkbox"/>	Name	String	25	Media Activity
<input checked="" type="checkbox"/>	Value	Double	8	Minutes
<input checked="" type="checkbox"/>	Name2	String	44	Question
<input checked="" type="checkbox"/>	Value2	V_WString	255	Response

## 6

### Output the data into a Tableau Data Extract.

With the survey data reshaped and formatted, all that’s left is to output the data file as a Tableau Data Extract (TDE) for Tableau to ingest.



But what if the data is not static? In cases such as longitudinal surveys that update over time, Alteryx can also stream data directly to a relational data store such as SQL server which Tableau can then access directly itself.

In either case, as long as Alteryx is part of the survey analytics pipeline, new surveys can be processed using this workflow over and over again – and even automated.

With data processing reduced from hours to minutes (or even seconds), organizations that generate a lot of surveys stand to benefit greatly. For example, Consumer Reports generates 1.8 million surveys annually. Prior to adopting Alteryx into their Tableau survey analytics pipeline, each survey took 10 hours to prepare for Tableau. Now the process is automated and Consumer Reports can readily refine the workflow as their surveys and needs evolve.

### Enriching data for better insight

Alteryx also makes it easy to enrich existing survey data by appending third party content via integrated tools and macros from partners such as DataSift, FourSquare, GNIP, Google Analytics, Marketo and Twitter. With these full fidelity sources, survey analysts can now achieve unprecedented levels of insight into the drivers that influence their audience. For example, by appending household income data to an existing survey with location information, it’s possible to make inferences about how income might influence survey choices in a geographical area.

### Best practices for visualizing survey data in Tableau

While uses of Tableau for Survey Analytics can vary widely, here are two best practice tips that will take you further, faster.

#### Use clean, normalized data.

The key to successful data visualization of survey responses is to make sure that survey data are divided into two broad category axis:

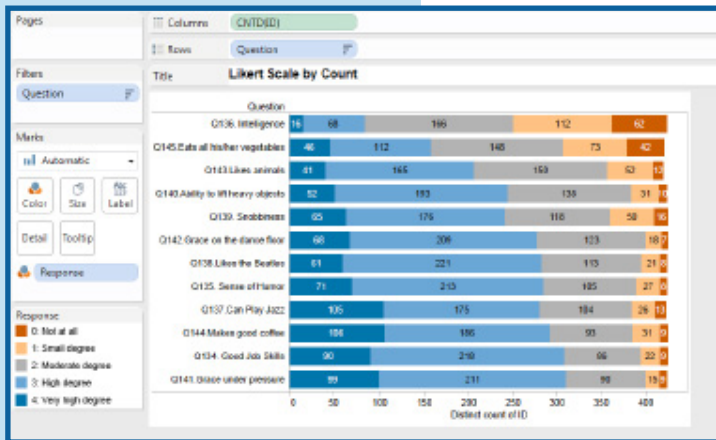
1. Dimensions you use to “cut” the data, i.e. Buckets such as gender, age, geographic locations, etc.
2. Responses to questions that indicate opinions or intentions on certain subjects

	A	B	C	D	E	F
1	ID	Gender	Location	Generation	Question	Response
2		2 Male	South America	Generation X	Q0. Vote in the upcoming election?	0: No
3		2 Male	South America	Generation X	Q1. Pulse Rate	0: No
4		2 Male	South America	Generation X	Q2. Metabolism	0: No
5		2 Male	South America	Generation X	Q3. Blood Pressure	1: Yes
6		2 Male	South America	Generation X	Q4. Temperature	0: No
7		2 Male	South America	Generation X	Q5. Galvanic Skin Response	1: Yes
8		2 Male	South America	Generation X	Q6. Breathing	0: No
9		2 Male	South America	Generation X	Q7. Perspiration	0: No
10		2 Male	South America	Generation X	Q8. Pupil Dilation	0: No
11		2 Male	South America	Generation X	Q9. Adrenaline Production	1: Yes

It's therefore critical that the data ingested by Tableau be normalized first in a format where there is a separate row for each question and where the dimensionable data (e.g. ID, Gender and Generation Data) is repeated for each survey respondent, like so:

Because the task of normalization can be notoriously tricky (especially in cases where an external data store is involved or the dataset is large or constantly updating (e.g. ongoing longitudinal surveys)), Alteryx is the recommended tool in the survey analytics tool belt. Alteryx saves Tableau users many hours of scripting or manual data pivoting and lets you:

