Academic Year: 2024-25 Sap Id:60003220189

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COURSE CODE: DJS22ITL6015 **DATE: 04-02-2025**

COURSE NAME: ISIG Laboratory **CLASS: T. Y. B.Tech**

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Experiment No. 2

CO/LO: Describe the types of support that an information system can provide to each functional area of the organization.

AIM / OBJECTIVE: To create a Tableau dashboard that visualizes the characteristics and usage of Decision Support Systems (DSS) in different organizational scenarios.

THEORY:

A decision support system (DSS) is a computer program used to improve a company's decisionmaking capabilities. It analyzes large amounts of data and presents an organization with the best possible options available.

DSS brings together data and knowledge from different areas and sources to provide users with information beyond the usual reports and summaries. This is intended to help organizations make informed decisions.

A decision support application might gather and present the following typical information:

- Comparative sales figures between one week and the next.
- Projected revenue figures based on new product sales assumptions.
- The consequences of different decisions.

A DSS is an *informational* application as opposed to an *operational* application. Informational applications provide users with relevant information based on a variety of data sources to support

better-informed decision-making. Operational applications, by contrast, record the details of business transactions, including the data required for the decision-support needs of a business.

A DSS is an information system commonly used by middle and upper management levels of an organization, typically in operations or planning teams.

What is the purpose of a DSS?

The purpose of a DSS is to gather, analyze and synthesize data to produce comprehensive information reports that an organization can use to assist in its decision-making process. Unlike tools that are limited to just data collection, DSS also processes that data to create detailed reports and projections.

DSS are an adaptable tool meant to meet the specific needs of the organization using it. Finance, healthcare and supply chain management_industries, for example, all use DSS to help in their decision-making processes. A DSS report can provide insights on topics like sales trends, revenue, budgeting, project management, inventory management, supply chain optimization and healthcare management.

All of this is meant to provide decision-makers with comprehensive information that can be used to make quicker and more accurate decisions.

Decision support system components

A typical DSS consists of three parts: a knowledge database, software and a user interface.

Knowledge base

A knowledge base is an integral part of a decision support system database, containing information from both internal and external sources. It's a library of information related to particular subjects and is the part of a DSS that stores information used by the system's reasoning engine to determine a course of action.

Software system

The software system is composed of model management systems. A model is a simulation of a real-world system with the goal of understanding how the system works and how it can be

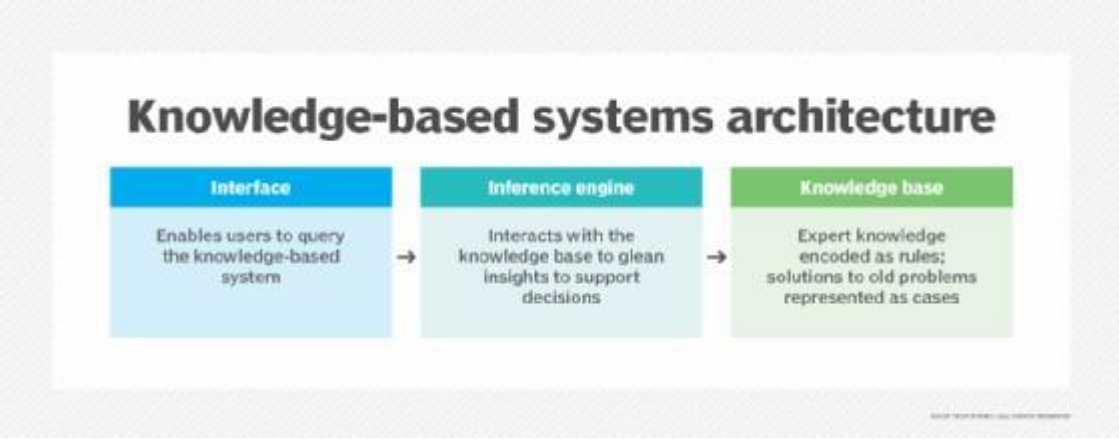
improved. Organizations use models to predict how outcomes will change with different adjustments to the system.

For example, models can be helpful for understanding systems that are too complicated, expensive or dangerous to fully explore in real life. That's the idea behind computer simulations used for scientific research, engineering tests, weather forecasting and many other applications.

Models can also be used to represent and explore systems that don't yet exist, like a proposed new technology, a planned factory or a business supply chain. Businesses also use models to predict the outcomes of different changes to a system -- such as policies, risks and regulations -- to help make business decisions.

