**Designing Enterprise Dashboards**

**A dashboard has only one page.**

You cannot manage well what you cannot monitor

What is a Dashboard

Visual display of data used to monitor conditions and facilitate actions

Right information at the right time for the right people

New face of the emerging information management field.

Vehicle of execution for several key initiatives

**Common misconceptions of Dashboards**

1. Dashboards are for senior executives only.
2. Dashboards are for report distribution only
3. Dashboard is a type of a portal. A portal is a collection of different applications presented together. A dashboard could be a part of a portal but not vice versa
4. Dashboard project has an ending. Dashboards evolve with time.

**Power of Visualization:**

* Observation of the trends and patterns in Data
* How visualization helps our short-term memory

**Pre-attentive Attributes:**

* Pre-Attentive Attributes and their role in visualization
* Color as a Pre-Attentive Attribute
* Size as a Pre-Attentive Attribute
* Length and Position as Pre-Attentive Attributes
* List of Pre-Attentive Attributes

**Encoding of Data:**

* Types of Data – Categorical, Ordinal and Quantitative
* Encoding Examples using Color and Position

**Color Theory:**

* Understanding of Colors, RGB Model, Color Wheel
* Primary, Secondary and Tertiary Colors in the Color Wheel
* Warm and Cool Colors
* Hue, Tint, Shade and Tone
* Color Schemes – Sequential, Diverging, Categorical, Highlight and Alert
* Dashboard Examples using different Color Schemes

**Pre-attentive Attributes:**

Visualizing data requires us to turn data into marks on a convas.

The marks are called **Pre-attentive Attributes.**

Our brain process these in milliseconds

There are different types of **Pre-attentive Attributes.**

1. Color
2. Size
3. Length and Position
4. List

**Color as a Pre-Attentive Attribute**

Color differences pop out quite significantly

Our eyes are amazing at spotting things like these.

We cannot overemploy this and have to be careful.

Using one color or few colors is effective and fine respectively.

If we use too many colors, it would be a mess

Let us look at the three kinds of data from official visualization perspective.

Categorical, ordinal and quantitative.

**Categorical(or Nominal)** data represent things this are qualitative in nature. Some examples of categorical data or name, profession, gender product, category, city, etcetera. typically the dimensions of analysis or categorical in nature.

**Ordinal** data is similar to categorical data, however, it has got a specific orders that is, it can be ordered naturally. Some examples of ordinal data, our satisfaction level salary bands ranked, etcetera.

**Quantitative** data. It refers to the numbers These are normally measured, like fails and then aggregated like average daily sales over a week. it can be discreet or continuous in nature. Some examples of quantitative data are sales profit margin page views, number of customers price. typically the fact that are analysed in any business situation are quantitative in nature, the quantitative data can be additive or non additive or semi additive.

in this example, we are going to flood the regional sales and profit data of an organisation by country. the data data type and including forgiven. countries categorical in nature. We want to include it using position on a map. sales is quantitative in nature and we want to use size to represent it. We will also use the tool tip to display the sales value. Similarly, the quantitative data profit is to be represented using Finally, we want to display whether the profit in a particular country is positive or negative. That is lost using collapse. We have chosen the including for each of the data points. Now we shall use them and see how the chart looks like. the regional sales profit. Visualisation is done using geo map. almost all the modern day reporting tools provide the option of plotting region specific data on the geo maps for better visual impact. In this visualisation, the bubbles referred to the sales their size, representing the sales amount. And they're colo you are representing whether the particular country is showing a profit or loss. Green means profits and red means loss in this charge. the position on the map shows the country and the pool team shows the country name fails and profit. next Vish A look at big country wise category ways profit. There are three countries. Cambodia, Malaysia and Singapore. There are three categories of products, namely furniture, office supplies and technology. in this example we discuss. the fails profit of Q one for these three countries across the categories. the data data type and preferred including or given country is categorical in major, represented by positions. category if categorical in nature. that is represented using Colo you are. and profit is quantitative in nature, which is to be represented by we have chosen the according for each of the data points. Now we shall use them and see how the example chart would look like. we use a three maps to represent the data. In addition to colour, size and position, we see data labels displayed for ease of comparison. We also see that as we move from left to right the quantity in this case, the profit keeps decreasing, so it is in some sense given in assorted orders. the data, including and the charts or not unique for a given set of data. let us look at another possibility for the same regional vice product category wise prophet. in this option, we represent country using colo our product category using position and profit using. it is a cluster column chat with multiple coloured columns where each colour represents a country. the category decides the position of the cluster of columns, whether it is technology or furniture or office supplies. and the prophet determines the vertical size of the column. so we see that there are multiple visualisations for civil for a given set of data. the according sort decided and then the different possible charge times or selected and then viewed in order to get an idea of which is the most appropriate one in the given business situation. to summarise. in this video, we have seen the three kinds of data from a visual isation perspective. namely categorical, Ordina LL and Quantitative. We also looked at two examples in details. The data types were in corded using colo our size and position.

