

*HND Computing and Information Systems
Implementation Project*

M5X01056

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Introduction

This report details the implementation of a program that will be designed to mainly store, collate and display data. The program has been designed via the guidelines presented by the client (See Appendix A). There are other functions that it is required to do which will be detailed within this report. The program is designed as a resource and tool to aid in the playing of the table top game Dungeons & Dragons. The general tools used to play this game are dice, pen and paper, and the players imagination. Due to this there is a need for a platform that can incorporate some of the tasks in the game in a way that makes it more convenient to play the game. This program will not only help play the game, but it will also track many aspects of the game. This is a feature that has been lacking in the game model. Many players would like to view certain statistics of their playthrough and this program will do that. There are many individuals, groups and companies that can maintain an income by playing Dungeons & Dragons. This can be achieved in table top stores and even online, using platforms such as Twitch and YouTube.

The game can be played by many players, one of which is the Dungeon Master. The role of the Dungeon Master, who for the remainder of this report shall be known as the DM for efficiencies sake, is a hard and arduous task. The amount of information to track can be daunting, with many numbers, statistics and points of note to recall at a moment's notice.

The client in question designs and builds DM screens. These screens are used as a barrier to the other players and conceals the DM's notes other material used to play the game

The objective of this program is to make the life of a DM manageable whilst also benefiting the quest, the player interaction and enjoyment.

Project Proposal

Objectives

The client who commissioned that creation of this program had specific features that they wanted the program to perform. This project will be a program that will act as a platform containing tools for a DM to use whilst playing as it incorporates several roles that the DM must perform regularly throughout the game session. The program will be a Web App, Accessible to a platform that can access the internet and login to the program. This allows it to be accessible to many devices such as Desktops, Mobile phones and Tablets. The program will contain a database wherein lies data that each function will access or store. There is a great need for the program to be very user friendly and quick to navigate. Half of the functions are required to speed up the game and keep it flowing. Hence the need for a quick to learn and use User interface.

This web app will allow the user to login, either as the DM or a player. Each login access will bring up a unique part of the program. The DM screen will allow the user full access to the programs features. The player login will only show certain sections. For instance, the player will be able to view the quests tracker, but the DM will be able to choose which quests are shown. The player will also be able to view and edit their characters stats throughout.

Included within the program will be an impeded Calendar, allowing the user to track time and sessions whilst also allowing the tracking aspect of the program to have a timeframe for the data and the graphs/tables it can present. As D&D revolves around the rolling of Dice, there will also be a simple electronic Roll Dice function. This will utilise all variants of the Die used in D&D. Such as a 4, 6, 8, 10, 20 and 100-sided dice.

The game revolves around a ruleset known as the Players Handbook [1]. In the rulebook, there is all the information included required to plan and play the game. The program will adhere to the same ruleset when designing and creating it. The information in this rulebook will also be stored in the program. The monster Manual [2] contains all the relevant data for all known monsters in the game, their data will also be contained within the database of the program. This ensures that all data displayed will be accurate to the game.

Notes and dedicated Quest information for the game. For instance, the objectives of the game, laid out by the DM will be stored on the program. This means the DM can record and recall information on the game at the click of a button, instead of flicking through written notes. There will be two random generators. These are for the DM to use at their convenience whenever they need may need to when playing the game. Thinking of certain aspects of the game on the spot is something a DM needs to be good at. The program will take away a lot of the planning process involved when creating a non-playable character in the game of an encounter the players in the game.

Limitations

The primary limitation of the program is the lack of visualisation other than in a textual form. However, there are programs that are used that allow the users to create maps and other forms of visualisation to bring the game alive. Such programs will be a perfect partner for the program discussed in this proposal. Programs such as Dungeon Painter Studio [3]. Another limitation of the program is that there is not an in depth playable character creator tool. Users can input their player stats but that is all. For future development the program can be improved by inputting a more detailed character creator, one that contains a character inventory for instance. A notable website called Roll20 [4] is used by many to play D&D online, this application allows users to create characters, roll die and it displays maps for the players to view. This program is a great companion to any player of this game however it does not include any of the functions that this web app will contain. Therefore, they both make for great additions to the tools accessible to players of this game.

The database involved in this program is detailed and must be capable of managing a huge amount of data. File sizes must be monitored to ensure that loading times are kept to minimum and the Database must be designed correctly to ensure a smooth-running program.

Assumptions

It is assumed that the Program will be accessed via Desktops, Laptops and mobiles devices such as a Mobile phone or Tablet. This means the Program must run effectively in various resolutions and be navigated via a mouse and keyboard or touch screen. Internet access is required to login and run the program.

Resources

For this project Microsoft SQL and ASP.Net will be used to create the program, they both encompass everything required to build this DM tool. No hardware other than a desktop capable of running both programs is required. To run the program once completed, only a device such as a Desktop, laptop, Mobile phone or tablet connected to the internet will be required to use it.

Project Requirement Specification

Analysis

Identified Problem

The issue at hand is that many of the D&D games are still played around a table and in person, therefore the DM is required to record many of what transpires with pen and paper. As the game is also played online using webcams, there are online tools available that utilise similar functions that will be detailed in this report. However, there is little availability with regards to a central program that encapsulates everything a DM requires. This program not only allows the user to have everything in one place as opposed to using separate websites, but the data provided is also linked directly into their quest/session. Allowing the program to collate said data and process it. This in itself is a unique feature.

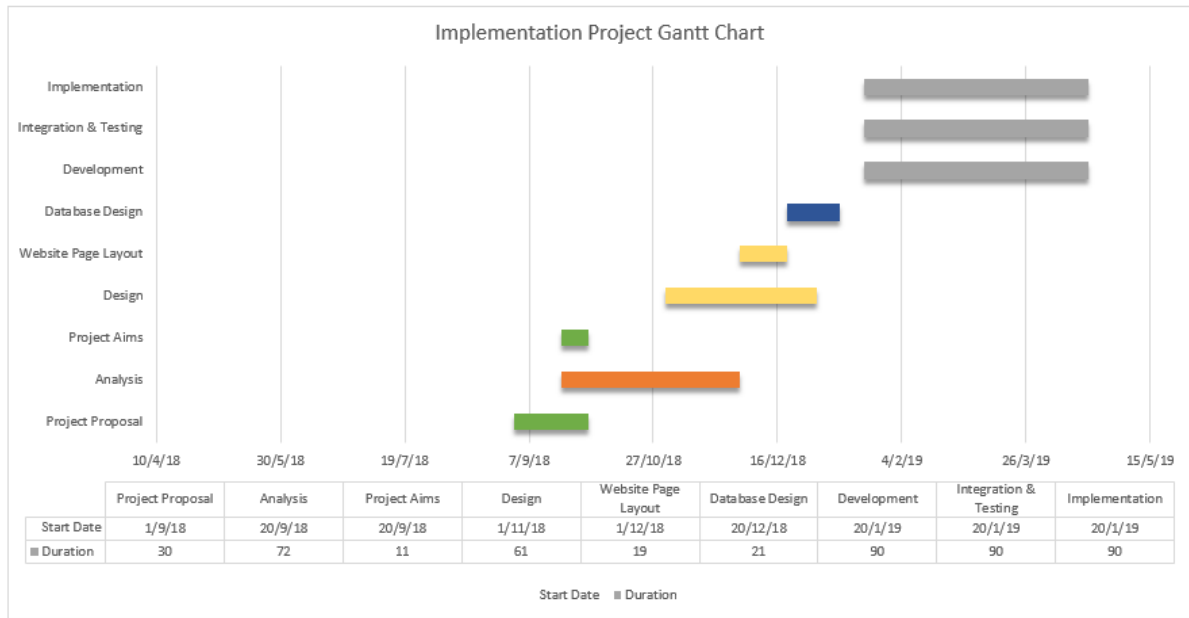
The Dungeon Master or DM will be required to plan out a quest. Throughout a quest there are side quests, enemies, encounters, player stats and various other statistics. This data in its entirety needs to be inputted, tracked and processed. The DM will also have to take many other notes throughout the duration of the game. D&D heavily relies upon imagination and dice rolls. Therefore, there is very little physical or tangible components that a normal table top game would contain. This means there is a lot involved when planning and playing. The role of the DM can be a hard and arduous task with many numbers, statistics and points of note to recall at a moment's notice. Implementing the features discussed in this report will solve all these issues.

