

# **PLEASE DON'T SHOOT**

**An analysis of 3D shooters features**

BY

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## Premise

This article is about the way 3D shooters have improved over time, both on the gameplay and game mechanics level, thanks to the implementation of brand new features.

Some of these features were so critical that they set new standards for the genre, forming an integral and essential part for other 3D shooters to come.

The goal of this analysis is to sum up what has been done so far in order to find new directions to head towards, so to expand 3D shooters mechanics.

When I say 3D shooters I mean those games where the player controls a character from a first or third person perspective, armed with a certain amount of offensive devices, in a 3D environment, the goal being to go through the game levels cleaning them out of any opposing force.

Games will be mentioned taking into consideration the features they introduced in the genre, without referring to their success or their good or poor quality.

## Methodology

Games will be examined taking into consideration 4 main groups of features that typically define 3D shooters:

- **Character Mobility:** does the main character crouch, or jump? Can he climb a ladder? Does the game provide any means for the character to move faster?
- **Killing Options:** does the game allow the player to kill in different ways? Can I shoot an enemy with a sniper rifle from a distance, or back-stab him with a knife? Can I electrocute him, or make him step on a landmine? Is there any difference between a leg hit or a head-shot?
- **Arsenal:** how many weapons does the game provide? How many can the character carry with him? Are there any alternate fire modes, or can I equip weapons with different ammo types? Are there any unconventional or exotic devices to effectively kill enemies?
- **Environment:** can I take advantage of the environment? Does the game allow the character to take cover, or hide in the shadows? Can I make an opening into a wall to create an alternate route to the enemy, or block him with a barricade?

The features breakdown into the 4 groups is merely approximate, because the groups inevitably overlap at some points. For example, arsenal variety in a game has an influence on the killing options that game provides (stealth backstabbing vs sniping from a distance).

Since this bias is an inescapable fact, I will do my best to mention only non-ambiguous examples for any group of features.

By making comparisons among games based on the interrelations between the 4 groups, I hope to provide a technique to analyze a complex theoretical construct as the **gameplay extension field** of a game, that is powerful and easy to read at the same time.

Let's start!

## SUMMARY

### **INTRODUCTION**

This section is about the Founding Father of all 3D shooters: **Doom**. **Doom** is the game that turned the industry on a dime (especially its sales!).  
But which game features described **Doom**?

### **CHAPTER 1 CHARACTER MOBILITY**

This section is about the techniques game designers adopted over time to improve the realism and efficacy of game controls in the shooters post-**Doom**. From crouching to jumping, 'till the incredible acrobatic tricks that make games like **Bionic Commando** so good.

### **CHAPTER 2 KILLING OPTIONS**

How did the techniques to spread dead evolve through time in the genre? From the free-look option to the complex strategies based on plasmid cocktails in **Bioshock**, let's go back over the stages on the path of the perfect mass-murderer.

### **CHAPTER 3 ARSENAL**

Every job has its tools, and weapons are a "shooter's" tools. Let's find out the way weapons evolved, and how the weapon concept stretched though time, to cover with exotic devices like whirling blades or gadgets to shift time.

### **CHAPTER 4 ENVIRONMENT**

Usually a shooter environment is pretty much hostile, and overcrowded with enemies with an intention to kill the main character. Anyway, at some point game designers started to feel the need to give a more subtle and character-friendly role to the environment. Let's see how this goal has been achieved.

### **CHAPTER 5 ROOM FOR IMPROVEMENT**

By the end of the analysis, i'll try to spot some alternate routes to convey our game design efforts. Is there anything else a weapon can do, besides shooting?

# INTRODUCTION

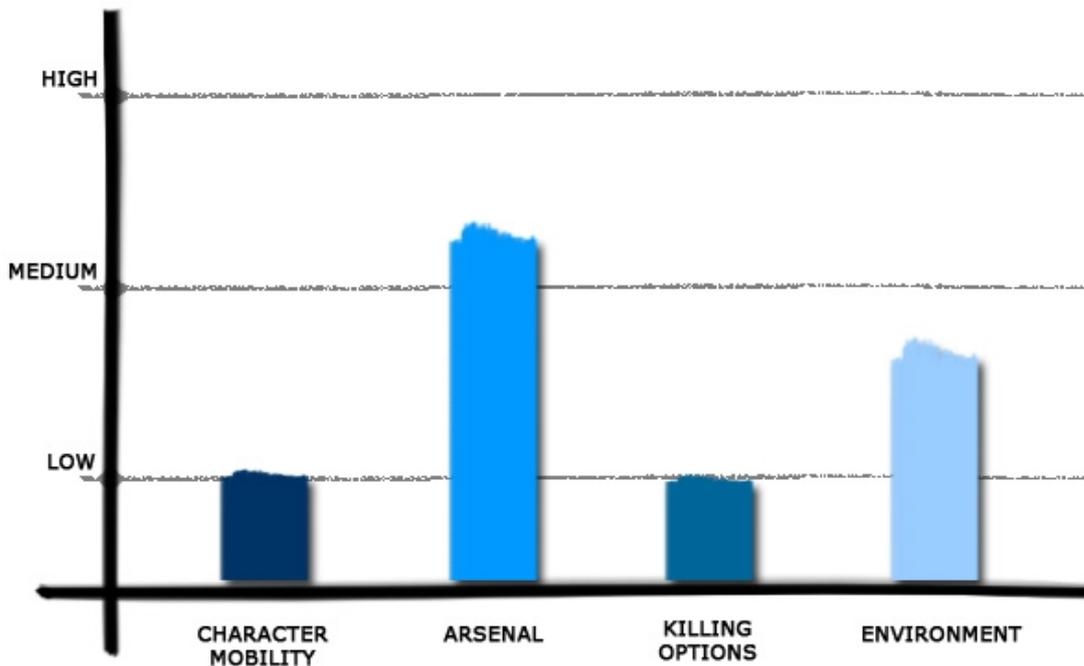
## *In the beginning Id created Doom...*

The first generation of 3D shooters that turned the industry on a dime was led by **Doom**. To tell the truth, gameplay in **Doom** is cut to the bone: the main character can run horizontally, shoot and open doors. That's it! He cannot jump, he cannot look up or down (unless you insert the line "m+look" via the command console, an illustrator told me), he cannot climb, and he moves at constant speed. To hit a target you just need to point towards its direction, without the possibility to really aim or split the hairs.

