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The Freemium Economy: An Analysis of Consumer Spending in Free-to-Play Gaming

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ABSTRACT

This paper examines the psychological and economic determinants of spending in free-to-play (F2P) games, focusing on high-school students in Mumbai. Drawing on 49 survey responses, the study investigates how behavioural biases, such as impulsivity, social pressure, instant gratification, and sunk-cost effects, influence microtransaction purchases despite limited financial independence. The findings reveal strong links between gaming engagement and expenditure, with higher playtime and PC/console use associated with substantially greater spending. Results support existing literature on the freemium model's reliance on cognitive biases and reward mechanisms. The study highlights how F2P game design effectively converts non-paying players into paying users, even among youth with constrained resources.

Keywords: Free-to-Play (F2P) games, behavioural economics, microtransactions, consumer psychology.

1. INTRODUCTION

In recent years, the gaming industry has undergone a fundamental transformation in how games are marketed and monetized. Among the most influential developments is the rise of free-to-play (F2P) games, which can be downloaded and played at no initial cost but rely on microtransactions and in-game purchases for revenue. This business model, commonly known as freemium model, entices players by offering core gameplay for free while monetizing optional content such as cosmetic upgrades, additional levels, or competitive advantages. While this model has made gaming more accessible to a global audience, it has also introduced new economic and psychological dynamics that blur the boundary between entertainment and consumption.

The popularity of F2P games, particularly among younger players, raises important questions about how psychological and economic factors interact to influence spending. The freemium model leverages behavioural biases such as instant gratification, social comparison, and the fear of missing out, encouraging users to make impulsive or emotionally driven purchases. For adolescents and your adults, groups still developing financial literacy and self-control, these mechanisms may be especially potent.

This paper explores these dynamics through a survey of consumer behaviour in F2P gaming, with a particular focus on psychological and economic determinants of spending. Based on a structured survey of high school students in Mumbai, the study examines how factors such as impulsivity, social influence, and gaming engagement correlate with expenditure patterns. The analysis draws upon insights from existing literature on behavioural economics and digital consumption to contextualise the findings.

The remainder of the paper is organized as follows. Section 2 reviews related literature on the freemium model, behavioral economics, and digital consumption patterns. Section 3 presents the survey methodology and analyses the results, linking them to the existing literature. Finally, Section 4 concludes with implications for understanding consumer behaviour in F2P gaming and the broader digital economy.

2. SURVEY

The survey collected 49 responses to a structured questionnaire aimed at exploring the psychological and economic factors influencing consumer spending in free-to-play games and identifying correlations be=tween them. Respondents were students from various high schools in Mumbai, India, with the majority aged 16-18, followed by 13-15 year-olds, and a smaller proportion of adults (18+) and children under 13.

The primary age group (16-18) is particularly significant, as online gaming is a major part of their social life. At this stage, individuals are highly influenced by social media trends and digital marketplaces. Their purchasing behavior is often impulsive and emotionally driven, focusing on cosmetic items or competitive advantages that enhance social status within games. Limited financial literacy in this group means that the freemium model leverages psychological tendencies rather than actual purchasing power.

Most respondents in this age group are unemployed, so their spending on F2P games is typically restricted to small, occasional transactions. These purchases are usually prompted by social pressure, special offers, or emotional appeal rather than planned expenditure. The majority of the respondents were male, with very few female participants, reflecting the higher prevalence of gaming among teenage boys. This also aligns with the tendency of teenage boys to favor competitive, action-oriented, and socially interactive genres such as shooters and sports games, which are common in the F2P market.

Some findings from the survey are particularly revealing, highlighting how the freemium gaming model effectively exploits behavioural and psychological biases to drive consumer spending. As can be seen in Appendix C, several economic and behavioural anomalies underscore the highly addictive nature of the gaming industry, particularly within the F2P games. Despite a significant portion of respondents being unemployed high-school students (Appendix A3), many reported spending considerable amounts on F2P games. This contradicts traditional economic expectations, which predict that individuals with limited disposable income would spend less on non-essential or luxury sectors such as gaming. The persistence of such behaviour suggests that gaming expenditure is not purely rational but rather influenced by behavioural economic factors, including loss aversion (the pain of loss outweighing the pleasure of gain), social comparison, and the pursuit of instant gratification.

Data from Appendix C.3 shows that half of the respondents who admitted to impulsive spending fall within the ₹2250+ range, indicating that these purchases are not insignificant but substantial relative to the likely income of these mostly unemployed participants. From an economic perspective, this behaviour can be explained by hyperbolic discounting, where players overvalue immediate rewards (such as unlocking exclusive features or status boosts) relative to long-term financial considerations. Further evidence in Appendix C.2.e reinforces this behavioural pattern. Respondents who play 20–30 hours per week consistently fall within the ₹20000+ spending category. This strong positive correlation between time spent and money spent illustrates the concept of consumer lock-in, where prolonged engagement increases emotional attachment, leading to a greater willingness to pay. This is a mechanism that many F2P games actively exploit.