Risk Assessment

The program will only require certain details to use. An email and password are required to login and to create an account a name and DOB will be used for validation. Those are the only personal details stored. Therefore, the web app must follow the GDPR guidelines [5].

Schedule

Below is the schedule for the entire project, including development and implementation stages.



System Specification and Design

Functions

Listed below are the functions within the program and the data which they manipulate or store.

1. **Random Encounter Generator.** Encounters are a regular occurrence during a playthrough of D&D. Some of which happen without the DM planning one themselves. The aim for this generator is that it allows the creation of an encounter in a fraction of the time it would normally take to think of one. This Generator will allow the DM to select certain parameters for an encounter the players come across. Essentially the user will have the option to select drop down boxes to select specific parameters that will then be randomly generated, or the user can select the Random option which will completely randomize an encounter.

Contained in the Database of the program will be the data required for the encounter generator. This includes all details regarding the monsters involved, taken from the Monster Manual. This ensures accurate information is provided. This is useful for any DM to be able to create an encounter in moments, especially a detailed one. This part of the program will randomly select information from the database according to the parameters set and output it in a presentable form for the user.

Information included:

- CR Rating (Challenge Rating)*
- Monster Quantity*
- Monster Type*
- Monster Size*
- Environment*
- Monster Health*
- Total XP (Experience Points) for encounter*

2. **Random NPC Generator.** The same applies for the Random NPC Generator as above but using different parameters and data.

Information included:

- *Name*
- *Race*

- *Class*
- *Sex*
- *Hair*
- *Eyes*
- *Body type*
- *Attitude*
- *Flaw*
- *Calm Trait*
- *Stress trait*
- *Profession*

3. **Player stats tracker.** This allows the user to track the players stats along the game. The user can input data which will be stored. Again, this aids in the playability of the game.

Stats tracked:

- *Kills*
- *Most damage dealt*
- *Critical Hit (Roll 20 on a 20-sided dice)*
- *Critical Fumble (Roll 1 on a 20-sided dice)*
- *quests completed*
- *Accuracy*
- *Days (Duration played in game)*
- *Total Experience (XP)*

Data inputted

- *Character stats*
- *Character xp*

4. **Quest tracker.** This tool is very important to the user. As the DM they will have specific points and notes of interest in which they will need to keep track of. The Quest tracker will allow the user to input information regarding important questlines and side quests. It will allow the user the ability to concentrate on the game at hand instead of flipping through notes on paper or a word document. The information will be displayed on the same program that the user is operating already. The data stored will be displayed in easy to read bullet points. Quests can have Sub quests added to them and an option to set a completion marker once applicable.

Information included:

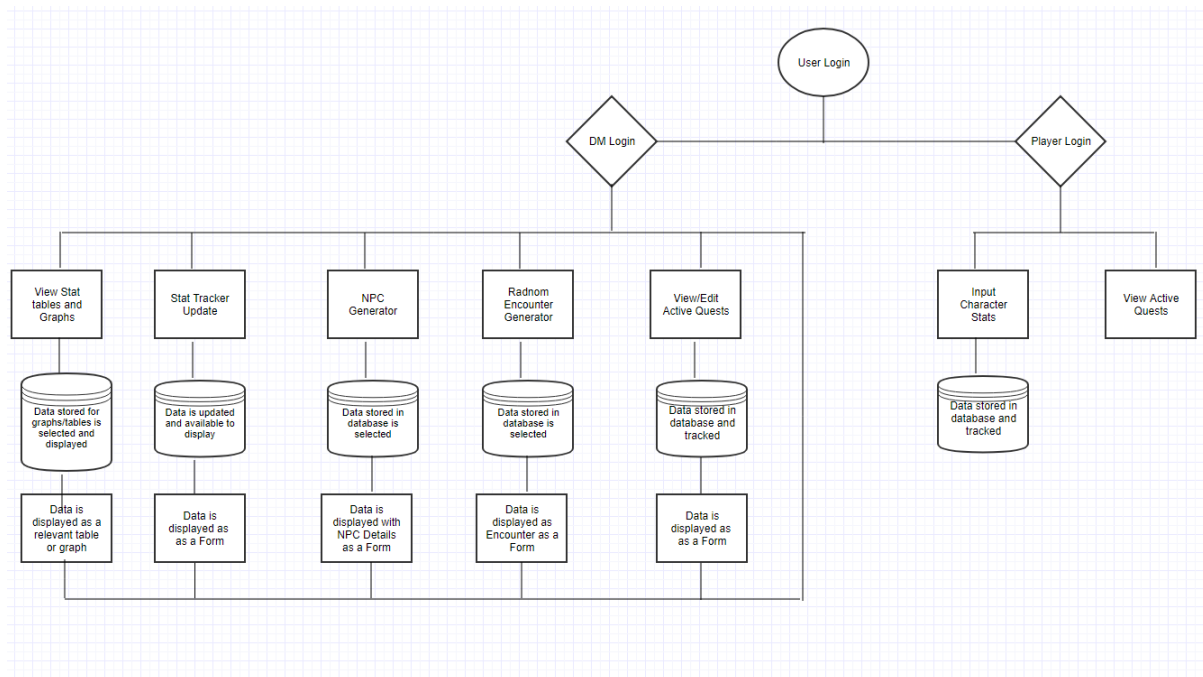
- Linear quest layout (bullet points that can be ticked when completed)
- Add side and main quests options (have a web of connected quests)
- Details of quest (quest giver, objectives, reward)
- Track Completed quests

Data dictionary

The Monster encounter generator is laid out in the data dictionary. The tables have been Normalised and are ready to be inserted into the Database.