User interface

The user interface enables easy system navigation. The primary goal of the DSS's user interface is to make it easy for the user to manipulate the data that's stored on it. Businesses can use the interface to evaluate the effectiveness of DSS transactions for end users. DSS interfaces include simple windows, complex menu-driven interfaces and command-line interfaces.



A knowledge base is an integral part of a knowledge-based decision support system. **What are the advantages of a DSS?**

DSS offer several advantages, including the following:

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- **Enable informed decision-making.** By taking multiple different data sources into account, DSS can facilitate better, up-to-date and informed decisions.
- **Consider different outcomes.** DSS consider different business outcomes, as possible decisions are based on current and historical company data.
- **Increase efficiency.** DSS automate the analysis of large data sets.
- **Provide better collaboration.** DSS tools might also include communication and collaboration features.
- **Enable flexibility.** DSS can be used by many different industries.
- **Handle complexity.** DSS can handle complex problems that have multiple interdependencies and variables.

What are the disadvantages of a DSS?

While DSS offer several potential benefits, they also have notable downsides, including the following:

- **Cost.** Expenses for developing, implementing and maintaining DSS can be high, which can limit their use by smaller organizations.
- **Dependence.** Developing an over-reliance on a DSS eventually takes away from the subjectivity involved in decision-making.
- **Complexity.** DSS must consider all aspects of a given problem, which requires a lot of data. They can also be complex to design and implement.
- **Security.** Data that DSS use might involve sensitive or critical data, meaning that an increased focus on security is required.
- **Employee resistance.** Some employees might be resistant to any workflow change based on the recommendations of a machine.

OBSERVATION:

Dataset Description:

This dataset provides detailed information about various vehicles, including their make, model, year, engine specs (e.g., fuel type, horsepower, cylinders), performance (e.g., highway and city MPG), and pricing (MSRP). It also includes data on transmission type, driven wheels, vehicle size, and market category (e.g., sedan, SUV).

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The dataset helps analyze trends in vehicle performance, fuel efficiency, pricing, and popularity across different vehicle types and years. It is useful for comparing the relationship between vehicle features (like engine power and price) and evaluating market segmentation.

Observations on Visualizations:

- **Bar Chart (Vehicle Count by Market Category)**: This chart shows the distribution of vehicles across different market categories (e.g., SUV, Sedan) by counting the number of vehicles in each category. Colors can be added to differentiate vehicle sizes (Compact, Midsize, Fullsize).
- **Scatter Plot (Engine HP vs. MSRP)**: This plot highlights the relationship between engine horsepower and vehicle price (MSRP). It visually shows if higher horsepower correlates with a higher price, with colors representing different vehicle sizes.
- **Line Chart (Average Highway MPG by Year)**: This line chart displays how highway fuel efficiency has changed over the years, helping to track trends in fuel economy. Fuel types can be color-coded for further insights.
- **Pie Chart (Vehicle Distribution by Engine Fuel Type)**: This chart shows the proportion of vehicles using different fuel types (e.g., Gasoline, Electric), providing an overview of fuel type distribution in the dataset.
- **Heatmap (MSRP vs. Engine Cylinders)**: The heatmap visualizes how MSRP varies with the number of engine cylinders. It uses color intensity to show the concentration of vehicles at different price levels based on cylinder count.

