



SMITE GODS DATABASE

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Database Management
Design Project

Table of Contents

Table of
Contents.....1

Executive
Summary.....2

Entity-Relationship
Diagram.....3

Gods
Table.....4

Abilities
Table.....6

Players
Table.....7

God Select
Table.....8

Inventory
Table.....9

Items.....

10



Views.....
11

Reports.....
13

Store

Procedures.....16

Triggers.....
16

Security.....
17

Implementation


Notes/Problems.....18

Future

Improvements.....19

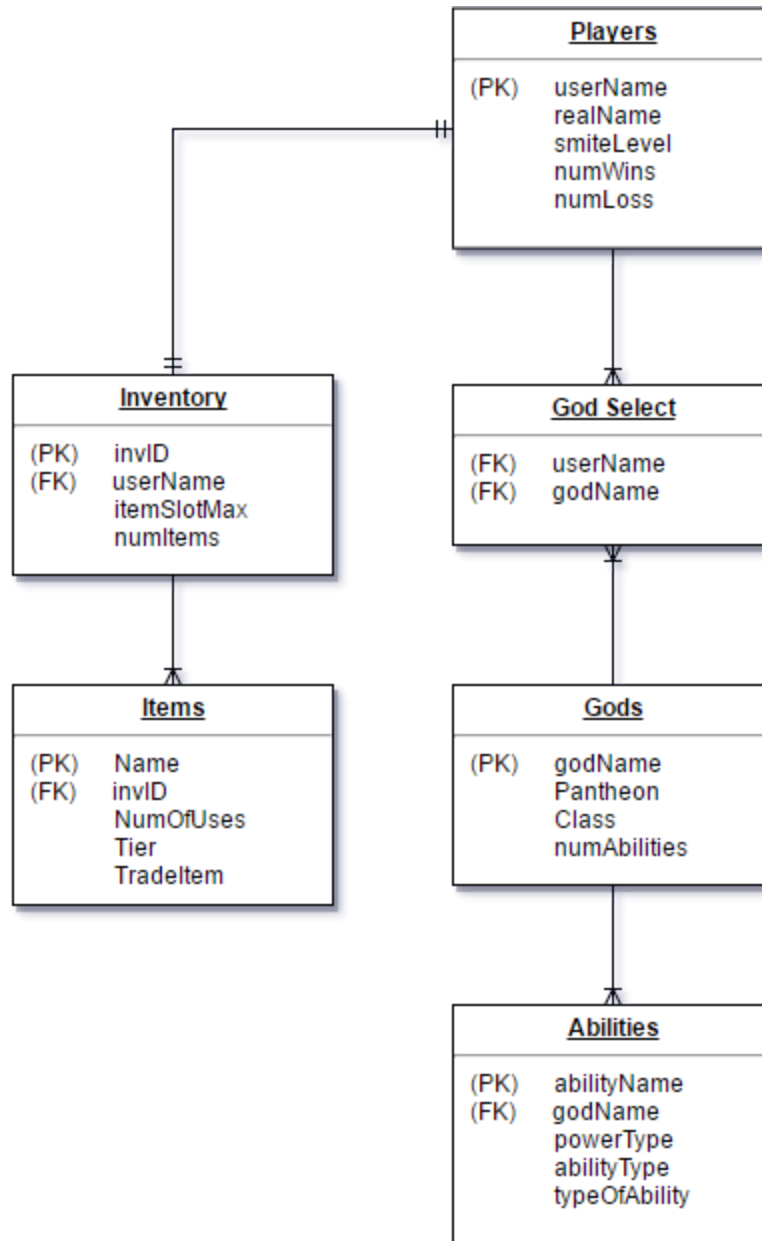
Executive Summary

This paper will provide an outline of the “Smite DB” database. Smite is a massive multiplayer online battle arena (MOBA). Smite is a game that was created by Hi-Rez Studios. The game has a vast amount of playable gods from ancient mythology ranging



from Greek Gods to Norse Gods. The reason for this database is because of the vast amount of data within the game that the player should know by the time he/she reaches Level 30. The Entity-Relationship diagram is illustrated to show functional dependencies within the database. As well as details on each element within the diagram with SQL code and examples for the database to display some test data, which was tested with PostgreSQL 9.6.1. Finally, I will talk about the problems that are known within the database as well thing I wish I did with project and things I would like do in the future if I ever get back to it.

