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**Narrative Visualization Essay Report**

**Explanations behind USA's Declining popularity of Domestic Autos**

* **Messaging. What is the message you are trying to communicate with the narrative visualization?**

Due to globalization, trade agreements, profit margins, recessions and COVID-19, there has been a significant decline in popularity of domestic autos in the U.S. over the past 50 years, as seen in the data from the Federal Reserve Bank of St. Louis (CUSR0000SETA01, CPIAUCSL, DAUTONSA, DLTRUCKSNSA and DAUPSA). This trend will likely continue and can be explained using this data from FRED along with national events. Many emerging electric car companies like Slate and Rivian and the longstanding Big Three all have adapted increasing the number choices of light weight trucks into their fleets both electric and classic combustion.

* **Narrative Structure. Which structure was your narrative visualization designed to follow (martini glass, interactive slide show or drop-down story)? How does your narrative visualization follow that structure? (All of these structures can include the opportunity to "drill-down" and explore. The difference is where that opportunity happens in the structure.)**

I use Martini Glass approach as a Narrative Structure. I take the user through scene by scene alongside my author-driven content of observations. In a controlled approach I only allow the user to chronologically proceed to the next section by incrementally stepping through each of the four scenes or moving back to any of the previous scenes. When the user moves from the third to the fourth scene, they will experience my jumping off point where the reader can freely view all the graphs, observe sources, and explanations behind the observations that exist in scenes one to three. Furthermore, when the user enters the jump off point in scene four they can hover their mouse over all the data to see exact values with tool tips of those respective points that were observed in scenes one - three.

* **Visual Structure. What visual structure is used for each scene? How does it ensure the viewer can understand the data and navigate the scene? How does it highlight to urge the viewer to focus on the important parts of the data in each scene? How does it help the viewer transition to other scenes, to understand how the data connects to the data in other scenes?**

First, second and third scenes act as an Annotated Charts. The title is provided for each scene and along with a legend if there are more than two variables being observed at once. In each of these scenes a line is drawn to the highlighted data point(s) explaining events behind the cause of this data.

For the first scene, it is explained to the user that back in the 1980s the competition in the U.S. auto market became much higher, creating tighter profit margins for U.S. domestic auto companies thus causing a lower-than-average CPI, making the auto market an even more competitive industry.

For the Second scene, users are shown that not only is the market competition increasing for autos, but the demand for them has been decreasing on a macro level by observing the decrease in sales (retail purchases) of domestic autos while domestic light weight trucks have stepped up to overtake domestic autos in the new millennium.

For the third scene, users are shown the undeniable evidence from the FRED DAUPSA data set that production of the domestic auto has been experiencing a steady decline over the past 30 years with each of the two recent 2008 and 2020 recessions heavily decreasing the number of thousands of units. With the most recent recession still not showing signs of a full recovery for this industry.

The final fourth scene acts as a Magazine Article by allowing the user to either read the visual graphs or the text to gain a better understanding on variables that are causing the U.S. domestic auto to fall in popularity.

* **Steel blue** is always assigned throughout the graphs to represent the U.S. domestic auto, in the first two scenes coral is used to compare the U.S. domestic auto against CPI of All Items in U.S. City Average and retails sales against domestic lightweight trucks.
* On all the scenes FRED’s [definition](https://fred.stlouisfed.org/series/DAUTOSA#:~:text=Notes:,DAUTOSA%2C%20August%202%2C%202025.) of an Auto is provided
* Mouse hover interactions are also supported on the graphs for the last scene to allow further exploration for the user.

* **Scenes. What are the scenes of your narrative visualization? How are the scenes ordered, and why**

Throughout my scenes I did my best to chronologically show events that range further and future into the future, making the Narrative Visualization read like a story for the user.

Scene 1 - CPI: Consumer Price Indexes for All Urban Consumers from 1953 to 2025 (Seasonally Adjusted), marks the point in which the 1980s where the U.S. domestic auto industry started to face a lot of globalized competition with competitive pricing.

