## 1.    Trends of Data Analytics in Different Sectors

The data analytics market is replete with techniques and tools that are rapidly expanding to keep up with the growing volumes of data gathered and used by businesses.

The first trend is growing interest in self-service data analytics. Data analytics informs both internal operations and client-facing decisions on everything from revenue targets to marketing touchpoint performance and staff turnover data. Every type of data that businesses generate can and should be put into data analytics software to better understand what's going on in the business and how that knowledge affects the organization's plans.

The second trend is stronger data integration through embedded analytics. Many users lack not only the necessary skills or access to data analytics tools but also the time or user interfaces to make data analytics a part of their daily work. As a result, the data analytics market is moving toward more robust data integration via embedded analytics or analytical insights that appear immediately in the applications and interfaces where workers already operate.

Besides, the trend of data analytics is finding tools that support data integrity. If data quality isn't guaranteed and data compliance rules aren't fulfilled, data analytics processes or technologies are useless. Data integrity, or ensuring that data is correct and ethically obtained, is one of the most important developments in data analytics right now.

The last trend of data analytics is the emergence of analytics on the blockchain. Performing data analytics on the blockchain is maybe the most intriguing and underappreciated data analytics trend. Most people think of blockchain as a technology for cryptocurrencies or safe transactions, but it's rapidly being utilized for accurate data analytics calculations due to its high levels of documentation and security.

**Reflection**

Data analytics drives both internal operations and client-facing decisions on everything from revenue targets to marketing touchpoint performance and staff turnover data, thanks

to the increased interest in self-service data analytics. The advantages of embedded analytics will vary depending on the business application to which they've been introduced, but there are a few overarching themes in the areas of the user interface, user experience, data blending, mashups, and process optimization. Data integrity is critical because data integration is impossible without it. When data integrity is preserved, it indicates that the data values saved in the database are consistent with the data model and/or data type. As a result, the data model can provide trustworthy insights, allowing users to make well-informed business decisions with the finding tools that support data integrity. With the emergence of analytics on the blockchain, participants in the network verify or validate the blocks, removing the requirement for a trusted authority to authenticate the information in them, such as a regulator or an accounting firm.

## 2.    Industrial Talk 7: Introduction to Data Visualization (iCEP)

In the discussion of the talk, we have learnt several things related to data analytics. We have learnt types of data that exists, types of data relations, and types of charts that can be used to visualize our data and findings. As per the talk as well, we were briefly introduced to Power Bi as one of the interfaces that can be used to visualize our data.

To simply put, Power Bi is an interface that can be used to present and visualize data. Multiple tools can be used to visualize our data and make the insights to be understood in simpler ways.  Power Bi also is a beginner-friendly interface, as we are already briefed and thought in the talk itself. With a mere click of a button, we will be able to have our data into proper and understandable information and insights.

We can use Power BI multi-dimensional categories. Power Bi is different from excel in terms of visualization of the data itself, Power Bi transforms data from excel into a graphical form that is easier to be understood. It also have an automation feature that allows easier job for companies, you don't have to create the visualization every month.

You can use Power Bi for various sectors and reasons depending on how you would like the date to be visualized. For example, Power Bi can be used to study the number of diseases at certain locations of the country with proper insight which will enable the user

to know the reasons the disease spreads and how to maintain them and come out with solutions.

**A narrative of the analytics was conducted.**

In the talk, we were walked through certain analytics that was prepared by the speaker. The speaker explained briefly the sections and tools that are available for us to be able to use Power Bi. The speaker used data from an excel template that was prepared earlier before the talk on product orders with the customer details. The modelling was prepared before the talk. The speaker used a clustered column chart to visualize the category of the products and sales of the products which enable us to get insight on the number of sales for each category of products available. We were also thought about how to design the data and make it more look-able and understandable. The speaker also used different types of data visualization tools to represent the same data in different ways, such as aquarium data visualization. We were also shown a proper data visualization that can be presented in a professional platform and how different data visualization can interact with one another.

