



Wednesday 9th February 2022,
5:15 - 6:30pm

| le savoir vivant |

Swiss Sport Sciences Society (4S)

Online conference

esports and virtual environments: the realm of data?

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SPORTWISSENSCHAFTLICHE
SOCIÉTÉ SUISSE DES
GESELLSCHAFT DER SCHWEIZ
SCIENCES DU SPORT

Unil
UNIL | Université de Lausanne

Institut des sciences du sport
de l'UNIL (ISSUL)

ISSP EA 3625
Institut des
Sciences du
Sport-Santé
de Paris

1 | ESPORTS?

WHAT IS ESPORTS?

1999

First appearance of the term

Difficult to Define for 3 Reasons:

1. Relatively new phenomenon (~25 years)
2. Constant evolution
3. At the crossroads of multiple fields:
 - Video Games
 - Sport
 - Media
 - Culture

A SPECIFIC FORM OF VIDEO GAME PRACTICE

ESPORTS CRITERIA	PRIMARY	SILMUTANEOUS OPPOSITION (BETWEEN AT LEAST 2 PLAYERS OR 2 TEAMS OF PLAYERS)
		VIDEO GAMES (INTELLECTUAL PROPERTY OWNED BY THE PUBLISHERS)
		ORGANIZED COMPETITION (TOURNAMENTS, LEAGUES, CHAMPIONSHIPS)
		ESTABLISHED RULES (VICTORY CONDITIONS, MATCH FORMAT, BEHAVIOUR, MATERIAL, ETC.)
	SECONDARY	ONLINE OR OFFLINE
		ANY TYPE OF PLATFORM: PC, CONSOLE, MOBILE
		AMATEUR OR PROFESSIONAL
		IN FRONT OF AN AUDIENCE AND/OR VIEWERS
		CASHPRIZES AND/OR EQUIPMENTS & HARDWARE

**ESPORTS IS THE SIMULTANEOUS OPPOSITION OF PLAYERS
IN ORGANIZED AND REGULATED VIDEO GAME COMPETITIONS**

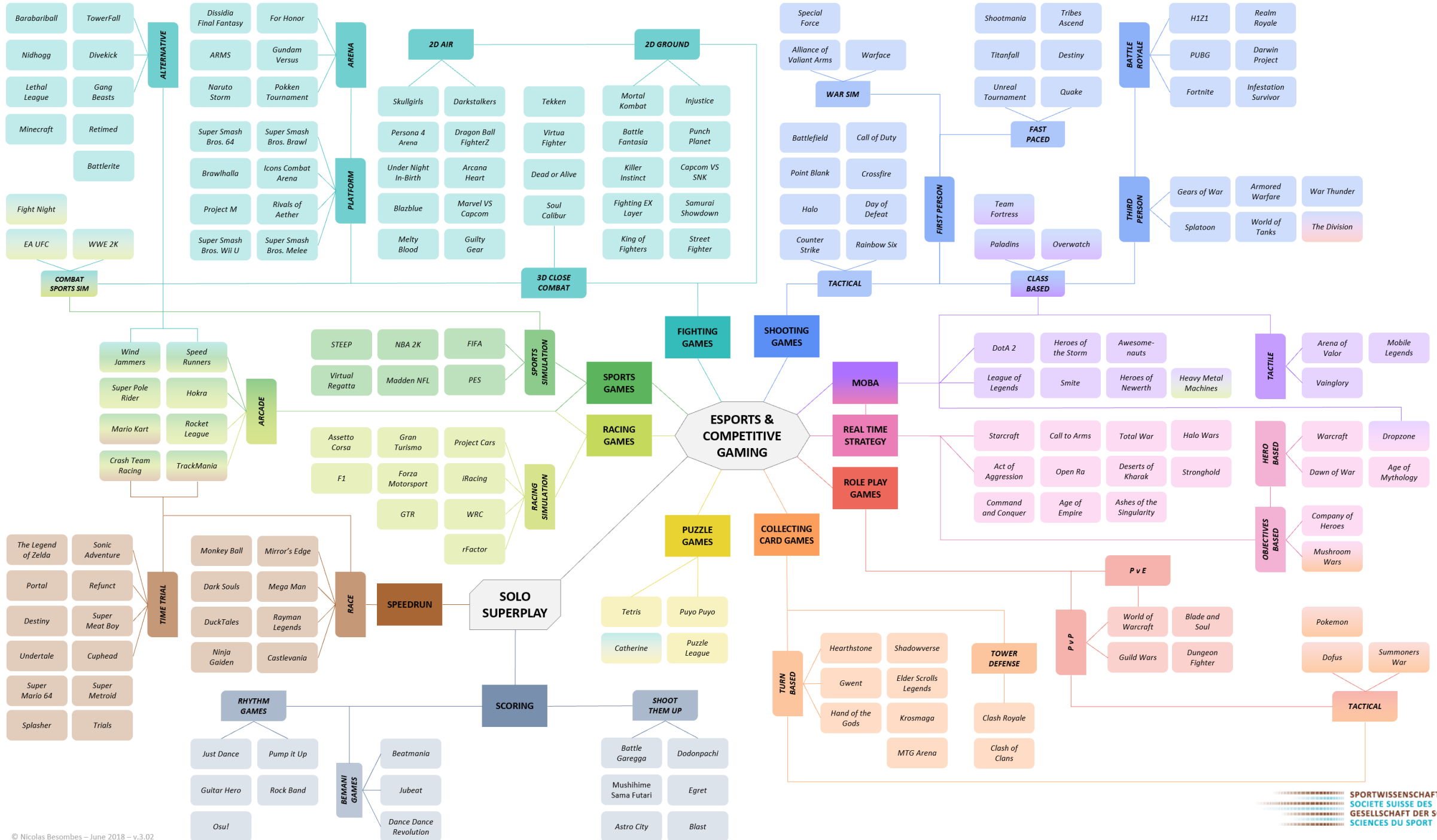
Taylor (2012), Besombes (2016), Jenny et al. (2017), Hamari & Sjöblöm (2017), Abanazir (2021)

