**Soft166 CGD Report**

**Skills and Roles of a Computing & Games Development Professional**

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**Introduction**

In the game technology industry, there are many roles that need to be filled in order to complete projects on time and release high quality products within the game technology space.

This report discusses the skills and knowledge a Computing & Games Development professional should know, and how each required type of software or skills fit into the game’s technology pipeline. Topics such as roles, skills and knowledge in this report have some supporting information and points to go along with them and covers different subtopics such as Game Engines and Analytics.

**Software Developer/Programmer**

Software developers and programmers create and implement works based off concept art and the original visions Artists and Game Designers have for their final products. Those put in the role of a Software developer or Programmer are tasked with coding the game project mechanics and functionality (for example, Menus). They are most often required work in teams to plan, design and produce video games for different platforms such as computers, mobile devices, or game consoles. (Job roles.3)

**Lead Game Designer**

Lead game designers are tasked of planning, detailing and supervising the work of their fellow game designers. They establish formal design documentation and tools to ensure the development team’s performance and manage the situations that might otherwise hinder any production objectives of any project. (Job roles.2)

**Game Designer**

Game designers are tasked with designing levels, characters, art and animation. They may also design puzzles and other gameplay-based mechanics for game levels. They must consider, plan and detail every element of a new game, including the settings, rules, story, props, interface and gameplay modes after convincing the development team that the game is worth going forward with. Game Designers will also work with game developers, artists and programmers to produce prototypes of ideas. In their position they may also write code using the various programming languages available to them (i.e. C#, C++). (Job roles.1)

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**Common skills involved in all the roles described on the first page:**

**Strong IT Skills**

Within any job related to Game Development, strong skills and experience with IT, specifically with programming, video graphics and hardware are essential. If someone in the role of any of these jobs/tasks doesn’t have experience with the required software/hardware, they would simply be unable to do their jobs and are unlikely to even be accepted for any job that requires such experience.

**Problem Solving**

Overcoming tasks and finding solutions to technical bugs/glitches are a very involved part of a games developer’s job. Such problems require patience and time, an example of this would be when the developer must debug and find problematic lines of code. Another essential part would be the ability to see from different perspectives, as others testing game projects could see differently from the developer. This can help with potentially fixing issues the developer hasn’t noticed yet.

**Time Management**

Video game development in our time is very complex and has various moving parts that play into the game development cycle. These moving parts will very often require multiple teams of professionals in artistic and technical areas to get the job done. For projects to succeed and move forward to a release, teams are required to work well under pressure and collaborate with other members. This will ensure that projects will keep to their deadlines.

**Communication Skills**

Communication to a developer is a necessity, although often overlooked by those who need it the most in such roles as programmer and anything technical related. Communication is important, you will need to convey your ideas and visions with other team members like producers or sound engineers for example. Going back to solving problems, communicating with other programmers and developers may help to solve any technical glitches one may be unable to solve by themselves. Other members opinion on things could be another example of this, as debating over a feature or certain implementation of code could be required to get the best outcome overall.

**Industry Awareness**

Game developers will undoubtably love games and play them frequently, since the developers themselves can learn new techniques and designs from them. Or design flaws. But it’s important to stay updated on what’s going on in the industry, with other competitors and the gaming world. Experiencing games created by other developers/companies can aid the developer in making their own game project even better. An example of this would be adapting good ideas and avoiding/improving the things that didn’t work out so well.

**Page 2/6 (Skills)(reference info was inspiration for Common Skills)**

**Software Knowledge and Skills**

**Project/time management**

Time management in any game development/design related job, such as creating assets, or developing in-game worlds/models etc. is very important and has little to no difference based on the job role. For game programmers, you could be tasked with developing multiple features or code by a specific date or time so that the project you are assigned to can stay on track for alpha, beta and release phases. A project getting behind on features and development can be bad and cost the higher-ups/company who are funding the project more money, and delays to the games release could occur or problems could arise from the company who put the development team together, such as layoffs or shifts in management.

Services like Trello could be bundled in with working on a full force project headed for a release date. The project team/project leaders may provide and use their own Trello board to track and list ongoing development with deadlines, bugs/issues with the project development and important dates for the project. Project leaders could be asking you to handle multiple tasks at once and refer you to Trello where you can find a more detailed description on what they involve.

In roles such as game designers and other similar roles in the technology industry, it may be almost the same situation but with changes such as instead of developing code you could be designing or conceptualizing characters, objects or scenery for the project. And in other roles you may be tasked with management of person(s) involved in these roles or making sure features and project assets can be directly compared to an original vision of the game to see if it matches/lines up with it or not.

**Version control**

Version control can be important to the game development scene because a record is made of every change created within a game project and mistakes/errors can be easily found or solved/reversed from that. An example of a service which has this capability would be GitHub. Ideally not recommended for projects with hundreds of gigabytes of files, and more useful to smaller projects and projects that come outside of game development too. Every change is documented and sorted so that you, the developer or project lead can see what’s been fixed and what issues there currently is. Git would be another example of this.

Another angle to this would be Game Engines. Game engines are crucial to game development, but more importantly is these game engines will often be updated and improved over the years which could give developers new functionality for things they’d want to put in their games. A downside to this is these updates can break or create errors in projects, this can cause problems and hold up development. A development team can avoid these problems by universally deciding to use a certain game engine version, and only that version every time they work on the project.

