PET VOLUNTEER OPPORTUNITY

This Animal Shelter is always looking for friendly volunteers that love animals and want to do what they can to help.

PAW PETROL

ARTIFICIAL INTELLIGENCE FOR BUSINESS DECISIONS AND TRANSFORMATION CSCN8030

Group:
ASSIGNMENT: 1

Prashansa Rathod - 8993410
Harsh Joshi – 8952840
Jaiv Burman - 8930180
Nidhi Ahir – 9041129
Nil Kumar Patel - 8983991

Overview
This project leverages data analytics to optimize animal shelter operations, focusing on improving animal welfare, increasing adoption rates, and streamlining shelter processes. The stakeholder perspectives, goals, concerns, and success metrics for this initiative are summarized below.

Stakeholder Perspectives
1. **Shelter Managers**
- **Goals**: Maximize animal care efficiency, reduce overcrowding, and improve adoption processes.
- **Concerns**: Limited resources, data accuracy, and resistance to technology adoption.
- **Success Metrics**: Reduced animal stay duration, improved health outcomes, and higher adoption rates.
2. **Veterinarians**
- **Goals**: Enhance animal health monitoring and treatment.
- **Concerns**: Access to real-time health data and integration with existing medical systems.
- **Success Metrics**: Faster diagnosis and treatment times, reduced illness rates, and improved vaccination coverage.
3. **Adopters and Public**
- **Goals**: Simplify the adoption process and access detailed animal profiles.
- **Concerns**: Transparency in animal health history and ease of access to shelter information.
- **Success Metrics**: Increased adoption satisfaction, higher repeat adoptions, and positive public feedback.
4. **Donors and Sponsors**
- **Goals**: Ensure resources are used effectively and demonstrate the impact of their contributions.
- **Concerns**: Accountability and visibility of project outcomes.
- **Success Metrics**: Clear reporting of project KPIs and increased donor retention rates.
5. **Data Analysts and Developers**
- **Goals**: Develop accurate and actionable predictive models for shelter operations.
- **Concerns**: Data quality, model interpretability, and collaboration with stakeholders.
- **Success Metrics**: High model accuracy, seamless integration with shelter operations, and stakeholder satisfaction with insights.

Integration of Views
By aligning stakeholder goals, addressing concerns, and defining clear success metrics, this project aims to create a unified decision-support system (DSS). This will improve animal welfare outcomes, streamline operations, and enhance community engagement. Each stakeholder's input is vital to achieving a holistic solution that benefits all parties involved.

PART:2 Data Analysis and Visualization

Insights from Data Analysis

- The dataset provides detailed records of animal intakes and outcomes from Austin Animal Center.
- Key outcome types include **Adoption**, **Transfer**, **Return to Owner**, **Euthanasia**, and more.
- **Adoption** is the most frequent outcome, highlighting its importance in shelter operations.

The dataset we have contains information about animal shelter operations, focusing on the following key metrics:

- **Animal Types**: Includes categories such as dogs, cats, rabbits, and other animals.
- **Intake**: The number of animals taken in by the shelter.
- **Adopted**: The number of animals successfully adopted.
- **Euthanized**: The number of animals euthanized.
- **Calculated Metrics**: Adoption and euthanization rates have been computed for a deeper understanding of shelter performance.

Key Insights:

- Dogs and cats have higher adoption rates compared to other animals.
- Euthanization rates are relatively low across all categories, indicating a focus on animal welfare.