WHICH GAMES?

ESPORTS &
COMPETITIVE
GAMING

WHICH GAMES?





CONFUSIONS

VIDEO GAMES SPORTIZATION

Gamers borrow some of the apparent functional characteristics of sport (e.g., competition) without necessarily being part of the institutional framework of sport.



ESPORTS

DIGITIZATION OF SPORT

All video games whose topic is to simulate existing real sports.
Sport is turned into bits and bytes, or 1's and 0's.



SPORTS VIDEO GAMES

DIGITALIZATION OF SPORT

Sport relies on the use of digital tools (not necessarily video games) and interactions with virtual environments for performance, health, education or entertainment purposes.



DIGITAL SPORTS

2 | ESPORTS & OLYMPISM

FROM ESPORTS TO VIRTUAL SPORTS

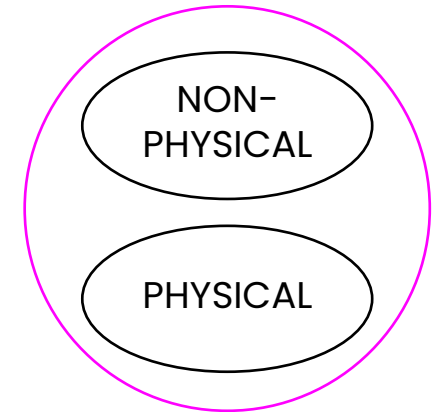
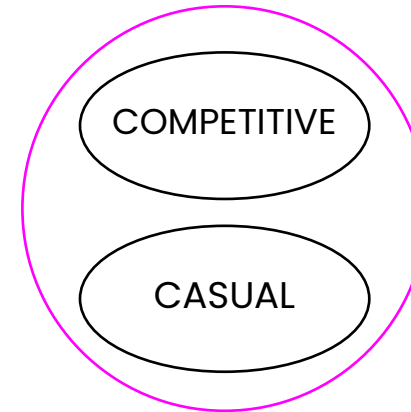


WHAT ARE « VIRTUAL SPORTS » FOR THE IOC

~~ESPORTS~~

VIDEO
GAMING

VIRTUAL
SPORTS



GENRE	SUBGENGRE	GAMES (Examples)
Virtual Sports	NON-PHYSICAL	FIFA, NBA 2K, Virtual Regatta, Gran Turismo, eBaseball
	PHYSICAL	Zwift, World Rowing

TWO STRATEGIES TO REJUVENATE THE OLYMPIC BRAND

1

AUDIENCE REACH

INTEL EXTREME MASTERS (IEM)
& INTEL WORLD OPEN (IWO)

UNDER THE UMBRELLA OF THE OLYMPIC PARTNERS (TOP)

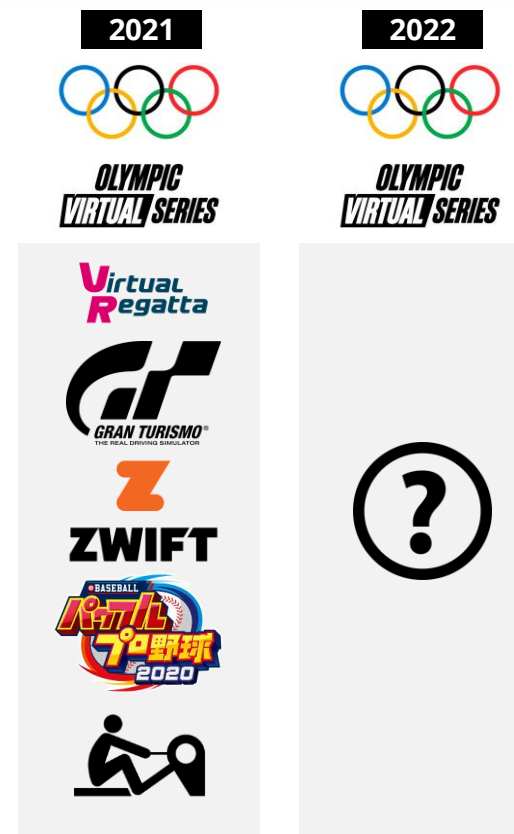


2

MASS PARTICIPATION

OLYMPIC VIRTUAL SERIES (OVS)

UNDER THE UMBRELLA OF THE INTERNATIONAL OLYMPIC
COMMITTEE (IOC)





THE PARADOX OF VIRTUAL SPORTS

By so much imitating in a realistic way the real sports, what is the added value of virtual sports as a broadcasted show / event compared to the real sports they simulate?