Speaking about the arsenal, the player has a bunch of different and specific weapons at his disposal, that constitute a versatile equipment to fit every specific combat situation. This is a proof that a well differentiated and versatile arsenal is a fundamental feature in this genre, coded in its DNA since the very beginning.

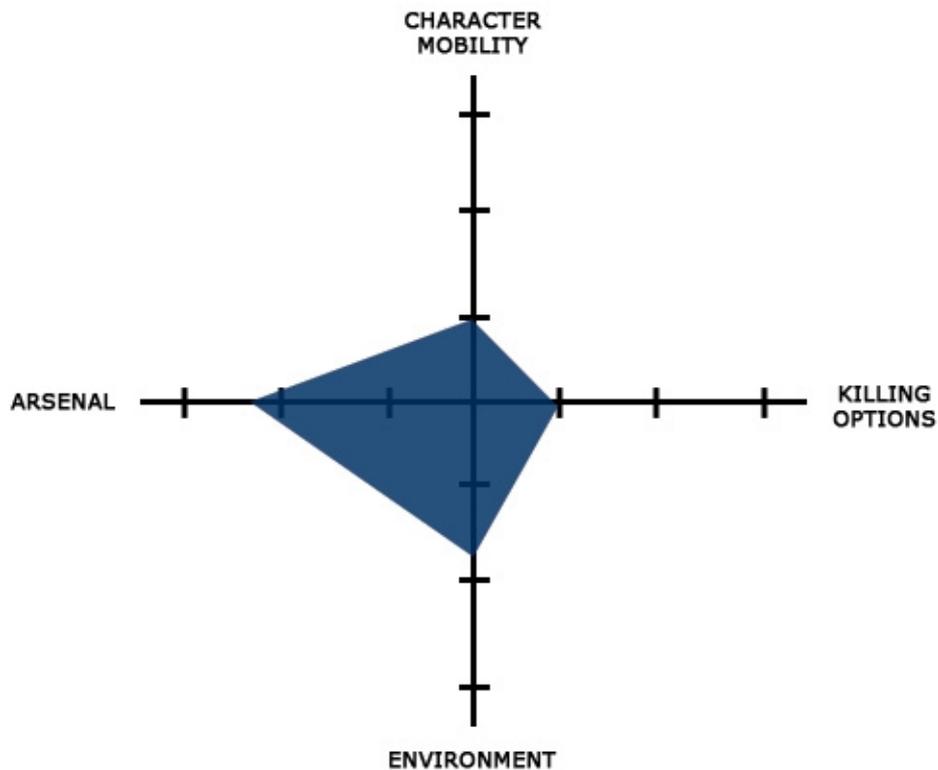
The game requires also an ACTION button to activate switches that open doors and move lifts. This features is an ever-present in these games, too.

If we trace the described features on a bar chart, we can get an image like the following.



The length of each bar represents (approximately) the number of features for each main group (of features) that **Doom** implements. As you can see, Character Mobility and Killing Options reach minimum values, while the Arsenal level is more than enough.

We can represent the same information in a different way, coding the 4 bars on a 4 axis chart. The polygon that we obtain gives a picture of what I call the “gameplay extension field” of a game: in this case, the gameplay extension field of **Doom**.



This chart is the yardstick for all other games that will be analyzed through the rest of this article.

# CHAPTER 1

## CHARACTER MOBILITY

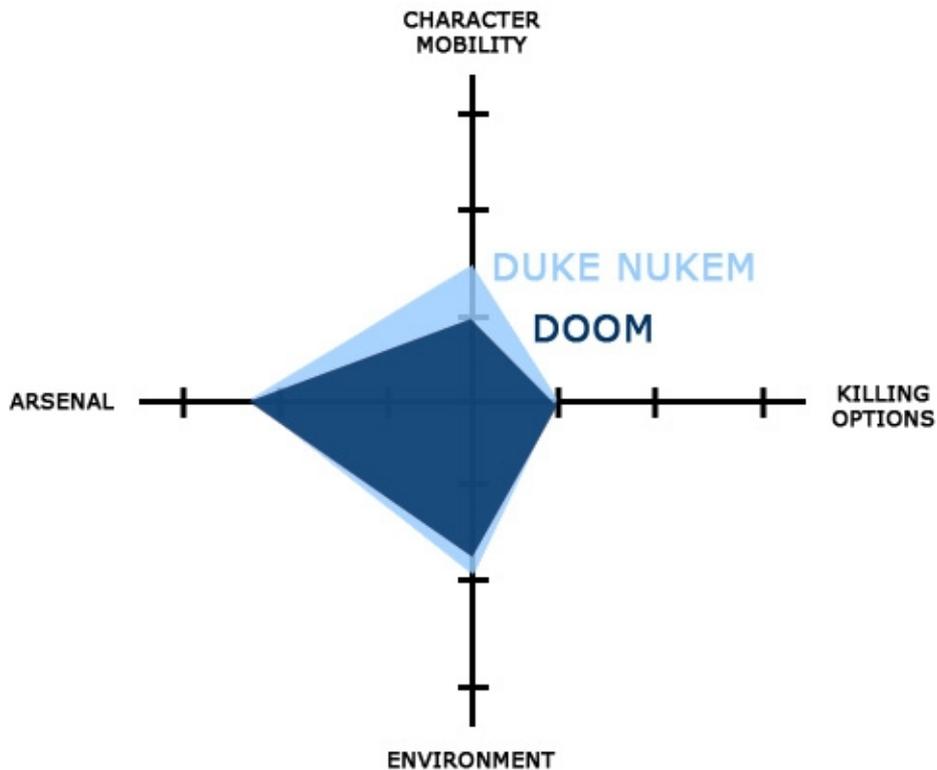
### *Dodge, Duck, Dip, Dive, Dodge. Dodge ball!*

The first set of interventions to 3D shooters worked on the character movement and posture systems.

