Lagoon Games – A.Y. 2024-2025

Game Technical Document

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Credit to Viola Sarti for the game and studio logos.

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1. Project goal

Rise of the Chancellor is a stealth competitive multiplayer game in which two players compete against each other to become the next university chancellor. The experience requires a reliable online connection for the players. The game can be played by two players and is being developed for Windows and Linux PCs and Nintendo Switch consoles. The game can only be played in multiplayer, so the service must be available 24/7.

This document will provide an overview of the technical requirements for a European-only beta.

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2. Provided services

In order to enhance the players' experience and game appeal, we plan to provide a series of services: a game website, social media official pages and regular content and technical updates.

2.1 Game website

The website will give information about the game itself and it will be used as a channel for news and updates information, as well as a blog containing the development process and in-depth details.

It will also provide URLs to the Steam and Nintendo storefronts, which will be the game distribution platforms, also used as a channel for update and communications. Steam will also grant a great interaction with the public with reviews, discussions and its community system.

For the development of the website, we will have to hire a website developer.

2.2 Social media presence

Our main social medial platforms will be Instagram, X, TikTok, Twitch and YouTube on which we plan to publish news, anticipated and various content of the game in order to reach a wide audience. Additionally, we will provide a Discord server for the most hardcore members of the community to chat and discuss the game mechanics, gather feedback on the development process and make an estimate of the number of currently active users.

2.3 Content updates

Every two months, starting from the launch, there will be contents update to keep alive player's interest in the game. These updates include change of season: the renewal of the seasons will comprehend a new season pass, new skins, new traps, new buff and de-buff, new game maps and new quests.

Inside the game there will be a shop where players can purchase skins and the premium season pass, during the first six months of the game, the shop will be updated weekly.

2.4 Technical updates

Technical updates will keep the game balanced and free from bugs. The updates will account for players' experiences and feedback shared on our social media channels, Steam and Discord.

3. External services

Some of the services offered are handled by external companies or products.

In this section we often refer to PlayFab services, which we use as the base of our online infrastructure. Further details about PlayFab can be found in Section 6.

3.1 Customer support

The service will run 24/7, thus it is reasonable to guarantee customer support to contact for any problem that a player could encounter in the game. We plan to outsource the service to Helpsquad, which offers flexible and scalable support for our growing service and help through chatbot, live chat or social media.

Our website will link directly to the customer support services.

3.2 Authentication and personal data management

As a company we do not want to collect data on players, as complying with all the existing regulations about personal data security would be very challenging. For this reason, we will rely on Steam and Nintendo authentication services to verify the identity of each player and load their profile before connecting to the game server. The game will support cross-save through PlayFab cross-save system, this way people who purchase it on different platforms will still be able to play with a single account.

3.3 Matchmaking

For our game, we intend to use a matchmaking system that allows players to compete against each other. The system will be managed by the PlayFab matchmaking service.

Refer to Section 5.5 of the GDD for more details about the matchmaking system of the game.

3.4 Friendship system

Players will be able to send friend requests to other players of the game, watch their online matches in spectator mode and challenge them in casual or event matches. Friendships relations will be directly managed by Steam and Nintendo and access by the game through their API.

3.5 Leaderboard

The game incentives competition by giving players with the highest score special power-ups and cosmetics that they can use during matches to show off their strength. For this reason, it's important for players to access the game leaderboard and constantly check their progress and position relative to other players. We will be possible thanks to the PlayFab leaderboard system.

3.6 Payment system

The game will be purchasable through the Steam and Nintendo storefronts at the cost of 9,99€ (adjusted to local currency).

Additionally, players will be able to purchase additional in-game currency to use in the in-game store to buy cosmetics for their characters. All payments will be processed by Steam and Nintendo through the PlayFab Economy API to guarantee the validity of each transaction and the security of the player's data. In return, Steam and Nintendo will take 30% of our revenues.

