**Bottlenecks at all stages of Data Science**

**1960-1970**: no clear distinction between statistics, mathematical statistics, data science

**1970-1980:** data is a normalized representation of facts or ideas that can be disseminated or manipulated in some form. Data science is the science that deals with data after data is formed. The relationship between data and what it represents belongs to other fields and sciences. How to connect traditional statistical methods , modern computer technology and the knowledge of experts in various fields to convert data into information and knowledge. There are no tools, no paradigms, and no new science to support it.

**1980-1990:** computer technology and statistics begin to converge. Data mining is more of a science than a methodology, and it leads to the development of data science, but with very little change.

**1990-2000:** data science is only a concept and hypothesis, which is studied and discussed by a few scholars. Its significance is limited to the huge amount of data, and there is no further exploration on the collection, processing and storage of data.

**2000-2010:** the research of data science is mainly in the academic field. Traditional statistical methods work well in small data sets. However, today's data sets can involve millions of rows and hundreds of columns, and unstructured data is emerging in large quantities that traditional database processing cannot cope with. Scalability is a huge problem in data mining, and another technical challenge is to develop models better suited to analyzing data, discovering nonlinear relationships and interactions between elements, and specialized data mining tools to help websites make decisions.

**2010-2020**: data science is from data collection and fusion, to the application of statistics and machine learning and other skills, to interpretation and communication and visualization of results. The nature of data science is interdisciplinary, and it can touch all aspects of the same problem, from the initial data collection and adjustment to the conclusion. At this time the main problem is data scientists how the science and business practice, incremental willingness to establish data products, ability of exploring and iteration to obtain the ability to solve and hacker spirit, how to continue to business, science and technology, medical, government, education, economy, transportation, logistics and social each domain seepage, continuous innovation.