As seen in Appendix C.1.b, PC gamers exhibit the highest concentration of high-value spending (₹2250+ and ₹20000+), suggesting that certain platforms foster a more immersive and competitive environment that encourages greater expenditure. One possible explanation is that PC gamers often invest substantial amounts in building or purchasing their systems. This prior investment may make them more willing to spend in F2P games, as they are psychologically motivated to “get the most” out of their setup or enhance their gaming experience. This behaviour reflects the sunk cost fallacy, where individuals continue to invest time, money or effort into something because of prior commitments, even when further investment may not be rational.

3. LITERATURE REVIEW ON FREEMIUM AND PSYCHOLOGY OF GAMERS

Current studies on freemium business models and the gaming market show that game publishers strategically exploit human behavior and cognitive biases to encourage greater consumer spending. For instance, Kovsca et al. (2023) highlight that freemium games are deliberately designed to attract players with the promise of being free, only to later monetize them through microtransactions, advertisements, or restricted gameplay experience. This is similar to the results of this research where 26 respondents said they never thought they would spend money on F2P games before playing it.

The economic and psychological drivers behind such behavior have been examined through theories such as present bias and the economics of impatience, as discussed by Evans (2016). These theories help explain why players often favor immediate rewards despite their long-term economic costs. This perspective supports the present study’s argument regarding the exploitative nature of the freemium business model in the gaming industry. This is particularly evident among unemployed high school respondents who engage in in-game spending despite lacking real income. This suggests that rational economic decision-making is frequently overshadowed by emotional and impulsive tendencies within gaming environments.

A similar pattern is observed in Imbert's (2023) analysis of feedback cycles in gaming, which demonstrates how reward systems and progression paths drive player engagement. Related studies likewise indicate that higher engagement levels are associated with increased spending. This relationship is also reflected in this research through the conditional probabilities of spending derived from gaming engagement. However, Imbert's (2023) study focused primarily on adults and predominantly on Western populations, whereas the present study identifies comparable spending patterns linked to feedback mechanisms among Indian youth.

In addition, Imbert (2023) and Kovsca et al. (2023) examine "the whale effect," a phenomenon in which a small subset of users accounts for a disproportionately large share of total revenue. These "whales" generate spending patterns that reinforce the freemium model's dependence on high-value players for profitability. This dynamic closely aligns with the principles of sunk-cost reasoning, whereby prior financial or time investment increases a player's likelihood of continued spending as engagement deepens. In this context, the freemium model not only capitalizes on behavioural biases but also strategically structures progression and reward systems to encourage sustained monetary commitment from its most dedicated users.

4. CONCLUSION

This research aimed to investigate spending behavior in F2P gaming among high-school students in Mumbai, focusing on the freemium model and the psychology driving consumer choices. Over 49 responses, the results consistently showed that even low financially independent players spend money through microtransactions based on behavioral rather than economic motivations. From these, quite clear patterns emerge: casual and mobile gamers spend the least, while PC and console gamers show considerably higher-value purchases. Furthermore, conditional probability analysis shows that increased weekly playtime is strongly related to higher spending, supporting global literature on linking intensity of play with the likelihood to monetize. Also, a significant number of respondents (26 students) stated that they did not expect to spend any money before playing, but eventually ended up making purchases. This finding supports existing research showing that freemium games are designed to gradually convert non-paying players into paying users through strategies such as time limits, small rewards, and subtle psychological prompts that encourage spending. These interpretations, however, have to be made in the context of the demographic limitations of this study. The sample is concentrated among 16-18-year-old teenagers, of which 85.7% are males, and the majority of them are unemployed. It is this demographic bias which limits generalisability, particularly in comparison with global gaming trends, where gender distribution is almost equal and the average gamer is much older. The findings thus reflect behaviour patterns specific to a young, school-going population whose spending choices may be shaped by peer influence, digital culture, and limited monetary resources. The study also lacked a wider socio-economic or regional sample, and did not capture long-term spending trajectories, which could provide deeper insights into the freemium spending behaviour.

Despite these limitations, this research also strongly upholds the previous scholarly works which underline the efficiency of microtransactions, the role of impatience, and the strategic design of freemium systems that leverage behavioural determinants. Data here reinforces the idea that the freemium economy thrives not by restricting access, but by influencing player psychology through time-gating, cosmetic enhancements, social comparison, and the perceived need for progression. This study, therefore, provides meaningful evidence that even within a young and financially dependent demographic, F2P games effectively create real-money spending, and demonstrates better the power of persuasion in game design and the wider economic importance of the freemium model.

5. REFERENCES

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[2] Imbert, D. (2023). What makes videogames engaging? A deep dive into the design, mechanics and psychology of games, Bachelor's thesis.

[3] Kovsca, V., Vincek, L.Z., Atnun, T. (2023). The impact of microtransactions on the development of computer game business models, *Economy and Market Communication Review*, 13(2), 462-474.