HOWEVER...

*"We open the door to the possibility of seeing **physical forms of virtual sports** like Zwift (virtual cycling) or rowing. These types of **physical simulations could integrate the Olympic program in the future.**"*

*The Olympic program of Paris 2024 is already finalized but **for Los Angeles, this door is open**".*

Kit McConnell – IOC Director of Sports – June 1st, 2021

Declaration of the 10th Olympic Summit

11 Dec 2021

IOC News

Press Release

- Olympic Virtual Series

The Summit received a review of the successful first edition of the Olympic Virtual Series in 2021, bringing together the virtual sports of five International Federations and **reaching nearly 250,000 participants, with more than two million entries.** The Summit noted that, building from this strong base, the Olympic Virtual Series is planned to continue on an annual basis, providing opportunities for IFs to reach out, engage with and promote their sports, and reach new communities. Details for the Olympic Virtual Series 2022 will now be confirmed in the first half of 2022, including the timing and the sports to be included.

TO SUM UP

	SPORTIZATION OF VIDEOGAMING		DIGIT(AL)IZATION OF SPORTS
	ESPORTS (= competitive video gaming)	VIRTUAL SPORTS	
		NON-PHYSICAL & PHYSICAL	EXCLUSIVELY PHYSICAL
EVENTS	Intel Extreme Masters (IEM) Intel World Open (IWO)	Olympic Virtual Series (OVS)	Olympic Games (OG) ?
OLYMPIC LEVEL	International	International	International
YEARS & LOCATIONS	2018 (PyeongChang) 2021 (Tokyo / online) 2022 (Beijing / online) 2024 (Paris) ?	2021 (online) 2022 (Beijing / online) ?	2028 (Los Angeles) ?
SELECTED VIDEO GAMES	StarCraft 2 Street Fighter V Rocket League Dota 2	eBaseball Powerful eCycling (Zwift) eRowing Virtual Regatta Gran Turismo Sport	eCycling (Zwift) ? eRowing ?
Olympic Movement's Stakeholders involved	International Olympic Committee (IOC) The Olympic Partners (TOP)	International Olympic Committee (IOC) International Federations (IFs)	International Olympic Committee (IOC) International Federations (IFs)
Esports' Stakeholders involved	ESL	DreamHack Sports	?
Olympic Sport ?	NO	NO	YES , it could be considered as an Olympic Sport under the control of the IFs

3 | ESPORTS & DATA

CHARACTERISTICS

1

Esports is the **product of the digital revolution** and the mirror of our digitized societies

- Esports is intrinsically dematerialized and virtual
- Huge volume of data stored

Scholz (2019)

2

Data are collected in an **ecological situation**

- Real situation (in-game situation)
- Less invasive than a laboratory situation
- Less expensive

3

Data are directly collected **from the game server**

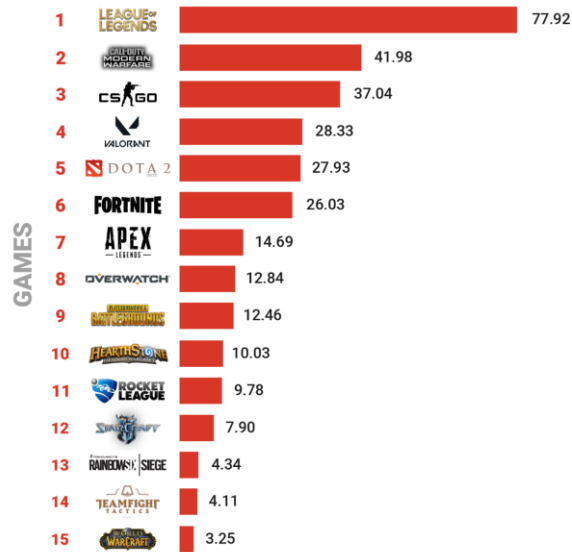
- API is owned by the publisher
- Its access depends on the publisher's goodwill



APPLICATIONS: MARKET KNOWLEDGE (AUDIENCE, ECONOMICS...)