4. Client side

4.1 Hardware requirements

4.1.1 PC

PC requirements	Minimum	Recommended
Processor	2.2 GHz	3 GHz
Memory	2 GB RAM	4 GB RAM
Storage	500 MB free	500 MB free
Graphic card	With 512 MB VRAM	With 1024 MB VRAM
Connection	20 Mbps ADSL network, with a latency not higher than 30ms	20 Mbps ADSL network, with a latency not higher than 30ms
Devices	Mouse and keyboard / Controller	Mouse and keyboard / Controller

4.1.2 Nintendo Switch

Nintendo Switch requirements	
Storage	500 MB free
Internet	20 Mbps ADSL network, with a latency not higher than 30ms
Other	Nintendo Switch online plan

For further details refer to Section 3.5 of the GDD.

4.2 Software requirements

OS requirements	Windows	Linux
Operating System	Windows 7 (SP1+), Windows 10 and Windows 11	Ubuntu 20.04, Ubuntu 18.04, and CentOS 7
Graphics API	DX10, DX11, DX12 capable	OpenGL 3.2+ or Vulkan-capable

5. Workload estimation

To estimate our game's workload, we primarily use the SteamDB.info website, which collects and provides free access to data on every game released on Steam. For this analysis, we focus on three of the four top performers identified in Section 3.2 of the GDD: PayDay 2, Among Us, and Fall Guys. We exclude The Binding of Isaac here because it is not a multiplayer game and was considered in the GDD solely for its power-up system.

5.1 Similar games and workload analysis

5.1.1 PayDay2

Payday2 is the sequel of the cooperative first-person shooter stealth game Payday: The Heist, both developed by Overkill Software. The game was released on August 13, 2013, for Windows, PlayStation 3 and Xbox 360; on 12 June, 2015, for PlayStation 4, Xbox One; on 21 March, 2016, for Linux; on 23 February, 2018, for Nintendo Switch via digital distribution and retail.

5.1.2 Fall Guys

Fall Guys is a free-to-play platform battle royale game developed by Mediatonic. It was released on August 4, 2020, for PlayStation 4 and Windows for 19,99€. In March 2021, Mediatonic was bought by Epic Games, the game became free-to-play and was released for Switch, PS5, Xbox One, Series X/S and removed from Steam. For our analysis we considered only the period in which the game was available on steam.

5.1.3 Among Us

Among us is an online multiplayer social deduction game developed by Innersloth. It was released on June 15, 2018, for Android and iOS; on November 16, 2018, for Windows; on December 15, 2020, for Nintendo Switch; on December 14, 2021, for PlayStation 4, PlayStation 5, Xbox One, Xbox Series X/S.

5.2 Estimation

From the analysis of the data provided by SteamDB we expect a workload similar to that of Among Us, as our studio and IP are new and cannot count on an already established community. Player's count is expected to fluctuate but not to drop to zero, thanks to periodic new content and the season pass system.

Given the competitive nature of the game a good advertising campaign before the game launch, possibly with Twitch streamers' support, might boost the daily players' count to 100.000, as this is what happened to Among Us. However, we do not expect to reach their players' peak of nearly 450.000 as they probably greatly benefited from the global COVID-19 pandemic of 2020-2021. In any case, as a small indie studio at their first game, we do not have the budget for such a marketing campaign, and we cannot afford to expect such numbers. For this reason, we will rely on Azure PlayFab gaming services, that are able to adjust the infrastructure resources based on demand.

Finally, the first closed beta will be exclusive for Steam players, in order to focus on major problems and fix them before the public beta. Thus, the workload for the first beta will be contained.

Based on these considerations, we estimate the following figures:

	Closed beta	Open beta
Total users	250	1500
PC users	250	1100
Switch users	Not available	400
Peak	50	700

In any case, during both the closed and public betas, we will collect data to adjust our estimates before the actual game launch.

6. General architecture

For the development of the online infrastructure of the game we decided to use the Azure PlayFab services, which will handle player matchmaking, the leaderboard and friendship systems and payments. Authentication will be managed through the Steam and Nintendo API, PlayFab will enable cross-save support.

6.1 Frontend

The frontend consists of our game's client, the website, Steam and eShop stores pages and a Discord server.

6.1.1 Hardware

Frontend hardware is the user's hardware itself: PC or Nintendo Switch systems.
Keyboard and mouse or a controller are required.

