



The Dungeon Master's Dashboard

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01

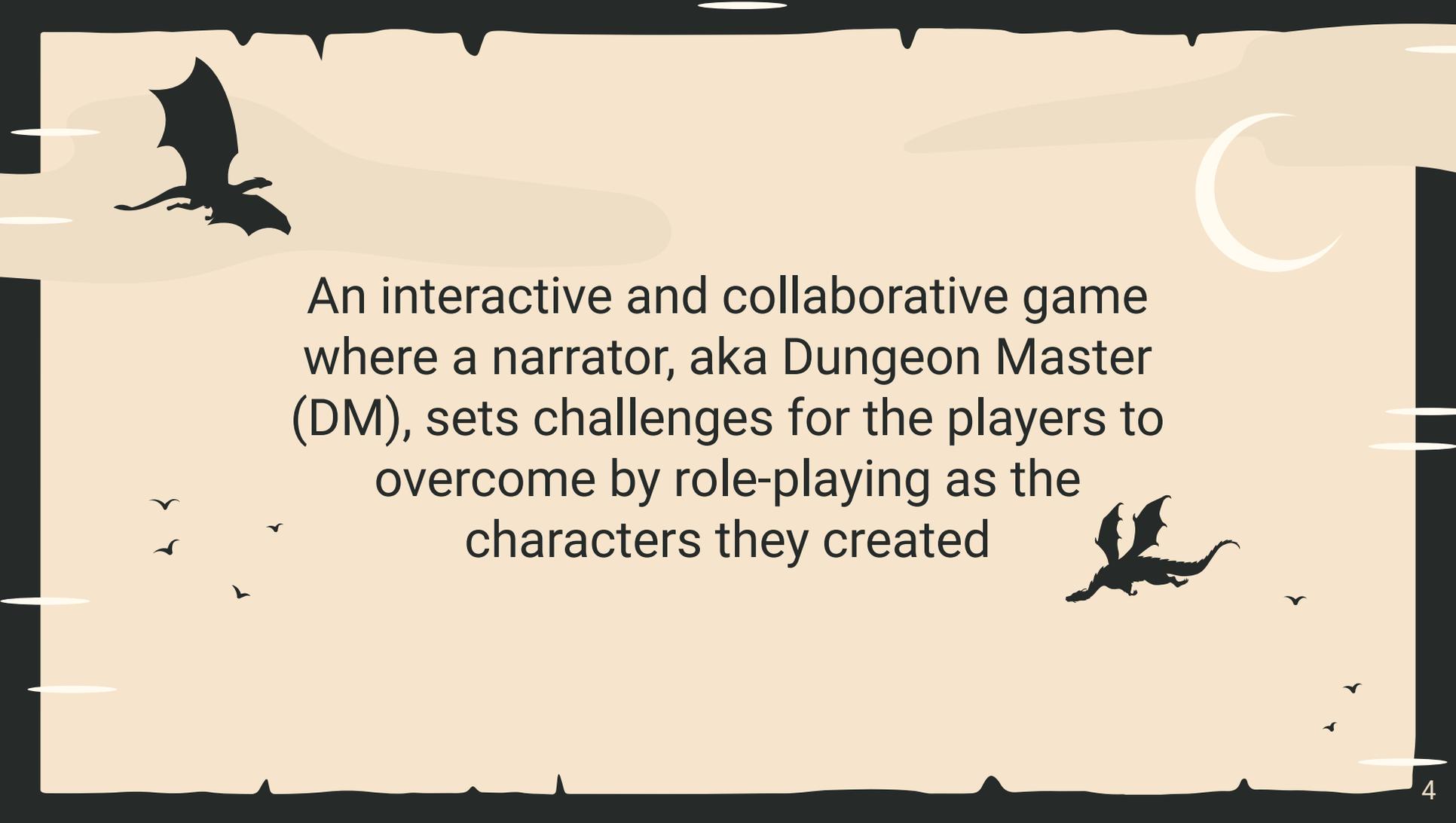
Introduction and Domain Background



Dungeons & Dragons



M. Duffer and R. Duffer. Chapter one: The vanishing of will byers. In Stranger Things. Netflix, Jul 2016. Season 1 - Episode 1.