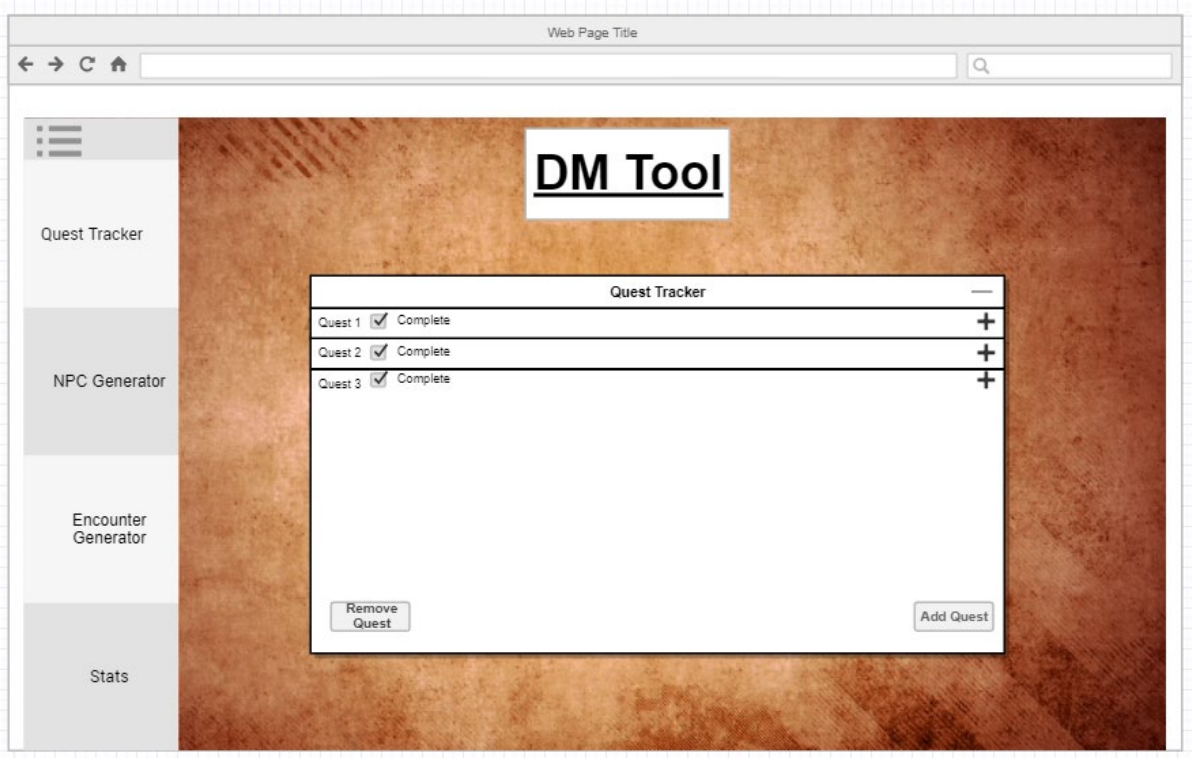
Table Name	Attributes	Data Type	Field Size
MonsterSize	SizeID PK	Integer	10
	Size	Varchar	50
		Varchar	50
MonsterType	MonsterTypeID PK	Integer	10
	MonsterType	Varchar	50
		Varchar	50
MonsterAlignment	AlignmentID PK	Integer	10
	Alignment	Varchar	50
		Varchar	50
Environment	EnvironmentID PK	Integer	10
	Environment	Varchar	50
MonsterEnvironment	MonsterEnvironmentID PK	Integer	10
	Environment FK	Varchar	50
	MonsterID FK	Integer	10
Monster	MonsterID	Integer	10
	AlignmentID FK	Integer	10
	MonsterTypeID FK	Integer	10
	MonsterSizeID FK	Integer	10
	ChallengeRating FK	Integer	10
	AC	Integer	10
	HP	Integer	10
	AttackDamage1	Integer	10
	AttackDamage2	Integer	10
ChallengeRating	ChallengeRating PK	Integer	10