6.1.2 Software

6.1.2.1 Game Client

The game client running on the users' hardware is built using Unity engine.
It uses Steamworks and Nintendo's API to authenticate the users and access useful features such as friend's systems or payments.
The client uses Azure PlayFab APIs to connect to the backend, play online, handle the player's points and stats and cross-save support.

For further connection details see Section 7.

6.1.2.2 Website

The website will give information about the game itself and it will be used as a channel for news, updates and development process blog as well as a source linking stores pages or Customer Support.

6.1.2.3 Steam and eShop pages

Steam and Nintendo eShop are our distribution channels and they will be used by users to purchase the game and the additional contents. The payments process and methods will be handled by Steam and Nintendo.

Refer to Section 9.1 for cost estimation.

6.1.2.4 Discord Server

This will be for the most hardcore members of the community to chat and discuss game mechanics and gather feedback on the development process.

6.2 Backend

6.2.1 Azure PlayFab

The game backend is responsible for the following tasks:

- Managing secure communications with the clients and storing their data;
- Minimizing latency in communication;
- Analyzing how players count vary in time and how they interact with the game (which modalities they prefer, which powerups they tend to use the most, ...).

For these reasons, we decided to rely on Azure PlayFab as the core of the whole online infrastructure, as it is cloud based and offers great scalability, while at the same time letting us use it during development for free (up to 100.000 users). With the beginning of the closed beta, we will switch from the free plan to the standard plan (99$/month = 91,24€/month) to benefit from monthly meters and better support from the Azure team.

The beta will be limited to Europe and each player authenticates through Steam or Nintendo services and connects to the game server. From there, they will be able to check the game leaderboard, challenge their friends and start a new match. Each 1v1 match is managed by a different process, which is hosted on a virtual machine (VM): each virtual machine will be able to host up to 100 matches; after this threshold PlayFab Multiplayer Servers service will automatically spawn new VMs according to demand. In the final version of the game each region will have a different main game server, so an additional component will have to be added to the architecture to make each player connect to the correct server.

As the public beta will be Europe only, we estimate the costs of running the necessary VM for the expected number of players during the beta. We made this estimate using the PlayFab charges calculator:

Data	
Maximum expected concurrent players at *peak* times	1500
Concurrent players on *average*	700
Players per game servers	2
Game servers per VM	100
Standby % of total game servers	10%
Network egress per player	01 Mbps
Region	West Europe
VM series	Dasv4
Operating system	Linux
vCPUs	2
Price	
Compute costs	319,09€/month
Network costs	1020,76€/month

6.2.3 PlayFab Authentication

PlayFab offers Authentication APIs to authenticate using different providers: in our case the client retrieves the user's token using SteamWorks or Nintendo APIs and uses it to authenticate through PlayFab (for further details see PlayFab Authentication documentation).

6.2.3 PlayFab Player Data/Statistics

Through specific APIs it is possible to gather data about the player and update their score and counters without the need of an external database (for further details see PlayFab Player Data documentationand PlayFab Player Statistics documentation).

6.2.4 PlayFab Matchmaking

Rise of the Chancellor's matchmaking system will be powered by PlayFab's Matchmaking service. When a player wants to start a match, the game sends a request to the matchmaking service, which will hold the request until it finds another to match it with (for further details see PlayFab Matchmaking documentation).

6.2.5 PlayFab Leaderboards

The top 100 players leaderboard will be implemented using PlayFab's Leaderboard service. The service is able to handle the ranking of the players and update it according to their score at the end of each match (for further details see PlayFab Leaderboards documentation).