The background is a light beige color with a dark, irregular border at the top and bottom, resembling a torn piece of parchment. In the upper left, a black silhouette of a bat is flying. In the upper right, a white crescent moon is visible. In the lower right, a black silhouette of a dragon is flying. Several small black bird silhouettes are scattered across the lower half of the page. The text is centered in a black, sans-serif font.

An interactive and collaborative game where a narrator, aka Dungeon Master (DM), sets challenges for the players to overcome by role-playing as the characters they created

Characters

(players)

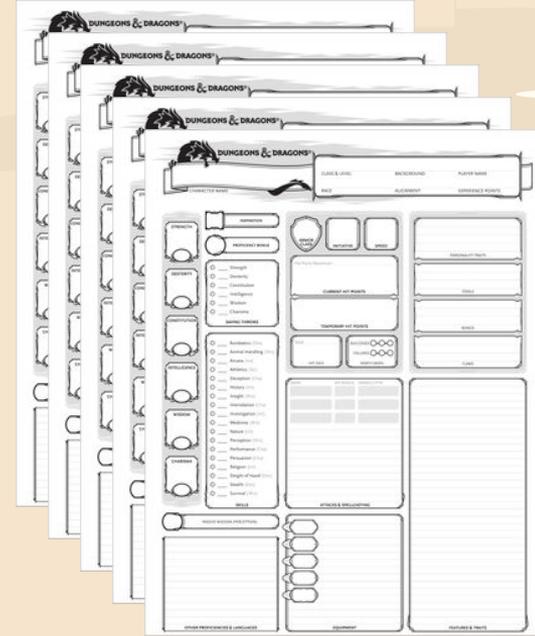


Character Attributes

- Abilities
- Armor Class (AC)
- Health Points (HP)
- Passive Perception (PP)
- Experience Points (Exp)

Character Abilities

- Strength
- Wisdom
- Intelligence
- Dexterity
- Constitution
- Charisma



But a party typically has around 5 players!

Characters

(non-players)



Relationships

NPCs contribute to making the created world feel more alive, the players can interact with them and develop positive or negative relationships which impact interactions

Monsters



[www.https://www.dndbeyond.com/monsters/16779-ancient-copper-dragon](https://www.dndbeyond.com/monsters/16779-ancient-copper-dragon)

Monster Attributes

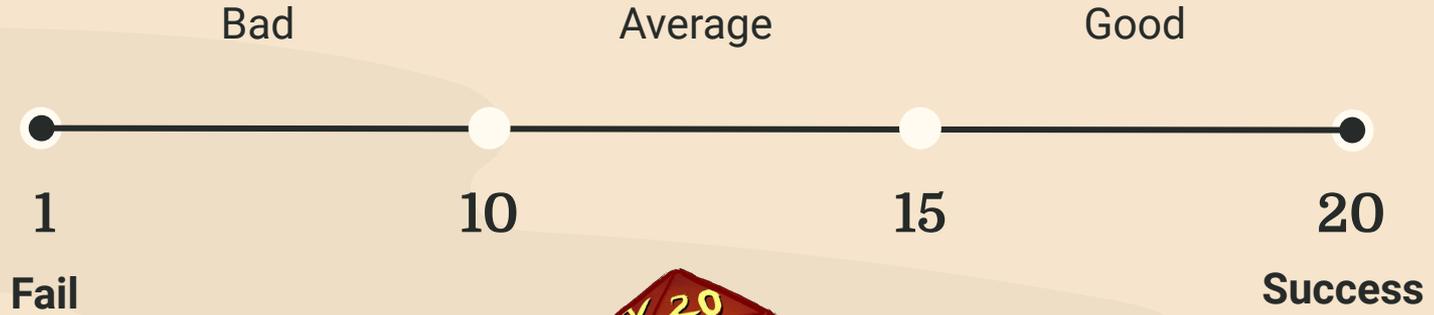
- Challenge Rating (CR)
- Environment
- Type
- Size
- Alignment
- Abilities

Monster Environment

- Arctic
- Coastal
- Desert
- Forest
- Hill
- Swamp
- Grassland
- Mountain
- Underdark
- Underwater
- Urban

There are
thousands of
monsters!