Characters can now walk or run, climb ladders, jump or crouch. This way you can quickly evade enemy fire, or gain a vantage point, or hide, or walk a hidden passage.

These really basic improvements have been included in the genre so naturally that it's hard for me to remind when did that happen, and in which games. I just remember that you could jump in **Duke Nukem**, and crouch in Quake 2.

If we now compare **Duke Nukem** with **Doom**, we get a chart similar to the following one. The dark polygon is a picture of the gameplay extension field in **Doom**, while the bright polygon represents the gameplay extension field in **Duke Nukem**.



As you can see, adding the jump feature (and a thing or two more) **Duke Nukem** expands the gameplay field of the FPS genre on the axis of Character Mobility.

By adding this feature it also triggers a slight increase on the Environment axis, because the ability to jump and climb horizontal surfaces adds some vertical gameplay to the experience.

### *Fuel me up, please*

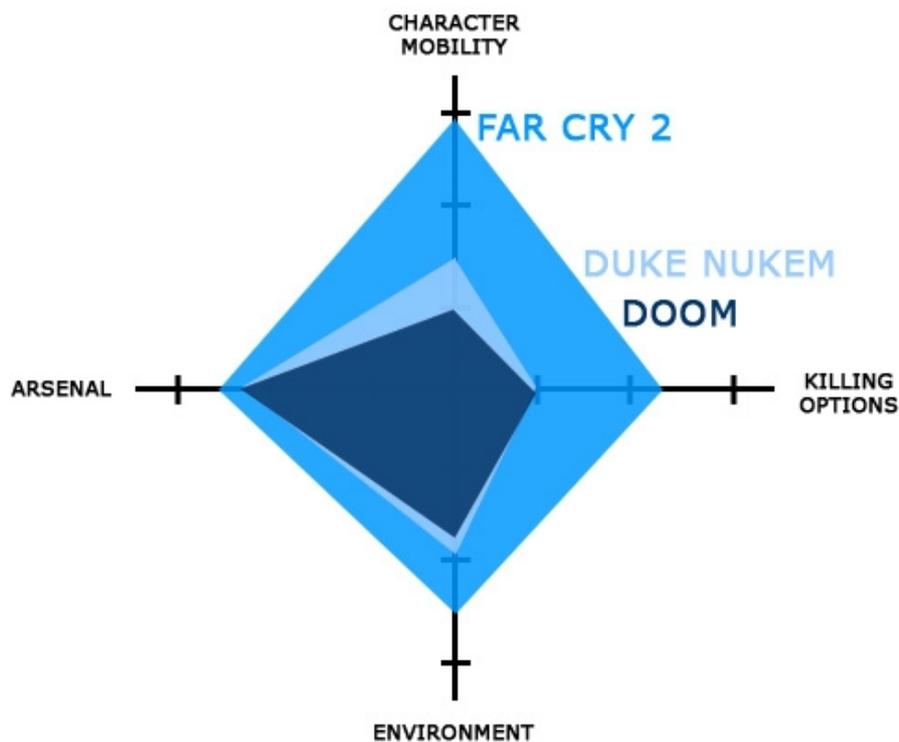
Improving the main character's dexterity is not the only way to increase his mobility.

Since **Halo**, many games could not but provide players with a certain number of means of transport to quickly cover long distances, and fight, if necessary.

The availability of means of transport that are faster than the character's legs allowed a critical growth of the game levels, and increased their complexity.

With regards to this aspect I will mention **Far Cry 2**, which is set in no less than 50 Km<sup>2</sup> (more or less) of hostile territory that the character can go across by feet, swimming, by car, boating (and I strongly suggest to do that at sunset, believe me!).

If we add the gameplay extension field polygon of **Far Cry 2** to the previous chart, we get the following image.



It's obvious that the gameplay extension field of **Far Cry 2** is wider than **Doom's** on all 4 axis; but even if we just take into account the extension on the Mobility axis, there's a remarkable difference between the two games.

We talked about some conventional ways to increase a character's mobility, but these are not a complete exploration of the issue. There are in fact games that implement exotic gadgets which not only increase a character's mobility, but they also achieve this goal in spectacular ways. I refer to the jet-pack in **Dark Void** (or maybe I should say **Tribes**), or to Nathan Spencer's bionic arm, in **Bionic Commando**. These characters literally fly, therefore it would be a useless effort to chart them: they would easily get out of the page!



*IMAGE: William Augustus Grey happily fluttering through the skies in Dark Void.*

## CHAPTER 2

### KILLING OPTIONS

#### *The heads, go for the heads!*

Next feature I would like to talk about is *free-look*, the ability to look around in the game environment using a mouse or an analogical stick on a pad.

*Free-look* was brought in very early in 3D shooters control systems, and it could have not been any different. In real life it's so natural and so important to look around while we do things, that it seems impossible that you cannot do that in a first or third person videogame. In fact, I didn't remember that there was no *free-look* in **Doom**. And I face a hard time playing it now. I keep on trying to look up...but I simply cannot do that. It sounds weird to even write it down!

The main reason why I'm talking about the *free-look* feature is not that it improved the feeling with shooters controls (mainly FPS), but that it triggered a true evolution in the genre: with this feature players can finally aim to their targets.