1. Think about your data differently. Cleaning it up and maximizing opportunities to see the survey's impact.
2. Make data that is readily ingestible by Tableau by exporting data to and from Alteryx as a TDE.
3. Readily update surveys or rework Tableau visualizations, streaming survey data right into a Data Store from Alteryx's workflow.
4. Leverage the strengths of both products to maximize your survey impact. For example, Alteryx can be used to enrich a survey with additional demographic insight to filter upon.
5. Label the reference data rows appropriately so that they 'make sense' to users in the Tableau schema (eg. questions are labeled as questions, responses as responses, etc.).



### Stacked Bar Charts are useful for representing survey responses.

With the survey data properly prepared and ingested into Tableau, the focus shifts to presentation. To tell more of the story, one chart type that often proves useful is a stacked bar chart. You create a stacked bar chart in Tableau by counting the total number of responses for each question and then creating a colored bar for each of the possible responses, as shown here:

While colorful, it's hard to sort this by overall sentiment.



Both samples on this page can be found in Steve Wexler's "Visualizing Survey Data."

<http://www.tableausoftware.com/learn/whitepapers/visualizing-survey-data>

One step better is to use a divergent stacked bar (or modified GANTT) combined with an overlaid Likert scale and modified axis to show response percentages instead of actuals: Now you have both a good indication of the percentage of people leaning towards something and the overall sentiment in a visually intuitive manner.

## About Alteryx

Alteryx is the leader in data blending and advanced analytics software. Alteryx Analytics provides analysts with an intuitive workflow for data blending and advanced analytics that leads to deeper insights in hours, not the weeks typical of traditional approaches. Analysts love the Alteryx analytics platform because they can deliver deeper insights by seamlessly blending internal, third party, and cloud data, and then analyze it using spatial and predictive drag-and-drop tools. This is all done in a single workflow, with no programming required. More than 600 customers, including Experian, Kaiser, Ford, and McDonald's, and 200,000+ users worldwide rely on Alteryx daily. Visit [www.alteryx.com](http://www.alteryx.com) or call 1-888-836-4274. Alteryx is a registered trademark of Alteryx, Inc.

## Conclusion

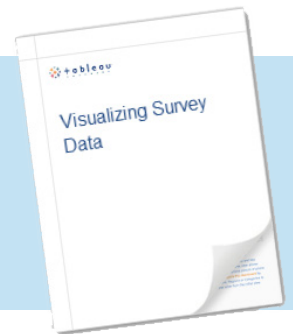
While tremendously insightful, for a long time surveys faced many limitations primarily due to an inability to fully process and analyze the data on a timely basis. As a result, many analyst questions were left unanswered for the sake of expedience or the surveys themselves were dumbed down, to keep data preparation to a minimum. With the advent of powerful visualization tools like Tableau, it's no longer necessary to hold back on filtering and drilling into data. The entire story is now there to be seen ... as long as the raw survey data the visualization is based on is prepared properly.

Doing the heavy lifting of data cleaning, shaping and preparation, Alteryx is indispensable to the Tableau workflow. Turning days of effort into minutes or even seconds, Alteryx together with Tableau provides a game changing ecosystem for modern survey analytics.

### Take your learning to the next level

Check out this in-depth guide from Steve Wexler of Data Revelations — an excellent companion piece to this whitepaper.

<http://www.tableausoftware.com/learn/whitepapers/visualizing-survey-data>



## About Tableau

Tableau Software (NYSE: DATA) helps people see and understand data. Tableau helps anyone quickly analyze, visualize and share information. More than 21,000 customer accounts get rapid results with Tableau in the office and on-the-go. And tens of thousands of people use Tableau Public to share data in their blogs and websites. See how Tableau can help you by downloading the free trial at [www.tableausoftware.com/trial](http://www.tableausoftware.com/trial).

# alteryx

230 Commerce, Ste. 250, Irvine, CA 92602  
+1 714 516 2400  
[www.alteryx.com](http://www.alteryx.com)

© 2014 Alteryx, Inc. Alteryx and Geographic Business Intelligence are registered trademarks of Alteryx, Inc. 7/14  
Tableau and Tableau Software are trademarks of Tableau Software, Inc. All other company and product names may be  
trademarks of the respective companies with which they are associated.