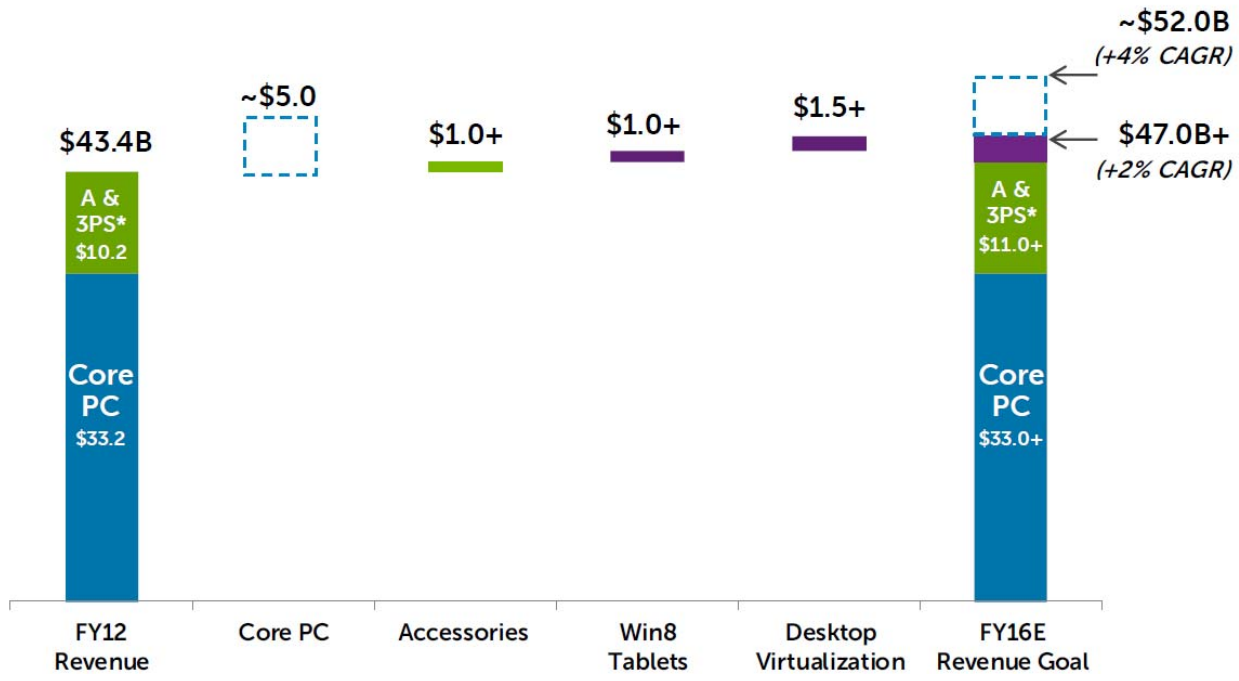
Excellence with Excel: How to Create a Waterfall Bridge Chart for EBITDA (Case Study)

In this case study, you'll get practice creating **waterfall charts** that show how companies move from revenue, profit, or EBITDA in one year to revenue, profit, or EBITDA in the next year, or in the next several years.

Here's a real example of what such a waterfall chart would look like, taken from one of Dell's older investor presentations:



The individual chart elements vary: sometimes you'll see segmented columns and sometimes you'll see normal columns.

The positioning of the smaller bars that "bridge" revenue or other metrics in between these two years may also differ, and you'll see different conventions used by different groups and companies.

However, the **purpose** of waterfall charts is always the same: to demonstrate **visually** how a company can grow (or decline) from year to year, and where additional revenue or profit is coming from.

In this practice case study, you'll complete 2 exercises related to these waterfall charts. We'll walk through the first, more complex, exercise together so you can learn the fundamentals, including how to deal with **negatives** (e.g. if the company's revenue or profit actually declines in one segment).

Then, in the second exercise, we'll go through a simple example first and then you'll get to practice on your own with a different scenario.

The first exercise is more complex since we track revenue over multiple years and since we're building in support for both negative and positive contributions. However, the second exercise has an added complication since we're building in support for "connector lines" in between the columns in the chart.