Roll the dice!





02 Methods and Implementation



Methodology

Pre-Design Interviews

Conducted ~30 min interviews with 9 domain experts (DMs)

Technology

Dice Tracker, Party Tracker, Relationship Tracker

Vega Lite + Observable

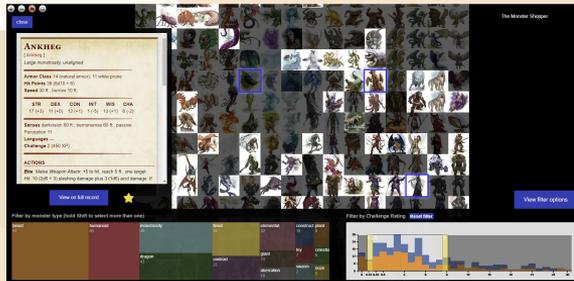
Monster Shopper

Customized of <https://github.com/amnh-sciviz>
AI: Python/Keras/PCA/TSNE
Vis: D3.js, OpenseaDragon

03

Results

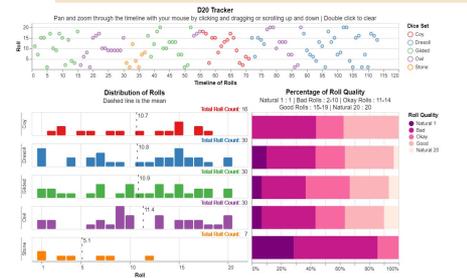




Before the game



During the game



The background is a stylized illustration of a fantasy landscape. In the foreground, there are dark, silhouetted mountains and a large, multi-towered castle with a central gate. Two dragons are flying: one on the left side of the castle and one on the right side of the upper half of the image. The sky is a light beige color with several small birds flying. The overall style is flat and minimalist.

The Monster Shopper



Archangel

Archangels are the highest of the angels, and are often depicted as winged figures. They are the most powerful of the angels, and are often depicted as being in charge of the other angels.

Stats

STR	CON	INT	DEX	CHA	WIS
10	10	10	10	10	10

Skills: Archangel is a class that is a combination of the Angel and the Demon. It has a lot of skills, including the ability to fly, and the ability to use fire and lightning.

Class Features: Archangel is a class that is a combination of the Angel and the Demon. It has a lot of skills, including the ability to fly, and the ability to use fire and lightning.

Archangel Abilities: Archangel is a class that is a combination of the Angel and the Demon. It has a lot of skills, including the ability to fly, and the ability to use fire and lightning.

Archangel Skills: Archangel is a class that is a combination of the Angel and the Demon. It has a lot of skills, including the ability to fly, and the ability to use fire and lightning.

Archangel Class: Archangel is a class that is a combination of the Angel and the Demon. It has a lot of skills, including the ability to fly, and the ability to use fire and lightning.

Advanced Classes

Advanced classes are those that are more powerful than the basic classes. They are often more difficult to play, but they offer more options and more power.

Advanced Abilities

Advanced abilities are those that are more powerful than the basic abilities. They are often more difficult to use, but they offer more options and more power.

Advanced Items

Advanced items are those that are more powerful than the basic items. They are often more difficult to find, but they offer more options and more power.

Advanced Spells

Advanced spells are those that are more powerful than the basic spells. They are often more difficult to cast, but they offer more options and more power.