TEO PC GAMES IMPACT INDEX Q3 2020

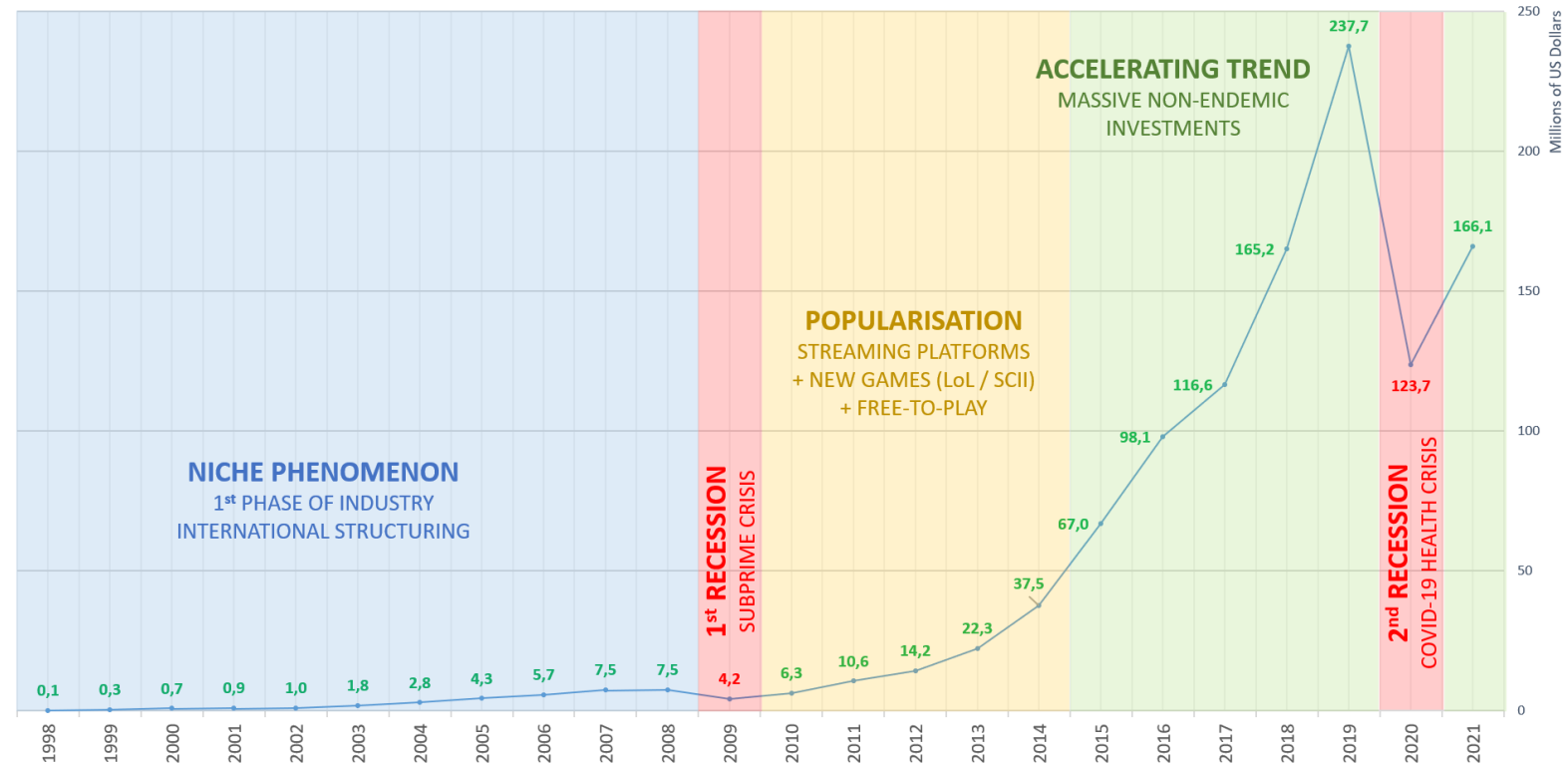


IMPACT INDEX

WEIGHTED KEY PERFORMANCE INDICATORS



Total Prize Money in Esports per Year (1998-2021)



Source (Dec 21): <https://www.esportsearnings.com/>

APPLICATIONS: GAME RESULTS PREDICTIONS (BETTING, FANTASY LEAGUES...)

BONUSES ODDS BETTING SITES NEWS TIPS

SICKODDS CS:GO LOL DOTA 2 OVERWATCH ALL ESPORTS

YOUR NEW ESPORTS BETTING DESTINATION.

SickOdds lives and breathes esports betting comparison. We help you find the most trusted betting sites, generous bonuses, range of markets and best live odds. Let's play!



WESG 2018 QUALIFIER **BET NOW**

betway BETWAY 8.9 RIVALRY 7.2 **ARCANE BET** 7.9

4\$ NO DEPOSIT 100% FIRST DEPOSIT

New customers only. 18+ T&Cs apply. begambleaware.org

ESPORTS	TEAM 1	ODDS	SCORE	TEAM 2	ODDS	STATUS	ACTION
WESG 2018 QUALIFIER	ESPADA	1.69	0.0	Team Empire	2.09	LIVE	BET NOW
2018 CN VS EU TOURNAMENT	A83650	1.85	1.85	Furyhunter		00:00:00	BET NOW
RESHUFFLE MADNESS	Alliance	1.41	2.73	ferzee		00:29:28	BET NOW
TAIROBA INVITATIONAL	Team Empire	4.38	2.76	The Final Tribe		00:29:28	BET NOW