Scene 2 - Sales: Motor Vehicle Retail Sales for Domestic Autos and Domestic Light Weight Trucks from 1967 to 2025 (Not Seasonally Adjusted) as we step into the next scene, I show that in the year 2000 the retail sales of Domestic Autos are overtaken in popularity by Domestic Lightweight Trucks. By the year 2018 we can see that lightweight trucks have overtaken the retail market by holding 69% of all new retail sales.

Scene 3 - Production: Domestic Auto Production (DAUPSA) from 1993 to 2025 (Seasonally Adjusted), I highlighted the recent major recessions in 2008 and 2020 to show how significantly they have decreased Domestic Auto Production.

Scene 4 - Summary: This is used as my jumping off point to allow the users to freely explore the insights and data I have gathered to come to their own conclusion.

* **Annotations. What template was followed for the annotations, and why that template? How are the annotations used to support the messaging? Do the annotations change within a single scene, and if so, how and why**

I used annotations in scenes 1,2 and 3. I drew lines, circles and added text all to custom areas of the SVGs that held my graphs to allow me a lot of freedom on how to annotate my data.

Scene 1: In the start of the 1980s shortly after an energy crisis and during the boom of the semi-conductor, the Big Three U.S. automakers experienced intense competition with Japan’s auto market to create modern autos (cars). This global competition drove down the CPI of New Vehicles in U.S. City Average with respect to other goods and services at large. Th

Scene 2: I show the clustering of data in the late 90s and early 2000s to show that light weight trucks are becoming more popular, I also show 11,609,00 light weight trucks were sold in 2018 which was 69% of new light vehicle sales to support the retail sales data.

Scene 3: 2008 Financial Crisis, COVID-19 Recession

None of my annotations change within a single scene because I want the reader to see all available annotations I have carefully placed for each page.

* **Parameters. What are the parameters of the narrative visualization? What are the states of the narrative visualization? How are the parameters used to define the state and each scene?**

My Parameters that fill the view of the data are as follows:

data-type – one/two/three/summary : this parameter told the controller with scene should be rendered in the view.

headers/titles – scenes one, two and three all had

* **Triggers. What are the triggers that connect user actions to changes of state in the narrative visualization? What affordances are provided to the user to communicate to them what options are available to them in the narrative visualization?**

My Triggers that change the state of the visualization based on user interactions are as follows:

Navigation control buttons: Clicking “CPI”, “Sales”, “Production” and “Summary” allows the controller to update the view to that respective scene and show the appropriate model(s).

Hover events: will show Tooltips for each graph to show the user that exact data value, the navigation control buttons have also been given hover events.

My Affordances for the user to guide them through the narrative visualization are as follows:

Disabling on-hover affects data until they approach the fourth scene.

Disabling buttons to prevent the user from skipping scenes.

Insights Gathered

Due to globalization, trade agreements, profit margins, recessions and COVID-19, there has been a significant decline in popularity of domestic autos in the U.S. over the past 50 years, as seen in the data from the Federal Reserve Bank of St. Louis (CUSR0000SETA01, CPIAUCSL, DAUTONSA, DLTRUCKSNSA and DAUPSA). This trend will likely continue and can be explained using this data from FRED along with national events. Many emerging electric car companies like Slate and Rivian and the longstanding Big Three all have adapted increasing the number choices of light weight trucks into their fleets both electric and classic combustion.