Advanced Abilities

STR	CON	INT	DEX	CHA	WIS
10	10	10	10	10	10

Skills: Advanced Abilities is a class that is a combination of the Angel and the Demon. It has a lot of skills, including the ability to fly, and the ability to use fire and lightning.

Class Features: Advanced Abilities is a class that is a combination of the Angel and the Demon. It has a lot of skills, including the ability to fly, and the ability to use fire and lightning.

NAME YOUR ENCOUNTER

The Forgotten City

OF CHARACTERS: 4

AVERAGE PARTY LEVEL: 5

MANAGE CHARACTERS

SAVE

MONSTERS

SUMMARY

MONSTER FILTERS

REMEMBER MY FILTERS

Monster Type

Environment

Source

Alignment

Show Official Only

CHALLENGE RATING



SIZE



CLEAR ALL FILTERS

SHOW ADVANCED FILTERS

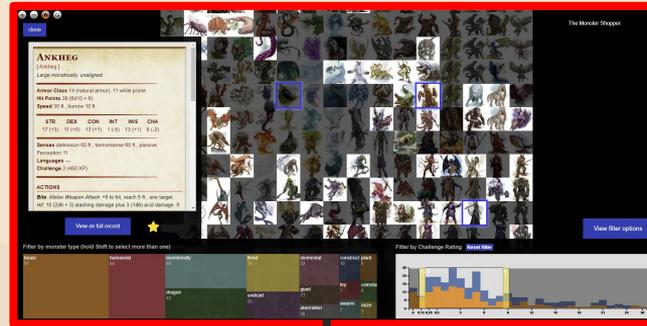
Q Search

HOME BREW: Show Official Only

NAME	TYPE	SIZE	CR	DIFFICULTY	
"The Demogorgon" Infernal Machine Rebuild	Giant	Large	8	●●●●○	+ ADD ▾ =
Aarakocra Monster Manual	Humanoid	Medium	1/4	●●●●○	+ ADD ▾ =
Aarakocra Simulacrum Storm King's Thunder	Humanoid	Medium	1/8	●●●●○	+ ADD ▾ =
Aarakocra Spelljammer Spelljammer: Adventures in Space	Humanoid	Medium	6	●●●●○	+ ADD ▾ =
Aartuk Elder Spelljammer: Adventures in Space	Plant	Large	3	●●●●○	+ ADD ▾ =
Aartuk Starhorror Spelljammer: Adventures in Space	Plant	Medium	2	●●●●○	+ ADD ▾ =
Aartuk Weedling Spelljammer: Adventures in Space	Plant	Medium	2	●●●●○	+ ADD ▾ =
Abhorrent Overlord Mythic Odysseys of Theros	Fiend	Large	9	●●●●○	+ ADD ▾ =
Abjurer Legacy Volo's Guide to Monsters	Humanoid	Medium	9	●●●●○	+ ADD ▾ =

