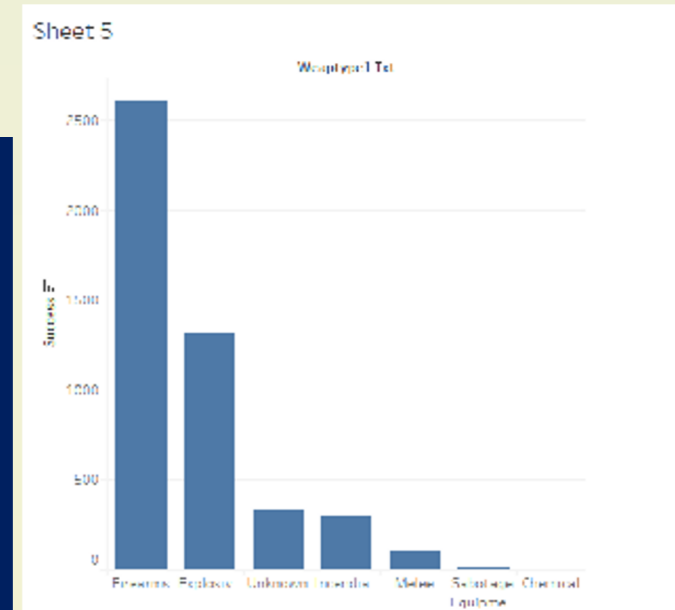
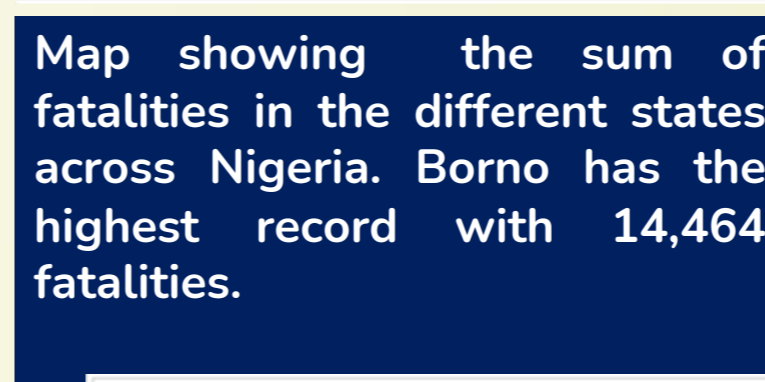
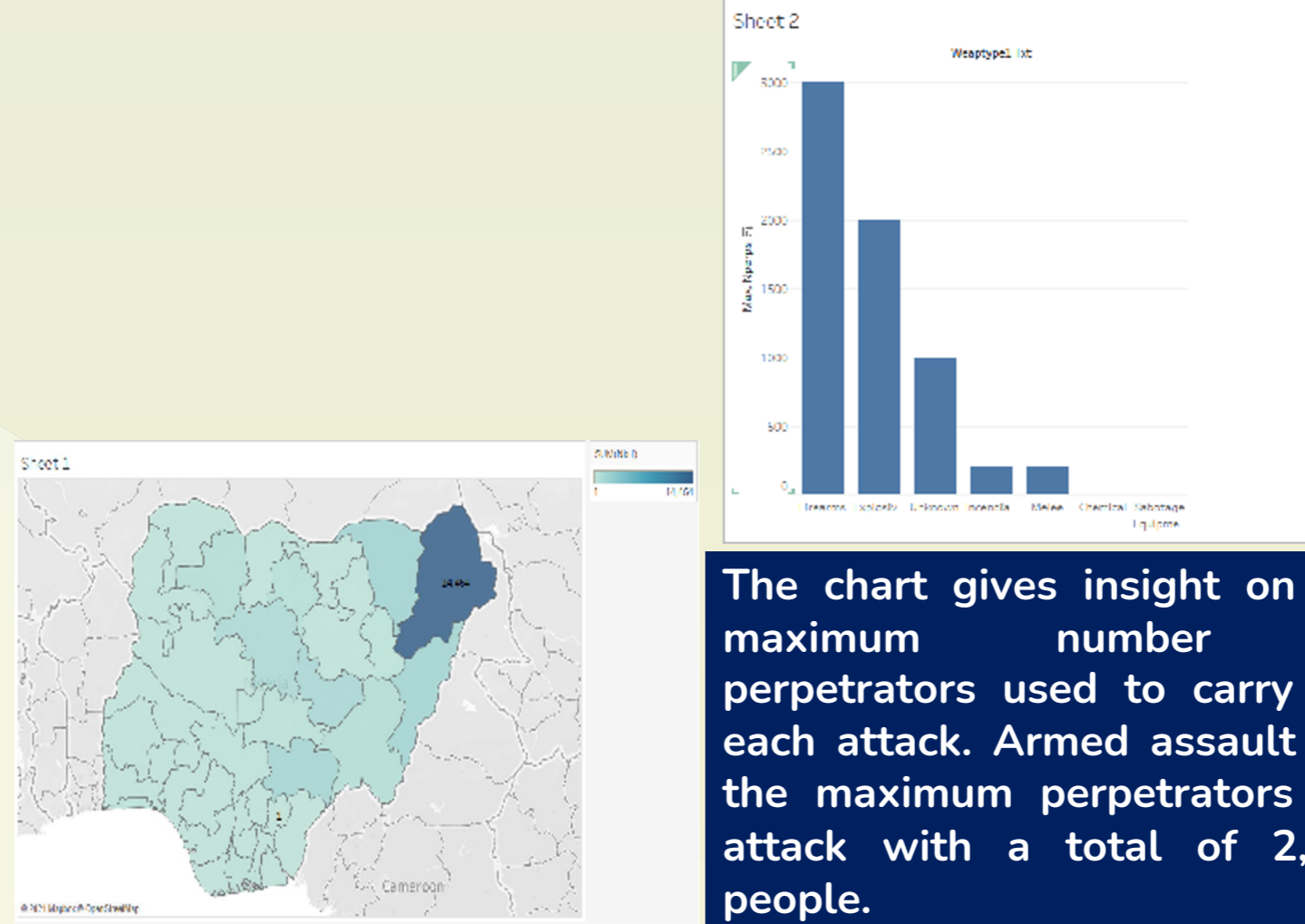


