Project Sketch

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Subject:	PM3
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1 Introduction

The Swiss card game "Frantic" [1], developed by four friends in St. Gallen, was released in 2015. The game has a successful history including over 100'000 sales. Successful enough for "Carletto", a Swiss toy and game distributor, to purchase the selling rights and launching the game in Austria and Japan. [2] Unfortunately, due to a pandemic, social gatherings for card games are not recommended or even prohibited.

2 Idea

In order to continue playing Frantic during social distancing times, we want to build a digital online version of the game. It is an identical copy of the physical card game, so you do not have to learn any new rules.

We realize, that playing a card game online is not nearly as enjoyable as playing in person with your friends. Although, we rather play online than not at all. This allows you to have all the fun without risking yours or your friend's wellbeing. In addition, it also allows you to play with your soon to be friends from anywhere in the world.

3 Customer values

We see the following values delivered to our customers:

- The only digital game based on Frantic on the market.
- Multiplayer with up to eight Players. Matchmaking allows game sessions with players around the globe.
- Easy to start game sessions with friends. They can join using the generated QR-code or through the invitation link being sent to the email.
- We will support a wide range of devices.
- No need for an account on any video game distribution platform. The game is ready to play after being downloaded through our website.
- The game can be easily started at any time and location.

4 Market analysis

While there are many different online/digital tabletop games available for computers, frantic isn't one of them. A direct competitor is therefore as of yet not on-hand. Therefore, possible competition only comes from other popular card and tabletop games. Extensive research on Steam, the largest digital game distributor platform [3], has revealed two potential rivals. A quick introduction to both can be found in the following paragraphs.

UNO by Ubisoft

UNO (Fig.1) can be purchased for 12 CHF on Steam or the Ubisoft Store [6]. It shows a nice design, has animations and it supports in-game voice communication. Due to the poor server logic most players are experiencing problems when joining the game. Because of Uplay integration and Ubisoft game service, players are forced to create or link a Ubisoft account. Single Player is also supported.

Figure 1: Screenshot of UNO by Ubisoft [4] as can be found in Steam

Tabletop Simulator by Berserk Games

Tabletop Simulator (Fig.2) on the other hand is only available on steam and can be purchased for 19 CHF. It allows to experience several tabletop games like Uno, Monopoly, Pong, Catan, Bang and others. As the name suggests Tabletop Simulator is a simulator game. The player interacts with card decs, cards and even with the game board. They can be dragged, dropped or thrown. No sessions against the computer are possible in the original game. Add-ons from the community make this and other features possible.

Figure 2: Screenshot of UNO in Tabletop Simulator by Berserk Games [5]

5   Main procedure

The main application is a person who likes to play card games with friends:

- The person starts the program. He has already downloaded it.
- He decides whether he would rather play against the computer or against other people.
- If he wants to play against other people, he can decide whether he wants to join an existing game or rather create a new game.
- The number of players is used to calculate the maximum number of points.
- He can choose to start a tutorial, or he can directly start playing.
- The game is started, and the virtual cards are dealt. Each player receives seven cards to his hand.
- In the middle of the playing field is the deposit pile. There is already a card.
- For each card there is an information button, which refers to the game instructions.
- The legally playable cards are marked accordingly.
- The player chooses one of these cards and plays it. The card is moved to the discard pile.
- If he cannot play a card or he doesn't want to, he must take a new card. After that he now again has the option to play a card.
- If the card being played is an event card, this event is executed immediately.
- Now it is the turn of the next player.
- As soon as a player has no more cards in his hand, the round is over, and the points are counted.
- The new round starts with the player who has made the most points in the last round.
- The game ends as soon as a player has reached or exceeded the maximum score.
- The player with the fewest points wins.

6   Further requirements

In Addition to the main game, there are further requirements that would positively influence the flow of the game.

- In multiplayer mode the program should create a virtual room with all participants.
- It must be possible to interrupt the game at any time without losing any data.
- If the connection to the other players is lost, the program must try to reconnect.
- Every created multiplayer game generates a code. With this code other players can join the game.
- Illegal moves should be detected and prevented.
- A maximum number of eight players should be supported.
- The program must be executable on the current computer systems (MacOS, Windows).
- Creating a connection to a virtual room may take a maximum of five seconds.
- The move of a computer-controlled opponent must be calculated within 0.5 seconds.
- A multiplayer game must comply with industry security standards to prevent data manipulation and unauthorized access.
- There is a chat function that can be used by all players in the same virtual room.
- The transfer of a player's move to the other players may take a maximum of one second and must be successful in 99.9% of cases.