**Reflection**

Information can be visualized in several ways that can provide specific insights. It is important to identify and understand the story you are going to tell. Proper visualization is very important when it comes to delivering your message or insight on the data you have collected. With good insights and a storyline from the data, companies will be able to improve themselves to a whole new level. The reason behind this is because they can identify what is the problem the company is facing and what needs to be improved so that the companies' sales or production can be generated better. As discussed in the talk, Power BI is one of the user interfaces which is easy and functional that can be used to create your data visualization and interpretation. You can manage your data and keep an insight on the changes of the data up to date just by clicking some simple buttons. It is believed that usage of interfaces such as Power Bi on data analytics will be growing and much enhanced in coming years together with the technological growth and how much important data and information has become. Thus, everyone should be able to adapt to the usage of data analytics in daily life as it will be a trend in future for the humans to be able to do certain actions in their daily lives.

### 3.    Microsoft Power BI Data Visualization & Analysis

Millions of people suffer from pain and are often prescribed drugs to treat their conditions. However, the dangers of prescription misuse, drug use disorder, and overdose have been a growing problem throughout the world. Since the 1990s, when the number of drugs prescribed to patients began to grow, the number of overdoses and deaths from prescription drugs has also increased. The rate of overdose deaths in Connecticut increased from 9.9 per 100,000 residents in 2012 to 28.5 per 100,000 residents in 2018; a 221 % increase with the majority occurring among persons aged 35-64 (65.3 %), men (73.9 %), and non-Hispanic whites (78.5 %). Among deaths involving fentanyl, the overall deaths escalated from 5.2 deaths per 100,000 residents in 2015 to 21.3 deaths per 100,000 residents in 2018 and more than 50% of these fentanyl-related deaths involved polysubstance use.

Our main objective is to use data visualization using Microsoft Power BI. The beauty of Power BI is that we can look at each element as a whole to make better decisions. The dashboard's visual representation allows us to quickly see the data that's relevant for the choices we have to make. The advantages of Power BI are numerous, and it aids management teams in making fast decisions. Data visualization is made simple with Power BI. It offers a full summary of our data in visual form, with display choices such as tables, charts, gauges, and maps, making it easier for us to use it. Other than that, Power BI is also a powerful decision support tool that makes the difference between typical data and an efficient, agile, and flexible organization, thanks to its simplicity and visual representation.

We also came up with several questions for our research data. Our first question is what is the trend of death due to drug overdose by year in the state of Connecticut? The second question that we are trying to figure out its answer by applying data visualization would be what is the gender trend of drug overdose death by the year from 2012 to 2018? The third question that we are trying to figure out is the answer by applying data visualization would be which race suffers from most death due to drug overdose by the year from 2012 to 2018? The last question that we are trying to figure out its answer by applying data visualization would be which city has the highest count of mortality due to drug overdose?
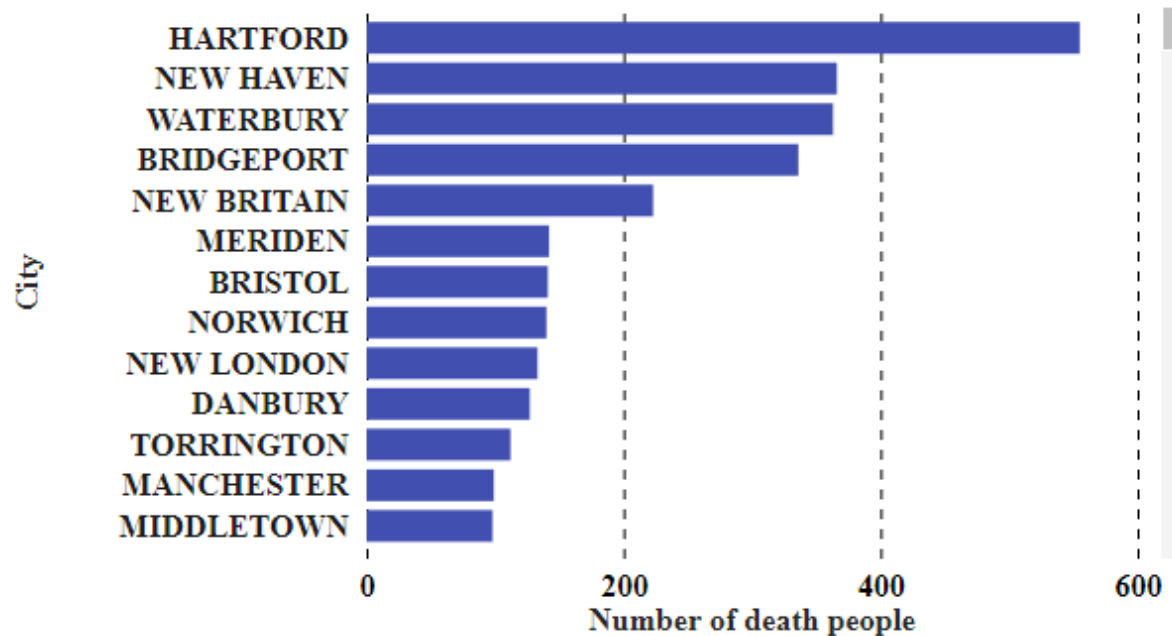
**Figure 1**

