History of what? Be more specific, History of Oil and Gas Drilling.  And, then you need to actually have a few pages on the history.

You definitely need a section on the current drilling techniques (pictures that can be published in your paper would be good;-)

You need a section on the data  (not just data cleansing)

History:

The Permian Basin stretches from the lower Southern portion of New Mexico and extends to much of West Texas [INSERT PERMIANBASIN.jpeg]. This basin was formed during the Paleozoic era. From the geological timeline, much of the structures which ultimately formed the traps for hydrocarbon were created during the late Paleozoic Era (251 million years ago).

\footnote[1] {Tang, Carol Marie. “Permian Basin.” Encyclopedia Britannica, Encyclopedia Britannica, Inc., 25 May 2015, www.britannica.com/place/Permian-Basin. [Accessed 3 June 2019]}

Oil was first produced from the basin in the middle of the 1920’s, and major activity started during the 1950s. Much of the data from these early periods is still used today to deliver control points of the basin. These control points help geologists map different formations in the subsurface layers.

\footnote[2] {Rapier, Robert. “Fracking Has Been around since 1949, Why the Recent Controversy?”, Global Energy Initiative, 1 Dec. 2014, globalenergyinitiative.org/insights/58-fracking-has-been-around-since-1949-why-. [Accessed 3 June 2019]}

Though the basin has been producing for more than five decades, new technology emerged that brought additional life to the basin in recent years. Hydraulic fracturing ("fracking") has been around since 1949, but it was not until the early 2000’s that fracking was combined with horizontal drilling techniques. The ability to drill in a horizontal direction to stay within a formation gave an unprecedented way to drain reservoirs that were once thought to be on the decline for producing hydrocarbons. [INSERT Vertical\_vs\_Horizontal.png]

A vertical well refers to a well bore that extends below the derrick, a true horizontal well is a well that at a point in the well path the bore hole goes from vertical to a true horizontal fashion [INSERT Types\_of\_WellPaths.PNG]. The first vertical well was drilled in 1895 using a percussion drilling method, this well was drilled to 65 ft measured depth. In comparison deep water well have a measured depth of over 24K feet. The technology advancements lead to a new type of drilling called rotary drilling. The basic concept that that was brought fourth in the late 1800’s can still be seen today as the drill pipes are spinning while drilling down into the subsurface. This type of drilling was a necessity to allow for Energy companies to reach targets that are at deep targets.

The directional drilling was done on an accident basis as a well bore path was deviated without knowledge of the act. The deviation was discovered when fishing tools lost in the boreholes. In 1930 this was the first documented records of an intentional deviation to reach a target he hydrocarbons. The rig was situated on a jetty that was perpenduclar to the target, this intentional directional drilling was done on the shores of Huntington Beach, California. In 1934 directional drilling was used to kill a blowout of a well by pumping heavy mud into the deviated bore hole and stop the blowout.

A leap in technology and computing power thrust many industries, including Energy, into Big Data Analytics. However, the velocity of the data captured proved to complicate analysis for the Energy industry.\footnote[3] {Mohammadpoor, Mehdi. “Big Data Analytics in Oil and Gas Industry: An Emerging Trend.” Petroleum, Elsevier, 1 Dec. 2018, www.sciencedirect.com/science/article/pii/S2405656118301421. [Accessed 3 June 2019]} Specifically, real time drilling sensors capture data every second. Many in the industry were not experienced in how to analyze and make the best use of this data. With the market drop in 2014, Energy companies began to realize this data was a valuable asset. Efforts were put forth to recruit talent that could make use of these large datasets that had been sitting idle in 3rd party vendor databases.