This is the dataset Of Intake table taken by the animals

	Animal ID	Name	DateTime	MonthYear	Found Location	Intake Type	Intake Condition	Animal Type	Sex upon Intake
2	A786884	*Brock	01/03/2019 04:19:00 PM	January 2019	2501 Magin Meadow Dr in Austin (TX)	Stray	Normal	Dog	Neutered Male
3	A706918	Belle	07/05/2015 12:59:00 PM	July 2015	9409 Bluegrass Dr in Austin (TX)	Stray	Normal	Dog	Spayed Female
4	A724273	Runster	04/14/2016 06:43:00 PM	April 2016	2818 Palomino Trail in Austin (TX)	Stray	Normal	Dog	Intact Male
5	A857105	Johnny Ringo	05/12/2022 12:23:00 AM	May 2022	4404 Sarasota Drive in Austin (TX)	Public Assist	Normal	Cat	Neutered Male
6	A682524	Rio	06/29/2014 10:38:00 AM	June 2014	800 Grove Blvd in Austin (TX)	Stray	Normal	Dog	Neutered Male
7	A743852	Odin	02/18/2017 12:46:00 PM	February 2017	Austin (TX)	Owner Surrender	Normal	Dog	Neutered Male
8	A635072	Beowulf	04/16/2019 09:53:00 AM	April 2019	415 East Mary Street in Austin (TX)	Public Assist	Normal	Dog	Neutered Male
9	A708452	Mumble	07/30/2015 02:37:00 PM	July 2015	Austin (TX)	Public Assist	Normal	Dog	Intact Male
10	A844350	*Ella	10/15/2021 11:40:00 AM	October 2021	2112 East William Cannon Drive in Austin (TX)	Stray	Normal	Cat	Intact Female
11	A818975		06/18/2020 02:53:00 PM	June 2020	Braker Lane And Metric in Travis (TX)	Stray	Normal	Cat	Intact Male
12	A731435	*Casey	08/08/2016 05:52:00 PM	August 2016	Austin (TX)	Owner Surrender	Normal	Cat	Neutered Male
13	A707375	*Candy Cane	07/11/2015 06:19:00 PM	July 2015	Galilee Court And Damita Jo Dr in Manor (TX)	Stray	Normal	Dog	Intact Female
14	A696408	*Pearl	02/04/2015 12:58:00 PM	February 2015	9705 Thaxton in Austin (TX)	Stray	Normal	Dog	Intact Female
15	A726659	Harris	03/17/2023 12:30:00 PM	March 2023	Twilight Trail in Travis (TX)	Stray	Injured	Dog	Neutered Male
16	A774147		06/11/2018 07:45:00 AM	June 2018	6600 Elm Creek in Austin (TX)	Stray	Injured	Cat	Intact Female
17	A657188	Tommy	11/10/2013 05:19:00 PM	November 2013	Austin (TX)	Owner Surrender	Normal	Cat	Neutered Male
18	A760053		10/11/2017 03:46:00 PM	October 2017	8800 South First Street in Austin (TX)	Stray	Normal	Dog	Intact Male
19	A707658	*Mint	07/15/2015 05:43:00 PM	July 2015	6118 Fairway in Austin (TX)	Stray	Normal	Cat	Intact Female
20	A790209	Ziggy	03/06/2019 02:31:00 PM	March 2019	4424 S Mopac Expwy in Austin (TX)	Public Assist	Normal	Cat	Intact Female
21	A736287	*Twilight	10/08/2016 11:53:00 AM	October 2016	South First And Stassney in Austin (TX)	Stray	Normal	Cat	Intact Female
22	A697950		03/04/2015 11:22:00 AM	March 2015	1501 S Fm 973 in Austin (TX)	Stray	Normal	Dog	Intact Female
23	A743114		02/04/2017 10:10:00 AM	February 2017	208 Beaver St in Austin (TX)	Stray	Injured	Cat	Intact Female
24	A298074	Stumpy	09/06/2015 02:21:00 PM	September 2015	1801 Westridge in Austin (TX)	Stray	Normal	Dog	Spayed Female
25	A856107	A856107	04/28/2022 11:56:00 AM	April 2022	4700 Prock Lane in Austin (TX)	Stray	Normal	Cat	Intact Male
26	A876774		03/19/2023 07:27:00 PM	March 2023	10320 Bankhead Drive in Travis (TX)	Wildlife	Normal	Other	Unknown
27	A783861	Tulip	11/07/2018 03:53:00 PM	November 2018	3110 Guadalupe Street in Austin (TX)	Stray	Normal	Cat	Intact Female
28	A841760	Duke	03/30/2022 09:27:00 AM	March 2022	512 Bowery Trl in Austin (TX)	Stray	Injured	Dog	Neutered Male
29	A831808		04/02/2021 11:16:00 AM	April 2021	Austin (TX)	Owner Surrender	Normal	Cat	Intact Female