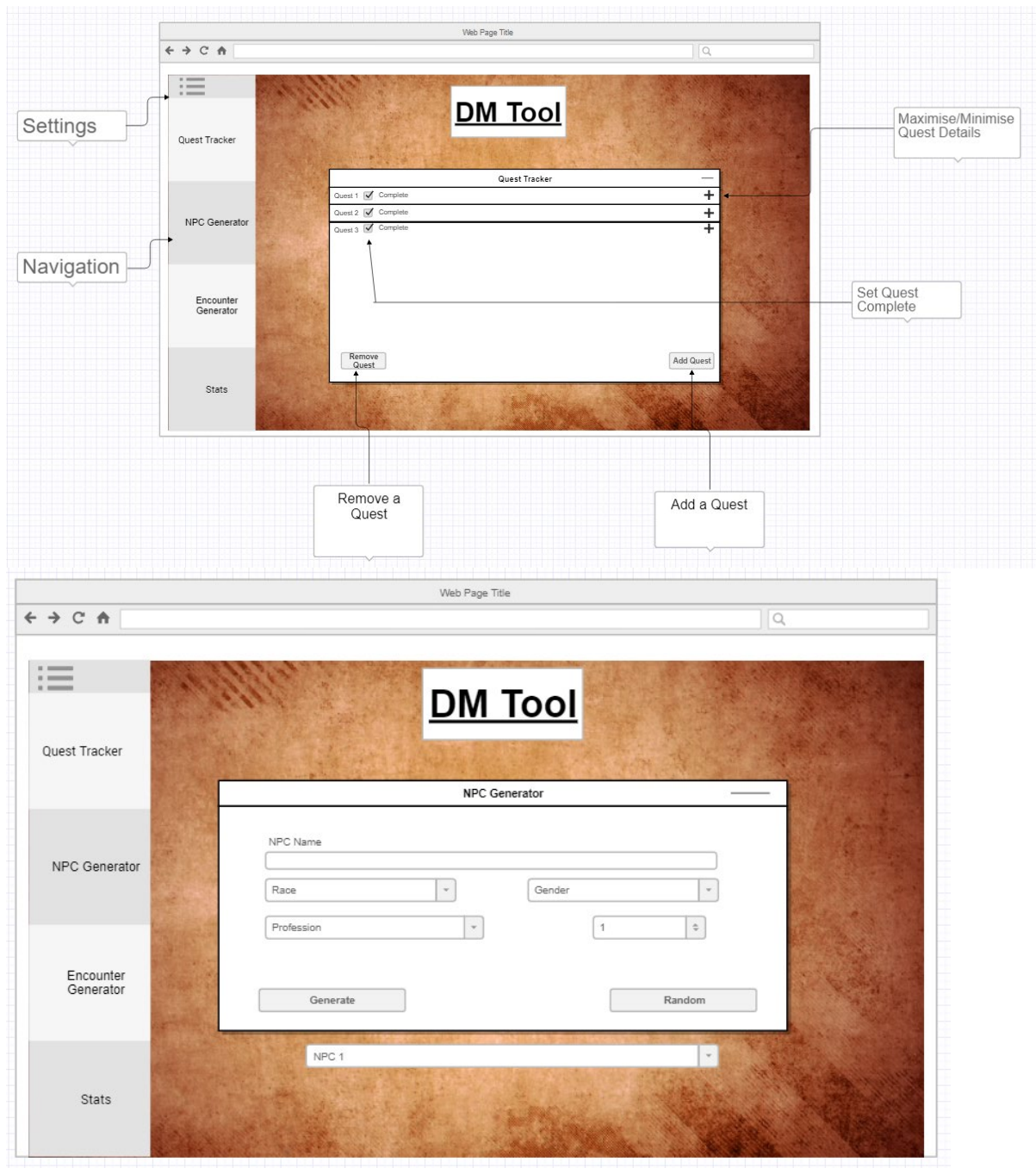
Flowchart

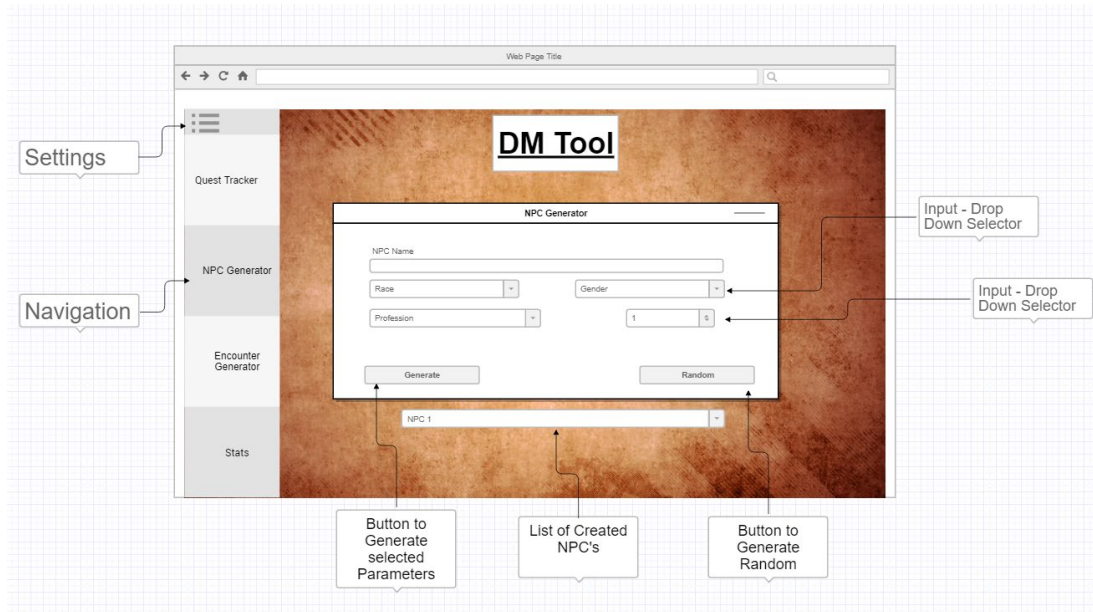


Story Board

The layout of the application is designed to be quick to navigate. With the navigation bar on the left side, the user can select the functions of the program and they will swiftly load on the clear space at the centre of the program. Each function be displayed at any time, it is up to the user to decide what they want open. The program only displays information and functions that are applicable to its required needs. The program is meant to be minimalistic.





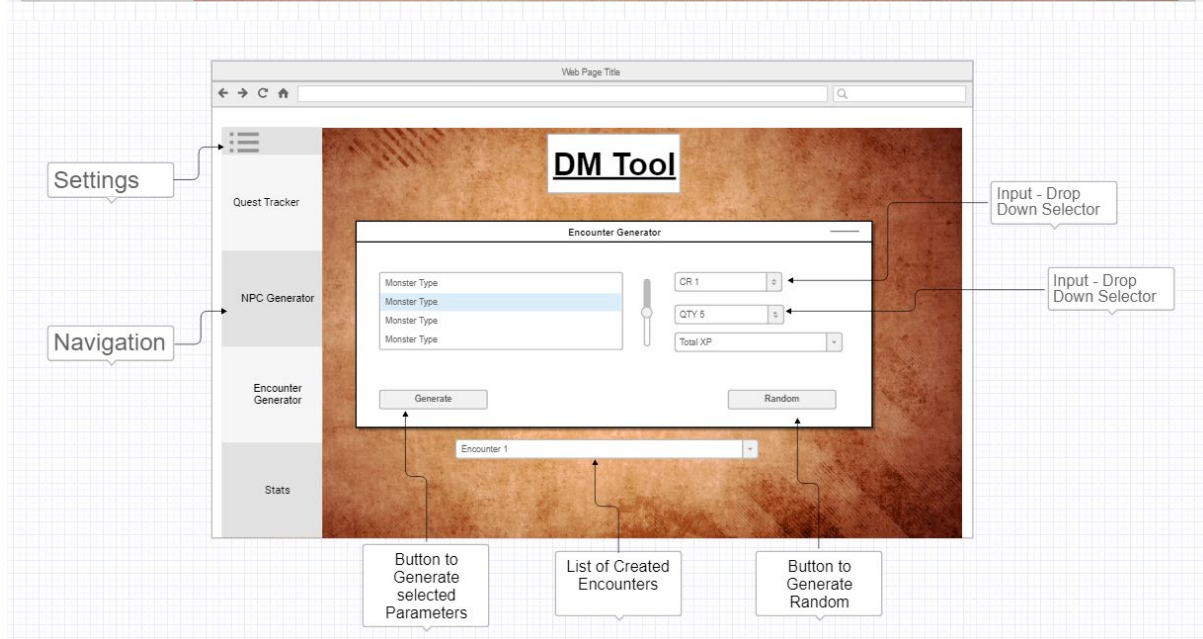
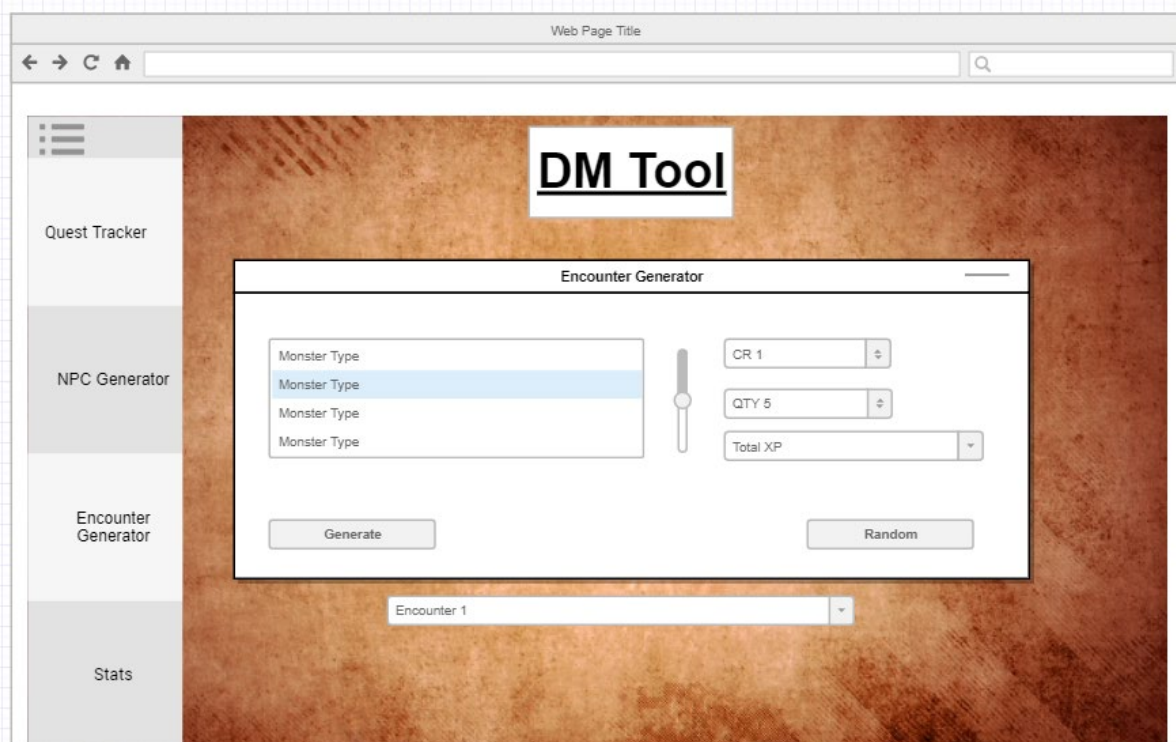