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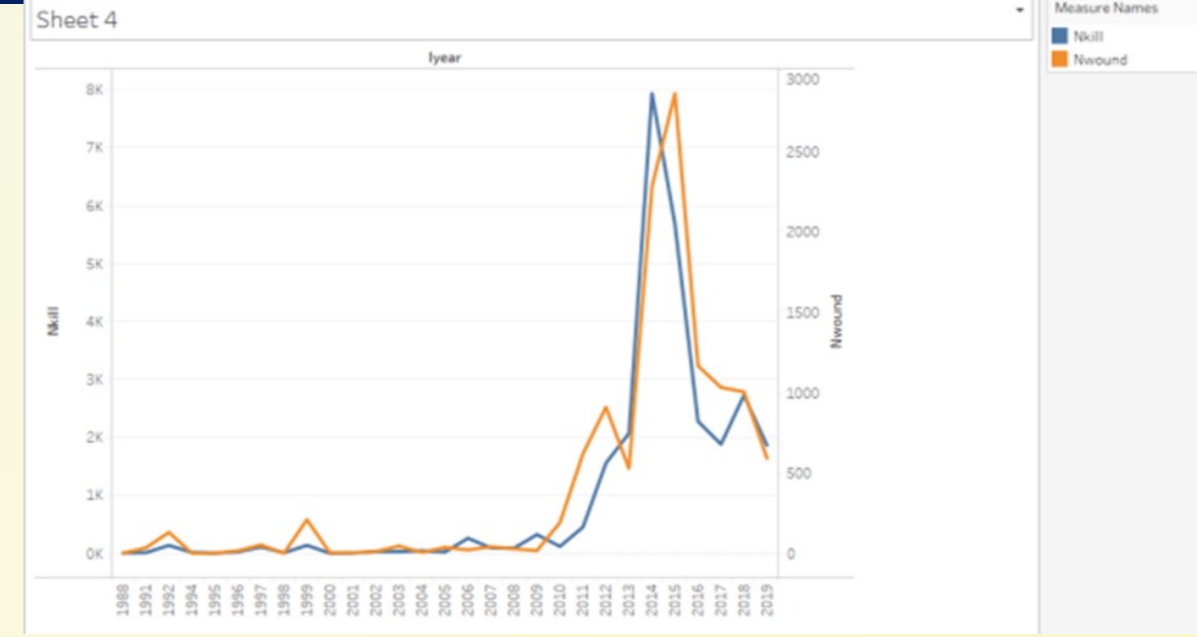
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MOTIVATION

- Insurgency and insecurity have been a major challenge facing Nigeria's security establishments
- Instances include armed robberies, Boko Haram attacks and high rate of kidnapping of both high- and low-profile citizens on highways and even in the comfort of their homes
- As of December 2020, almost 350,000 lives have been claimed in the Northeastern part of Nigeria (UNDP)
- Over 3.2 million people displaced, including 2.9 million internally displaced persons (IDPs) in N/E Nigeria (UNHCR)
- Over 778,000 internally displaced in Cameroon, Chad and Niger
- In 2021, there was 22% increase in the number of organized political violence in Nigeria (ACLED)
- Between December 2021 and June 2022 (seven months), 3,478 people were killed while 2,256 others were abducted across the country (Punch Newspaper – 21st June, 2022)



The chart shows successful attacks with the different types of attack. The chart revealed that firearms has the most successful attacks with a rate of 2,606 followed by explosives with 1,316 attacks.