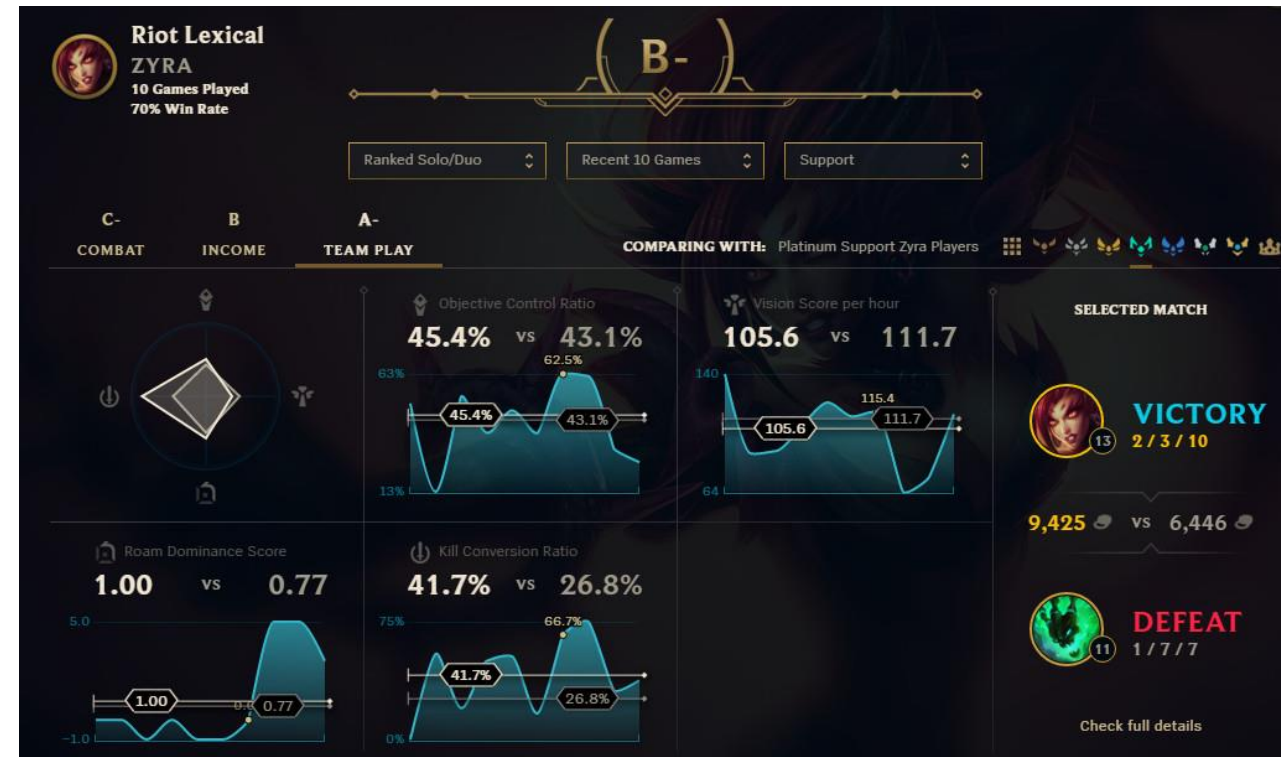
LEC SUPER FANTASY BETA 70 200 Cier

ROSTER LOBBIES COLLECTION **PLAYERS** PACKS STORE

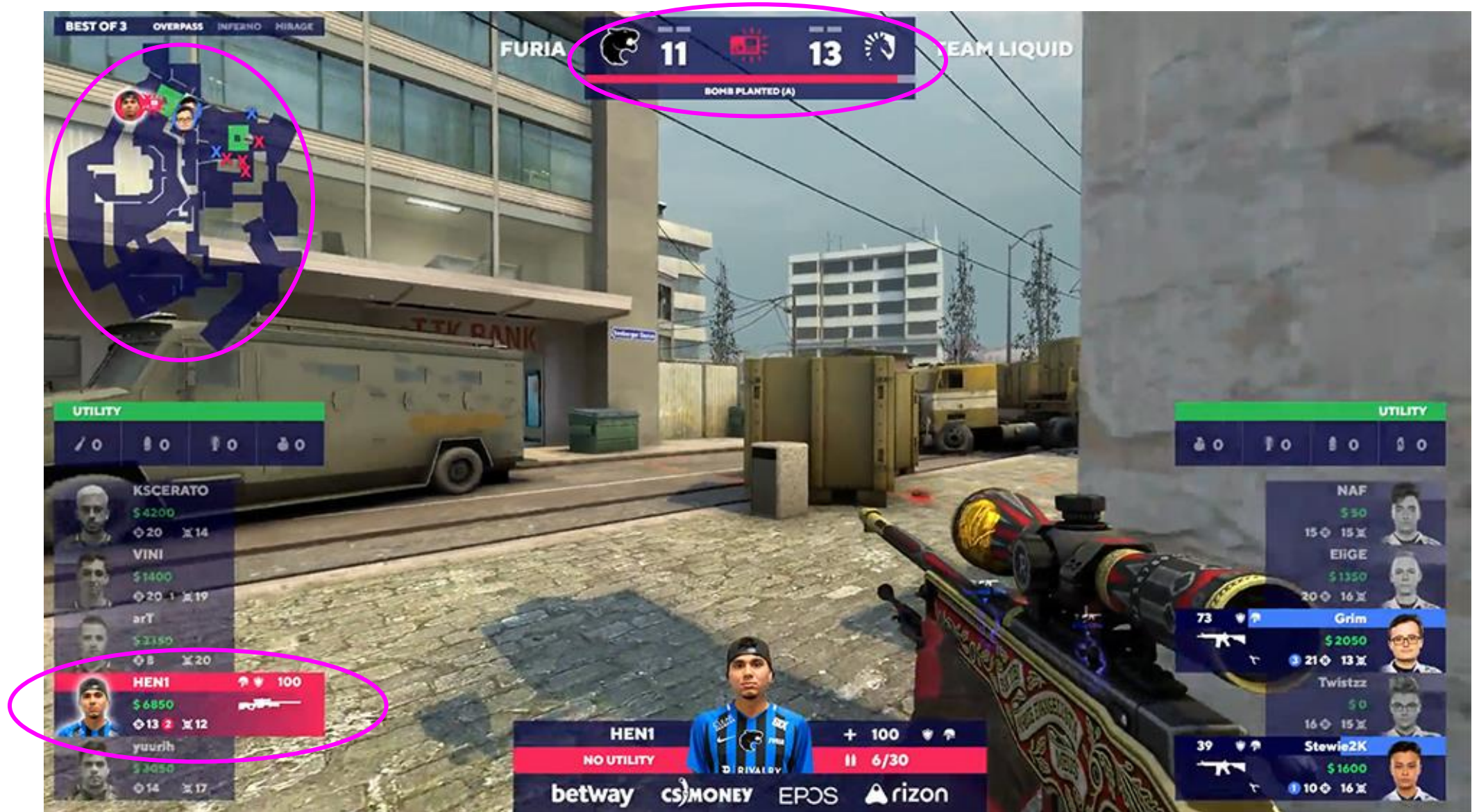
PLAYER LIST

PLAYER	POSITION	TEAM	RECENT MATCHES					SEASON SCORES
Jankos		C2 Esports	14	45	78	41	79	653
Caps		C2 Esports	38	49	40	39	58	639
Rekkles		Fnatic	13	49	18	30	46	621
Perkz		C2 Esports	23	48	37	48	32	596
Upset		Origen	27	38	36	34	-7	480
Mikyx		C2 Esports	19	25	33	19	50	446
Grabz		C2 Esports	24	27	28	32	24	426
Selfmade		Fnatic	9	15	17	31	81	423
Wunder		C2 Esports	15	22	30	32	41	421
Gullhoto		Origen	25	28	37	35	2	419

APPLICATIONS: PLAYER EXPERIENCE



APPLICATIONS: VIEWER EXPERIENCE (GFX, IN-GAME STATS...)



APPLICATIONS: SCOUTING (PLAYERS STATS, GAME KNOWLEDGE...)



OP.gg



Leaguepedia



TheSpike.gg



LoLPros



Porofessor

Classé Solo
Master