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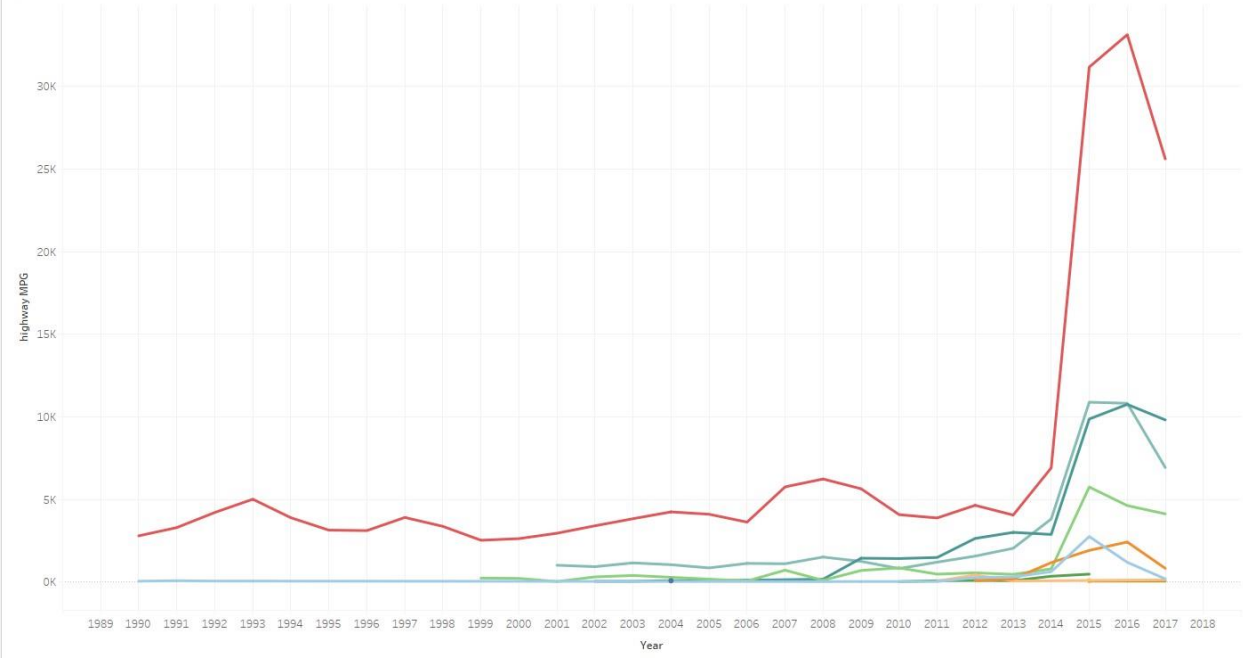
Sheet 1

Sheet 3



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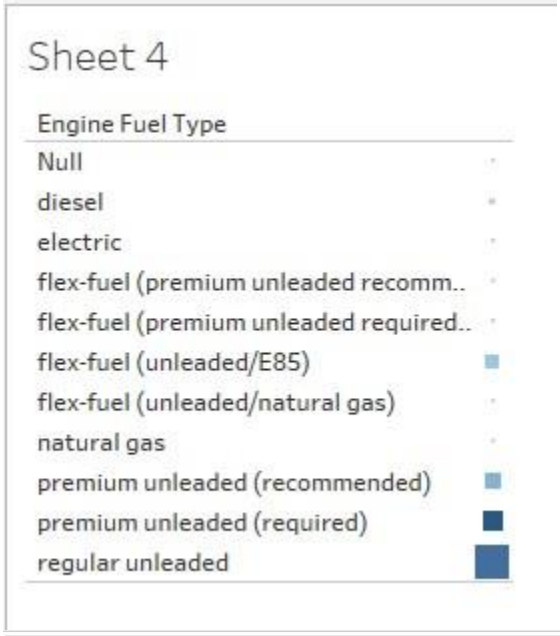