Exercise #1: Subscribers and Churn Rates

You are working as an investment banker, representing an online subscription services company (think: Netflix, Hulu, Spotify, etc.) that is seeking outside investment. The company earned $11.9 million in revenue in its most recent fiscal year, and its internal projections state that it will earn $14.2 million next year, and $17.1 million the year after that.

You've used these projections in the confidential information memorandum (CIM) sent to potential buyers, including several private equity firms and strategic acquirers, but one of them has stepped forward to express skepticism over the numbers.

This firm does not believe the company's estimates are realistic, and has requested additional detail on the assumptions behind the numbers.

The company's growth is driven by a combination of assumed price increases in each year, as well as additional subscribers gained in key geographies and from specific marketing initiatives, such as paid online advertising (e.g. Google AdWords, Facebook advertising, and LinkedIn ads) and content marketing (e.g. creating YouTube videos, blog posts, podcasts, and so on).

Here's the information for the company's current subscribers and average monthly fees, followed by the projected subscribers in each segment and the average monthly fees in future years:

- **Year 1**
    - **Subscribers:** 100,000
    - **Average Monthly Fees:** $9.95
    - **Revenue:** $11.9 million
- **Year 2**
    - **Subscribers from Year 1:** 100,000
    - **Churn (Lost Subscribers):** 5,000
    - **North America New Subscribers:** 4,000
    - **Europe New Subscribers:** 2,000
    - **Emerging Markets New Subscribers:** 8,000
    - **Paid Online Advertising New Subscribers:** 2,000
    - **Online Content Marketing New Subscribers:** 1,500
    - **Average Monthly Fees:** $10.50
    - **Total Subscribers:** 112,500
    - **Revenue:** $14.2 million
- **Year 3**

- **Subscribers from Year 2:** 112,500
- **Churn (Lost Subscribers):** 6,000
- **North America New Subscribers:** 5,000
- **Europe New Subscribers:** 3,000
- **Emerging Markets New Subscribers:** 10,000
- **Paid Online Advertising New Subscribers:** 2,700
- **Online Content Marketing New Subscribers:** 2,200
- **Average Monthly Fees:** $11.00
- **Total Subscribers:** 129,400
- **Revenue:** $17.1 million

Using this data, create a **waterfall chart** that shows how the company moves from revenue in Year 1 to revenue in Year 2 to revenue in Year 3.

Please make sure your chart includes the following features:

- The **segments** between each year should include "Churn," additional revenue from each different region, revenue from each marketing initiative, and revenue from price increases.
- These segments should all represent **annual dollar amounts**, *not* the # of subscribers.
- As a result, you need to **separate out** the impact of revenue from price increases vs. everything else… which will require some thought.
- The chart itself should feature positive and negative contributions in **different colors**, data labels for the dollar amounts at the top of each bar or segment, and axis labels that correspond to what each bar or segment represents (e.g. "Year 2 Revenue" or "Price Increases."
- **Hint:** The trickiest part of this entire exercise will be adding in the proper data labels in the right positions. Think about how you might calculate the correct vertical position of each data label in the chart…

Exercise #2: Pharmaceutical Product Launches

You're representing a pharmaceutical company that has built up its pipeline over time and is planning to launch new products aggressively in the next year. This company's revenue will come from several sources in the next year:

- **Baseline Sales of Existing Generics:** $510 million
- **Launches of New Generics:** $40 million
- **Launches of New "Specialty" Products:** $30 million
- **Cross-Selling of Existing Generics Into Emerging Markets:** $25 million

Based on this data, create a **waterfall chart** that shows how the company will grow its revenue from $510 million in the last fiscal year to $605 million in the next year.

Please make sure that your waterfall chart includes **connector lines** in between each segment so that you can clearly demonstrate where one segment ends and where another begins.

Also make sure that you include data labels, axis labels, and distinct colors for everything.

Once you're done with this, extend the exercise by creating a *separate* graph that shows how revenue will grow from Year 2 into Year 3:

- **Baseline Sales:** $605 million
- **Launches of New Generics:** $30 million
- **Launches of New "Specialty" Products:** $25 million
- **Cross-Selling of Existing Generics Into Emerging Markets:** $20 million

Complete this exercise on your own, and then check your work against our walkthrough at the end of the video.