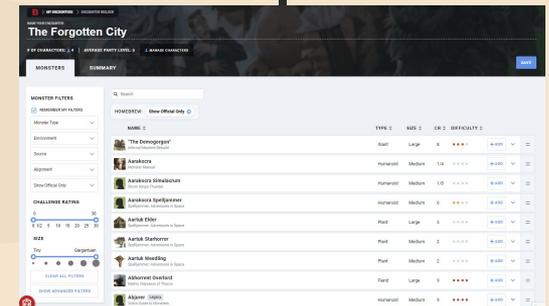


The Monster Shopper



Visuals driven

Data driven





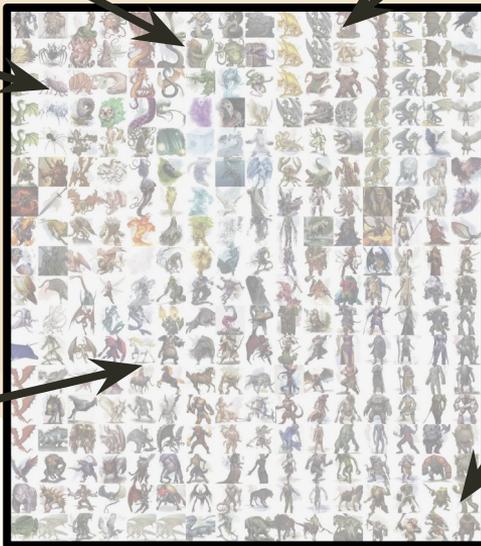
Insects



Snake-like



Dragons



Grid layout



horses



2-legged animals

close

ANKHEG

[Ankheg]
Large monstrosity, unaligned

Armor Class 14 (natural armor), 11 while prone
Hit Points 39 (6d10 + 6)
Speed 30 ft., burrow 10 ft.

STR	DEX	CON	INT	WIS	CHA
17 (+3)	11 (+0)	13 (+1)	1 (-5)	13 (+1)	6 (-2)

Senses darkvision 60 ft., tremorsense 60 ft., passive Perception 11
Languages —
Challenge 2 (450 XP)

ACTIONS

Bite. *Melee Weapon Attack:* +5 to hit, reach 5 ft., one target.
Hit: 10 (2d6 + 3) slashing damage plus 3 (1d6) acid damage. If

View on full record ★

The Monster Shopper.

View filter options

Filter by monster type (hold Shift to select more than one)

beast 97	humanoid 64	monstrosity 49	fiend 35	elemental 22	construct 10	plant 8
		dragon 43	undead 25	giant 13	fey 7	celestial 6
			aberration 10		swarm 7	ooze 5

Filter by Challenge Rating [Reset filter](#)

Challenge Rating	Number of Monsters
0	12
0.13	1
0.25	1
0.5	1
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1
18	1
19	1
20	1
21	1
22	1
23	1
24	1
25	1
26	1
27	1
28	1
29	1
30	1