**KEY PERFORMANCE INDICATORS(KPI)**

We shall introduced the three main components of the process of designing the dashboard and go into one of them. That is the information component in this video. the process of designing the dashboards could be chartered by answering the following questions.

Number one What information.  - INFORMATION

number two for home.  - AUDIENCE

number three how to present.  - PRESENTATION

**INFORMATION**

let us look at the information element of the dashboard in this video. the process. The process is finding out the critical questions of the business whose answers we are seeking through deployment of the dashboard and then relating key performance indicators or KPIs to these questions. These kpi would be displayed in the dashboard and help in answering the business questions. For example, in order to answer the business question, we are seeing an increase in sales, but the profits seemed to be declining. What is happening? The relevant KPI is the profit margin. This KPI, when captured every month and looked at for the last 12 months, leads us to the answer of the business questions. let us start by looking at the four elements of a KPI’s, are broken down into four elements

data sources,

granularity,

variance

calculations.

We will look into these elements one by one. We will look at a typical large enterprise information landscape here. The operational data sources freed into the data warehouses and Data marts. master data can flow from some of the systems customer master data from CR um, for example, into the monster data management systems. If any, we would find out the details about the data sources, which will provide information to the calculation of Cape Ease. Some of the data can come in from third parties, such as data vendors who provide detailed market information. if we are interested in employees attrition KP we would get the employee data for the duration from the Enterprise Data Warehouse, for example. it is quite a challenging task to make all these data sources communicate with the reporting software in a seamless manner. while finding out the data sources for KP determination, we may find gaps in the data management process of the companies. For example, a data source might not have put in the needed validation for the incoming data. or the same data stored in different formats in different systems or data redundancies and so on. The KP calculation process provides an opportunity to sit right, the data related insufficiencies of the organisation. Sometimes we may have to get data from multiple sources in order to calculate a K P is, for example, if we want to find out the market share of over products, we require the sales data from our data warehouse and the total sales of similar kind of products, as provided by a third party analyst who is tracking the industry. granularity sets up the different levels of competitions needed for the KP. The kph can have different grains across different dimensions. the three most government dimensions exhibiting grain time. geography and product. the grains are determined by all possible combinations across the three dimensions. it has look at the most common grains in any business. time Grain for a K P A can range from hourly daily, weekly, monthly, quarterly, yearly year today and so on. The year waste customer count of an organisation is shown in the waterfall charge. She had the time greyness year. The same keep it is that is, customer count can be looked at in multiple time granularity such as. quarter. month. and Dave. we can go on to have it at an hourly level, also if the business demands it and the data is captured in such granularity. geography grain goes on to include world Region, country, state, city court and so on. The same customer account is given across the world in this geo map chart. Again, the same can be looked at multiple levels such as region. country. and state. Finally, the product grain can take on values such as company, overall division, product category, brand item, group item and so on. we are looking at a simple bar chart giving the overall sales of an organisation. Now this can be looked at multiple granularity Ys across the product dimensions, namely. product category wherein we see the sails of three different categories of products. We may go one level down in granularity to see the failed at. an individual product level. We may have sub categories under categories and any number of levels before we reach the individual product level. This is closely linked to the management hierarchy of the organisation. For example, the head of the furniture's division would want the sales information at the level of product category so that he can know his divisions, performance and how. With compared with other divisions such as technology and office supplies, the close mapping between the management hierarchy and the KP granularity helps to make the dashboard personnel and meaningful at every level. apart from these three given business situation might bring in New Year grains in other dimensions. For example, there could be an employee, Graeme, that is, individual employee employees of a project, employees of an account business unit and the entire organisation. When we consider a metric at the employee level, such as the productivity, it can be looked at different grains by employees at different levels. let