APPENDIX

Appendix A

DEMOGRAPHICS OF SURVEY RESPONDENTS

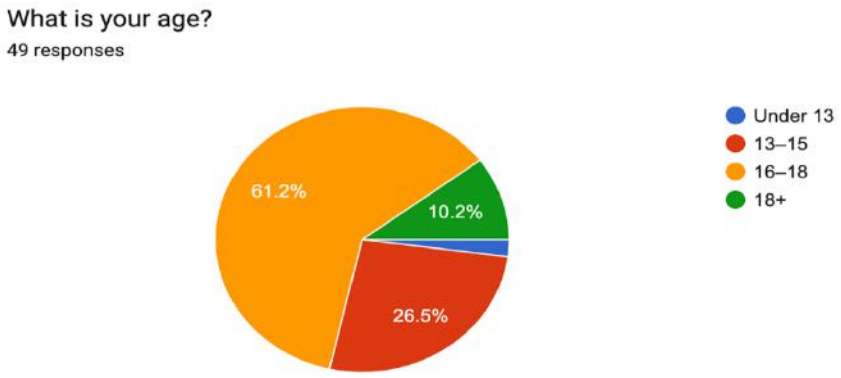


Figure A1: Age Distribution of Respondents

The majority of respondents(61.2%) are 16-18 year olds, indicating that the majority of our respondents are students/dependents, which directly affects their financial independence and overall spending capacity.

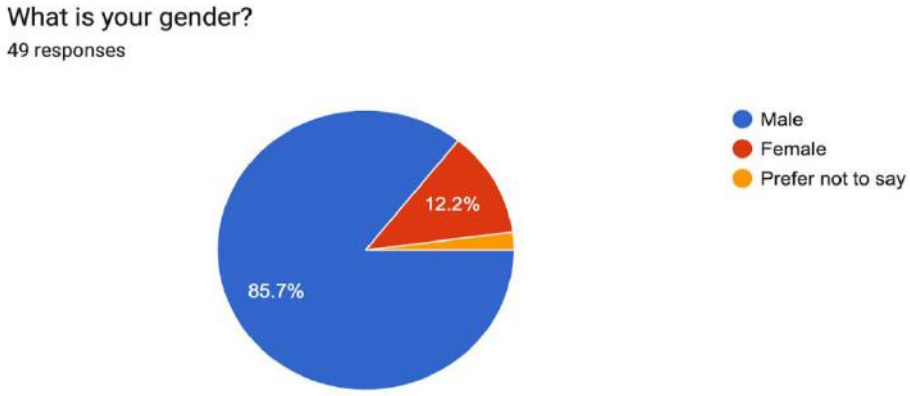


Figure A2: Gender Distribution of Respondents

There is a majority of male respondents(85.7%) in comparison to female respondents(12.2%). This imbalance could influence spending patterns and product preferences, as different genders may prioritise different categories of expenditure or technology usage.

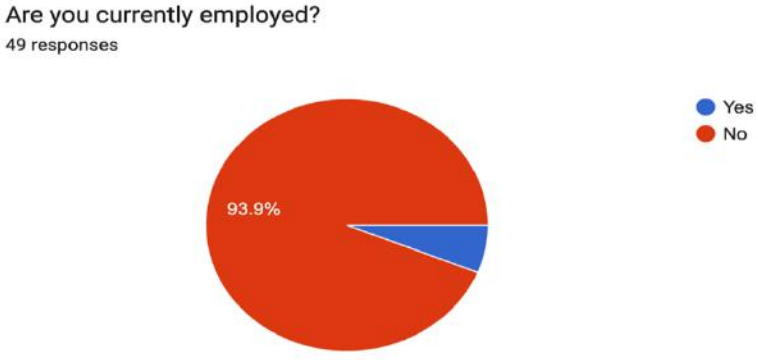
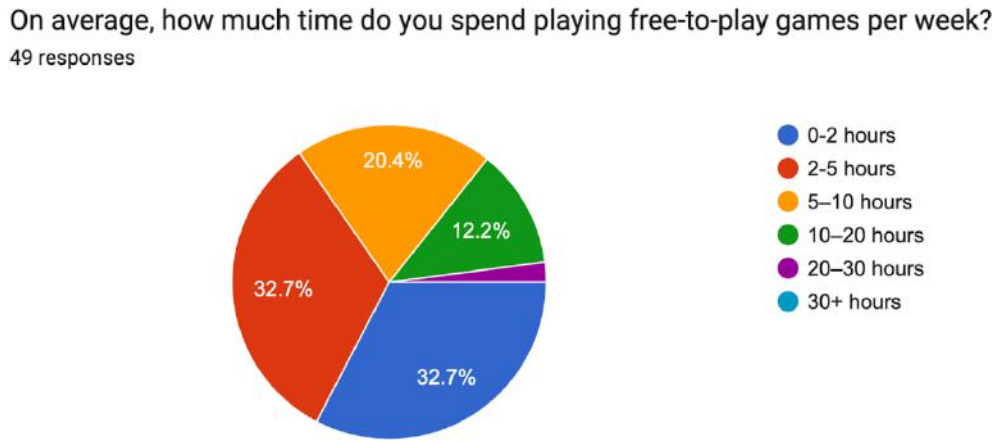


Figure A3: Employment Status of Respondents

Despite most respondents being unemployed and lacking a steady income, many still spend on in-game purchases driven by psychological and social influences rather than necessity.