7   Resources

For the creation of the game a team of seven developers will be needed. All of them need to have sufficient knowledge of how the game is played. At least one team member must have some experience in machine learning and artificial intelligence in order for the single player mode to be challenging. Another required experience in our team is the creation and maintenance of a server in order for the game to be played between different computers.

Since the game will be coded in Java, all team members must be sufficient in this programing language. No external help will be needed. In total we estimate an effort of 100 hours for each team member.

8   Risks

Due to the complexity of machine learning, it is to be expected certain difficulty and failure with its implementation. This should be evaded after the algorithm has had enough time to learn and become better. The implementation of multiplayer will be challenging considering the security of the player's data alongside the capability and scaling of the server.

Since the game is only known in Switzerland and it has some complicated rules that may be confusing, sales could be restricted and the break-even point might come later or in worst case, never.

9   Project Outline

9.1   Use-Cases

1. Joining a game
2. Starting the game
3. Playing a card
4. Activating card events
5. Next players turn
5. End of the round
6. End of the game

9.2   Project plan

For the development of a beta release, an effort of 700 hours is estimated. This will be developed in two-week iterations over a period of 10 weeks according to the following overall project plan with milestones.

Milestone	Iteration	Start/Duration (Weeks) Planed (h)	Goal
	1	1/1 70	Everyone is familiar with the game, finishing project sketch
Project sketch	**M1**	**Start of week 2**	**Project sketch and presentation slides**
	2	2/2 120	Practical solution architecture, division of labour, setting up the project
	3	4/1 70	Working on technical report
Technical report 1	**M2**	**Start of week 5**	**Technical report and presentation slides**
	4	5/3 200	Finishing the architecture, setting up the server, start training the AI
	5	8/2 150	Implement UI, write test cases, improve cyber security, implement communication protocols and chat functionality
	6	10/1 90	Clean up code, add missing documen-tation, make performance upgrades, finding all the bugs, writing technical report 2
Beta-Release Technical report 2	**M3**	**Start of week 11**	**Implementation and testing. A stable game state is reached.**
What is coming next:			
Stable release	*7*	*tbd*	*Stable game with advanced game experience*
General availability (GA)	*8*	*tbd*	*Ready for distribution*

Table 1: Rough planning table: from ideation to general availability

9.3   Milestones:

- M1: Project sketch
- M2: Solution architecture, technical report 1
- M3: Beta-Release, technical report 2
- M4: Stable release
- M5: General availability

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10 Feasibility

The estimated effort is 700 hours for a team of seven developers. For an hourly rate of CHF 120 the total development costs would be 120 * 700 = 84'000. When pricing the game at CHF 15.00 we would need 5'600 sold beta-release versions to recoup the costs.

Description of earnings	Amount in CHF
Product sales (pre-order)	84'000
Product sales (without pre-order)	100'000
Merchandising	5'000
Sponsors	7'000

Table 2: List of all earnings

Description of expenditures	Amount in CHF
Personnel costs (till beta release)	84'000
Personnel costs (after beta release)	84'000
Marketing	10'000
Events	5'000
Server costs	5'000
Infrastructure	1'000

Table 3: List of all expenditures

Description sum	Amount in CHF
Earnings	196'000
Expenditure	189'000
profit	10'000

Table 4: Calculation of profit

11 References

[1] R. F. &. C. KLG, „Rule Factory," [Online]. Available: https://rulefactory.ch/en/frantic/ [Accessed Sept. 27, 2020].

[2] S. Rohner, „FM1Today.ch," 12 September 2020. [Online]. Available: https://www.fm1today.ch/ostschweiz/stgallen/frantic-hat-auch-schon-wehen-ausgeloest-139092655 [Accessed Sept. 26, 2020].

[3] Welcome to Steam. [Online]. Available: https://store.steampowered.com/?l=english [Accessed Sept. 27, 2020]

[4] Uno on Steam. [Online]. Available: https://store.steampowered.com/app/470220/UNO [Accessed Sept. 27, 2020]

[5] Tabletop Simulator on Steam. [Online].
Available: https://store.steampowered.com/app/286160/Tabletop_Simulator/ [Accessed Sept. 27, 2020]

[6] UNO® - AT_Ubisoft. [Online].
Available: https://store.ubi.com/at/game?pid=57c19450ef3aa52a768b4567. [Accessed Sept. 27, 2020]

11.1 Tables

11.2 Figures