Figure 1 illustrates the number of dead people by the city in Connecticut state from the year 2012 to the year 2018. According to the bar chart, Hartford city has the highest number of dead people which is 555 people due to drug overdose. The second-highest number of dead people is New Haven city whereas the third-highest number of dead people is Waterbury city. The New Haven city and Waterbury city have almost the same number of dead people which are 366 people and 363 people. Furthermore, Bridgeport city has 336 dead people while New Britain city has 223 dead people due to drug overdose. The rest of the city has a number of dead people less than 200 and below. From this chart, we can conclude that Hartford has the highest number of death due to drug overdose.
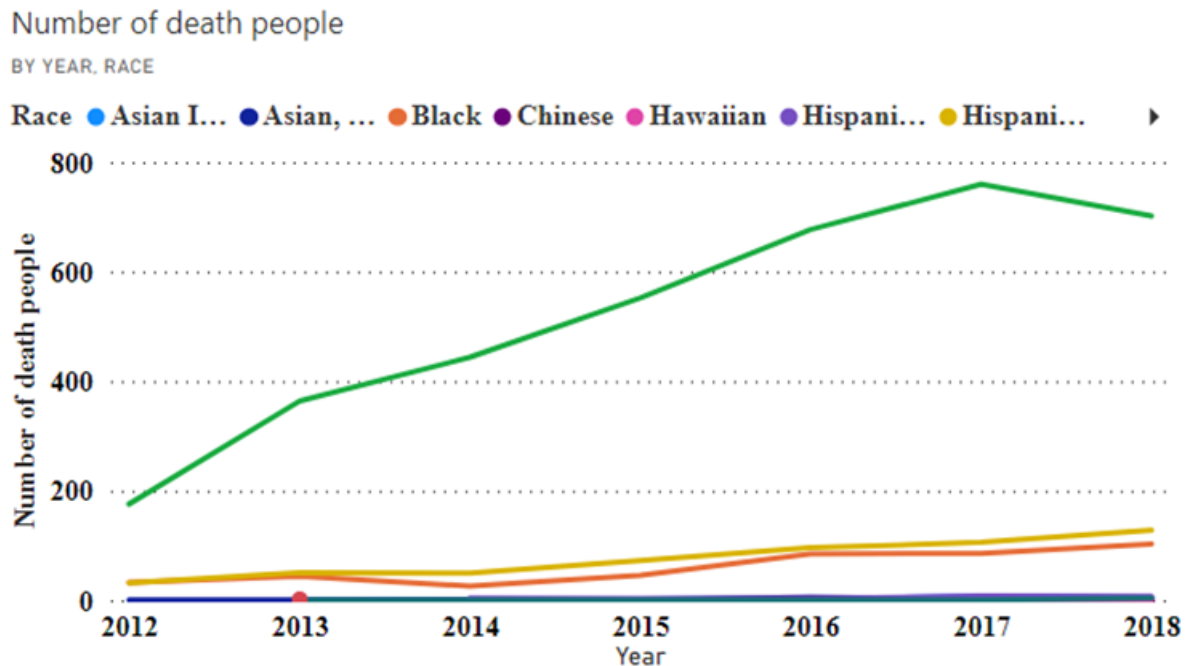
Race ● Asian I... ● Asian, ... ● Black ● Chinese ● Hawaiian ● Hispani... ● Hispani...   ▶