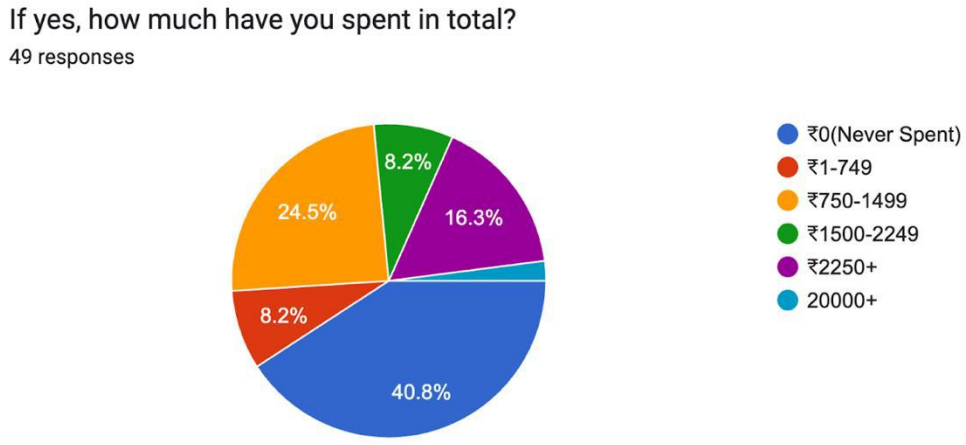
Appendix B

Behavioural and Spending Patterns



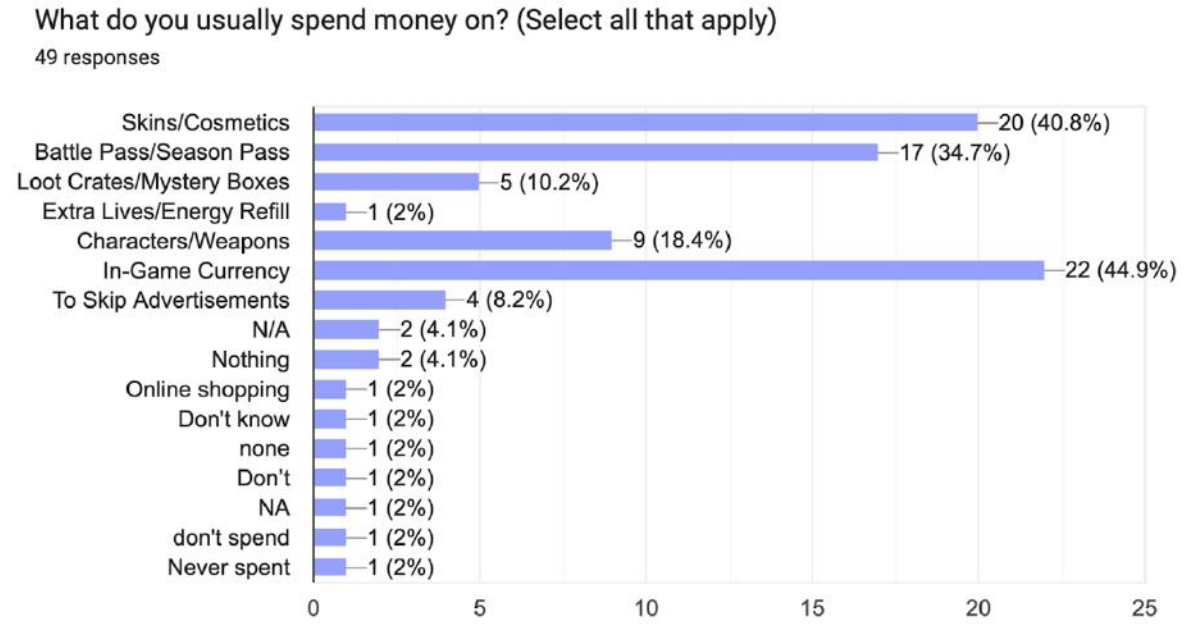
B.1 Weekly Gaming Duration

The largest segment falls within the 0–2 hours and 2–5 hours ranges, showing that most respondents play casually rather than excessively. A smaller portion exceeds 20 hours, indicating only a few highly dedicated gamers