With the possibility to aim, the designers could implement a damage localization system in their games: shoot the head to get an instant kill, hit the legs to make an enemy fall on the ground, or hit the arms to make him drop his weapons.

The majority of games restrict the damage localization system potential to making *head-shots* mortal hits, compared to other body locations hits. But there are some cases where this feature is used in a far more effective way.

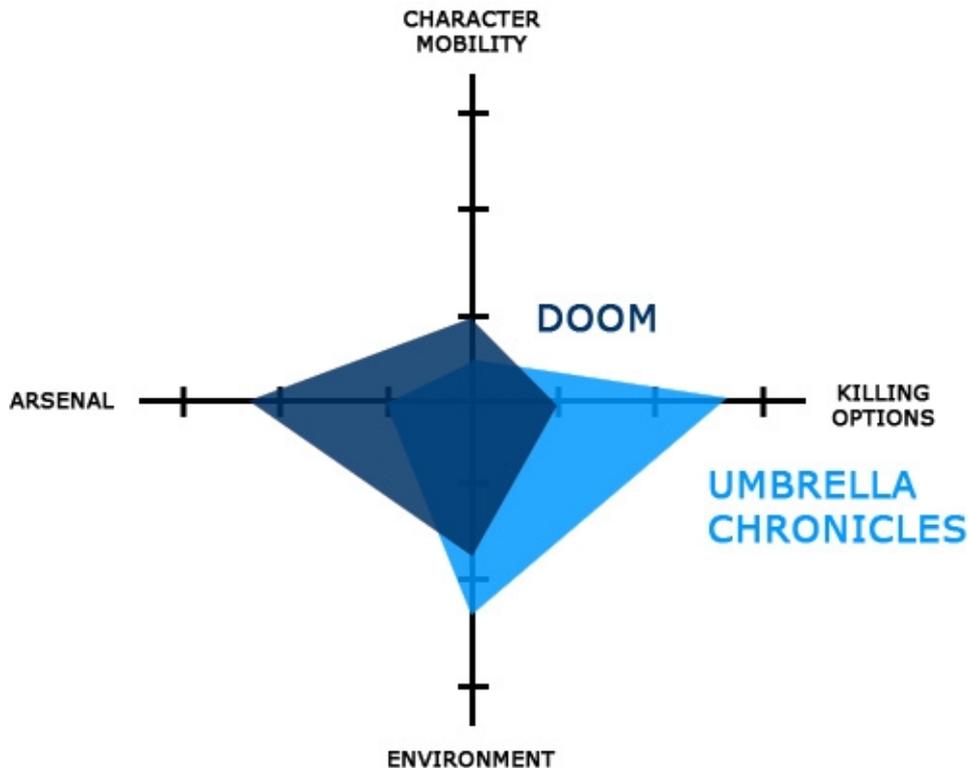


*IMAGE: Gruesome side-effects of a sharp head-shot.*

While in **Soldier of Fortune** localized damage has mainly “entertaining” purposes, since it is only used to add drama to enemies' death, in **RE Umbrella Chronicles** this feature is a critical aspect of the gameplay.

It increases in fact the chance of survival of the player who takes advantage of it: shoot at a zombie's legs to make it fall on the ground, slowing its attack down, so that in the meanwhile you can take care of other targets.

The next chart shows how **RE Umbrella Chronicles** expands the gameplay extension field quite a bit on the Killing Options axis, compared to **Doom**.



The possibility to aim the shots towards specific enemy body locations boosts the tactical elements of 3D shooters, and it's a perfect “gameplay translation” of the *easy to learn, difficult to master* motto. Although everybody can hit a sitting duck, only the most skilled players can aim a perfect *head-shot* in the middle of a hard fought shootout.

I bet you have all been thinking about zombies\aliens\robots\nazis die loosing heads, arms and so on. But there's more than that. The amount of realism brought by the damage localization feature carried players' avatars away too, giving birth to a number of games, the most part being entitled to a popular novel writer, where the rule is *one shot, one kill*.

I consider these games a niche of the market, because if a single, well aimed bullet can cause the instant death of your character, you will pay dearly for any mistake, and that can be very frustrating on the long run.

## Gnôthi seautón

Some shooters allow the player to modify the abilities of his character as the game goes on. Basically it deals with putting classic RPG elements into shooters' mechanics (the evolution of this genre, according to Cliffy B).

This way the player is provided with a flexible editing system for his character which may be used to mould the character into the image of the gameplay he desires.

Let's take **Bioshock** as example. In **Bioshock** there is a currency called *adam* that the player can spend to acquire *plasmids*. *Plasmids* can be then equipped by the character, so that he gets special abilities like setting enemies on fire, making the guard robots help you during the shootouts, or even letting your enemies think you are a friend. These abilities combined with the different weapons characteristics, offer a lot of different strategies to engage the fight to the player, and to be very creative in doing so. For example you can set an enemy on fire, and then finish him with a nice and crispy heat-seeking missile, or kill an entire group of enemies accidentally walking into a pool of water, electrocuting them.