**Figure 2**

The line chart depicts the number of dead people due to drug overdose from 2012 to 2018 and different races. Based on the line chart, white people have the highest number of dead people which is 176 people in 2012. All other races have less than 100 dead people due to drug abuse in that year. The number of dead people for white people races increased steadily which is 176 people increased to 760 people from the year 2012 to the year 2017. For black people and white Hispanic people, the number of dead people rose gradually which are 33 to 103 for black people and 32 to 128 for white Hispanic people in this period. In contrast, the number of dead people due to drug overdose for other races were nearly zero in this entire period. In essence, it can be said that most of the drug overdose case happens to white people with green line representation.
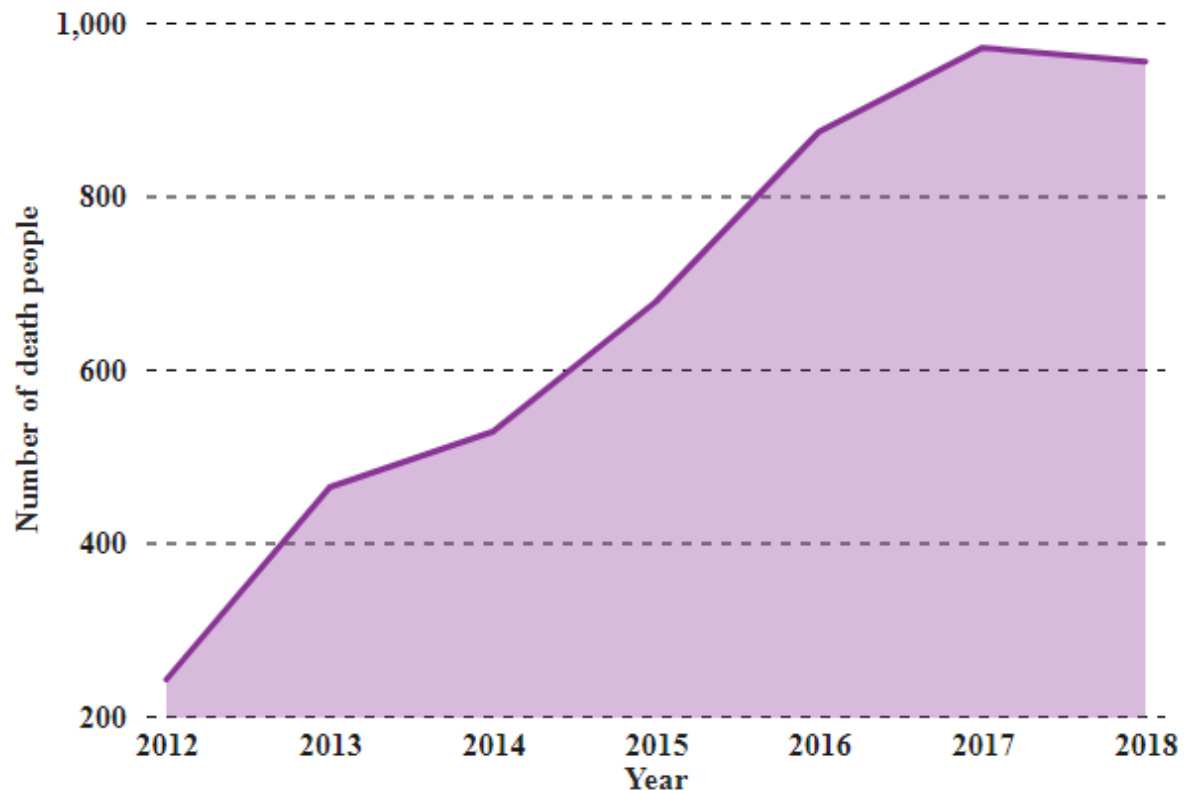
**Figure 3**