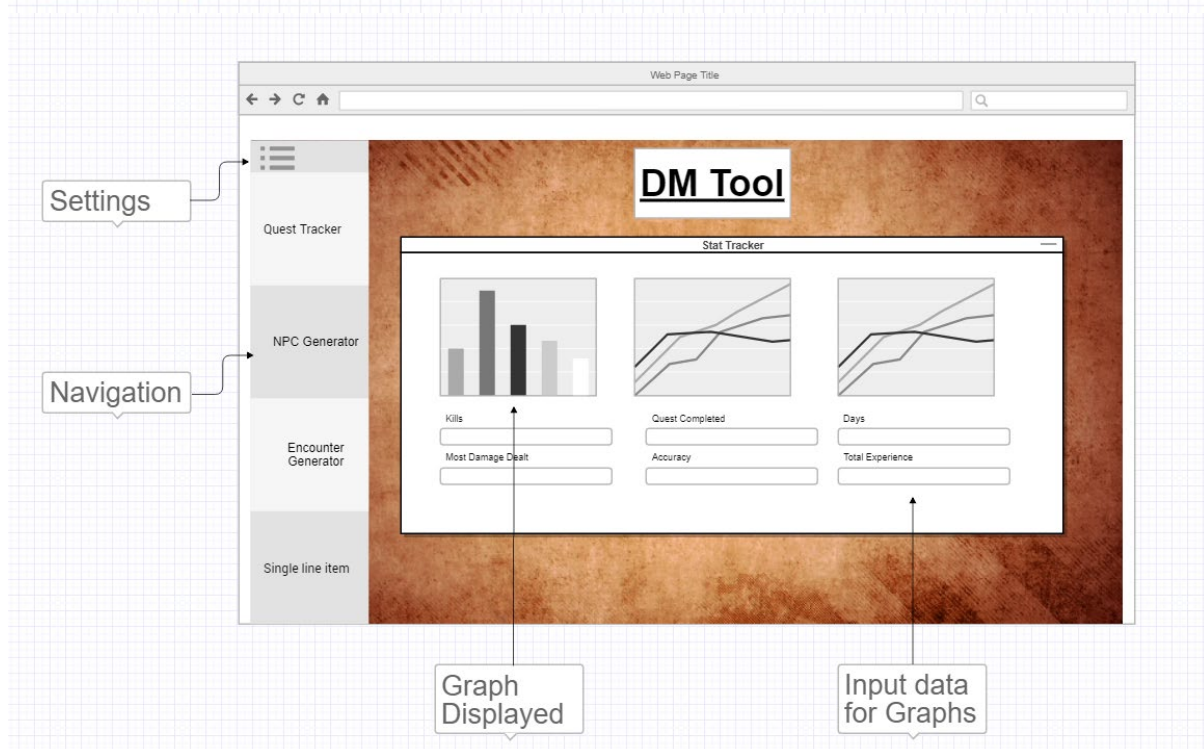
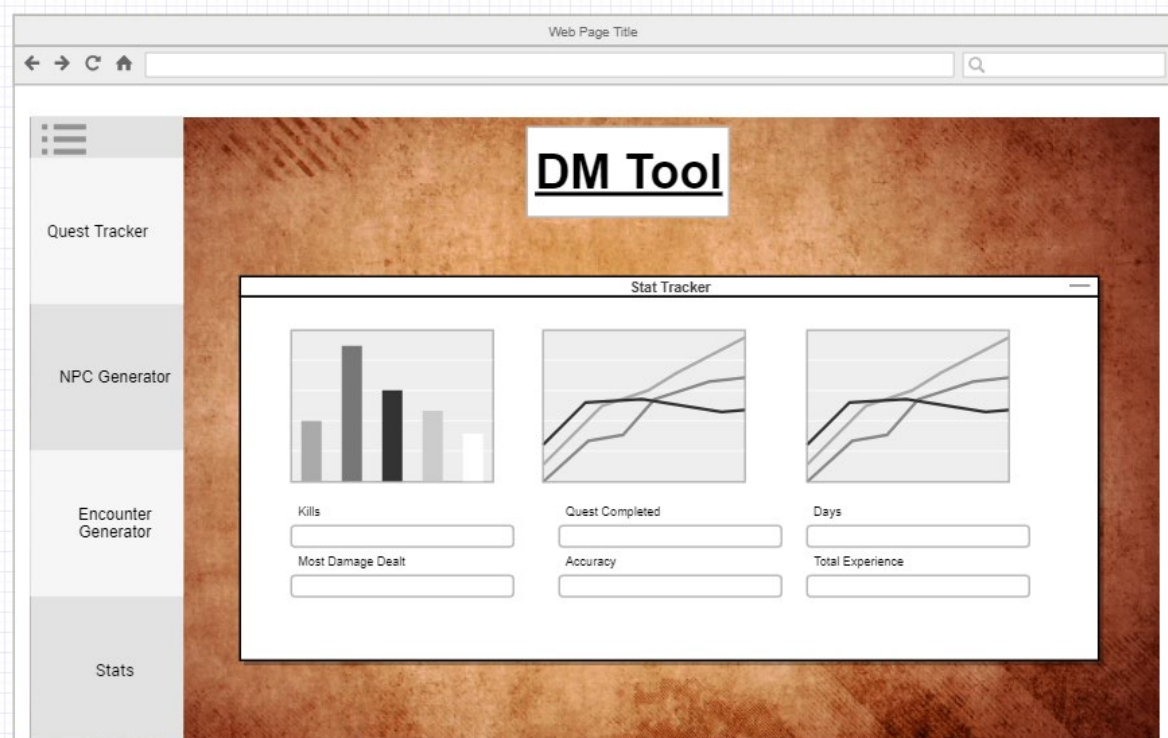
NPC 1