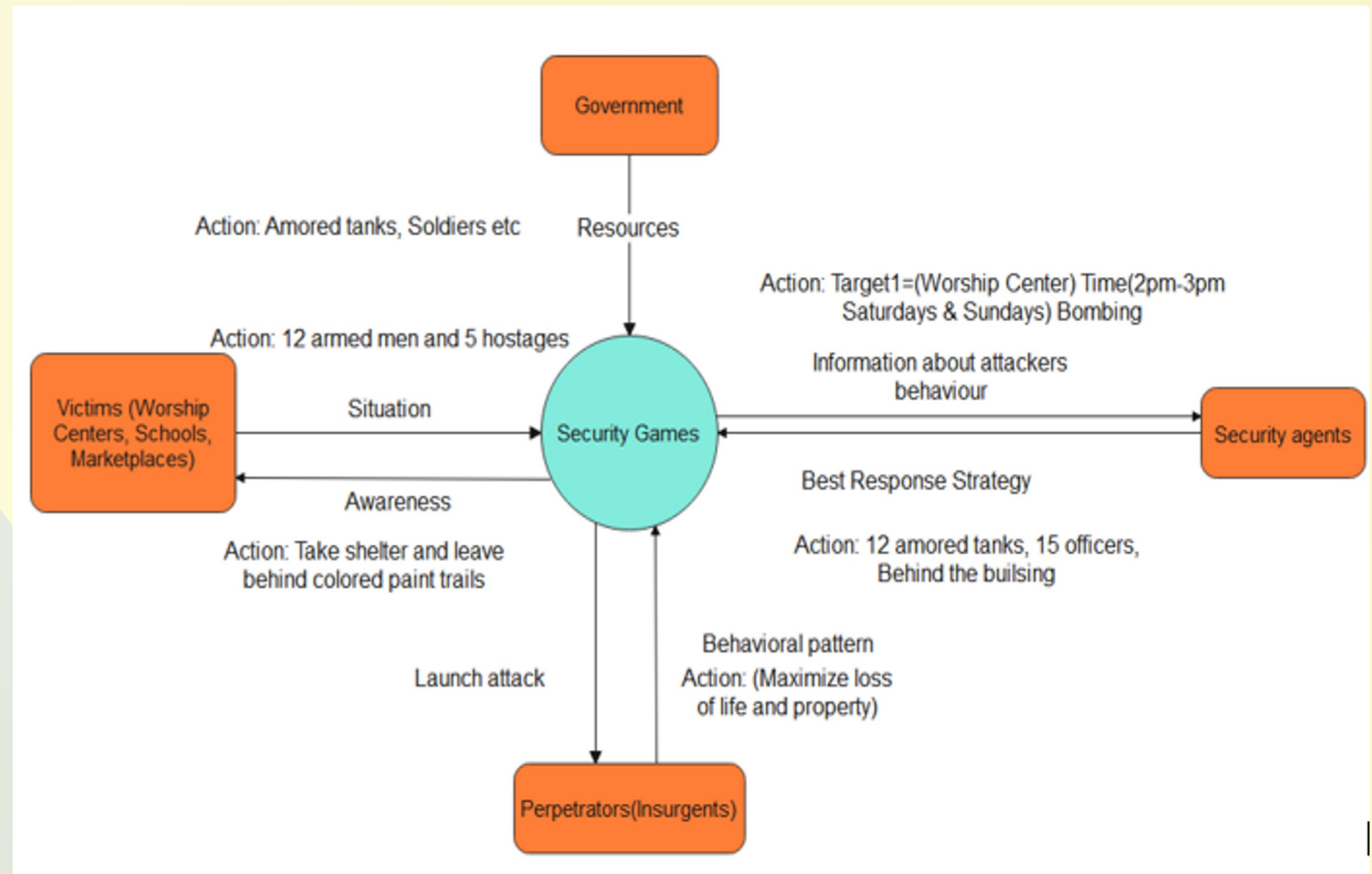


Casualties And Fatalities Over The Years



DATA COLLECTION AND VISUALIZATION

FRAMEWORK



year	imonth	provstate	attacktype1_txt	success	weaptype1_txt	targtype1_txt	nperps	nkill	nwound
1976	2	Lagos	Assassination	1	Firearms	Government (Gen	0	3	1
1980	1	Kaduna	Armed Assault	1	Firearms	Government (Dipl	0	2	0
1983	11	Borno	Assassination	0	Firearms	Government (Gen	0	0	1
1983	11	Lagos	Assassination	1	Firearms	Government (Gen	0	1	0
1983	11	Lagos	Assassination	0	Firearms	Government (Gen	10	0	1
1988	1	Lagos	Assassination	1	Firearms	Government (Dipl	0	1	0
1988	3	Lagos	Assassination	1	Firearms	Educational Institu	1	3	0
1991	3	Katsina	Facility/Infrastructure Attack	1	Incendiary	Journalists & Medi	0	0	0
1991	8	Zamfara	Facility/Infrastructure Attack	1	Incendiary	Government (Gen	0	2	0
1991	10	Kano	Facility/Infrastructure Attack	1	Firearms	Private Citizens &	0	8	34
1992	1	Katsina	Unarmed Assault	1	Melee	Police	0	0	29
1992	2	Akwa Ibom	Armed Assault	1	Incendiary	Private Citizens &	0	80	0
1992	2	Edo	Assassination	1	Firearms	Government (Gen	0	1	0
1992	3	Taraba	Bombing/Explosion	1	Firearms	Religious Figures/I	0	20	0
1992	5	Lagos	Armed Assault	1	Incendiary	Private Citizens &	0	11	0
1992	5	Ondo	Facility/Infrastructure Attack	1	Incendiary	Private Citizens &	0	0	0
1992	5	Kaduna	Armed Assault	1	Firearms	Private Citizens &	0	10	0
1992	5	Kaduna	Armed Assault	1	Firearms	Private Citizens &	0	13	100
1992	5	Lagos	Armed Assault	0	Melee	Business	0	0	0
1992	5	Lagos	Hostage Taking (Kidnapping)	1	Firearms	Business	0	0	0
1992	12	Lagos	Assassination	0	Firearms	Government (Dipl	0	0	1
1994	2	Bayelsa	Armed Assault	1	Firearms	Maritime	7	13	0
1994	5	Cross River	Armed Assault	1	Firearms	Military	0	2	0
1994	8	Lagos	Bombing/Explosion	1	Explosives	Government (Gen	0	0	0