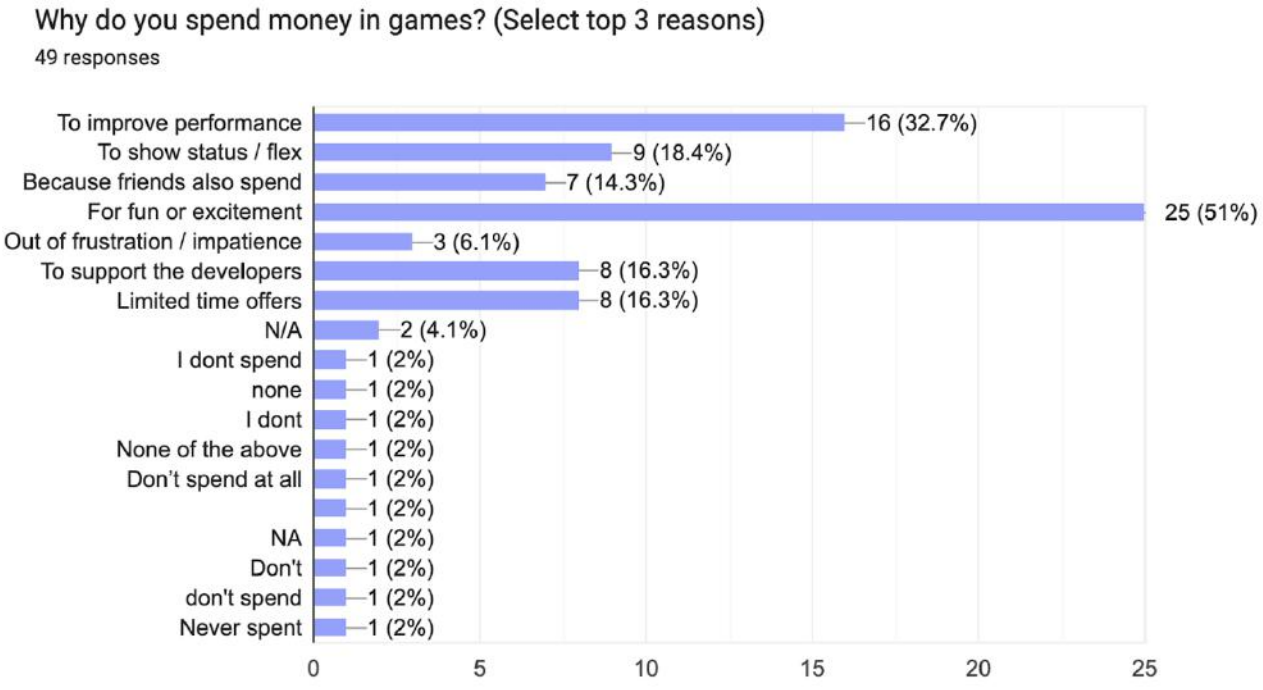
B.2 Spending Distribution

A majority of respondents report never spending money on games, likely reflecting limited disposable income among high-school students. Only a small percentage fall in the ₹1500+ bracket(8.2%), highlighting how cost sensitivity shapes purchasing behaviour.



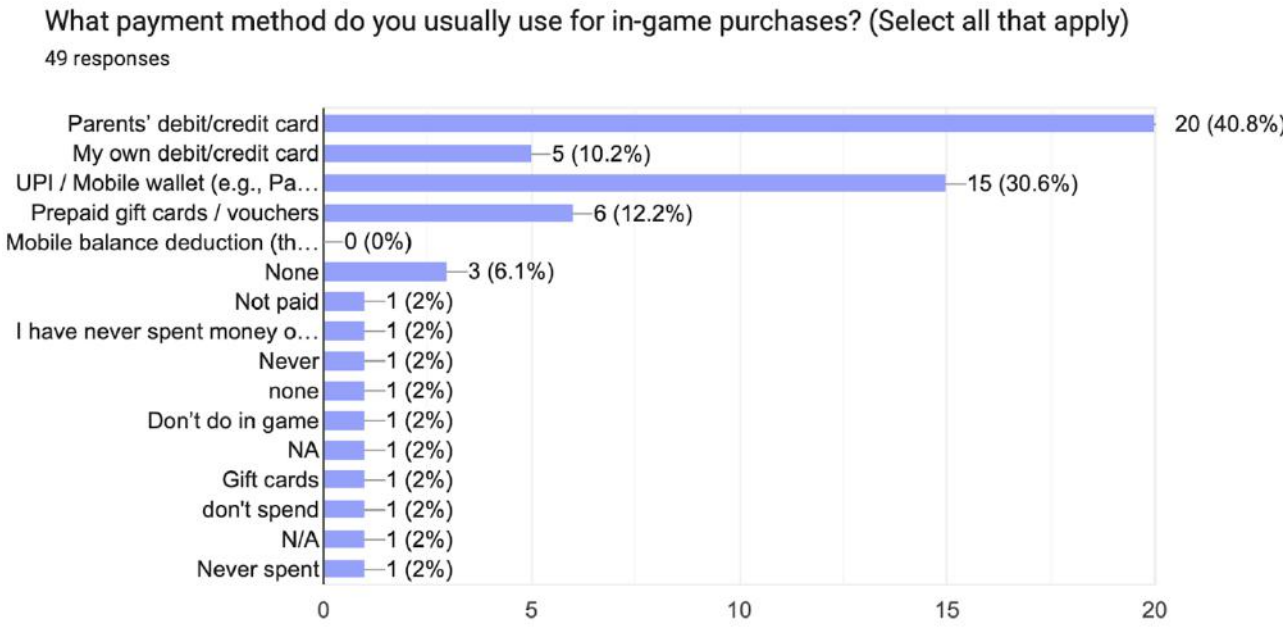
B.3 Area of Spending

Most spending is on In-game currency and Skins and Cosmetics



B.4 Reasons for Spending

Most spending is motivated by performance improvement or enjoyment, while fewer respondents cite social or status-based reasons.