6.3 Webserver
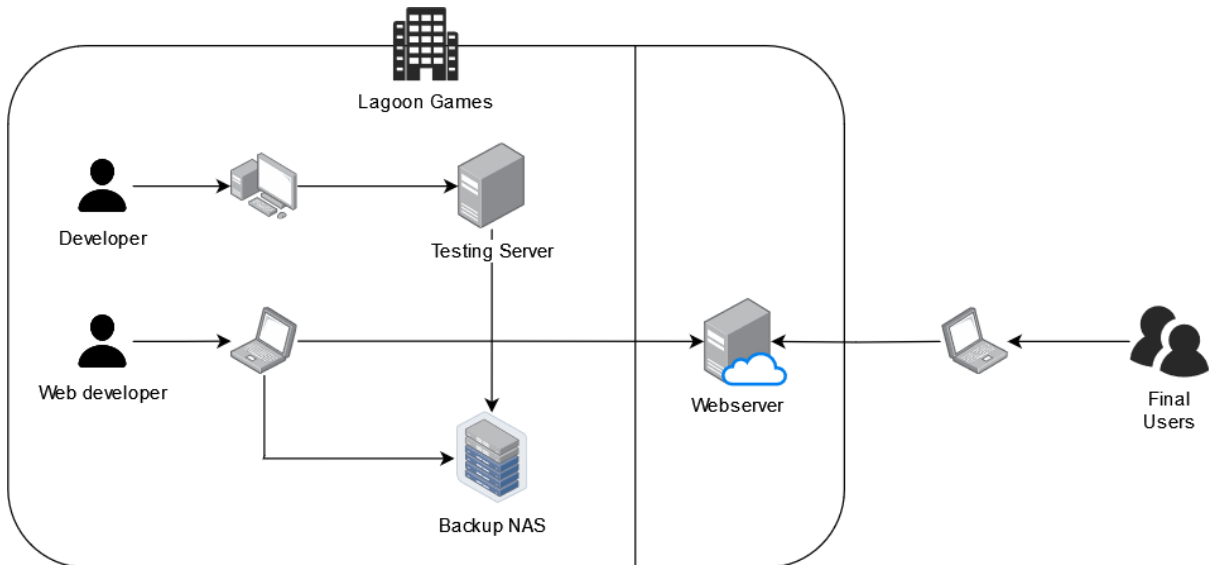
The upper image shows the internal infrastructure with a webserver hosting the website of the game, using a cloud hosting service to save on hardware and maintenance.

6.4 Workload Capacity

We can rely on PlayFab's Scaling Standby feature which allows us to scale the game server hosting capacity to meet the actual demand. This gives us complete control over the scaling behaviour (either dynamic or scheduled) to meet the needs of the moment. The standard plan for PlayFab offers 60 million Reads and 30 million Writes of Player data included in the plan, which exceeds by far the number of requests needed for the expected workload of 1500 users, which by an overestimation would require an amount of approximately 100.000 Writes and just as many Reads.

The same goes for the authentication process, which is 9,99$ (9,20€) per million requests and it is more than enough.