217 LP / 73V 46D
Win Ratio 61%
Les mousquetaires d'Olaf

Flex 5.5 Rank
Unranked

S2022 Total	Classé Solo	Ranked Flex 5v5
Gwen CS 206.3 (8.1) 7.8 / 5.8 / 4.1 30 Jouées	2.05:1 KDA 70%	
Jayce CS 202.5 (8.3) 6.9 / 4.9 / 6.5 18 Jouées	2.74:1 KDA 56%	
Gragas CS 186.8 (6.7) 3.9 / 5.3 / 8.8 12 Jouées	2.43:1 KDA 50%	
Jax CS 157.9 (7.1) 5.8 / 5.8 / 3.9 11 Jouées	1.67:1 KDA 73%	
Kennen CS 207.9 (7.0) 11.5 / 5.1 / 9.4 8 Jouées	4.07:1 KDA 75%	
Irelia CS 211.0 (8.4) 7.3 / 7.5 / 6.2 6 Jouées	1.80:1 KDA 50%	
Lucian CS 166.6 (7.7) 6.8 / 4.8 / 5.0 5 Jouées	2.46:1 KDA 100%	

Show More + Past Seasons

Taux de victoire en partie classée durant les 7 derniers jours

Gwen	53%	8V	7D
Jax	67%	6V	3D
Jayce	50%	4V	4D
Gragas	40%	2V	3D

Total **Classé Solo** Ranked Flex Type de partie * Rechercher un char

20P 11V 8D

58%

5.9 / 5.7 / 4.9
1.90:1 (39%)