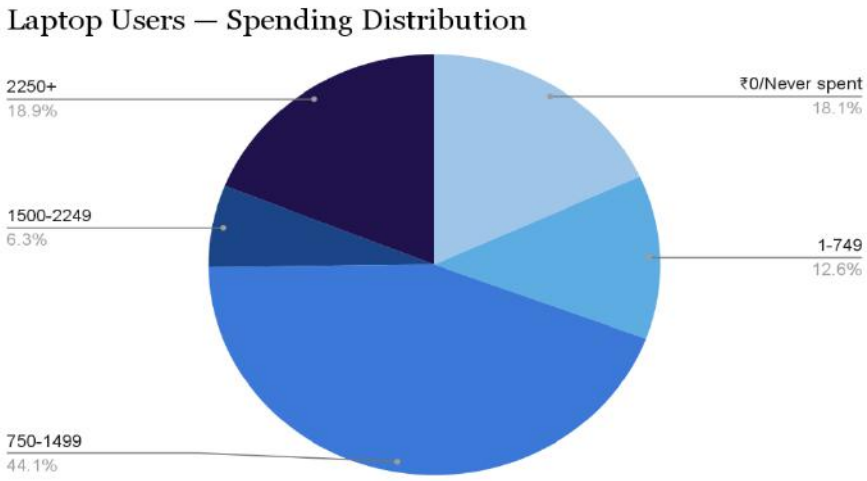
B.5 Payment Methods Used

Parents' cards and UPI wallets dominate, reflecting limited financial independence. The high "None" segment further supports that most respondents are non-spenders.

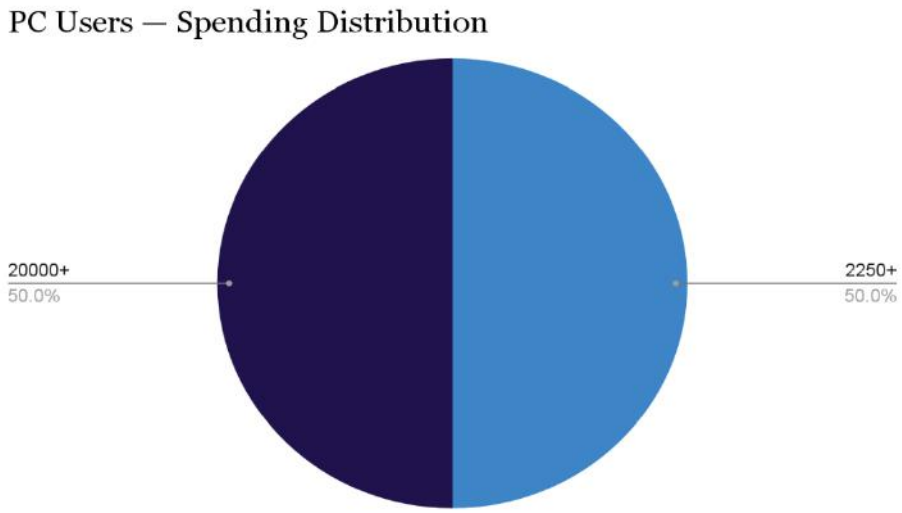
B.6 Summary of Insights

The Bar charts shown above highlight that high-school gamers in Mumbai are largely casual players with limited spending power.
Most play fewer than 10 hours per week and rarely spend beyond ₹749.
Console players, though fewer, show higher spending tendencies, and motivation is primarily performance-driven rather than social.

