Chapter 14 - Designing a Database for a Video Game

1.Approach

The first step is to decide on the theme of the Game.

For this Tutorial, we have chosen a 'Shoot 'em Up' which is based on a very popular Game for the Microsoft Xbox called Gears of War.

Here is the page on the Database Answers Web Site that shows the Data Model :-

* http://www.databaseanswers.org/data_models/gaming_gears_of_war/index.htm

This Kick-Start Data Model features :-

* the Good Guys, who are Soldiers

* the Weapons

* the Bad Guys, who are Locusts

* the Rules of Engagement between the Good Guys and the Bad Guys

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2.The Good Guys

There are six Soldiers in the Game, with different Ranks and different backgrounds

2.1 Colonel Victor Hoffman

A military man to the core, Colonel Victor Hoffman demands discipline and sacrifice from those under his command.

2.2 Sergeant Marcus Fenix

His Profile reads :-

Few have given more and lost as much as Marcus Fenix.
A promising soldier during the Pendulum Wars, Marcus saw everything change on Emergence Day.
Marcus bravely fought the Locust for ten years, then, during an intense battle, he abandoned his
post to rescue his father, Professor Adam Fenix.
But he arrived too late. Marcus was tried for dereliction of duty and sentenced to 40 years in
Jacinto Maximum Security Prison.
Incarcerated for four years before being released to fight Locust again, Marcus was later promoted to sergeant.

2.3 Private Damian Baird

Private Damon Baird is a dedicated tech-head and professional skeptic.
In Baird's world, if something can go wrong, it probably already has.
His sarcasm can keep people at a distance, which is why Baird prefers the company of machines.
He believes in the Coalition's cause, but he's often frustrated with command decisions, and took offense when Hoffman promoted Marcus Fenix to lead Delta Squad instead of him.

2.4 Private Anthony Carmine

As the youngest member of Delta Squad during the Lightmass Offensive, what Private Anthony Carmine lacked in combat experience, he made up for in unbridled enthusiasm.

2.5 Private Dominic Santiago

A seasoned fighter who's positive even in the darkest of hours, Dominic Santiago freed his best friend Marcus Fenix from Jacinto Maximum Security Prison and recruited him into Delta Squad.

His battlefield intensity is rivalled only by his loyalty to Marcus--and his wife, Maria.

Dominic's relentless search for his wife finally ended during Operation: Hollow Storm, when he and Marcus found her in a Locust processing facility, barely alive and irrevocably twisted.

Marcus left his side to allow Dom a final moment with his beloved Maria before ending her suffering.

2.6 Lieutenant Anya Stroud

As Delta's Control contact, Anya Stroud guided Delta Squad on their mission to destroy the Locust, providing vital intel and strategic advice to the squad in the field.

2.7 Samantha 'Sam' Byrne

Samantha "Sam" Byrne's father, Sgt. Samuel Byrne, fell in battle at the siege of Anvil Gate in Anvegad, Kashkur before the birth of his daughter.

2.8 Summary

At this point, we can see that we have identified that all Soldiers as having Names, Ranks and a military background.

Therefore, our Soldiers Data Model looks like this :-

3.Choosing the Weapons

Now we can choose the Weapons to match the Soldier's unique qualities.

These are our options that are described here.

3.1 Boomshot Grenade Locust

A Boomshot Grenade Locust is a short- to mid-range grenade launcher that can easily take down a target in a single shot

3.2 Hammer of Dawn

The Hammer of Dawn is An Imulsion-powered satellite that rains down a devastating particle energy stream.
It can wipe out anything from small Locust squads to entire city blocks.

3.3 Long Shot Sniper Rifle

The Longshot Sniper Rifle is a high-powered, bolt-action sniper rifle with a powerful zoom sight.

3.4 One Shot

The OneShot is an intimidating and obscenely powerful long-range sniper rifle capable of destroying most foes in a single shot

3.5 Scorcher Flamethrower

The Scorcher Flamethrower is a short- to mid-range weapon that emits a concentrated stream of fire that chars your enemies.

3.6 Troika

The Troika Turret is a high-powered, turret-mounted Locust machine gun that fires continuous rounds across the battlefield.

3.7 Summary

A Boomshot Grenade Locust is a short- to mid-range **grenade launcher** that can easily take down a target in a single shot.

The Hammer of Dawn is An Imulsion-powered **satellite** that rains down a devastating particle energy stream. It can wipe out anything from small Locust squads to entire city blocks.

The Longshot Sniper Rifle is a high-powered, bolt-action sniper **rifle** with a powerful zoom sight. The OneShot is an intimidating and obscenely powerful long-range sniper **rifle** capable of destroying most foes in a single shot

The Scorcher **Flamethrower** is a short- to mid-range weapon that emits a concentrated stream of fire that chars your enemies.