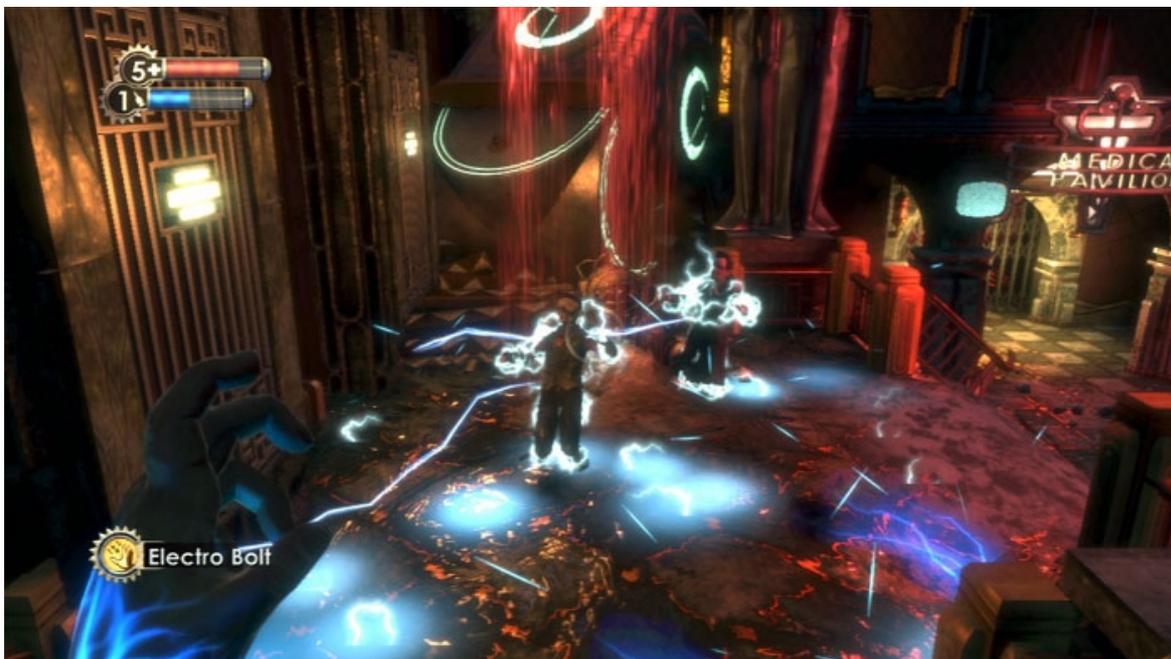


IMAGE: Fried electrocuted enemies in water bath from **Bioshock**.

I will spare you the graphic comparisons between **Doom** and **Bioshock**, for it would be harsh on **Doom**. It is already clear that the complexity level that can be evoked in today's shooters when the designers turn to other genre can be huge. So many different game variables that the player can take advantage of are involved, that the gameplay extension field in such games expands in directions not foreseen even by the designers themselves.

This is technically called *emergent gameplay*, the true strength of those games a step ahead of the mass.

## CHAPTER 3

### ARSENAL

#### You sure you know how it works?

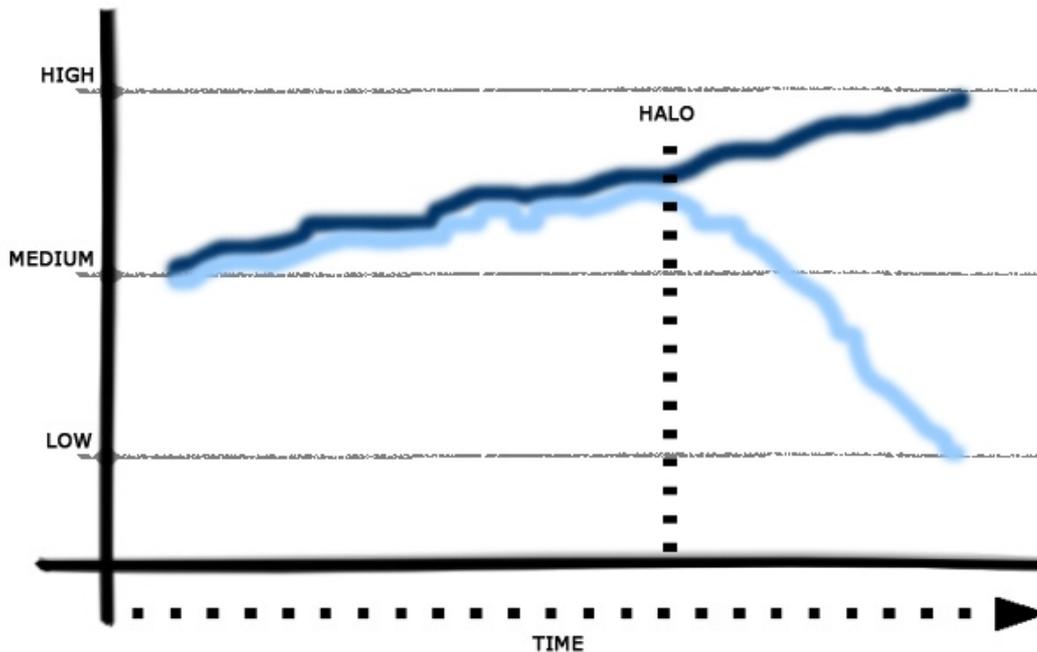
One domain where a lot of effort have been put to evolve the 3D shooters genre is the arsenal at player's disposition.

The evolution of weapons in shooters is an interesting phenomenon, for it developed, and still does, along two separate directions: on one side we have the increasing overall number of weapons that the game offers, on the other side we have the reduction in the number of weapons in the character's inventory.

10 years ago the overall number of weapons implemented in a shooter was equal to the number of weapons carried by the character. But as long as the number of weapons grew, the fact that the character had all of them in his inventory was less and less plausible.

At some point, from **Halo** on (again, and there's still someone who doesn't think it is a great game...), the number of weapons that the character could carry started decreasing, so that it's uncommon, in today's shooters, that the character has more than 2\3 at a time. Nothing to do with the 8 to 12 pieces standard of the 90's!

The next chart shows the separate trends for these 2 features: while the overall number of weapons available in games has always been growing (dark curve), the number of weapons in the character's inventory decreased, stabilizing itself across a low value (average 3 pieces, bright curve).