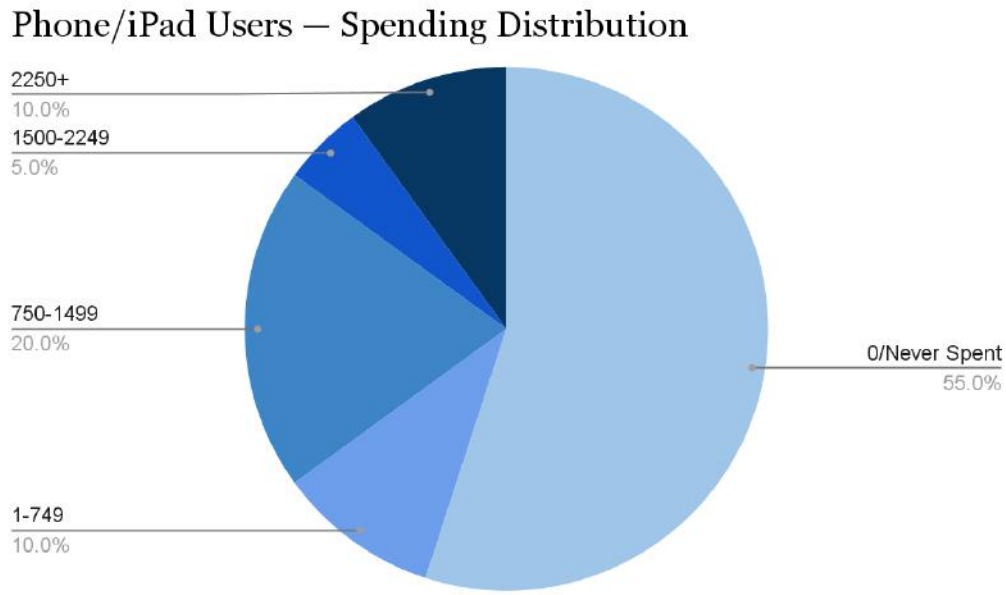
Appendix C
Correlations



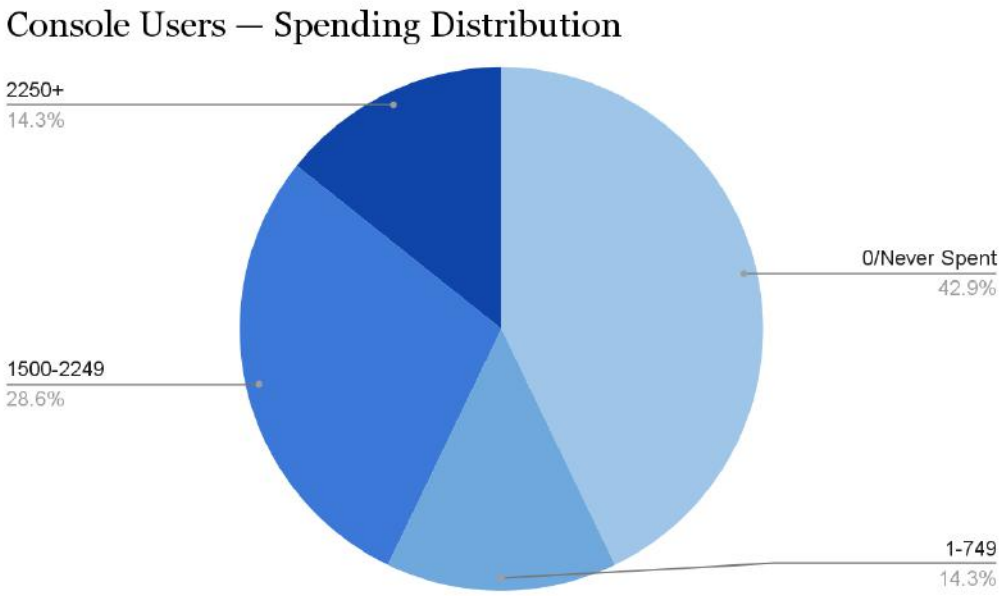
C.1.a Laptop Users-Spending Distribution
Most laptop gamers spend between ₹750–1499 (43.75%), indicating moderate but consistent discretionary spending despite 18% not spending at all.



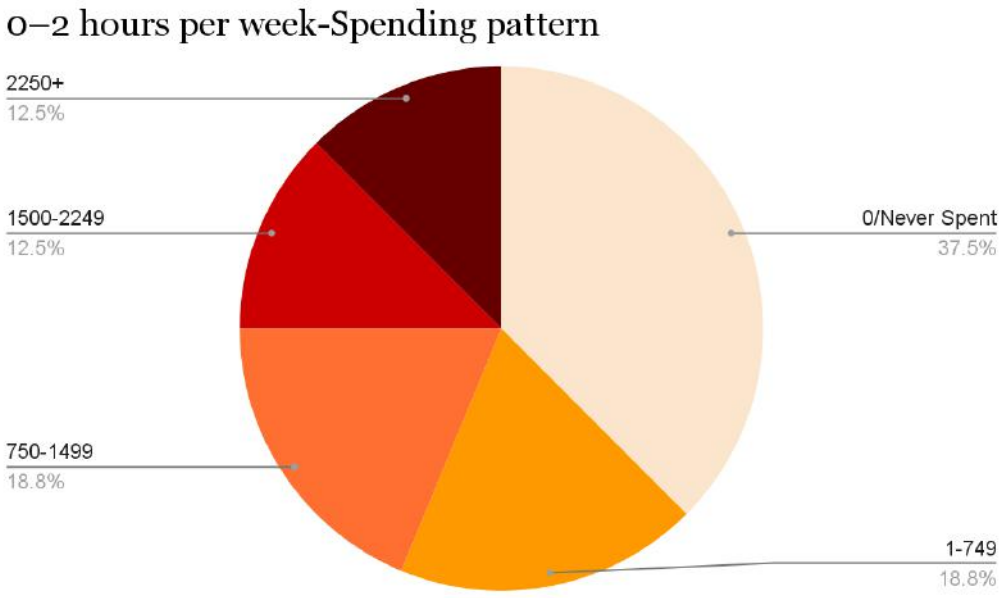
C.1.b PC Users-Spending Distribution
Half of PC users spend ₹2250 or more, showing that PC gaming attracts higher-value purchases and more dedicated financial investment.