This area chart in Figure 3 represented the number of dead people in Connecticut state by year. In 2012, there had 242 people dead due to drug abuse and increased dramatically to 464 people in 2013. After that, the number of dead people in 2014 which is 528 people grew strikingly to 971 people in 2017 and decline steadily to 955 people in 2018. This shows the trend of people dying due to drug overdose in Connecticut is increasing by the year.
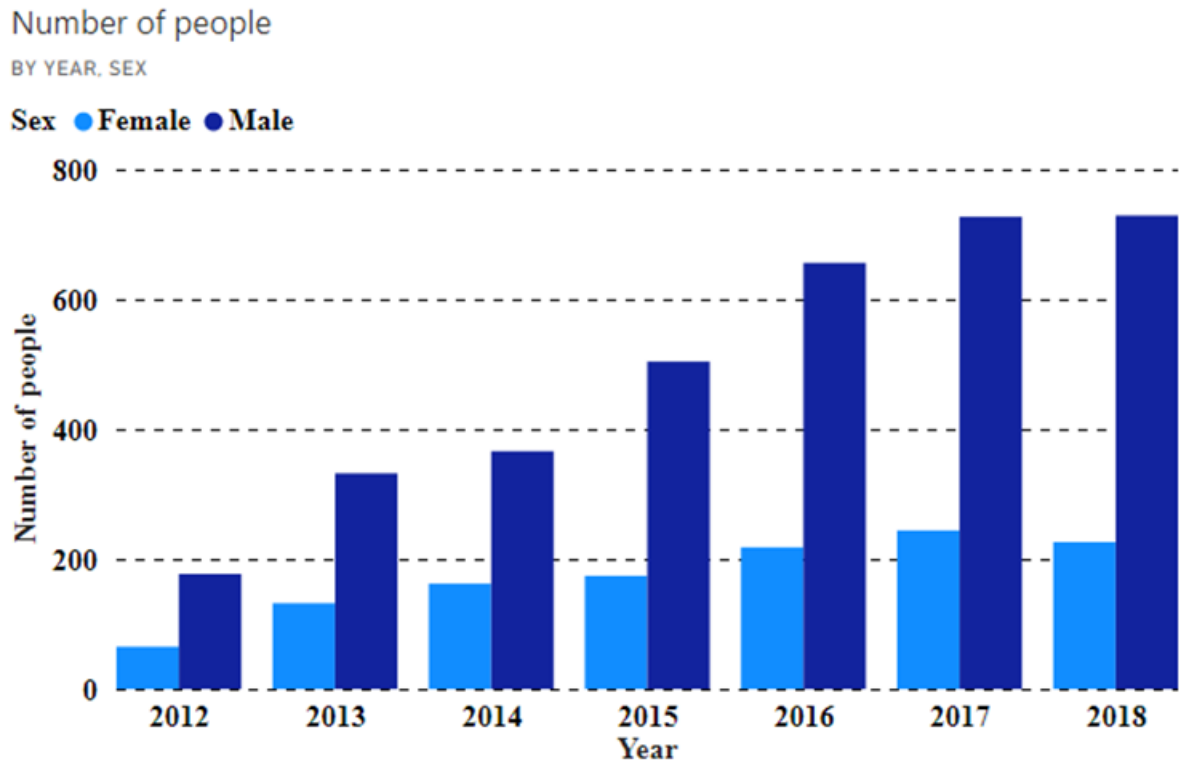
**Figure 4**

This clustered column bar chart shows the number of dead people involved in drugs abuse by year and sex. According to the chart, gender male has a higher number of dead people due to drugs overdose than females from the year 2012 to the year 2018. For males, the number of dead people increased slowly from 177 people in 2012 to 366 people in 2014 and then spiked to the highest which is 727 people in 2017. The number of dead people in the year 2017 is almost the same in the year 2018 which is 727 people and 729 people. For females, the number of dead people rose steadily from 65 people in 2012 to 244 people in 2017 and then have a little decrease in 2018 which is 226 people. In conclusion, it can be said that both men and females that are associated with drug overdose death increase over time, even though women are more than 50% lower compared to men.

Feel free to visit our Microsoft Power BI Dashboard;
https://app.powerbi.com/groups/me/dashboards/f74fe1ab-88c6-46ad-9fae-31fc0c6904f1?ctid=0e0db2ad-c416-47c7-88ec-ceac4ee76767&pbi_source=linkShare