Overview
An interactive slideshow layout was used to narrate the story of the farmers market and its growth in the USA. The presentation is a linearly ordered slideshow built using D3 JavaScript library in combination with HTML5 and CSS to depict the narrative visualization. D3 add on libraries, created by the open-source community, are incorporated into the visualization to provide dynamic and static annotation capabilities. The Bootstrap JavaScript open-source library plays an important role in the presentation. It provides a consistent HTML framing and a consistent navigation metaphor.

Messaging
The presentation intends to narrate a story of Farmer's market and its growth in the USA in a contextual and directed manner and provides an ability for the reader to explore various dimensions of farmers market such as its product offering, payment options, digital presence and its schedule around the year. Viewers should be able to see the various product offering by the farmer's markets in each state. Similarly, they could depict the various payment options, farmers market accepts for their business and could generalize farmers market need to modernize for the newer consumers especially millennial.
Viewers could conclude by a brief look at the presentation that most of the farmers market opens-up during the peak harvest season which is usually spring, summer, and early autumn.

Narrative Structure
An interactive slideshow layout was used to narrate the story of the farmers market and its growth in the USA from 1994 till 2018. The presentation is structured with the following scenes for viewers to drill-down details at each scene for additional details:
1. **Overview of Farmer's market**: This section showcases the overview of the popularity and growth of farmers market across the nation. The page has two charts annotated with additional information for the viewer to get deeper access to information in it.
2. **Products offerings**: Products availability is one of the important dimensions of a farmer's market growth. This scene depicts the availability of various products in farmers market across the various state via the Bar chart. Viewers could drill-down the additional details by tool-tips on each bar. They could also drill-down further by applying filter via dropdown containing a list of states. The scene also displays a table when a filter is applied, with the list of the farmers market and its nominal variables such as location information.
3. **Payment options**: Payment method is another important criterion for a market to scale by adapting the newer form of payment methods. This scene depicts the acceptance of various payment options across the nation via Bar chart. Viewers could drill-down the additional details by tool-tips on each bar and could also drill-down further by applying filter via dropdown containing a list of states. The scene also displays a table when the filter is applied, with the list of the farmers market and its nominal variables such as location information.
4. **Social media presence**: Digital presence is another important dimension which has become essential for such kind of business model. Like scene-1 and scene-2, it groups the farmers market by its social media presence across the states via Bar chart. Viewers could drill-down the additional details by tool-tips on each bar and use the dropdown to

filter by state. The scene also displays a table when a filter is applied, with the list of the farmers market and its nominal variables such as location information.

5. **Year-round schedule:** Farmer's market relies heavily on season. This scene depicts the volume of farmers market opened during a season. A line chart provides an overview of the number of farmers market opened per month. Also, the scene has a bar chart to showcase the volume of farmers market across the state by month.

Visual Structure

1. Each scene has multiple charts to depict the volume of the number of farmers markets across various dimensions such as products, payment option, digital presence and its schedule around the year.
   - Line charts –
     o First line chart is displayed in the overview section to showcase its growth since 1994.
     o Second line chart displays the number of open farmers market by month. It showcases that the market opens during the harvest season during spring and summer and closes towards the end of the year.
   - Choropleth chart –
     o The map view of farmers market showcases the density of it across the nation. The legend associated with the chart provides the hint with the color associated in a state to refer to the number of the farmers market. It also has a tool to see the precise count of the farmers market in the state.
   - Bar Charts –
     o The presentations have used a bar chart to display various dimension of the farmers market in each scene.
     o Each bar chart is associated with a dropdown to filter the data associated with the chart.
   - Table –
     o All the scene also has the table view to display nominal information of farmer market. In all the scene, the table displays after the filter event is triggered.
2. The presentation used slide show genres to navigate from scene to scene. Each scene has NEXT and PREVIOUS button to navigate author-led linearly ordered scenes.
3. Viewers could also navigate to previous scenes using NAV bar from any scene. It provides a more viewer directed path. Also, each scene has multiple tooltips, annotations, and filters for viewers to drill-down additional details.
4. Each scene has an information-based alert to let viewers know to drill down for additional details.

Scene

1. **Overview of Farmer's market**: This section showcases the overview of the popularity and growth of farmers market across the nation. The growth is depicted in a line chart with tooltips to provide growth number at each data point of two quantitative continuous fields –
   - *Dependent variable* - Number of farmers market which is a quantitative continuous variable.

- *Independent variable* - Years which is an ordered and quantitative continuous variable.

  Also, a choropleth has been drawn to portray the volume of farmers markets for a state. A legend provides a hint, on the density of the number of the farmers market. Choropleth has a tool-tip associated with each state on the map, which provides the number of farmers market associated with the state.

2. **Products offerings**: Products availability is one of the important dimensions of a farmer's market growth. This scene depicts the availability of various products in the farmers market across the various state via the Bar chart. Viewers could also drill-down the additional details by tool-tips on each bar and use the dropdown to filter by state. Following fields are used to depict the bar chart and its filter:
   - *Drop-down (Filter)* – State names which are a discrete and an independent variable
   - *X-axis of bar chart* – Product names which is a discrete and an independent variable
   - *Y-axis of bar chart* – Number of farmers market which is a dependent and quantitative continuous variable.

