Essay Subject: Engine and Tooling investigation report

Word limit: 1000

This essay will be a high level overview of the state of the art games development tools and processes.

Questions you should attempt to answer could be:

* What are the engines and tools that are currently the most in use in the games industry today?
* Who is using them and what for?
* What are the pro’s and cons, which types of studios choose which tools, why?
* Are there any common trends to engines, are they all introducing certain new features?

You don’t have to list every engine and middleware library in existence, try to narrow down to a few common tools and compare and contrast them. This is a discursive assignments so you can and should include your own opinions. The targeted reader for this would be someone who is technically skilled in software development, but new to the games industry. 1000 words is a small amount when you get to it, this report should be a thousand feet view, don't get bogged down with details of one specific engine.

* What are the engines and tools that are currently the most in use in the games industry today?

Engines:

Unity, Unreal, Frostbite

Middleware:

Havok, Umbra 3, SpeedTree, Bullet

* Who is using them and what for?

Everycunt, everycunt, EA

SpeedTree – Far Cry 4, The Witcher 3

Umbra 3 – Occlusion Culling – COD:Ghosts, Destiny and The Witcher 3

Havok – BF3,4,BC and HL, COD: Ghosts, CS:GO, Far Cry 2,3,4, Uncharted 2,3,4, Watch Dogs, Halo2,3,4,5, Assassin’s creed.

**Bullet** is a [physics engine](https://en.wikipedia.org/wiki/Physics_engine) which simulates [collision detection](https://en.wikipedia.org/wiki/Collision_detection), [soft](https://en.wikipedia.org/wiki/Soft_body_dynamics) and [rigid body dynamics](https://en.wikipedia.org/wiki/Rigid_body_dynamics).

-GTA:IV, DiRT and Rocket League

* What are the pro’s and cons, which types of studios choose which tools, why?

Pros:

Cons:

-Unreal is in C++, unforgiving language with steep learning curve

-Aimed at professionals

* Are there any common trends to engines, are they all introducing certain new features?

**What are the engines and tools that are currently the most in use in the games industry today?**

In the game industry today, there are a vast amount of game engines being used. In some cases, particularly with smaller indie developers and studios, new engines are being built from scratch to coincide with a specific new game that they intend to create. This is not a great idea though, as it can be very expensive and will prolong the development of that particular game. If that game is the only game that studio is making, that consequentially means that the studio will be working for a long period of time before the project generates any revenue. In an industry where games are released at an exponential rate, this is not ideal for indie developers and larger, more established studios alike.

As a result, most games are built using pre-existing game engines. Two of the most popular of which are Unreal Engine and Unity.

In terms of titles, Unreal Engine boasts the Gears of War, Mass Effect and Bioshock series. Meanwhile, Unity paved the way for Hearthstone: Heroes of Warcraft, Assassin’s Creed: Identity, Temple Run and Pokémon Go.

From the beginning, Epic Games’ Unreal Engine was developed with big-time professional developers and studios in mind. While it has transitioned into something that can be used outwith the AAA bracket, Unity is said to be more appealing to beginners. One reason for this is that Unreal’s development language is C++, which has a large learning curve and is better suited to an experienced programmer. Additionally, Unity itself and the games it produces are more likely to perform well on lower-spec hardware.

^More depth?

Some larger studios have their own engines that they continue to use and improve over time. An example of this is the Frostbite engine used by Electronic Arts. It was previously mentioned that building a new engine is not highly recommended, however in this case it was not something that was only going to be used once. Furthermore, EA are a massive company that generates revenue rapidly year-round, and so the cost of building a new engine would not have been something that phased them.

However, it’s not just engines that are used as pre-existing templates. Certain features of games can be taken from elsewhere to save time otherwise spent reinventing the wheel. One of the most important aspects in modern games is a physics engine. A highly sought-after piece of middleware for game physics is Havok, with a plethora of big name games having used it; Battlefield, Call of Duty, Far Cry, Uncharted and Halo titles all having used it, along with CS:GO. Most of these games only used it for physics, but Uncharted 3 also made use of its destruction functionality and Halo 5 used it for animation as well, with Halo 4 including Havok AI.

Another physics system is Bullet, which simulates collision detection with both soft and rigid body dynamics. It was used in Grand Theft Auto: VI and Rocket League.

**Who is using them and what for?**

**What are the pro’s and cons, which types of studios choose which tools, why?**

**Are there any common trends to engines, are they all introducing certain new features?**