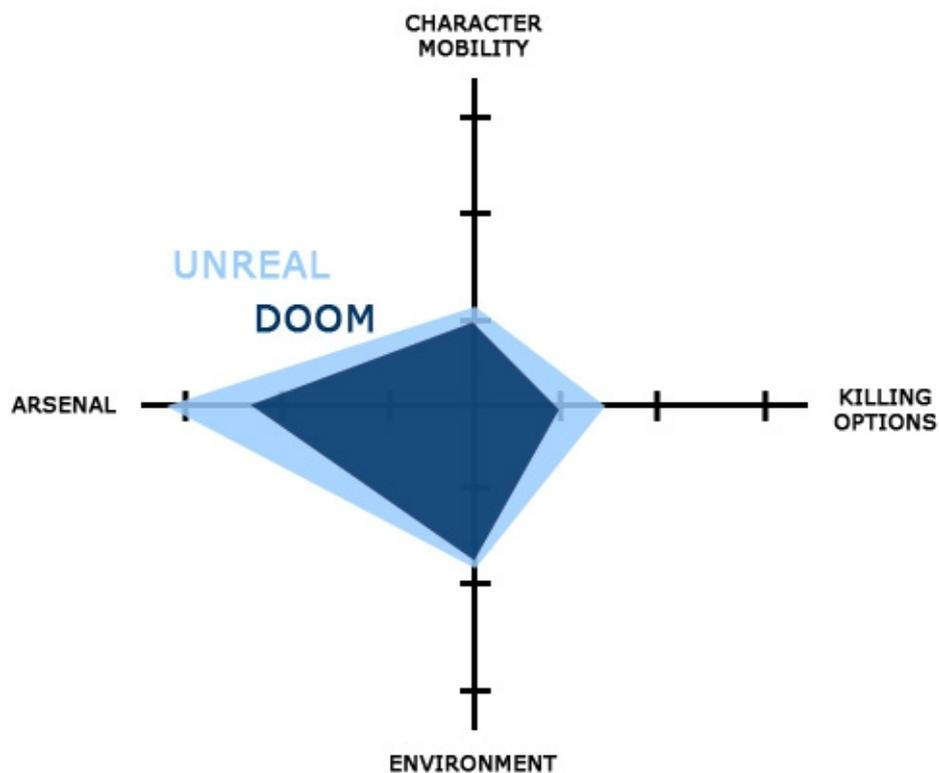


One of the games that aimed most at this aspect is **Unreal**. Not only in **Unreal** there are a lot of different weapons, but almost every weapon has a secondary fire mode, too. The alternative fire mode reveals the second nature of a weapon, thus increasing the variety of the arsenal at player's disposition.

Let's take the so called *snot-gun* as example. This weapon can shoot single green blob-like bullets that blow if they touch an enemy, OR they adhere to a surface and blow after a while, AND as a secondary fire mode the gun can shoot a single bullet, the size depending on how much time the player holds the fire button before releasing it, that blows when it touches something, releasing several smaller blobs that explode too, like a cluster bomb.

Another example is the *Laptop Gun* in **Perfect Dark**, a sort of assault rifle that the player can deploy on a wall, making it an automatic defense turret.

The following image represents the increase of the gameplay extension field on the ARSENAL axis between **Doom** (dark polygon) and **Unreal** (bright polygon). As you can see, the improved versatility of the arsenal at player's disposition in **Unreal** promotes an improvement on the KILLING OPTIONS axis, too.



Another feature that is worth to mention, since it is almost an ever-present, is the relation between the character's movements and the goodness of his aim. In other words, if the character stands still the aim is good, and even better if he crouches, but it gets worse if he shoots while running or jumping. This feature adds some plausibility to the game actions, and it rewards cold-blooded players that take their time to aim, maybe from a vantage point they gained, compared to the *rascals all running and bunny hopping*.

I have several pleasant memories of players from all over the world kicking my ass on Battlefield 1942, until I learned how to shoot effectively.

The interventions on weapons move on other directions, too. Some games allow the player to upgrade weapons. Upgrades can be found throughout the levels, or bought into shops at specific locations, and they usually grant more precision, recoil reduction, magazines with more bullets, more firepower, and so on.

For example, in Resident Evil 4 the main character Leon occasionally runs into a shady character that sells (at high prices!) weapons, equipment and upgrades.



*IMAGE: This shady character sells weapons and upgrades to Leon in RE 4.*

Another possibility that some games offer is to equip the same weapon with different ammo types, that goes along with the presence of enemies that are differently vulnerable to specific kind of bullets. This way the player not only has to choose the weapon to approach a shootout, but he chooses also the specific ammo type to employ.

System Shock 2 adopts this solution: the player has at his disposition bullets that are more effective against synthetics, and bullets that are more effective against organics.

In my opinion this features doesn't have always a positive effect on the gameplay. Switching ammunition can easily become a boring procedure, and it may happen that a feature adopted to expand the possibilities for the player, actually makes him feel even more constrained (did anybody say Mass Effect?).



IMAGE: The interface to switch weapons ammunition in System Shock 2.

The last group of features in the ARSENAL domain that I will talk about includes some very original devices that offer alternative offensive ways to common weapons. I refer to the *glaive* in **Dark Sector**, or to the time-slowing device in **Timeshift**, or to the *demon arm* in **The Darkness**. These features are distinctive elements of games that implement them and critical aspects around which entire gameplay sections are built.



*IMAGE: The effects of the Dark Sector glaive on the enemies*

## Honorable mention

When you discuss 3D shooters weapons, you cannot omit the *gravity gun* from **Half Life 2**. Considered by many the best weapon ever (in games!), the *gravity gun* (and the powerful physics engine implemented in **Half Life 2**) made possible things that the players could just imagine before.

For this reason, many thanks to the Valve guys, and let's go on!



*IMAGE: Throwing explosive barrels against defensive turrets? In Half Life 2, you can.*

## CHAPTER 4

### ENVIRONMENT

#### Take cover!

Another step on the path of evolution of the genre (but in this case I am just talking about 3<sup>rd</sup> person shooters) was the implementation of a cover system integrated into the game controls. I don't mean that players used to blindly run in front of the enemies before this feature was added to games: no news in covering between a pillar. But this outcome is achieved, so to say, "hand made", crouching behind walls or taking advantage of a barrel.