Demo

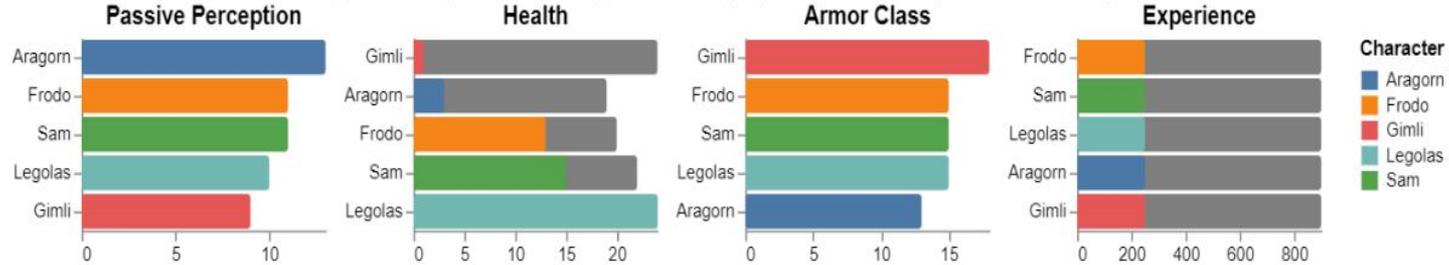


The Party Tracker

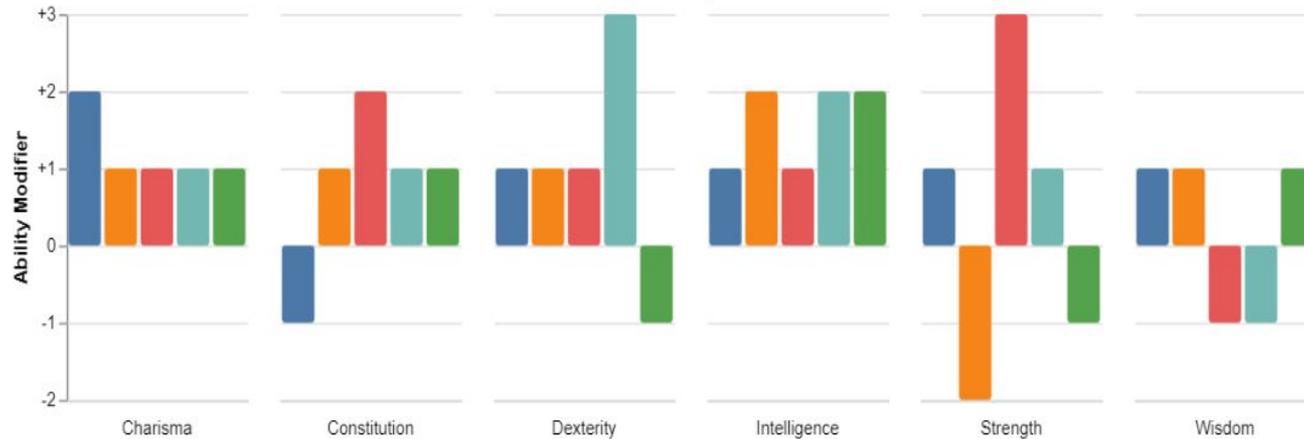


Party Tracker

Click the legend to filter | Shift click the legend to select party multiple members | Click below the legend to clear



Ability Stats



Demo

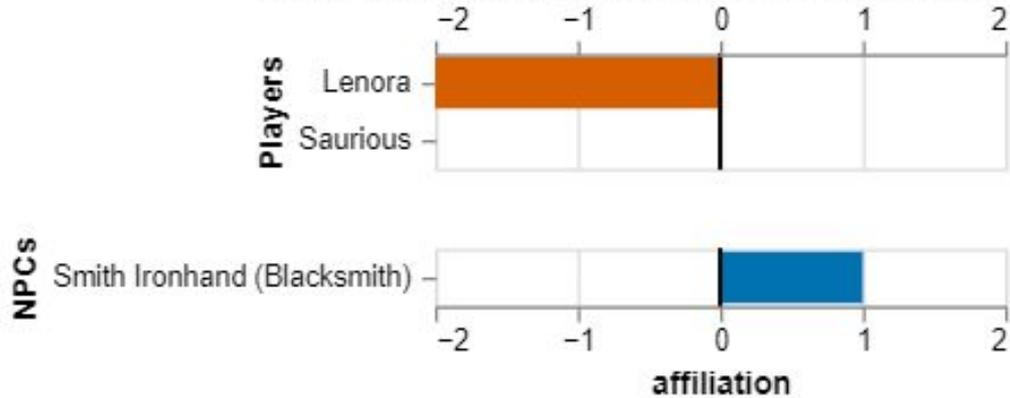


The Character Relationship Tracker

Character to Compare

Conrad Brandywood (Baker) ▾

Relationship between Conrad Brandywood (Baker) and others.



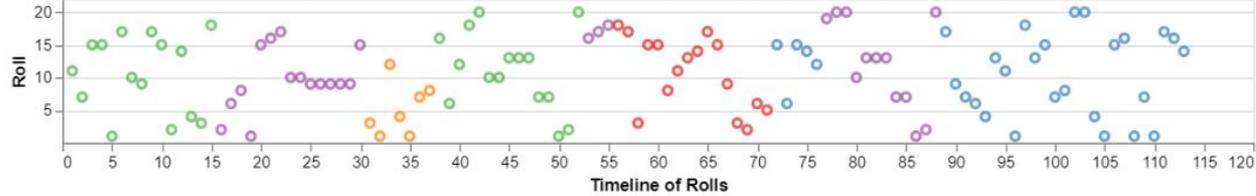
Demo

The background is a stylized fantasy landscape. It features rolling hills in shades of green and brown at the bottom. A dark silhouette of a forest with various tree shapes is on the right side. In the sky, there are several black silhouettes of dragons in flight. Some are small and distant, while one is larger and more prominent on the right. The sky is a light beige color with some faint, horizontal white lines. The title 'The Dice Tracker' is centered in a large, bold, black serif font.