us look at an example of a K p a grain from a multi national automotive company. this company manufactures trucks, cars, SUVs, a chakra and sells them in the USA as well as across the world. We will look at the most common KP revenue. We need to calculate it across all possible granularity ease that are relevant in the organisation. Some possible grains for this cape or given. We see that we can look at the grass revenue generated through a particular brand of a particular series of a vehicle in a particular geography over a specified time duration. This kind of looking at the grass revenue across different granularity ease of the dimensions gives the decision makers lots of insights and help them find root causes of events and take necessary actions. any operation that is performed on the data in order to calculate a K P is called calculation. examples of commonly used calculations are some percentage average, maximum minimum, moving average, weighted average, various etcetera. and some popular KP calculations or given. profit margin percentages. Profit divided by revenue in 200 employees at oppression during any period is ekotto number of employees who have left in that period in 200 divided by employee count at the beginning of the period. return on investment or oh, I record to profit and on an investment divided by total cost of the investment in 200. variants sets up the standards for comparison, for the comparison, adds meaning to a K P. for example, consider the revenue of a company for this quarter. When we compare it with the last quarter figure of revenue, we are able to get more insight. We may compare it with the competitors revenue. To get much more insight, variants has to requirements the change basis and change calculation. the most common basis or comparisons made in the time dimension, such as month ago, year ago, quarter ago forecast and so on. the most common change calculations are difference percent change and percentage point change. we shall look at the waterfall chart that shows the variation in the customer account over a period of four years. We have already seen this chart in the context of KP granularity he had. We see that the variance is given in terms of difference. That is, we are able to see the number of customers that got added in each year. We produced the percentage change as the change calculation. Also, that could mean finding out the ratio of newly added customers in a year to the customer account. At the beginning of the year, multiplied by hundreds, for example, 652 customers were added in 2012 and the number of customers at the end of 2011 was 172. So the percentage change in customer count over 2012 would be 652 divided by 572 in 200. That is an increase of 140%. reassures are for the KP to assist the performance and plan for actions. these thresholds may vary for each of the KP grains, for example, the threshold for revenue maybe set differently for the global level, regional level, country level and so on. Some of the Cape Age may have famed assures defined at every level. Profit margin, for example, may be applied uniformly across the grains, starting from the organisation level two unit level to account level to project level. let us look at an example of KP threshold. A company may fix some thresholds for profit changes, as even below the percentage change in profit over the last year is the calculation. let us. Now look at how the alerts are defined based on KP. Elects are closely related to pay pay threshold. did not. The actions taken when a K pay threshold is bridged. Not every threshold need to be associated with an alert, though. alleged provide warning when a k p a goes bad, that is breaches. bad threshold. alerts are associated with actions such as email notifications or other indications, which aims to catch the attention of the viewers. alleged support management. By exception. As the information to be processed by the decision makers keeps on increasing, it is quite natural that they may miss out breaching of a K P A. Let's make sure that any exception is not missed out and relevant team members are warned. campaigning. All the aspects of K P is that we have seen so far we can come up with a framework for documenting the KP. Starting with a p a name, we should document the data source granularity, calculation, variance, threshold and alert elements in the table. at an exercise. You can look at some standard kph across various industries and tried to fill in the other elements in the table, making necessary assumptions. some sample que pasar given in this flight. this are from the domains of sales, marketing, supply chain and customer service. some more que pasar given in this flight. These are from the domains of human resources, finance and manufacturing. to summarise In this video, we have seen the three questions of the dash boarding process, namely what information for whom and how to present. then we looked at the key performance indicators, or K P. and four elements of KPs such as data sources, granularity calculation and various. Then we looked at Cape A alerts and thresholds, followed by some sample kph from several domains. having gone through the question on the information content of the dashboard in great detail, we shall explore the second question of the desk boarding process in our next video, that is for whom, or be descending the dashboard for.