7. Connection

7.1 Global infrastructure
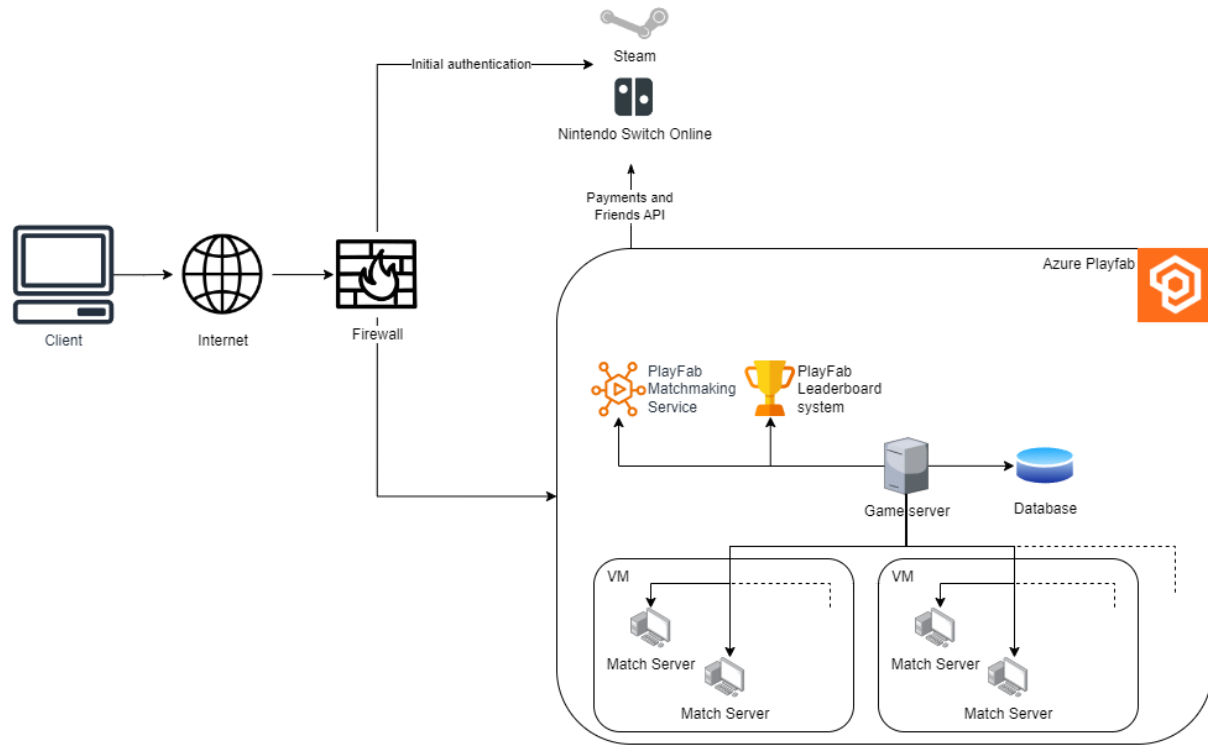
7.2 Network requirements

PlayFab's auto scaling grants good performances also with an unexpected number of users and limiting the betas on regions around Europe will grant a good QoS and a good latency. Client side the bandwidth needed shouldn't be large as the transferred data is low, although it requires a fairly fast response and low latency due to its competitive nature.
A 20 Mbps ADSL network should be enough for a good experience with a latency not higher than 30ms to guarantee fair game flow.

8. Delivery

8.1 Estimated delivery time

We expect to release the game in public beta in a year and a half. If there are no major issues with the game or the online infrastructure during the public beta, we will release the game in early access one month later. A closed beta, exclusive to Steam, will be launched one month before the public beta and will last for two weeks.

The game will release after 6 months from the beginning of the early access period: the first season – called Chancellor's Season – of the game will cover this entire period, while subsequent seasons will last two months each.

The betas, the early access version and the final version will be released on Wednesday, as it's the day in the middle of the working week and the reduced amount of people available to play will less likely cause problems given by an underestimated workload.

8.2 Delivery platforms

We plan to launch our game on PC and Nintendo Switch.

On PC the game will be published through Steam platforms which will also grant us the management of betas and early access through the same game page. After the public beta a paid early access version of the game will be published, useful to gather continuous feedback during the development.

At the same time, the open beta and the final game will be published on Nintendo Switch using the eShop platform.

8.3 Delivery methodology

The closed beta will be delivered to streamers and selected people via social media channels to spread the word. The selection will be done through online forms in order to select the most fitting players. The open beta will follow a less discreet approach and a wider target using social media platforms. Inside the closed and open betas, users will find two different free season-pass, one for each beta. This way we can introduce the player to this feature, and we can also reward their presence in the game from day 0 with exclusive items.

Since the game is nor story-focused nor text-heavy we plan to release the game only in English.

The betas will be free, while the early access and final versions will be paid for 9,99€.

9. Cost estimation

Some prices are approximated due to the conversion from USD to EUR.

9.1 Team

All salary estimates are based on data from GlassDoor specific to Italy.

9.1.1 Core team

Members of the core development team at Lagoon Games.

Profession	#	Gross salary	Notes
Game Designer & Programmer	3	700€/month	Lagoon Games founders
3D Artist & Animator	1	2.750€/month	From the third month, as the first two are for prototyping
Graphic Designer	1	2.500€/month	
Total		77.700,00€/year	

9.1.2 External members

People hired on a per-project basis or for a limited time.