The Troika Turret is a high-powered, turret-mounted Locust **machine gun** that fires continuous rounds across the battlefield.

An analysis of these weapon identifies that we have one Flamethrower, three Guns and a Satellite.

Therefore, the fragment of our Data Model for Weapons looks like this :-
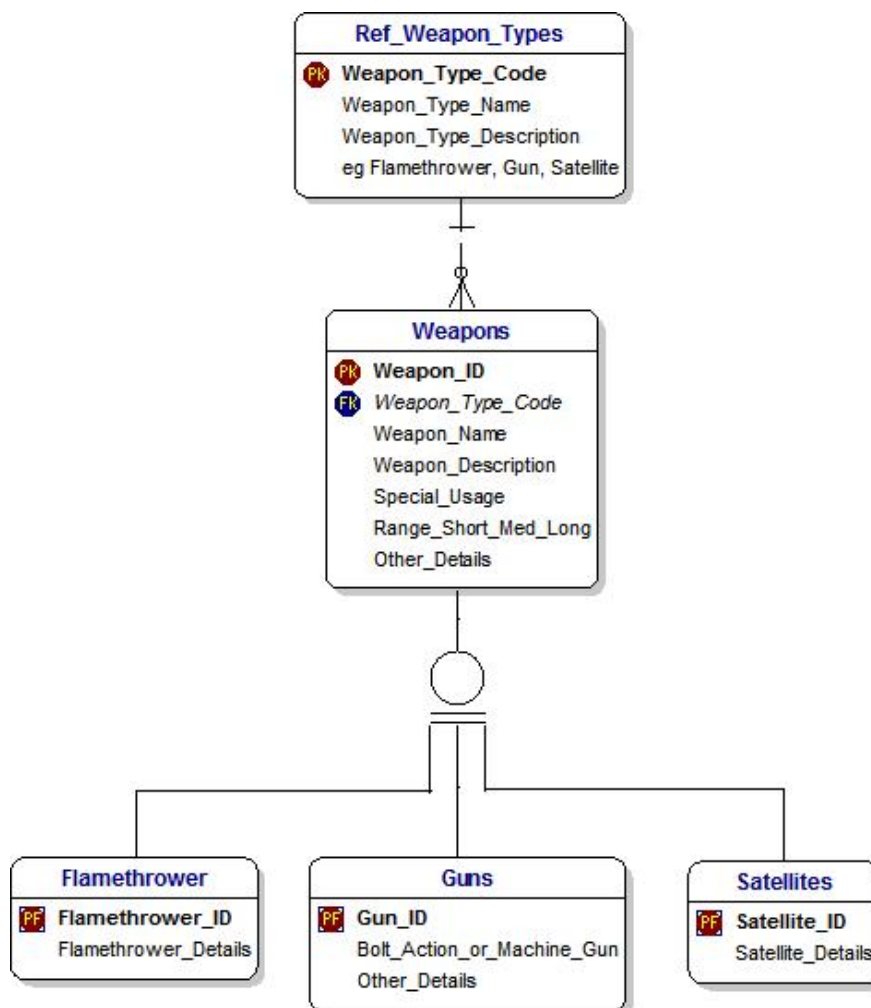
4. The Bad Guys

In this game, the Bad Guys are all Locusts. However, they come in different shapes and sizes, and offer different threats.

4.1 Berserkers

Berserkers are female Locusts.
They use their keen hearing and sense of smell to seek out their prey and bludgeon it to death with their hammer-like fists.

4.2 Brumaks

To stand in the Brumak's shadow is to stare death in the face.

These hulking war machines possess a deadly assortment of weapons, from wrist-mounted machine guns to over-the-shoulder rocket launchers.

For any chance of survival against a Brumak, blast away bits of its armor to reveal the soft, weak spots underneath.

4.3 Grenadier

Locust Grenadiers are never afraid to get up close and personal.
They have a hard-charging kamikaze attack and rush their enemy with little concern for their own welfare.

They specialize in both grenades and the Gnasher Shotgun, drawing their targets out of cover with one
before blasting them to pieces with the other.

4.4 RAAM

An imposing figure, RAAM towers over all humans, his silent demeanor concealing a violent and merciless nature.

In battle, RAAM is a formidable opponent who wields a Troika Machine Gun while controlling the Kryll that he sometimes employs as a shield. RAAM met his demise at the hands of Marcus Fenix aboard the Tyro Pillar, where his reign of terror came to an abrupt and welcome end.

4.5 Summary

One of the Locusts id identified as being female. Therefore, we have to assume that all Locusts have a gender, which will be male, female or unknown.

Locusts are identified as having strengths and weaknesses.

The photos of the Locusts show them having arms and legs. Therefore we include an Arm Count and Leg Count fields, which we default to two of each.