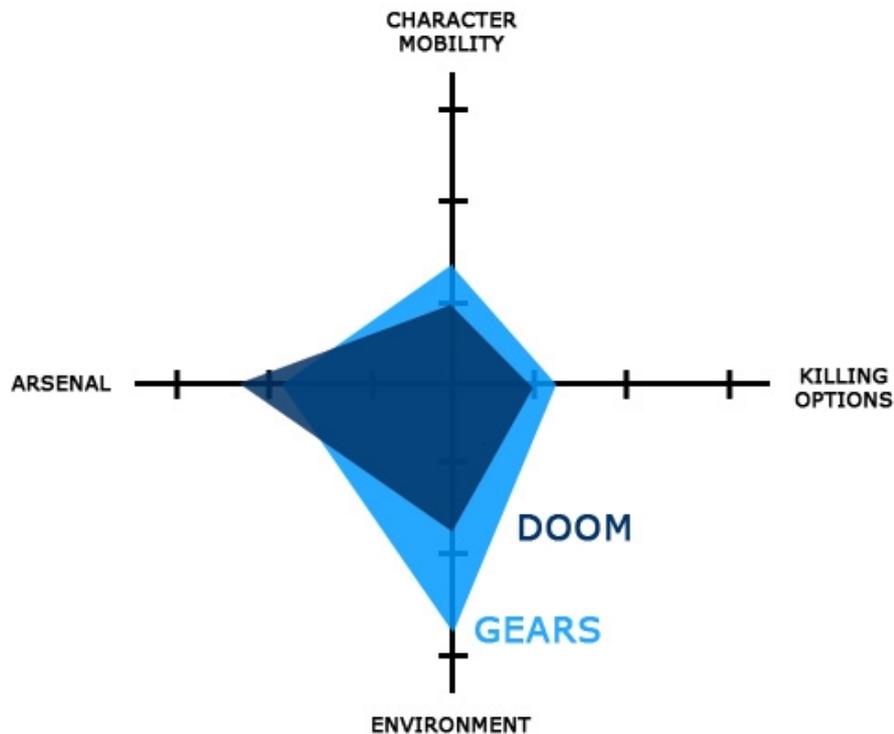
With **Perfect Dark** in the beginning, and once and for all with **Gears of War**, the addition of a cover system in the game controls became a *must-have*. In **Gears** to send the character into cover you simply get him close to a vertical surface and press the designated button, and Marcus "magnetically" attaches to the surface, shielding himself from enemy bullets.

Once the character is attached to a cover, several options unfold: to move along the cover, to lean out to shoot precisely or to shoot without aiming, and without exposing, too. Or even to dash towards a different cover.

Tactical movements to approach and flank the enemies transform into well-coordinated dances from one cover to the next. Although this actions once in a while can result frustrating, when everything works fine the game provides good satisfaction.

This way the environment is more than just the "box" where the character moves: it is a mean of survival for the player, which implies an increase of the gameplay space.

The following chart shows the improvement of the gameplay extension field on the ENVIRONMENT axis achieved by **Gears** compared to **Doom**.



**Gears'** cover system is so much appreciated by players, that when a game is released, and it is a third person shooter, if it does not implement a cover system, one of the first things that will be said about that game is that *"...it doesn't implement a cover system..."*

Integrated cover systems offer 2 kinds of benefits to designers: first is that players are provided with more refined controls for the character movements, so that their actions result more efficient, and thus satisfying.

The second benefit is that, besides the 3<sup>rd</sup> person camera, players get far more involved into the action represented on screen, which results more "real".

## Men at work

An interesting feature that allows players to take advantage of the environment in a different way is displayed in **Fracture**, by Lucas. The gameplay in **Fracture** is wrapped around the ability of the main character to modify the environment geometries to fight the enemies and overcome the game “puzzles”.

Weapons allow in fact to create pits, raise hills (that can be used to smash enemies on the ceiling, for example), make tunnels or create singularities that suck enemies in on a given spot. This system, working with realistic physics, gives the players a completely different and innovative way to relate to the game environment. Players are requested to not only “read” the level design, but also to “make” it: *emergent level design*, we could say.

Another way to operate on this field is to have a “destructible” environment, as it happens in **Red Faction: Guerrilla**. In this game the player has several ways at his disposal to crush buildings, open breaches, destroy bridges and trigger any kind of wrecking; obviously involving the enemies too.

This system, sometimes incredibly satisfying and powerful, provides creative and not-so-common ways to get rid of the enemies, and accomplish the different game assignments.



*IMAGE: We don't need no water let the motherfucker burn! Red Faction Guerrilla.*

## CHAPTER 5

### **ROOM FOR IMPROVEMENT**

So far we focused on what was already done. This a necessary starting point, but more important is what can still be done, how to innovate and be original. Even if originality in videogames is a tricky demon, that broke the dreams of many, those in particular who wanted to innovate too much. Let's say then that the best option is to try to be “mildly” innovative.

### **Please don't shoot**

An option to be original while developing 3D shooters, in my opinion, is to change the relation between enemies and the weapons at player's disposal. In a field where realism of the action is a dominant aspect of gameplay, if you act like a mercenary and shoot in the face of a regular soldier with a AK-47, you cannot expect that the soldier starts talking another language, or shape-shifts into a penguin. You shot him in the face, and he has to die, better writhing in pain and blood.

If we switch the regular soldier with a alien\demon\zombie\robot\mythical creature, “the song remains the same”: we shot, he\it dies!

Sometimes the killing dynamic is a little more complex than “i shoot, you die”, but the aim (to kill) is basically always the same.