Npc Name	Adrik Kildrak
Race	Dwarf
Gender	Male
Profession	Craft: Blacksmith Guild: Ironmongers
Quantity	1

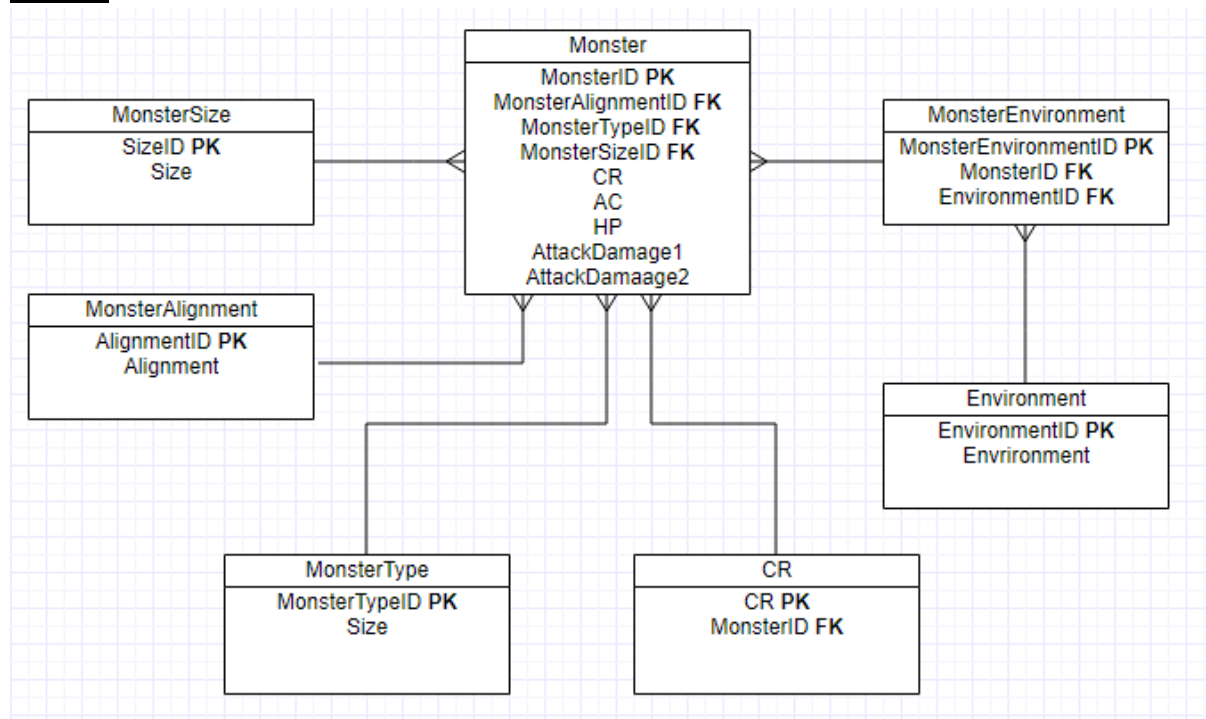
user selects generate, random then this box will open with selected information.

the user can also select from the drop down list at the bottom of the page





ERD



Verification and Validation

Due to the program requiring many inputs of the user it is pivotal for the program to have accurate Validation of the inputted Data. The use of drop-down menus to select parameters for several of the features will reduce incorrect inputs via the user. The data included in this database must be accurate for the playability of the game. The data provided is sourced from the resources available from the creators of D&D, Wizards of the Coast Ltd [6].

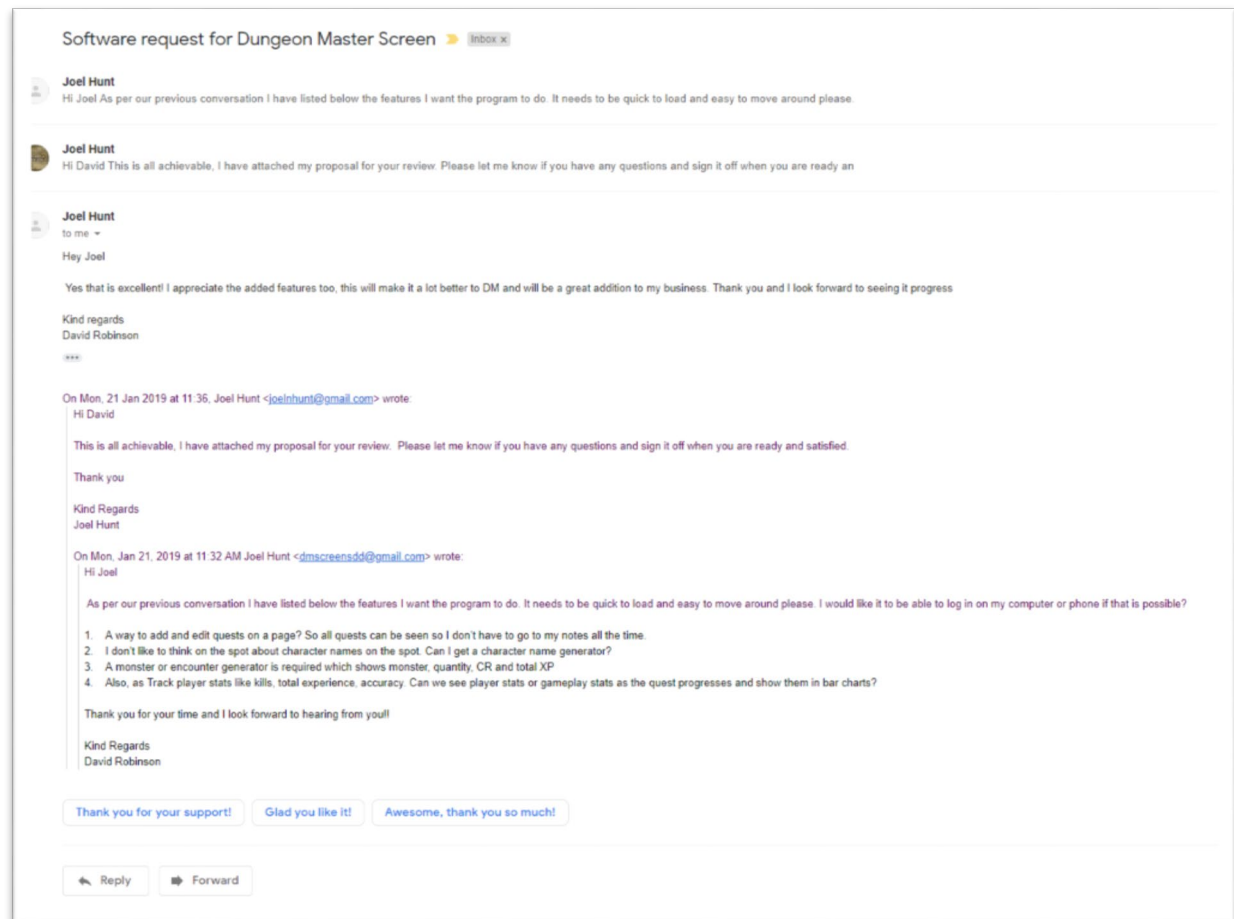
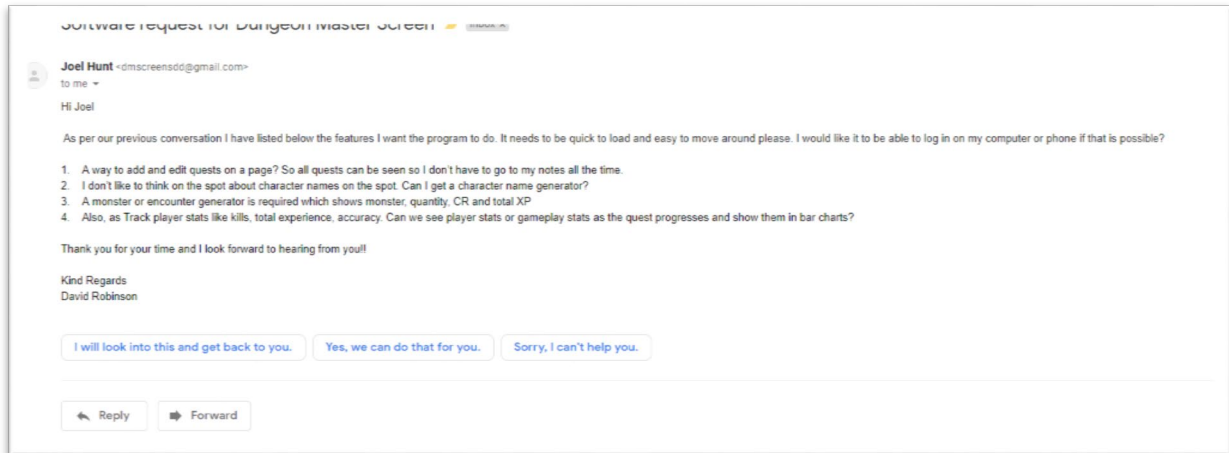
The calculation of the graphs to be displayed must also be accurate. The information provided will be validated and the formulas used will coincide with the functionality of the graph.