5. Thinking in General Terms

5.1 Soldiers and Locusts

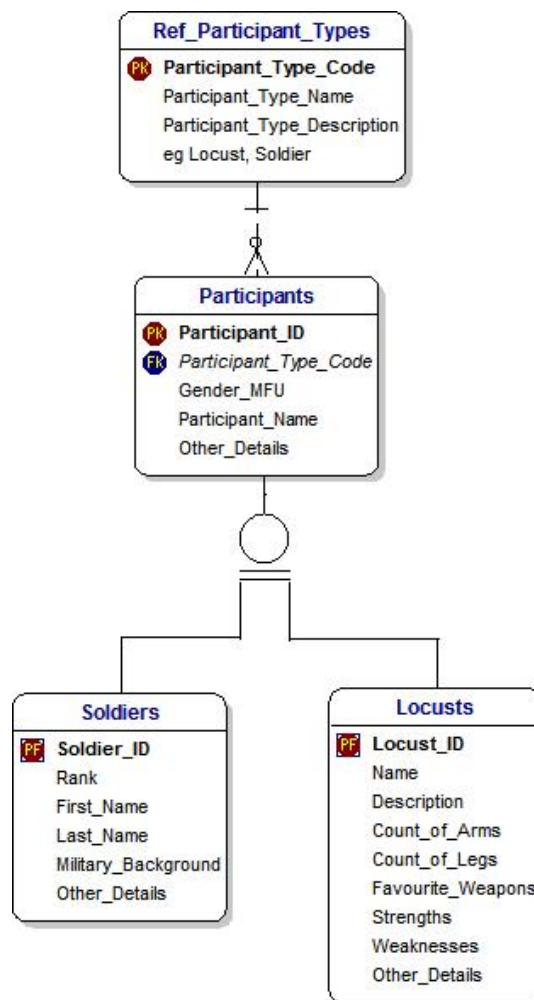In understanding the Game, we need to consider how to simplify the way we define Soldiers and Locusts.

This will help us to define the Game at a higher level and think about it in a more general way.

Our first step is to consider Soldiers and Locusts as Participants in the Game.

We could call them Beings or Actors or Roles but for simplicity at this basic level we call them simply 'Participants'.

They both have Names, and a Gender. Therefore, we move the Gender_MFU to the Participants entity.

Therefore, we can use Inheritance to clarify this situation and the Data Model fragment will look like this :-

Ref_Participant_Types
- (Pk) Participant_Type_Code
- Participant_Type_Name
- Participant_Type_Description
- eg Locust, Soldier

Participants
- (Pk) Participant_ID
- (Fk) Participant_Type_Code
- Gender_MFU
- Participant_Name
- Other_Details

Soldiers
- (PF) Soldier_ID
- Rank
- First_Name
- Last_Name
- Military_Background
- Other_Details

Locusts
- (PF) Locust_ID
- Name
- Description
- Count_of_Arms
- Count_of_Legs
- Favourite_Weapons
- Strengths
- Weaknesses
- Other_Details

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5.2 Favourite Weapons

It turns out that both Soldiers and Locusts have favourite Weapons and now that we have established a Participants entity, we can favourite Weapons as an attribute of the Participants entity.

Each Participant can have many favourite weapons, and each particular type of Weapon can be the favourite of many Participant.

In Data Modelling terms, we call this as a 'Many-to-Many Relationship' between Participants and Weapons.

We have moved the Favourite_Weapons attribute from the Locust entity to the new Favourite_Weapons entity.

Therefore, the Data Model fragment Soldiers and Locusts look like this, where the 'Favourite_Weapons' entity shows that each Participant can have many favourite Weapons and vice versa. :-
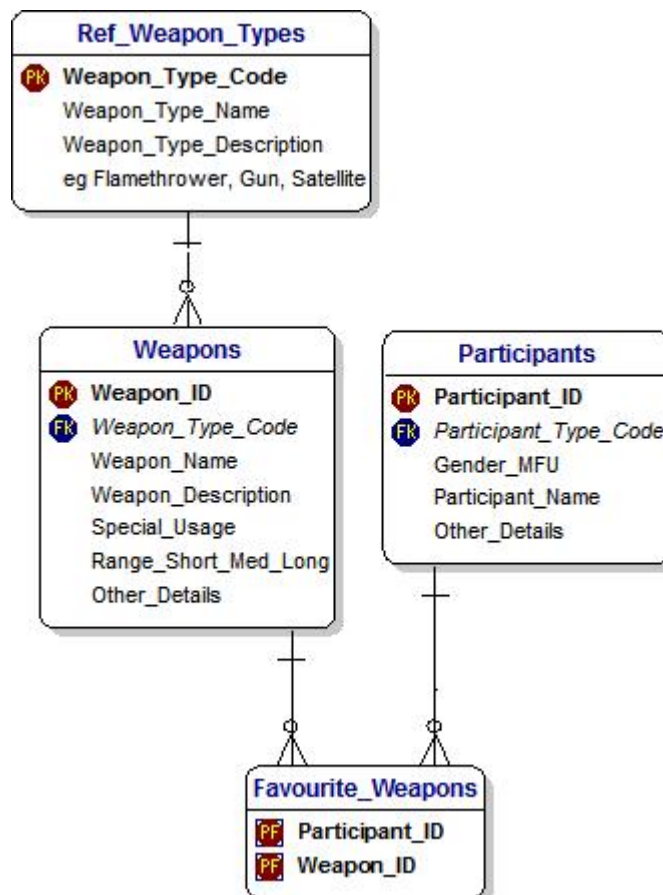
6. Rules of Engagement