For example in **Dead Space** (that we will welcome in the shooters genre for less than a minute) weapons' purpose is to kill enemies, but to achieve that you have to dismember your enemies piece by piece. The fact that the game clearly declares that shooting the head won't affect very much you enemies proves how much the killing attitude is linked to the idea of 3D shooters gaming in the player's mind.

The request to hit specific locations in order to expose the real critical spots, hitting which you can deal real damage to the enemy (typical final boss mechanic) doesn't change very much the axiom.



*IMAGE: In Dead Space, to kill the bad guys you have to dismember them.*

Let's try then to think of a multiplayer shooter with all the features that today's games have: realistic physics, realistic weapons with realistic feeling, and a well varied arsenal like Call of Duty 4 or Far Cry 2.

Now, let's imagine that the effects of the bullets on the enemies, on the other hand, are not realistic at all.

In an arena players are challenged to shoot puppets 4 meters big , each player having his own puppet to hit. When you hit "your" puppet it halves its dimensions. If you hit a player's character you don't cause him any harm, but if he was about to shoot, then he loses the aim, and maybe gets paralyzed for a few seconds. If you hit the puppet belonging to another player, it doubles its dimensions.

Puppets are as agile as a ninja who goes into amphetamine, jumping all over the place.

The goal of the game is to make your designated puppet fall into small pits that somehow cover the floor of the arena. To achieve that you need the skill to hit your own puppet in order to half its dimensions, until it is small enough to fall into a pit. At the same time, you have to avoid that the other players achieve the same goal. How? Shooting at them and at their puppets.

How much room for innovation to extend the gameplay field opens up, when you give up on realism? Does the lack of realism damage the fun factor of a game?

I've always been thinking that the best thing in videogames is that they allow you to temporarily detach from everyday reality, and act in a simpler world, where you do little to achieve much. But many (maybe too many!) games today move towards a manic representation of realism.

To me the search for realism in videogames looks like a little bit hypocrite: imagine an iper-realistic platform where the character, right before a difficult leap, turns to the player saying "I'm not gonna jump. I could fall and hurt myself!".



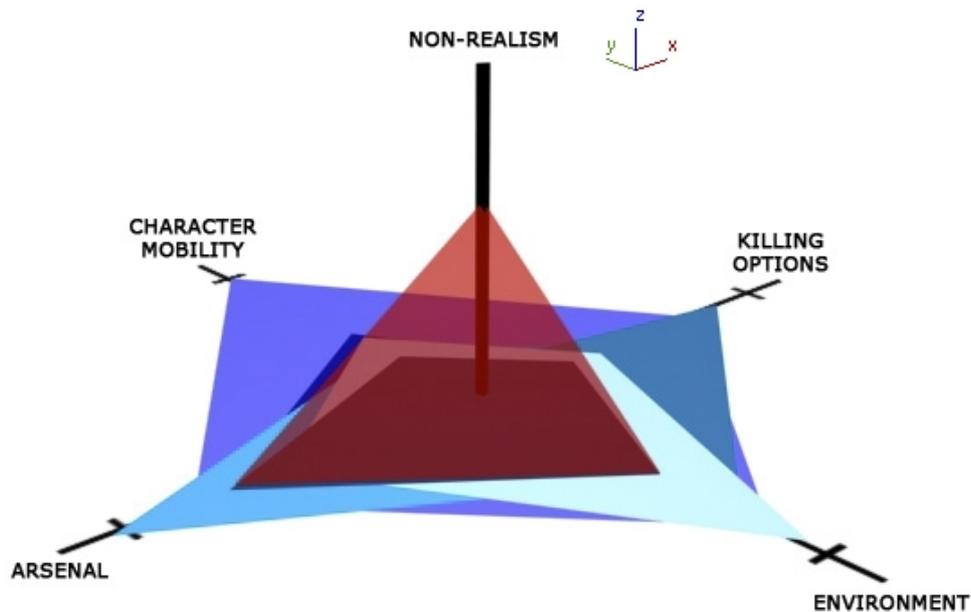
*IMAGE: Let's be serious for a second: if you were Altair, would you leap?*

If fun doesn't belong to a specific genre, why realism should? So, if platform games can be non-realistic, could 3D shooters be non-realistic, and still fun to play?

Let's try now to draw a last chart to represent the gameplay extension field of a non-realistic shooter.

Which direction the new axis, the one that estimates the non-realism of the game, goes? My impression is that it goes "up", on the third dimension, for it is orthogonal to the other 4 axis. In fact non-realism is not a feature for itself, but it is an entire macro-area that contains thousands of unexplored (yet!) other features.

In other words, the non-realism axis is on a higher conceptual level compared to the others, because all the features that are on the 4 axis can be expressed in the sphere of non-realism.



The result is that we have an alternative path to follow to expand the gameplay extension field of 3D shooters; a path that can hold everything (almost) that was done so far, and that can open new gameplay frontiers.

Someone interested to venture?

## About the Author



Claudio Scolastici is the game designer of the creative developing team at **Palzoun Game First**.

Age 30 he decides to quit his job and take his chance to commit himself to his one and only passion: videogame development.

With a degree in **General and Experimental Psychology**, he works for some time as a researcher on Cognitive Processes and AI at the **National Research Council** in Rome.

Works for a season as QA tester for **Electronic Arts**, moving for a couple of months to S. Francisco to take care of the Italian localization of some titles at EA headquarters in **Redwood Shores**.

A few jobs later, he attends the 2007-2008 edition of the **Videogame Design Master** held by Riccardo Cangini (Artematica) at **IED**, in Rome.

From that time on all his efforts are put into creating his own career as a game designer: in the United States, where he collaborates with **Muzzy Lane Software**, authors of the Making History series, and with **Medaverse Studios**, developers of Gravitronix for Nintendo Wii; and in Italy, where he works with **Spin Vector** first, and then **Palzoun**.

He likes to spend his free time (video-)gaming, skating and surfing, and having fun with his friends.

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