1994	8	Lagos	Bombing/Explosion	1	Explosives	Government (Gen	0	0	0

- 5070 attacks and 10 features ranging from 1976 to 2020
- I year- Year of attack
 - I month – Month of attack
 - Prov/state – State of attack
 - Attacktype1_txt – Type of attack
 - Success – if the attack was successful or not
 - Weaptype1_txt – Type of weapon used in attack
 - Targtype1_txt – The target of the attack
 - Nperps – Number of Perpetrators
 - Nkill – Casualties of attack
 - Nwound – Fatalities of the attack

Dataset used for the work was obtained from The Global Terrorism Database (GTD). Source: <https://www.start.umd.edu/gtd/access/>

RESULTS

Table 1: Success of Attack Prediction

MODELS	RECALL	PRECISION	ACCURACY
KNN	0:0.29 1:0.98	0:0.53 1:0.94	91.05%
SVM	0:0.17 1:0.99	0:0.61 1:0.93	91.84%
Random Forest	0:0.46 1:0.99	0:0.87 1:0.95	94.41%
Decision Tree	0:0.55 1:0.96	0:0.60 1:0.96	92.30%

Table 3: Target of Attack Prediction

MODELS	ACCURACY
ANN	46.53%
KNN	45.10%
Random Forest	53.97%
Decision Tree	48.25%

Table 2: Attack Type Prediction

MODELS	ACCURACY
ANN	78.69%
KNN	75.54%
Random Forest	81.72%
Decision Tree	78.17%

The model gives 8 possible modes of attack. These are armed assault, bombing/explosion, hostage taking, facility attack, assassination, barricade incident, unarmed assault and hijacking.

The model gives a 19 predictions includes government, police, utilities, military etc. Some of the features used in this prediction include location, mode of the attack, targets, weapons used during the attack etc.

CONCLUSION

A security system developed simulates the activities of an attack and predicts the conditions of the attacks using machine learning models. It creates an avenue for security agents to learn the attack patterns of the attackers while using limited resources to decrease the success of an attack.