Entity-Relation Diagram



Gods Table

This table will display information about a certain amount of heroes, such as their name, class, pantheon, and number of abilities all of which have four useable abilities. Smite although being in development for years was only released a little less than three years ago in March of 2014. Although being in open beta since January 2013. Currently there are 82 different Gods people can choose from. Down below is the create statements as well as the database populated.

```
CREATE TABLE Gods (GodName      text not null primary key,  
                    Pantheon      text not null,  
                    Class        text not null,  
                    numAbilities int  
);
```

Functional Dependencies:

GodName → Pantheon, Class, numAbilities

Sample Data

<input type="checkbox"/>	godname text	pantheon text	class text	numabili... integer
<input type="checkbox"/>	Sun Wuk...	Chinese	Warrior	4
<input type="checkbox"/>	Guan Yu	Chinese	Warrior	4
<input type="checkbox"/>	Ao Kuang	Chinese	Mage	4
<input type="checkbox"/>	Hou Yi	Chinese	Hunter	4
<input type="checkbox"/>	Anubis	Egyptian	Mage	4
<input type="checkbox"/>	Ra	Egyptian	Mage	4
<input type="checkbox"/>	Neith	Egyptian	Hunter	4
<input type="checkbox"/>	Sobek	Egyptian	Guardian	4
<input type="checkbox"/>	Apollo	Greek	Hunter	4
<input type="checkbox"/>	Arachne	Greek	Assassin	4
<input type="checkbox"/>	Zeus	Greek	Mage	4
<input type="checkbox"/>	Poseidon	Greek	Mage	4
<input type="checkbox"/>	Rama	Hindu	Hunter	4
<input type="checkbox"/>	Kumbhak...	Hindu	Guardian	4
<input type="checkbox"/>	Vamana	Hindu	Warrior	4
<input type="checkbox"/>	Kali	Hindu	Assassin	4
<input type="checkbox"/>	Raijin	Japanese	Mage	4
<input type="checkbox"/>	Amaterasu	Japanese	Warrior	4
<input type="checkbox"/>	Izanami	Japanese	Hunter	4
<input type="checkbox"/>	Susano	Japanese	Assassin	4
<input type="checkbox"/>	Awilix	Mayan	Assassin	4
<input type="checkbox"/>	Hun Batz	Mayan	Assassin	4
<input type="checkbox"/>	Chaac	Mayan	Warrior	4
<input type="checkbox"/>	Cabrakan	Mayan	Guardian	4
<input type="checkbox"/>	Odin	Norse	Warrior	4
<input type="checkbox"/>	Loki	Norse	Assassin	4

Abilities

Within Smite Gods have abilities, they all differ from each other but they all have four abilities. Within the table it stores what ability a God may have the name of it and what ability type it is. What that means is it a physical or magical ability. It also brings into account if the abilities are ranged or melee. As well as the type of ability it is, which might be a line area debuff, cone, buff, dash, or projectile.

```
CREATE TABLE Abilities (AbilityName      text not null primary key,
                        GodName          text not null references Gods (GodName),
                        PowerType         text not null,
                        AbilityType       text not null,
                        TypeOfAbility     text not null,
                        );
```

Functional Dependencies

AbilityName → GodName, PowerType, AbilityType, TypeofAbility

Sample Data

	abilityname text	godname text	powertype text	abilitytype text	typeofability text
<input type="checkbox"/>	The Magic Cudgel	Sun Wukong	Melee	Physical	Line
<input type="checkbox"/>	Conviction	Guan Yu	Melee	Magical	Area
<input type="checkbox"/>	Mark of the Golden Crow	Hou Yi	Ranged	Physical	Debuff
<input type="checkbox"/>	Plague of Locusts	Anubis	Melee	Magical	Cone
<input type="checkbox"/>	Heart Bomb	Cupid	Ranged	Physical	Projectile
<input type="checkbox"/>	Percussive Storm	Raijin	Ranged	Magical	Line
<input type="checkbox"/>	Mitgate Wounds	Hercules	Melee	Physical	Buff
<input type="checkbox"/>	Gungnir's Might	Odin	Melee	Physical	Area
<input type="checkbox"/>	Trident	Poseidon	Ranged	Magical	Buff
<input type="checkbox"/>	Groggy Strike	Kumbhakarna	Melee	Magical	Line

Players

The player is the most important part of the game, without the player there is no game, no game, no database. The table stores the user's username, he/she's real name, the Level of their account, the number of wins, and the number of losses. Normally if I was doing Heroes of the Storm, League of Legends, World of Tanks, or almost any other MOBA there would be some kind of ELO or MMR but Smite doesn't have that.

```
CREATE TABLE Players (UserName text not null unique primary key,
                        RealName text,
                        SmiteLvl int,
                        numWins int,
                        numLoss int
);
```