Profession	#	Months	Gross salary	Notes
Composer	1	-	4.000€	Per project
Tester	1	6	800€/month	
Legal Assistant	1	-	15.000€	Per project
Social Media Manager	1	8	3.000€/month	
Web developer	1	-	3.500€	Per project
Total			51.300,00€ once	

9.2 Location

	#	Price	Notes
Rent	-	2000€/month	Estimated, based on average rental rates in Milan
Desk	5	113,44€	
Chair	5	85,99€	
Whiteboard	2	180€	
Whiteboard eraser	2	5,40€	
Whiteboard markers	1	11,90€	
Stationary	10	9,51€	
Pen holder	5	3,99€	
Sheets of paper	1000 sheets	4,50€/100 sheets	
Coffee machine	1	80,99€	
Coffee pods	200/month	0,15€/pod	2 daily pods per people, 20 days per month
Microwave	1	69,90€	
Coat rack	2	27,99€	
Desk lamp	5	11,99€	
Closet	2	191,99€	
Rubbish bin	2	10,95€	
Cleaning service	-	15€/hour	Estimated, one time a week, 3 hours each time
Internet	-	35€/month	Static IP address included
Electricity	-	0,0462€/kWh	2000 kWh/month estimated
Water	-	1,076288€/mc	10 mc/month estimated
One-time total		2.212,60€ once	
Yearly total		28.177,95€/year	

9.3 Hardware

Most hardware prices are sourced from Amazon.it and may be subject to temporary discounts.

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Hardware	Name	#	Price	Notes
PC tower	Lenovo Legion Tower 5 Gen 8 (AMD)	5	1588,66€	Windows 11 included
Headset	HyperX Cloud III	5	78,40€	
Mouse and Keyboard	Dell Pro KM5221W	5	55,26€	
Webcam	Logitech C270	5	18,50€	
Monitor	MSI PRO MP273A	5	157,13€	27'', 1920x1080, Integrated speakers
Graphic tablet	Wacom Cintiq 16	2	577,99€	For 3D and 2D artists
Controller	Xbox Series X|S controller	8	44,99€	
Printer	HP DeskJet 2720	1	49,90€	With scanner
Printer toner subscription			4,99€/month	
Nas server	Synology DS220j	1	549,00€	For backups
Workplace servers	ThinkSystem ST50 V2 Tower Server	1	800€	For both AlienBrain and internal testing
Nintendo Switch devkit		1	500€	Estimated (source: jp.gamesindustry.biz)
One-time total			12.904,55€	
Yearly total			59,88€	

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9.4 Software

Service	#	Price	Notes
AlienBrain for Artists	5	230€/year	One for each core team member except the tester
Blender	1	-	Free
Microsoft 365 Business Basic	5	5,60€/month	Business e-email and cloud storage included
Photoshop	2	26,64€/month	
Slack Pro	1	8,25€/month	For task management and communication
Unity pro	3	170€/month	
Visual Studio Professional	3	41,45€/month	
Total		9.836,56€/yearly	

9.5 Advertisement

For a six-month marketing campaign before the beta release.

Platform	Price	Notes
Instagram	10€/day	
TikTok	50€/day	Estimated (source: nutshell.com)
YouTube	10€/day	
X Premium	8,54 €/month	
Discord Nitro	9,99€/month	
Total	12.711,18€	

9.5 Related services

Service	Price	Notes
Steam fee	91,99€ once	
Nintendo Switch fee	-	Free
HelpSquad Customer support	600€/month	For 3 months of betas
PlayFab Standard plan	91,24€/month	For 3 months of betas; Refer to Section 6 for details
PlayFab Multyplayer Servers	1.339,85/month	
PlayFab Matchmaking Requests	9,12€/month	
Webserver domain name	20,16€/year	
Webserver hosting	9,22€/month	For 6 months of marketing campaign
Game IP registration	199€ once	
Total	6487,10€	

9.6 Total

For the closed and public betas, we consider the related services costs as one-time, as the betas will last for only three months. After the game launch those will become yearly costs of 24.613,32€/year.

Yearly costs	Cost
Core team	77.700,00€/year
Location	28.177,95€/year
Hardware	59,88€/year
Software	9.836,56€/year
Safety margin	20%
Total	138.929,27€/year

One-time costs	Cost
External team members	51.300,00€
Location	2.212,60€
Hardware	12.904,55€
Advertising	12.711,18€
Related services	6.487,10€
Safety margin	5%
Total	89.896,20€