Evaluation Criteria

The criteria for a successful execution of this product will be gauged by the success of its usability and satisfactory functionality. The client must approve of the end product. Throughout the duration of playing the game, each session must successfully track all of the stats required. The graphs displayed must be correct and have a time-lapse connected with the internal calendar. Each button must work accordingly, and the validation must check out.

Appendix

Client Request(A)



Screenshots of Validated Data

NPC Encounter Data

NPC Calm Trait	NPC Stress Trait	NPC Eyes	Npc Chin/Jaw	NPC Hair	NPC Height	NPC Bodytype	NPC Clothing
Compassionate	Withdrawn	Sleepy eyes.	A pronounced chin.	Thick hair.	Unusually short.	Thin and delicate.	Crisp and new.
Cheerful	Murderous	Shifty eyes.	A cleft chin.	Wispy hair.	Short in stature.	Of average build.	Fashionable and hip.
Reserved	Obsessive	Watery eyes.	A dimple on the chin.	Straight hair.	Average height.	Well-muscled.	A bit old-fashioned.
Outspoken	Authoritarian	Bright eyes.	A rounded chin.	Wavy hair.	Slightly above average height.	Slightly overweight.	Of the highest quality.
Uninterested	Determined	Cold eyes.	A sharp jawline.	Curly hair.	Well above average height.	Grotesquely obese.	Faded, but in good condition.
Gruff	Brave	Smiling eyes.	A square jaw.	Wiry hair.	Unusually tall.	Lean and lanky.	Faded and patched.
Eager	Spiteful	Close-set eyes.	A round jaw.	Oily hair.		Lithe and lean.	Torn in places; missing buttons.
Deceitful	Belligerent	Wild eyes.	An underbite.			Thin and wiry.	Tattered and worn.
Foolish	Caustic	Distant eyes.				Sinewy and strong.	
Strict	Reckless	A lazy eye.				Flabby and weak.	
Agreeable	Argumentative					Lumpy or bent.	
Mischievous	Gluttonous					Covered in hair.	
Angry	Overly Protective						
Fearful	Angry						
Manipulative	Cowardly						
Devout	Meticulous						
Greedy	Sarcastic						
Funny	Stubborn						
Dour	Destructive						
Fun-Loving	Practical						
Lazy	Pushy						
Driven	Fanatical						
Boastful	Secretive						
Artistic	Scomful						
Assertive	Courageous						
Carefree	Impractical						
Cautious	Calculating						
Confident	Industrious						
Thoughtful	Manipulative						
Loyal	Destructive						
Sophisticated	Compulsive						
Weak-Willed	Intolerant						