Gwen 56% (5V 4D) 1.7 KDA
Jax 33% (1V 2D) 1.33 KDA
Lucian 100% (2V 0D) 1.63 KDA

Preferred Position (Rank)
Haut 70% | Win Ratio 36%
Milieu 25% | Win Ratio 100%

Use OP Score to get a more accurate breakdown of your skill level. **Beta**

Match clas... il y a 13 minutes
Victoire 16:15
Asha 9 / 2 / 5
7.00:1 KDA
Double Kill

Match clas... il y a 19 heures
Défaite 22:40
Jayce 2 / 6 / 4
1.00:1 KDA
ACE

Match clas... il y a 19 heures
Défaite 30:22
Gwen 12 / 2 / 4
8.00:1 KDA
Quadruplé ACE

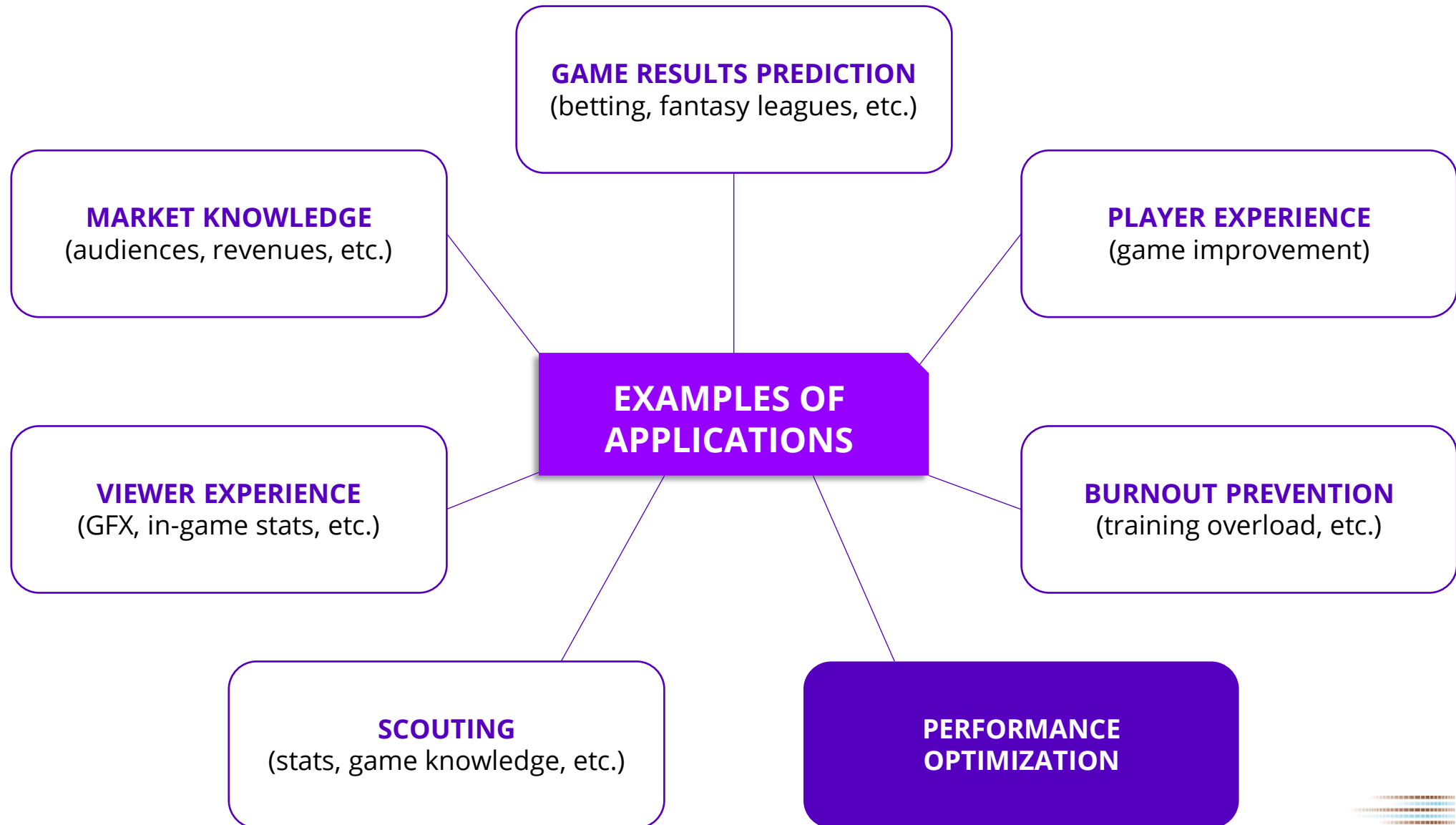
Match clas... il y a 20 heures
Victoire 20:54
Gwen 7 / 4 / 2
2.25:1 KDA

Match clas... il y a 21 heures
Défaite 22:58
Gwen 2 / 8 / 2
0.50:1 KDA

Match clas... il y a 21 heures
Victoire 16:58
Gwen 6 / 0 / 2
Perfect KDA
Double Kill

Match clas... il y a 21 heures
Victoire
5.00:1 KDA

APPLICATIONS



CHALLENGES REGARDING PERFORMANCE OPTIMIZATION


- Which performance **indicators** should be measured?
- Which **tools** to measure them (reliability, replicability, etc.)?
- How to **analyze** the data?
- How to **visualize** the data?
- Which **theoretical models**?