Functional Dependencies

UserName → RealName, SmiteLvl, numWins, numLoss

Sample Data

<input type="checkbox"/>	username text	realname text	smitelvl integer	numwins integer	numloss integer
<input type="checkbox"/>	420YoloScope	Booker DeWitt	30	420	421
<input type="checkbox"/>	Trumpler	Nicholas Barranco	30	919	910
<input type="checkbox"/>	TheRealDanielCraig	Daniel Craig	2	0	60
<input type="checkbox"/>	PinheadLarry	Hideo Kojima	12	28	32
<input type="checkbox"/>	Wheatley	Stephen Merchant	30	62	41

God Select

Before the game begins the player must choose a god to play. Each player can chose any of the gods they have. The God Select table works like this so that the user can play every hero and not be locked to just one and only one god. The way it's made is very simple the table contains just the player's username as well as the god the user chose.

```
CREATE TABLE GodSelect (UserName text not null references Players (UserName),
                          GodName text not null references Gods (GodName)
);
```

Sample Data

<input type="checkbox"/>	username text	godname text
<input type="checkbox"/>	420YoloScope	Nox
<input type="checkbox"/>	Trumpler	Ymir
<input type="checkbox"/>	TheRealDanielCraig	Ra
<input type="checkbox"/>	PinheadLarry	Hercules
<input type="checkbox"/>	Wheatley	Izanami

Inventory

Within the table for inventory the table will store each player's inventory including the player's inventory ID (or invID). The maximum number of item slots for the game, six being the max number of items a player can hold within the game.

```
CREATE TABLE Inventory (invID serial primary key,
                          UserName text not null references Players (UserName),
                          ItemSlotsMax int,
                          numItems int
);
```

Functional Dependencies

invID → userName, itemSlotMax, numItems

Sample Data

	invID integer	username text	itemslotsmax integer	numitems integer
<input type="checkbox"/>	1	420YoloScope	6	6
<input type="checkbox"/>	2	Trumpler	6	5
<input type="checkbox"/>	3	TheRealDanielCraig	6	1
<input type="checkbox"/>	4	PinheadLarry	6	2
<input type="checkbox"/>	5	Wheatley	6	4

Items

This table will store the data about the items within the game that is then stored within the player's inventory. It contains the name of the item, the inventory ID the number of uses, the tier in which the user can get it at, and whether or not its tradable.

Functional Dependencies

itemName \rightarrow invID, numUses, Tier, Tradable

Sample Data

<input type="checkbox"/>	name text	invID integer	numUses integer	tier integer	tradable boolean
<input type="checkbox"/>	Boots	1	0	1	true
<input type="checkbox"/>	Ancient Blade	2	0	1	true
<input type="checkbox"/>	Tiny Trinket	2	1	1	false
<input type="checkbox"/>	Mace	3	0	1	true
<input type="checkbox"/>	Steel Mail	4	0	2	false
<input type="checkbox"/>	Spell Focus	5	3	2	false
<input type="checkbox"/>	Rod of Healing	1	0	2	true
<input type="checkbox"/>	Doom Orb	3	0	2	false
<input type="checkbox"/>	Stone Gaia	4	0	3	true
<input type="checkbox"/>	Ancile	4	0	3	false
<input type="checkbox"/>	Odysseus Bow	2	0	3	true
<input type="checkbox"/>	Malice	5	0	3	true

Views

Here it retrieves all the relevant information about the Gods and their Abilities then displays them in one table. The Gods and Abilities table is the most reasonable because of how they are relatable and interchange with one another because a God without any abilities is useless, so you might as well give him to Daniel Craig.

```
CREATE VIEW GodsAndAbilities AS
    SELECT g.GodName, g.Class, g.numAbilities,
           a.AbilityName, a.PowerType, a.AbilityType, a.TypeOfAbility
    FROM Gods g
    JOIN Abilities a
    ON g.GodName = a.GodName;

SELECT * FROM GodsAndAbilities
ORDER BY GodName ASC;
```