* In the start of the 1980s shortly after an energy crisis and during the boom of the semi-conductor, the Big Three U.S. automakers experienced intense competition with Japan’s auto market to create modern autos (cars). This global competition drove down the CPI of New Vehicles in U.S. City Average with respect to other goods and services at large. This opened the way for tighter profit margins.
  + In November 2021, Larry Printz wrote that during the 1980s the Big Three had to engineer cars with newer technology and meet an unprecedented demand for smaller fuel-efficient cars.
  + In 1979 Peter J. Schuyten wrote in the New York Times that “The Menlo Park, Calif., market research company estimates that with the addition of such functions as transmission control and electronic braking, the volume could rise to as much as $3.9 billion by 1990; and this for an industry whose total billings this year will amount to around $6 billion.” Revealing positive predictions for manufacturers to keep driving up production.
* 1994 North American Free Trade Agreement (NAFTA) is officially enacted buy Canada, Mexico and USA. This shaped the landscape of the North American auto manufacturing industry to outsource more manufacturing to Mexico due to cost of labor (Klier, Thomas H., and James Rubenstein). If 50 to 62.5 percent of the auto was assembled in North American U.S. tariffs would be lightened or avoided altogether for each assembled auto.
* 1995, production declines as America’s Big Three lose Market Share to Japanese makers like Toyota, Honda due to Keiretsus in Diplomacy. A Yale Undergraduate research journal in 2020 explained:

“These tensions between the United States and Japan came to a fore in the 1995 auto dispute, in which President Clinton threatened to enact $6 billion in tariffs on luxury auto imports to the US from Japan in response to Japanese unwillingness to make room for American auto part imports in Japan. The lesson of the dispute, and its recognition of the increasingly globalized supremacy of the Japanese auto industry, speaks to the potency of Japan’s keiretsus to delay and avoid trade liberalization” (Boers, Jasper).

Due to this aggressive style of trade that did not allow the U.S. to enter the Japan auto market easily. The U.S. lost out on sale opportunities within Japan’s economy post Gulf because its policy makers argued that American manufacturing did not meet the Japanese auto market requirements. President Bill Clinton scheduled auto industry tariffs on the Japanese market for June 28, 1995. However, the tariffs never came into effect due to the Memorandum of Understanding (MOU) between the U.S. and Japan. (American Automotive Policy Council 2)

* At the turn of the millennium into the 2000s, a report from U.S. Department of Transportation the sales of lightweight trucks had fully caught up with autos in both use and sales for the first time.
  + The U.S. Department of Transportation noted the “Popularity of light trucks as personal vehicles continues to increase- retail sales of trucks for 2000 amount to 8,965,000 units sold.”
* With NAFTA’s ten-year phase-out of major trade barriers, which ended in 2004, foreign automakers began laying roots in Mexico. Brands like BMW, Mercedes-Benz, Kia, Mazda, and Audi unveiled plans to launch local assembly operations between 2013 and 2020. This influx boosted the number of vehicle manufacturers assembling cars in Mexico from 11 to 21 from 2004 to 2020 (Klier, Thomas H., and James Rubenstein).
* 2012 we see nearly a full recovery in the amount domestic auto production from the 2008 recession. Federal Bailouts, improved supplier relations and pent-up demand led to increases in Domestic Auto Production until about 2012.
  + Jul 2007 – 346.0 units by thousands
  + Jul 2008 – 375.4 units by thousands
  + Jan 2009 – 107.5 units by thousands
  + Jul 2012 – 361.4 units by thousands
* By the year 2015 the decision of USA automakers to remain conservative in the public demand for autos and strategic manufacturing to again produce more higher-margin vehicles like SUVs led to another decline in Domestic Auto Production. In 2015, industry experts Austan D. Goolsbee and Alan B. Krueger noted that they were pleased with the demand for autos since 2009 but also surprised since there had been a steady decrease in demand for the Big Three automakers for many years prior to 2009.
* In 2018 a notable milestone for the popularity or light weight trucks over autos was imminent with the Transportation Energy Data Book Edition 38 reported “11,609,000 light trucks were sold in 2018 which was 69% of new light vehicle sales” (Davis , Stacy C. C., and Robert G. Boundy.) This marked an undeniable decline of the popularity of Autos in the USA.
* By 2020 Production drops significantly more than it already was. COVID-19 caused chip shortages and labor disruptions.

Sources

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