Monster Encounter Data

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Name	Type	ALIGNMENT	Size	CR	AC	HP	Spellcasting?	Attack 1 damage	Attack 2 Damage	Page	Arctic	
2	Aarakocra	Humanoid	NG	Medium	1/4	12	13 NO		1d4+2	1d6+2	12 NO	NO	
3	Abjurer	Humanoid	ANY	Medium	9	12	84 YES		1d6-1	N/A	209 NO	NO	
4	Aboleth	Aberration	LE	Large	10	17	135 NO		2d6+5	3d6+5	13 NO	NO	
5	Abominable Yeti	Monstrosity	CE	Huge	9	15	137 NO		4d6+7	6d6	306 YES	NO	
6	Acolyte	Humanoid	ANY	Medium	1/4	10	9 YES		1d4	N/A	342 NO	NO	
7	Air Elemental	Elemental	N	Large	5	15	90 NO		2d6+5	3d6+2	124 NO	NO	
8	Alhoon	Undead	ANY EVIL	Medium	10	15	120 YES		3d6	4d6+4	172 NO	NO	
9	Allosaurus	Beast	U	Large	2	13	51 NO		2d10+4	1d8+4	79 NO	NO	
10	Androsphinx	Monstrosity	LN	Large	17	17	199 YES		2d10+6	N/A	281 NO	NO	
11	Animated Armor	Construct	U	Medium	1	18	33 NO		1d6+2	N/A	19 NO	NO	
12	Ankheg	Monstrosity	U	Large	2	14	39 NO		3d6+3	3d6	21 NO	NO	
13	Ankylosaurus	Beast	U	Huge	3	15	68 NO		4d6+4	N/A	79 NO	NO	
14	Annis Hag	Fey	CE	Large	6	17	75 YES		3d6+5	3d6+5	159 NO	NO	
15	Ape	Beast	U	Medium	1/2	12	19 NO		1d6+3	1d6+3	317 NO	NO	
16	Apprentice Wizard	Humanoid	ANY	Medium	1/4	10	9 YES		1d4	N/A	209 NO	NO	
17	Arcanaloth	Fiend	NE	Medium	12	17	104 YES		2d4+3	N/A	313 NO	NO	
18	Archdruid	Humanoid	ANY	Medium	12	19	132 YES		1d6+2	N/A	210 NO	NO	
19	Archer	Humanoid	ANY	Medium	3	16	75 NO		1d6+4	1d6+4	210 NO	NO	
20	Archmage	Humanoid	ANY	Medium	12	12	99 YES		1d4+2	N/A	342 NO	NO	
21	Assassin	Humanoid	NOT GOOD	Medium	8	15	78 NO		1d6+3	1d6+3	343 NO	NO	
22	Auroch	Beast	U	Large	2	11	38 NO		2d8+5	N/A	207 NO	NO	
23	Awakened Shrub	Plant	U	Small	0	9	10 NO		1d4-1	N/A	317 NO	NO	
24	Awakened Tree	Plant	U	Huge	2	13	59 NO		3d6+4	N/A	317 NO	NO	
25	Axe Beak	Beast	U	Large	1/4	11	19 NO		1d8+2	N/A	317 NO	NO	
26	Azer	Elemental	LN	Medium	2	17	39 NO		1d8+3	N/A	22 NO	NO	
27	Babau	Fiend	CE	Medium	4	16	82 YES		1d8+4	1d8+4	136 NO	NO	
28	Baboon	Beast	U	Small	0	12	3 NO		1d4-1	N/A	318 NO	NO	
29	Badger	Beast	U	Tiny	0	10	3 NO			1	318 NO	NO	
30	Balor	Fiend	CE	Huge	19	19	262 NO		3d8+8	2d6+8	55 NO	NO	
31	Banderhob	Monstrosity	NE	Large	5	15	84 NO		5d6+5	3d6	122 NO	NO	
32	Bandit	Humanoid	NOT LAWFUL	Medium	1/8	12	11 NO		1d6+1	1d6+1	343 YES	YES	
33	Bandit Captain	Humanoid	NOT LAWFUL	Medium	2	15	65 NO		1d6+3	1d4+3	344 YES	YES	
34	Banshee	Undead	CE	Medium	4	12	58 NO		3d6+2	N/A	23 NO	YES	
35	Barbed Devil	Fiend	LE	Medium	5	15	110 NO		1d6+3	2d6+3	70 NO	NO	
36	Bard	Humanoid	ANY	Medium	2	15	44 YES		1d6+2	1d6+2	211 NO	NO	
37	Barghest	Fiend	NE	Large	4	17	90 YES		2d8+4	1d8+4	123 NO	NO	
38	Barlgura	Fiend	CE	Large	5	15	68 YES		2d6+4	1d10+4	56 NO	NO	
39	Basilisk	Monstrosity	U	Medium	3	15	52 NO		4d6+3	N/A	24 NO	NO	
40	Bat	Beast	U	Tiny	0	12	1 NO			1	318 NO	NO	
41	Bearded Devil	Fiend	LE	Medium	3	13	52 NO		1d8+2	1d10+3	70 NO	NO	
42	Behr	Monstrosity	NE	Huge	11	17	168 NO		3d10+6	4d10+12	25 NO	NO	
43	Beholder	Aberration	LE	Large	13	18	180 NO		4d6	N/A	28 NO	NO	
44	Beholder Zombie	Undead	NE	Large	5	15	93 NO		4d6	N/A	316 NO	NO	
45	Berserker	Humanoid	C	Medium	2	13	67 NO		1d12+3	N/A	344 YES	YES	
46	Bheur Hag	Fey	CE	Medium	7	17	91 NO		2d8+1	N/A	160 YES	NO	
47	Black Bear	Beast	U	Medium	1/2	11	19 NO		1d6+2	2d4+2	318 NO	NO	
48	Black Dragon, Adult	Dragon	CE	Huge	14	19	195 NO		2d10+1d8+6	2d6+6	88 NO	NO	
49	Black Dragon, Ancient	Dragon	CE	Gargantuan	21	22	367 NO		2d10+2d8+8	2d6+8	87 NO	NO	
50	Black Dragon, Wyrmling	Dragon	CE	Medium	2	17	33 NO		1d10+1d4+2	5d8	88 NO	NO	
51	Black Dragon, Young	Dragon	CE	Large	7	18	127 NO		2d10+1d8+4	2d6+4	89 NO	NO	

Introduction to D&D (B)

The cult classic table top game Dungeon & Dragons swiftly became very popular upon its release in 1974 and peaked during the 1980's. It was estimated that since the beginning, the game had been played by upwards of 20 million people by 2004 [7]. Recently the game has had a resurgence. During this digital age D&D has found a new platform. With Online tools such as Discord and Skype it has made it easier for people to play with others at their convenience. Streaming services such as Twitch and YouTube have created an opportunity for individuals to stream the game. In 2017 there were over 7,500 unique streams of D&D with a collective total of 9 million viewers [8].

The game revolves around the players and the Dungeon master. The individual who plays the role of Dungeon master will set out a quest, premade or their own concoction and the other players will strive to complete the adventure laid out before them, using their chosen characters. A large part of the game is based around chance. Rolling a Die or several Dice is the main mechanic in the game and a specific players action, may it be a move or an attack, can be determined by the Dice rolls.

Data Dictionary(C)

Field Name	Data Type	Field Size
Monster Encounter Table		
SizeID PK	Integer	10
Size	Varchar	50
MonsterTypeID PK	Integer	10
MonsterType	Varchar	50
AlignmentID PK	Integer	10
Alignment	Varchar	50
EnvironmentID PK	Integer	10
Environment	Varchar	50
MonsterEnvironmentID PK	Integer	10
MonsterID	Integer	10
Monster	Varchar	50
EnvironmentID	Integer	10
Challenge Rating (CR)	Integer	10
Armour Class (AC)	Integer	10
HealthPoint (HP)	Integer	10
AttackDamage1	Varchar	10
AttackDamage2	Varchar	10
NPC Generator		
NpcID PK	Integer	10
NpcCalmTraitID	Integer	10
NpcCalmTrait	Varchar	50
NpcStressTraitID	Integer	10
NpcStressTrait	Varchar	50
NpcEyesID	Integer	10
NpcEyes	Varchar	50
NpcChinID	Integer	10
NpcChin	Varchar	50
NpcHairID	Integer	10
NpcHair	Varchar	50
NpcHeightID	Integer	10
NpcHeight	Varchar	50
NpcBodytypeID	Integer	10

NpcBodytype	Varchar	50
NpcAttitudeID	Integer	10
NpcAttitude	Varchar	50
NpcFlawID	Integer	10
NpcFlaw	Varchar	50
NpcProfessionID	Integer	10
NpcProfession	Varchar	100
NpcRaceID	Integer	10
NpcRace	Varchar	50
NameID	Integer	10
Name	Varchar	50
RollDice		
DiceID	Integer	10
DiceRoll	Integer	10
StatTracker		
Kills	Integer	10
MostDamageDealt	Integer	10
CritHit	Integer	10
CritFumble	Integer	10
QuestCompleted	Integer	10
Accuracy	Integer	10
Duration (days)	Integer	10
TotalXp	Integer	10

References

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