Sample Data

	godname text	class text	numabilities integer	abilityname text	powertype text	abilitytype text	typeofability text
<input type="checkbox"/>	Anubis	Mage	4	Plague of Locusts	Melee	Magical	Cone
<input type="checkbox"/>	Cupid	Hunter	4	Heart Bomb	Ranged	Physical	Projectile
<input type="checkbox"/>	Guan Yu	Warrior	4	Conviction	Melee	Magical	Area
<input type="checkbox"/>	Hercules	Warrior	4	Mitgate Wounds	Melee	Physical	Buff
<input type="checkbox"/>	Hou Yi	Hunter	4	Mark of the Golden Crow	Ranged	Physical	Debuff
<input type="checkbox"/>	Kumbhakarna	Guardian	4	Groggy Strike	Melee	Magical	Line
<input type="checkbox"/>	Odin	Warrior	4	Gungnirs Might	Melee	Physical	Area
<input type="checkbox"/>	Poseidon	Mage	4	Trident	Ranged	Magical	Buff
<input type="checkbox"/>	Raijin	Mage	4	Percussive Storm	Ranged	Magical	Line
<input type="checkbox"/>	Sun Wukong	Warrior	4	The Magic Cudgel	Melee	Physical	Line

Views Cont.

Another view that was put together is the Inventory and Items tables were retrieved and put together because the user might have the item and the developers may need it for statistical reason for balancing.

```
CREATE VIEW InventoryAndItems AS
Select i.itemName, i.invid, i.NumOfUses, i.Tier,
      n.UserName, n.ItemSlotsMax, n.numItems
FROM Items i
Join Inventory n
On i.invid = i.invid;

SELECT * FROM InventoryAndItems
WHERE NumOfUses = 3
ORDER BY username ASC;
```

Sample Data

<input type="checkbox"/>	itemname text	invid integer	numofuses integer	tier integer	username text	itemslots... integer	numitems integer
<input type="checkbox"/>	Spell Focus	5	3	2	420YoloScope	6	6
<input type="checkbox"/>	Spell Focus	5	3	2	PinheadLarry	6	2
<input type="checkbox"/>	Spell Focus	5	3	2	TheRealDanielCraig	6	1
<input type="checkbox"/>	Spell Focus	5	3	2	Trumpler	6	5
<input type="checkbox"/>	Spell Focus	5	3	2	Wheatley	6	4

Reports and Queries

Each Query down below just shows the basic tables.

Gods Table in Pantheon Order

```
SELECT * FROM Gods
ORDER BY Pantheon ASC;
```

<input type="checkbox"/>	godname text	pantheon text	class text	numabili... integer
<input type="checkbox"/>	Sun Wuk...	Chinese	Warrior	4
<input type="checkbox"/>	Guan Yu	Chinese	Warrior	4
<input type="checkbox"/>	Ao Kuang	Chinese	Mage	4
<input type="checkbox"/>	Hou Yi	Chinese	Hunter	4
<input type="checkbox"/>	Anubis	Egyptian	Mage	4
<input type="checkbox"/>	Ra	Egyptian	Mage	4
<input type="checkbox"/>	Neith	Egyptian	Hunter	4
<input type="checkbox"/>	Sobek	Egyptian	Guardian	4
<input type="checkbox"/>	Apollo	Greek	Hunter	4
<input type="checkbox"/>	Arachne	Greek	Assassin	4
<input type="checkbox"/>	Zeus	Greek	Mage	4
<input type="checkbox"/>	Poseidon	Greek	Mage	4

Ability Table in Order of Power Type

```
SELECT * FROM Abilities
ORDER BY PowerType ASC;
```

<input type="checkbox"/>	abilityna... text	godname text	powerty... text	abilitytype text	typeofab... text
<input type="checkbox"/>	The Magi...	Sun Wuk...	Melee	Physical	Line
<input type="checkbox"/>	Conviction	Guan Yu	Melee	Magical	Area
<input type="checkbox"/>	Plague of...	Anubis	Melee	Magical	Cone
<input type="checkbox"/>	Mitgate ...	Hercules	Melee	Phyiscal	Buff
<input type="checkbox"/>	Gungnirs...	Odin	Melee	Physical	Area
<input type="checkbox"/>	Groggy S...	Kumbhak...	Melee	Magical	Line
<input type="checkbox"/>	Mark of t...	Hou Yi	Ranged	Physical	Debuff
<input type="checkbox"/>	Trident	Poseidon	Ranged	Magical	Buff
<input type="checkbox"/>	Heart Bo...	Cupid	Ranged	Physical	Projectile
<input type="checkbox"/>	Percussiv...	Raijin	Ranged	Magical	Line

Reports and Queries Cont.