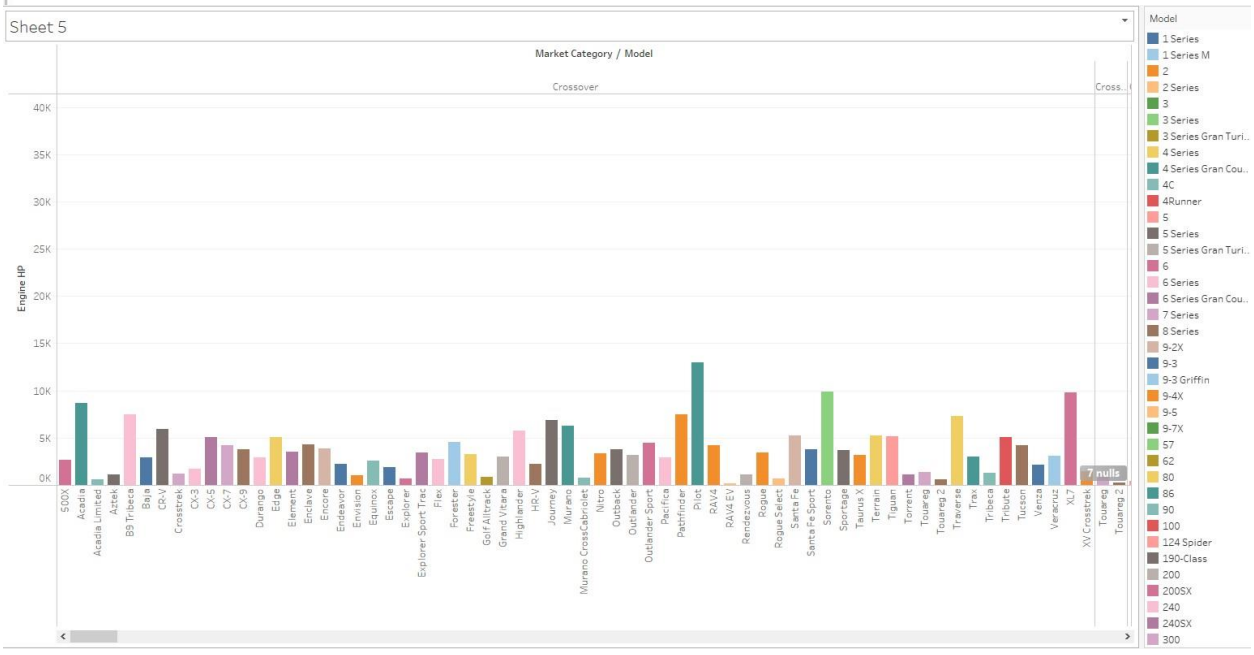

DASHBOARD:

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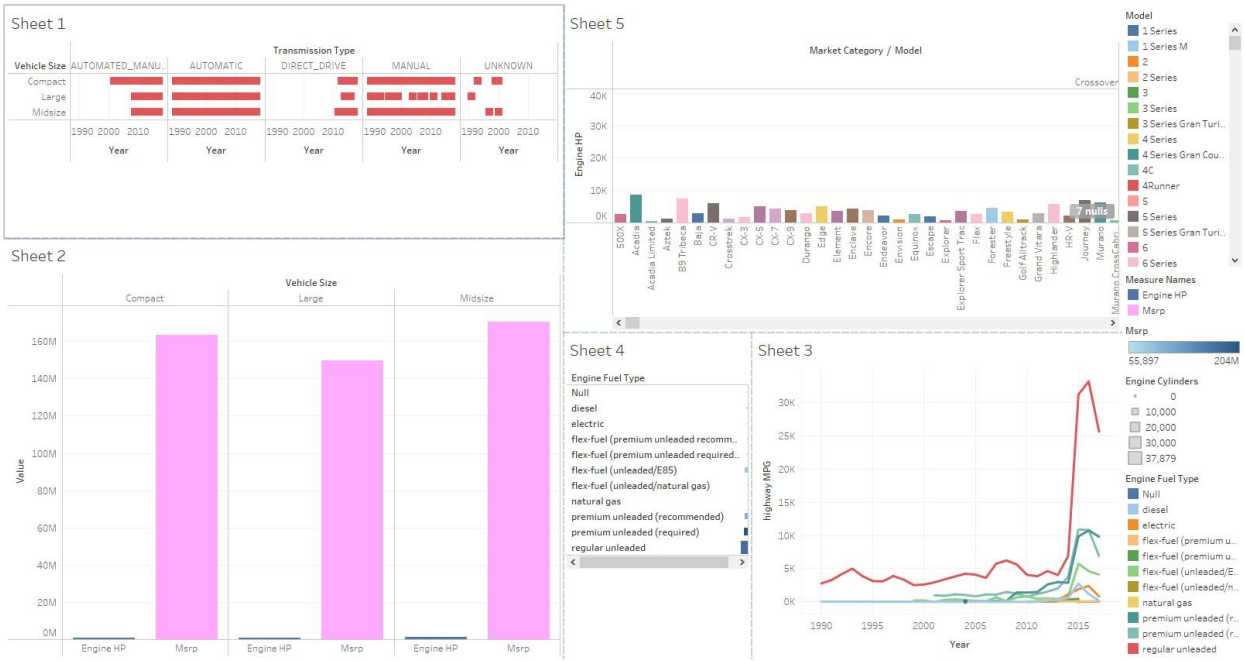
The dashboard visually represents key vehicle data, including market categories, engine performance, fuel efficiency, and pricing. It features multiple interactive charts:

- **Bar Chart**: Displays vehicle counts by market category (e.g., SUV, Sedan).
- **Scatter Plot**: Shows the relationship between engine horsepower and MSRP.
- **Line Chart**: Tracks highway fuel efficiency over time.
- **Pie Chart**: Illustrates the distribution of vehicles by fuel type.
- **Heatmap**: Visualizes MSRP variations based on engine cylinders.

These visualizations allow users to explore trends and correlations within the data, providing valuable insights into vehicle characteristics and performance.



CONCLUSION: In this experiment we created a Tableau dashboard that visualizes the characteristics and usage of Decision Support Systems (DSS) in different organizational scenarios.

REFERENCES:

1. Turban, E., McLean, E., and Wetherbe, J., "Information Technology for Management," John Wiley and Sons, 2nd Edition, 2000.
2. D.P. Goyal, "Management Information Systems-Managerial Perspectives," Macmillan, New Delhi, 2006.