Here Is the table of overall outcome of animals

	Animal ID	Name	DateTime	MonthYear	Date of Birth	Outcome Type	Outcome Subtype	Animal Type	Sex upon Outcome	Age upon Outcome	
1	Animal ID	Name	DateTime	MonthYear	Date of Birth	Outcome Type	Outcome Subtype	Animal Type	Sex upon Outcome	Age upon Outcome	
2	A794011	Chunk	05/08/2019 06:2	May 2019	05/02/2017	Rto-Adopt		Cat	Neutered Male	2 years	Domest
3	A776359	Gizmo	07/18/2018 04:0	Jul 2018	07/12/2017	Adoption		Dog	Neutered Male	1 year	Chihuah
4	A821648		08/16/2020 11:3	Aug 2020	08/16/2019	Euthanasia		Other	Unknown	1 year	Raccoor
5	A720371	Moose	02/13/2016 05:5	Feb 2016	10/08/2015	Adoption		Dog	Neutered Male	4 months	Anatol S
6	A674754		03/18/2014 11:4	Mar 2014	03/12/2014	Transfer	Partner	Cat	Intact Male	6 days	Domest
7	A659412	Princess	10/05/2020 02:3	Oct 2020	03/24/2013	Adoption		Dog	Spayed Female	7 years	Chihuah
8	A814515	Quentin	05/06/2020 07:5	May 2020	03/01/2018	Adoption	Foster	Dog	Neutered Male	2 years	America
9	A881795		06/13/2023 07:1	Jun 2023	05/26/2021	Transfer	Snr	Cat	Unknown	2 years	Domest
10	A689724	*Donatell(	10/18/2014 06:5	Oct 2014	08/01/2014	Adoption		Cat	Neutered Male	2 months	Domest
11	A680969	*Zeus	08/05/2014 04:5	Aug 2014	06/03/2014	Adoption		Cat	Neutered Male	2 months	Domest
12	A840370	Tulip	08/19/2021 07:3	Aug 2021	08/06/2019	Adoption		Dog	Spayed Female	2 years	Border (
13	A684617		07/27/2014 09:0	Jul 2014	07/26/2012	Transfer	SCRP	Cat	Intact Female	2 years	Domest
14	A742354	Artemis	01/22/2017 11:5	Jan 2017	01/20/2010	Return to Owner		Cat	Neutered Male	7 years	Domest
15	A818049	Fiona	06/01/2020 01:2	Jun 2020	06/01/2018	Return to Owner		Dog	Intact Female	2 years	Pit Bull
16	A843327	*Mary	10/08/2021 01:2	Oct 2021	09/29/2019	Transfer	Out State	Dog	Intact Female	2 years	Chihuah
17	A681036		06/11/2014 05:1	Jun 2014	06/09/2014	Transfer	Partner	Cat	Intact Male	2 days	Domest
18	A803149	*Birch	08/31/2019 04:2	Aug 2019	08/08/2019	Transfer	Partner	Cat	Intact Male	3 weeks	Domest
19	A882456		06/13/2023 07:1	Jun 2023	06/05/2021	Transfer	Snr	Cat	Unknown	2 years	Domest
20	A698049	Luigi	03/16/2015 02:5	Mar 2015	06/05/2014	Transfer	Partner	Cat	Spayed Female	9 months	Domest
21	A773792		06/05/2018 03:3	Jun 2018	05/05/2018	Euthanasia	Suffering	Cat	Intact Male	4 weeks	Domest
22	A882810		06/13/2023 07:1	Jun 2023	06/09/2021	Transfer	Snr	Cat	Unknown	2 years	Domest
23	A882757		06/13/2023 07:1	Jun 2023	06/08/2021	Transfer	Snr	Cat	Intact Male	2 years	Domest
24	A833999		05/08/2021 02:0	May 2021	04/23/2021	Transfer	Partner	Cat	Intact Female	2 weeks	Domest

Distribution of Outcome Types
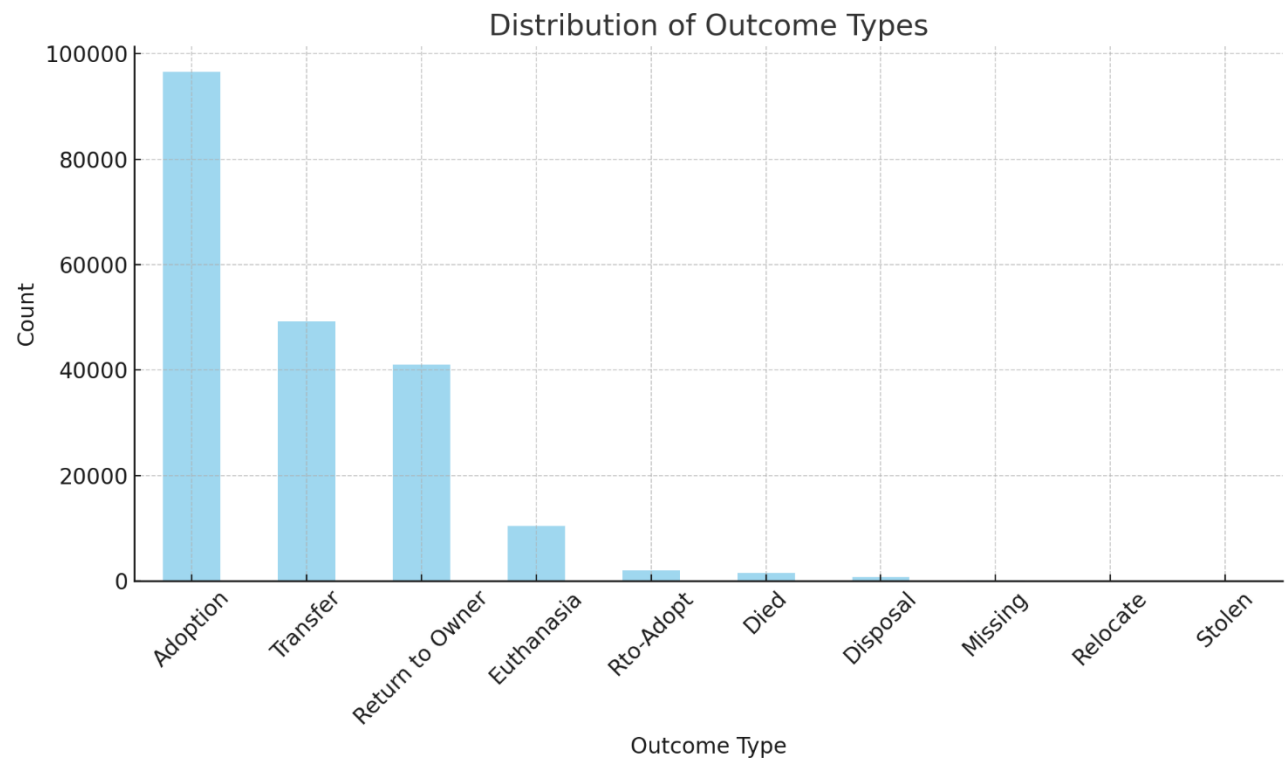
Proposed DSS-Based Solutions