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**Game Engine**

A game engine is a set of tools or framework that allows a developer or development team easily create and implement ideas to create a game. They may provide features such as animation and AI capabilities, collision detection, memory management, rendering and so on. Game engines will allow developers to compile their game into something that can be run on windows platforms, consoles, or whichever platform that the game engine supports. Programmers will be mostly using this type of software and picking the game engine to use is a very big decision. What you want to do with a game engine and what you already know about one should factor into that choice.

Unity and Unreal Engine 4 are some examples of game engines.

These two game engines are the two most used game engines, and there’s been many popular games made with them but with the most noticeable one being Fortnite in UE4.

Unreal engine uses C++ and a drag drop system called Blueprints where you can buy chunks of code other programmers have created for specific features and use it without extensive experience.

On the other hand, Unity, uses C# as the primary programming language and they previously supported a version of JavaScript called UnityScript but that’s been discontinued. Unity’s community is one of its strengths, which holds a range of shared information useful to any starting developer or existing developer. Hearthstone, developed by Blizzard Entertainment, was made using Unity.

(pipeline)(bits of info used from reference for Game Engine)

**Programming Languages**

Programming languages are prevalent in game development, they’re a set of grammatical rules for the computer and the very basis of anything you want to design and create in any game project. For example, if you want to make a 2d game, you would have to pick a programming language and code the functionality of the features of the game you want to create in whichever language you picked.

A programmer will use programming languages such as C++, C# or any other reasonable programming language from the very beginning of development. A developer would be more likely to test and experiment through Prototyping, to create and test an idea in hopes of pitching it as a new game or just general testing in a pre-alpha environment.

For example, you’ve been tasked with developing a new feature not yet made for your specified game project. Testing and playing around with the idea may be required. Or in the case of already being in early development, you’ve been asked to come up with a better solution to an already existing feature that doesn’t work as well as intended.

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**Analytics**

Analytics can be very important to determining the future of your game, for example a player’s playtime and how many players are engaged or determining what’s currently popular within the industry and community as well as in-game events, telemetry, or reviews. There are many forms.

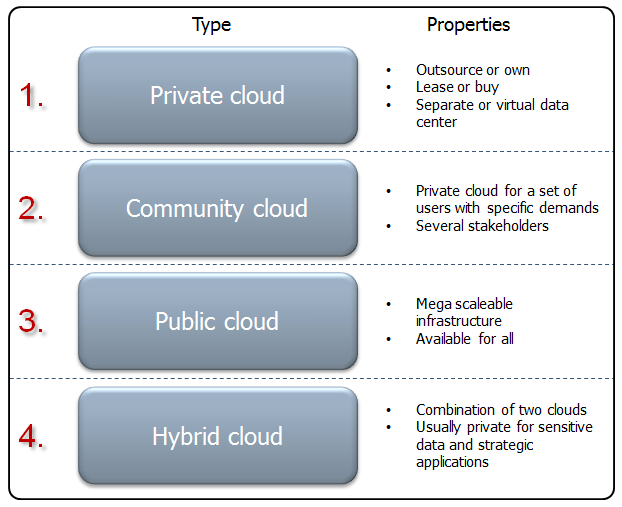
Games like Fortnite have a massive analytics backend, with 12 AWS data centers collecting/tracking multiple different kinds of data (Fortnite data servers). The company, Epic, uses its big data analytics pipeline for many things such as detecting any occurring issues or problems either from Fortnite clients on PC, Web and mobile interfaces. Epic will also analyze their player’s social media interaction to access design decisions, identity player sentiment and adjust the game accordingly. This data can help Epic create new events for players to enjoy, such as the ones that have gained massive media attention.

For example, on October 13th, 2019, Epic plunged their massively popular game Fortnite into darkness with the Black Hole event marking the end of the game’s first chapter. It sent hardcore fans into a craze, crashing Twitch and had millions of people tweeting about the event on Twitter.

On Twitch, more than 1.7m people were viewing either the official Fortnite stream or streams from popular creators related to the event. and on Twitter, the black hole event was the “most viewed gaming event on Twitter, with 50.7m minutes watched and 42.8m views.” (Figures for Fortnite event)

**Cloud Deployment**

Cloud deployment can provide developers the means of releasing a product or uploading a project on a private sector of a service to test. It could also provide networking capabilities to any games they develop. A service like Steam could provide such a thing, and through Steam a developer could test their game’s networking capabilities if they were developing a game to use Steams servers. For example, Multiplayer or always online games may use these features. Similar services would be Playstation Network or Xbox Live.

Databases and servers could store user data, in-game data and other from games up in the cloud. Communication between cloud servers and a game can be made whenever change occurs in a game world, or for multiplayer uses (tracking player movements, enemy movements, interactions etc. making sure client gets data so that changes go through on the players end and visuals are updated to represent those changes. - (cloud)

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**Conclusion**

* Common skills a person in a game technology role should know
* Broad spectrum of programming languages
* Compared game engines against each other
* Discussed analytics surrounding in-game events and other data
* How the cloud can be used in games/game development

To conclude this report, there are many skills a Computing & Games professional should know, and many ways different areas of game development can fit into the game development pipeline.

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3. <https://study.com/articles/Game_Developer_Job_Description_Duties_and_Requirements.html>

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