Upon usage of filter, the scene displays a table with all the discrete information of farmers market such as location information.

3. **Payment options**: Payment method is another important criterion for a market to scale by adapting the newer form of payment methods. This scene depicts the acceptance of various payment options across the nation via the Bar chart. Viewers could also drill-down the additional details by tool-tips on each bar and use the dropdown to filter by state. Following fields are used to depict the bar chart and its filter:
   - Drop-down (Filter) – State names which are a discrete and an independent variable
   - X-axis of bar chart – Payment type which is a discrete and an independent variable
   - Y-axis of bar chart – Number of farmers market which is a dependent and quantitative continuous variable.

Upon usage of filter, the scene displays a table with all the discrete information of farmers market such as location information.

4. **Social media presence**: Digital presence is another important dimension which has become essential for such kind of business model. Like scene-1 and scene-2, it groups the farmers market by its social media presence across the state via Bar chart.
Viewers could also drill-down the additional details by tool-tips on each bar and use the dropdown to filter by state.
Following fields are used to depict the bar chart and its filter:
   - Drop-down (Filter) – State names which are a discrete and an independent variable
   - X-axis of bar chart – social media name which is a discrete and an independent variable
   - Y-axis of bar chart – Number of farmers market which is a dependent and quantitative continuous variable.

Upon usage of filter, the scene displays a table with all the discrete information of farmers market such as location information.

5. **Year-round schedule:** Farmer's market relies heavily on season. This scene depicts the volume of farmers market opened during a season. A line chart with tool-tip provides an overview of the number of farmers market opened each month.

Following fields are used to portray the line chart:
- X-axis of line chart – Months which is a quantitative continuous and an independent variable
- Y-axis of bar chart – Number of open farmers market which is a dependent and quantitative continuous variable.

Also, the scene has a bar chart to showcase the volume of open farmers market across the state by month. Viewers could also drill-down the additional details by tool-tips on each bar and use the checkbox to filter by month.

Following fields are used to depict the bar chart and its filter:
- Checkbox (Filter) – Month which is a continuous, ordered variable and an independent variable
- X-axis of bar chart – Discrete State names and an independent variable
- Y-axis of bar chart – Number of open farmers market which is a dependent and quantitative continuous variable.

Upon usage of filter, the scene displays a table with all the discrete information of farmers market such as location information.

Annotation Usage

Three types of annotations are used.

· Static textual annotations that are embedded directly into the visualization. Its purpose is to highlight key points of interest, such as historical events and analytical facts, that shape the story, the presentation is trying to communicate. Static annotations are used in all the scenes to communicate a point of view. Web pages have used the d3-Annotation JavaScript library, to create static annotations. A consistent annotation style, fill color and text font are employed for all these static annotations.
· Dynamic annotations (e.g., tooltips) that change context as the viewer hovers over each visual mark in the chart. Tooltips provide a means to visualize the quantitative and categorical values of each data point in the depicted chart. They are employed on all charts in all scenes of the story. It uses d3-tip.js JavaScript library, to create these dynamic annotations. A consistent tooltip style, fill color and font are used for all these dynamic annotations.
· Legends that tie colors on a choropleth chart are used to portray ordinal and quantitative data categorization of state and volume of the farmers market in each state. Without the use of legends, it would be difficult for the viewers to understand charts showcasing multiple colors on it. It uses d3-Legend JavaScript library, to accomplish the same.

The static textual annotations, tooltips, and legends are cleared on leaving each scene; as each scene is has a unique context.

Parameter Usage

Parameters are used to filter subsets of the data, in all the scenes presented in the presentation passed via various trigger such as events. Scene 1- Product offering, Scene 2 – payment options and Scene 3 – Social media presence has a drop-down with a list of states to portray the volume

of farmers market offering various products, their acceptance of various payment options and their depth of digital presence. Scene 4 – Schedule has various checkbox depicting months, provides viewers to filter by month on the farmers market data. Overall, it provides the analytical view of the volume of farmers markets concentrated at various states on different dimensions. Each scene also provides a table view containing the farmer market locations which is visible post filter operation on the main chart, to see additional information on the markets such as name and its address.

Triggers

As mentioned above, parameters are passed to the main chart via various triggers such as user interface events. In the presentation, Scene 1 to 3 has incorporated the on-change event of the drop-down UI component. The on-change event handler, in turn, uses the data value (e.g., parameter) to select the data visualized in the accompanying bar charts. Similarly, scene 4 has incorporated a custom action called on-month-change which captures the updated values of checkbox since the last page load and apply to the main data to displayed filtered content on the bar chart.

Other window events, such as mouse hover and mouse out are used to trigger the toggling on and off the tooltips. The "X" and "Y" parameters are passed by these window events to signal the windowing system where to render the tooltips.

Viewers are made aware of the available triggering events by helpful hints that are displayed when the page load event is triggered on each scene. Each helpful hint displays till viewer close it via the on-click event of the close icon.