PERFORMANCE OPTIMIZATION: THE CASE OF ELITE LoL PLAYERS

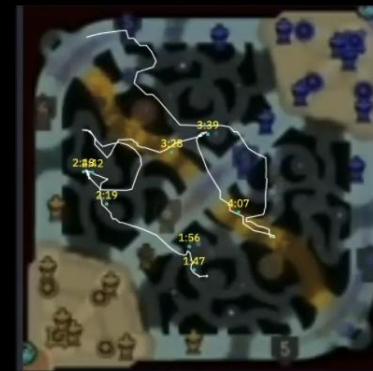
- Warding (map vision)
- Jungler Pathways
- Jungle Proximity (synergies)
- Main objectives
- Most played champions
- Player patterns by position
- Etc.

```
"type": "GAME_EVENT",
"subject": "TEAM",
"action": "KILLED_ANCIENT",
"payload": {
  "gameTime": 102375,
  "position": [
    3034,
    8136
  ],
  "killerTeamUrn": "live:lol:riot:team:one",
  "killerUrn": "live:lol:riot:player:f431529b-e3ff-3b9a-a98e-efb2d12af39f",
  "monsterType": "blueCamp",
  "dragonType": null,
  "assistants": []
}
```



THREE STEPS

1. Descriptive analysis to create "players ID"
2. Evaluation of the many possible game scenarios (second by second)
3. Evaluation of the probability of winning the match according to each scenario



Volibear vs Lee Sin

Red > Raptors > TCamps > TScut > OppRaptors > MidC > BScut > MidG > TopG > Base (5:02)



Lee Sin vs Diana

TCamps > Raptors > Red > BotG > BScut > Krugs > BotG > Base(4:42)

DOES DATA HELP ESPORTS PLAYERS TO WIN?

Difficult to measure / evaluate the impact of data in what makes esports performance

→ **Many factors** to explore

Nagorsky & Wiemeyer (2020)

- Game knowledge
- New patch
- Champions played
- Training load
- Emotional state
- Sleep
- Nutrition, etc.

→ Search for **links** between these different factors

FIRST OBJECTIVES

- Do not disrupt the experts' performance
- Do not make them loose (due to the change of habits)



ETHICAL QUESTIONING

KC Rekkles (EUW)
Karmine Corp - (ADC)
Niveau 1097 - #38 Janna - #566 Aphelios - #877 Jhin

VUE D'ENSEMBLE | CHAMPIONS | COMPORTEMENT | RECORDS

ACCUEIL > KC REKKLES (EUW) | TOUS LES CHAMPIONS | TOUS RÔLES | SAISON 12 | EN COURS

Côte personnelle

Challenger 1005 LP
Soloqueue
Rang: 120 (EUW: 49)
Top 0.0015%
LP: 1005
Victoires: 133 - Défaites: 113

Parties récentes

Statut	Mode	Score	CS	Kills	P.	Temps
Victoire	Normal (mid)	17 / 7 / 20	382	74%		Il y a 1h
Victoire	Normal (mid)	11 / 4 / 9	365	65%		Il y a 2h
Défaite	Normal (mid)	11 / 3 / 6	257	59%		Il y a 2h
Victoire	Soloqueue	5 / 3 / 14	370	56%		Il y a 8h
Victoire	Soloqueue	8 / 1 / 6	280	45%		Il y a 8h

Joue souvent avec ...

Joueur	Jouées	% victoire
KC Hantera1 GrandMaster	26	34.6%
BurnisTatichou Challenger	7	28.6%
Rasse Ranged Non classé	7	57.1%
Rezyn Non classé	5	60.0%
Bobby Biceps Non classé	4	50.0%
Lesnoy rab GrandMaster	4	50.0%

Autres comptes de Humanoid

Joueur	Rang
PogMirkler EUW	Non classé

PUBLICLY SHARED PERSONAL DATA

Ability to track:

- Planning of the day
- Who he/she plays with
- His/Her different nicknames

LIMITS OF DATA IN ESPORTS

Data belong to the publisher

- Only a few publishers share their game APIs
- Need an agreement from the publisher



Theoretical **accessibility** vs. real accessibility

Amateur vs Pros

Requires **specific skills**

- Data Engineer
- Data Scientists
- Data Analysts, etc.

Time consuming



"There is a big lack of competitive fairness in the LFL regarding the access to our scrims data managed by RIOT. The VITB/MSFP/GO/BDSA teams (40% of the LFL) have access to their scrims data like the LEC teams while the rest of the LFL teams do not. What to do?"

FUTURE CHALLENGES

How do we optimize data collection / processing?

How do we aggregate the different data sources?



ESPORTS DATA CENTRALIZATION SYSTEM?

How do we develop a **“data culture”**
(*sharing, valuing, trusting, and using data*)
among the different stakeholders
(and especially clubs, teams, players)?

Henderson & Powers (2018)





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THANK YOU

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