1. **Outcome Prediction System**:

- **Objective**: Forecast the likely outcomes (adoption, transfer, etc.) for incoming animals.
- **Implementation**: Use machine learning models to analyze historical data and predict outcomes based on attributes such as age, breed, and health condition.

2. **Adoption Priority Dashboard**:

- **Objective**: Identify animals with lower adoption probabilities and prioritize their visibility to adopters.
- **Implementation**: Create a dashboard highlighting animals at higher risk of prolonged stays or euthanasia.

3. **Seasonal Intake and Outcome Analysis**:

- **Objective**: Prepare shelters for seasonal trends in intakes and outcomes.
- **Implementation**: Use time-series analysis to predict seasonal variations and align resources accordingly.

4. **Enhanced Animal Profile System**:

- **Objective**: Increase adoption rates by providing detailed and visually appealing animal profiles.
- **Implementation**: Use AI-powered tools to generate descriptive profiles, including photos and behavior summaries.

5. **Resource Allocation Tool**:

- **Objective**: Optimize shelter resources (e.g., food, space) based on predicted intake trends.
- **Implementation**: Integrate predictive analytics into resource planning modules.

These data-driven solutions aim to improve animal welfare, streamline shelter operations, and maximize adoption rates. Let me know if you'd like to refine any of these or explore additional insights!

PART:3 Building a Simple AI Model

For this part We have Used Jupyter notebook the link is below

file:///C:/Users/ratho/Desktop/AI%20FOR%20BUSS/animal/1.html

PART:4 DSS Implementation Strategy

Technical Considerations

To implement the Decision Support System (DSS) effectively:

- **Required Tools**: Python-based frameworks (e.g., Scikit-learn, Pandas) for model development and data preprocessing. Use cloud services like AWS or Azure for scalability and storage.

- **Data Pipeline**: Establish ETL (Extract, Transform, Load) processes to clean, integrate, and standardize data from multiple sources (e.g., intake and outcome datasets). Automate data updates to ensure real-time insights.

- **Model Integration**: Use RESTful APIs to embed the AI model into existing shelter management software, enabling seamless access to predictions.

Operational Considerations

- **Deployment**: Deploy the DSS on a cloud-based platform for ease of access across multiple shelter locations.

- **Training for Users**: Conduct training sessions for shelter staff on using the DSS interface, interpreting predictions, and leveraging insights for decision-making.

- **Scalability**: Design the system to handle increased data volumes and additional features, such as advanced predictive analytics and multi-shelter integration.

Financial Considerations

- **Cost of Implementation**: Estimated cost of $15,000–$20,000 for initial development, cloud deployment, and staff training.

- **Potential Savings/Benefits**: Improved resource allocation could reduce shelter operation costs by 20%. Higher adoption rates would result in cost savings on animal care and increased donor satisfaction, boosting funding opportunities.

This strategy ensures a technically sound, operationally effective, and financially sustainable DSS for improving animal shelter operations.

Reference:

https://www.kaggle.com/datasets/thedevastator/austin-animal-center-data