The Dice Tracker

D20 Tracker

Pan and zoom through the timeline with your mouse by clicking and dragging or scrolling up and down | Double click to clear

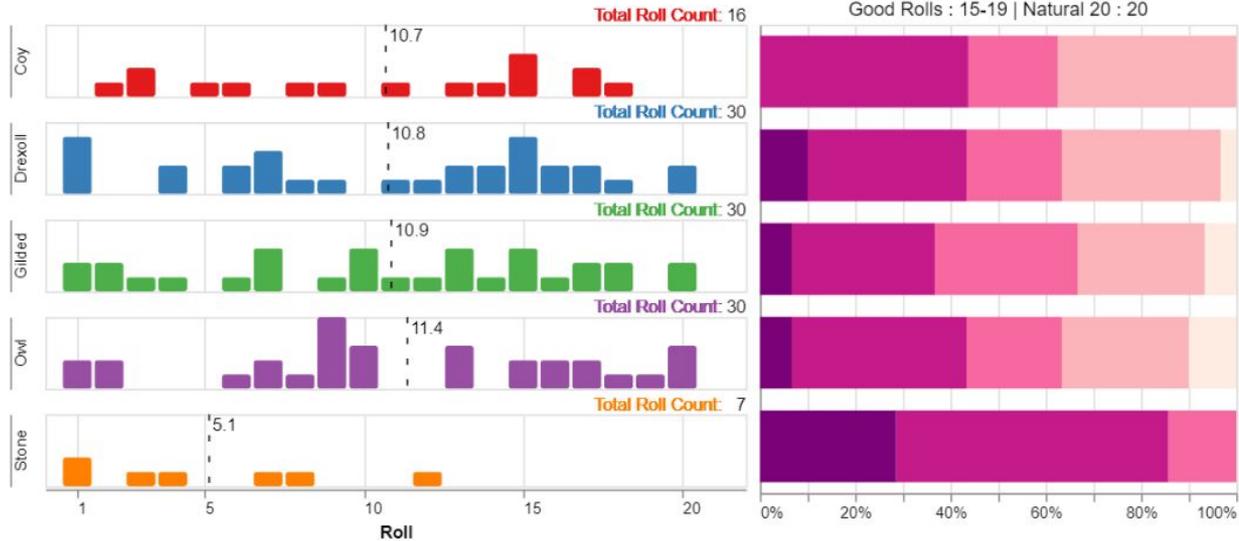


Dice Set

- Coy
- Drexoll
- Gilded
- Owl
- Stone

Distribution of Rolls

Dashed line is the mean



Percentage of Roll Quality

Natural 1 : 1 | Bad Rolls : 2-10 | Okay Rolls : 11-14
Good Rolls : 15-19 | Natural 20 : 20

Roll Quality

- Natural 1
- Bad
- Okay
- Good
- Natural 20

Demo

04

Discussion



Limitations and Critiques

- Low complexity ceiling of Vega-Lite
- Lack of direct input capabilities in Observable
- Filter options and algorithm tuning for Monster Shopper
- Too many modules

Future Work

01

User test

- ✓ Usability and utility testing with domain experts

02

Integration

With online RPG tools such as Roll20

03

Dashboard Building

Combining all modules into one dashboard for easy access

04

Scaling for Flexibility

More customization options of the modules.

We plan to release our tools!

Thanks

Questions?

CREDITS: This presentation template was created **by Slidesgo**, including icons **by Flaticon**, infographics & images **by Freepik**



The Monster Shopper Layout Algorithm

Monster images
~1000x1000
dimensions

Feature extraction with an
image classification model
(VGG16) pre-trained on
ImageNet
To dim. = 4096

Dimensionality
Reduction (PCA)
To dim. = 250

Grid to a giant
matrix image
with tiles

2D scattered
points mapped
into a 2D grid

tSNE
To dim. = 2