Players Table Displaying if the Number of Wins is less than a 100

```
Select * FROM Players
WHERE numWins <= 100
ORDER BY numWins ASC;
```

<input type="checkbox"/>	username text	realname text	smitelvl integer	numwins integer	numloss integer
<input type="checkbox"/>	TheRealDanielCraig	Daniel Craig	2	0	60
<input type="checkbox"/>	PinheadLarry	Hideo Kojima	12	28	32
<input type="checkbox"/>	Wheatley	Stephen Merchant	30	62	41

God Select Table Showing What User Chose the God 'Ra'

```
Select * FROM GodSelect
WHERE GodName = 'Ra';
```

<input type="checkbox"/>	username text	godname text
<input type="checkbox"/>	TheRealDanielCraig	Ra

Inventory Table in Order of the Inventory ID

```
SELECT * FROM Inventory
ORDER BY invid ASC;
```

<input type="checkbox"/>	invid integer	username text	itemslot... integer	numitems integer
<input type="checkbox"/>	1	420YoloS...	6	6
<input type="checkbox"/>	2	Trumpler	6	5
<input type="checkbox"/>	3	TheRealD...	6	1
<input type="checkbox"/>	4	PinheadL...	6	2
<input type="checkbox"/>	5	Wheatley	6	4

Items Table Where it Only Displays Tier 3 Items

```
SELECT * FROM Items
Where tier = 3;
```

<input type="checkbox"/>	itemname text	invid integer	numofuses integer	tier integer	tradeitem boolean
<input type="checkbox"/>	Stone Gaia	4	0	3	true
<input type="checkbox"/>	Ancile	4	0	3	false
<input type="checkbox"/>	Odysseus Bow	2	0	3	true
<input type="checkbox"/>	Malice	5	0	3	true

Stored Procedures

```
CREATE OR REPLACE FUNCTION tradeItems()  
  RETURNS trigger AS $$  
  DECLARE  
  BEGIN  
    DROP TABLE Items;  
  end;  
  $$ language plpgsql;  
  
SELECT tradeItems();
```

Triggers

```
DROP TRIGGER IF EXISTS endGame ON Items;  
CREATE TRIGGER endGame  
after DELETE on Inventory  
FOR EACH ROW EXECUTE PROCEDURE tradeItems();
```

Security

For basic reasons I kept the security measures simple. The roles 'Player', 'Admin' and 'Super Admin' were created. Although the 'Player' can only select, the 'Admin' can select, insert and update on the tables but they can't delete. Whereas 'Super Admin' can do all of the all of same things as the 'Admin' except they can delete tables. Very simple as well as passwords to each role but the 'Player.'

```
Create ROLE Player;
GRANT SELECT ON ALL TABLES IN SCHEMA PUBLIC TO Player;

CREATE ROLE admin WITH LOGIN PASSWORD 'alpaca';
GRANT SELECT, INSERT, UPDATE ON ALL TABLES IN SCHEMA PUBLIC TO admin;

--I had to.
CREATE ROLE superadmin WITH LOGIN PASSWORD 'thecakeisalie';
GRANT SELECT, INSERT, UPDATE, DELETE ON ALL TABLES IN SCHEMA PUBLIC TO superadmin;
```

Implementation Notes

- Within a MOBA that is highly competitive, changes are made constantly within the game. Whether the items changed, abilities are changed, or the statics of the gods are changed. Which is very often to keep the game from reaching a stalemate and the players use the same items or gods over and over. The changes add incentive for players to play other gods or items.
- It's also important to know that this database was made in the knowledge that the person who uses the database actually plays the game. Although the god's table is fairly easy to understand.

Known Problems

- One of the problems is the one of the items and inventory table. Despite there being a max of six items in the player's inventory when the query calls for the tables it shows that the players all have more than six items.
- Evidently not all the gods have abilities within the database as well as there aren't all the gods or items in the database like they are ingame. This is something I will cover in 'Future Improvements.'

Future Improvements

Future improvements I would make to this database is adding more abilities so each god has an ability. I would also add all of the Gods that are within the game as well. Although that would be well over 300 abilities, another 50 gods, and 200 items which is a lot of data. Although I'm quite happy with the database I currently have I wish I was able to more.

When I first started the design project I was originally going to do World of Tanks where instead of Gods their tanks. In my opinion it's something more down my alley with the physics of the game as well as the historical aspect of it. Although I like Greek and Ancient mythology a lot as well. As much as I enjoy making the database for Smite, if I was able to redo this project I would most certainly choose World of Tanks.