In general terms , the Soldiers will have a number of Objectives and will have to engage with the Locusts to achieve these Objectives.

We will consider these engagement as a series of Events involving all Participants (bit not every time).

Each Event will have an outcome (like Victory or Defeat) and use Resources, such as Bullets, that might be in limited supply.
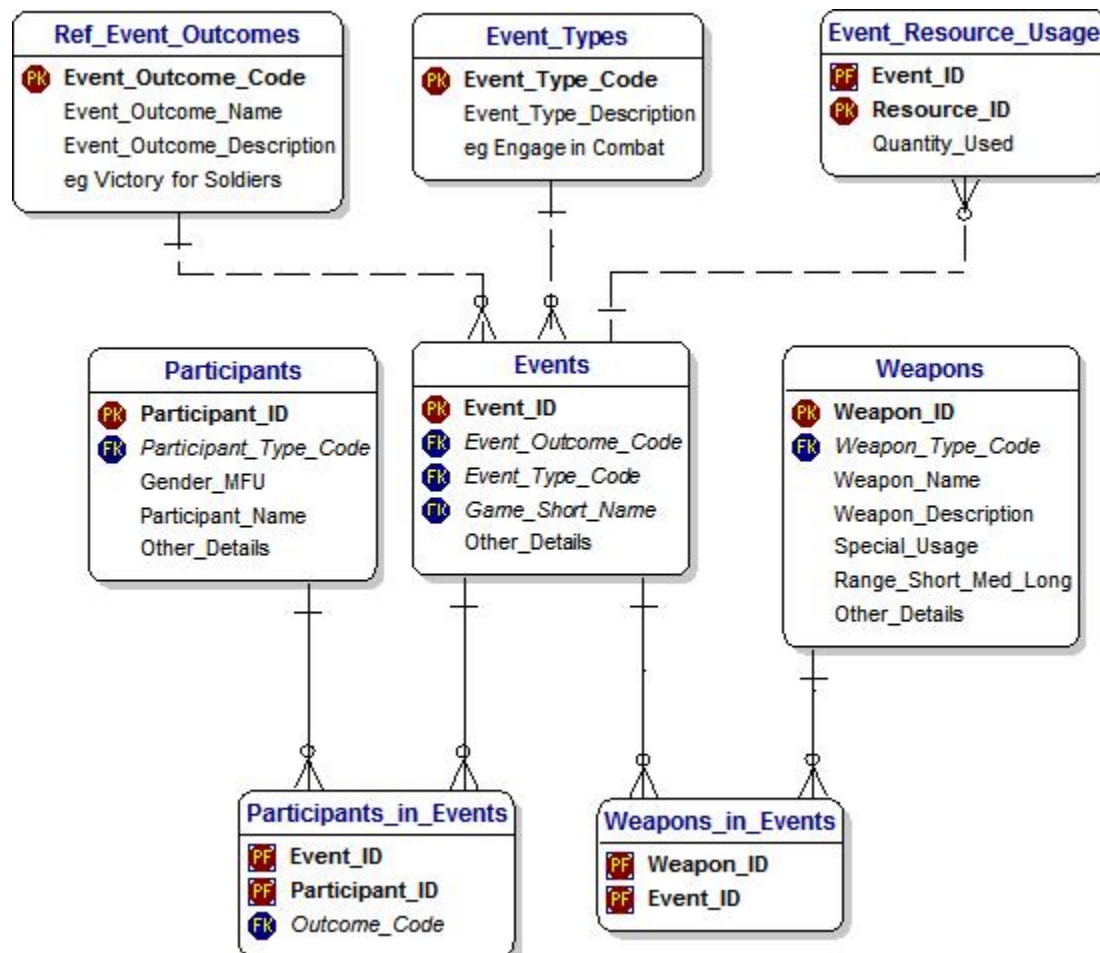
7. The Complete Data Model

When we combine the Soldiers, Locusts and Weapons, this is what our Complete Data Model looks like.

We have left out the Reference Data tables to keep the Model simple and easier to read.

For the same reason, we have included only the Primary and Foreign Keys and also omitted the Attributes.