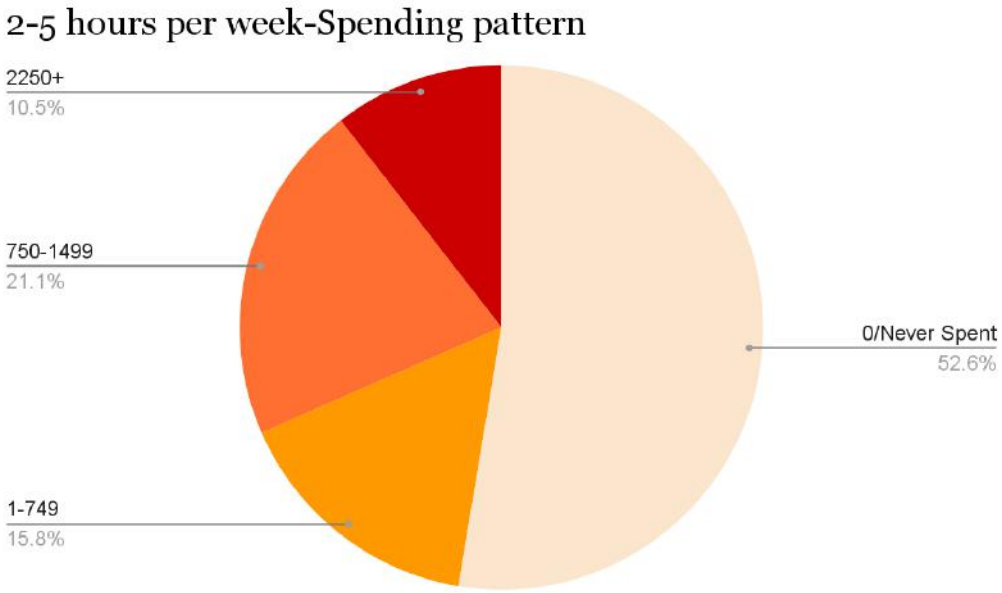
C.1.c Phone/iPad Users- Spending Distribution
A majority (55%) of mobile gamers report no spending, suggesting a strong preference for free-to-play models with selective premium purchases among the rest.



C.1.d Console Users- Spending Distribution
While 42.9% of console users do not spend, a notable 28.6% spend ₹1500–2249, implying that when console players do pay, they tend to invest in mid- to high-range titles.

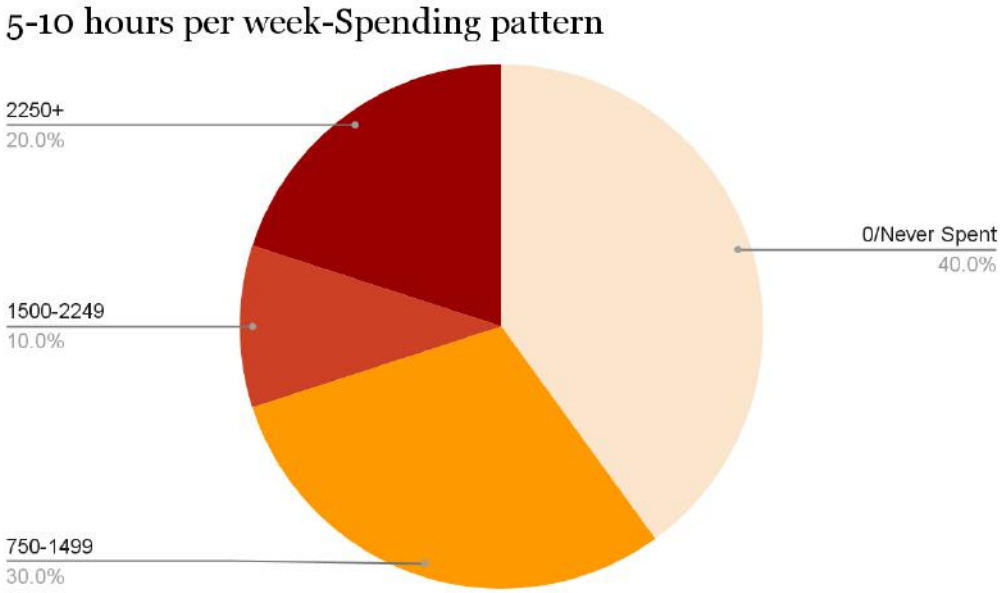


C.2.d 0-2 hours playtime-spending pattern
Most light gamers (37.5%) do not spend, with limited engagement translating to low financial commitment.



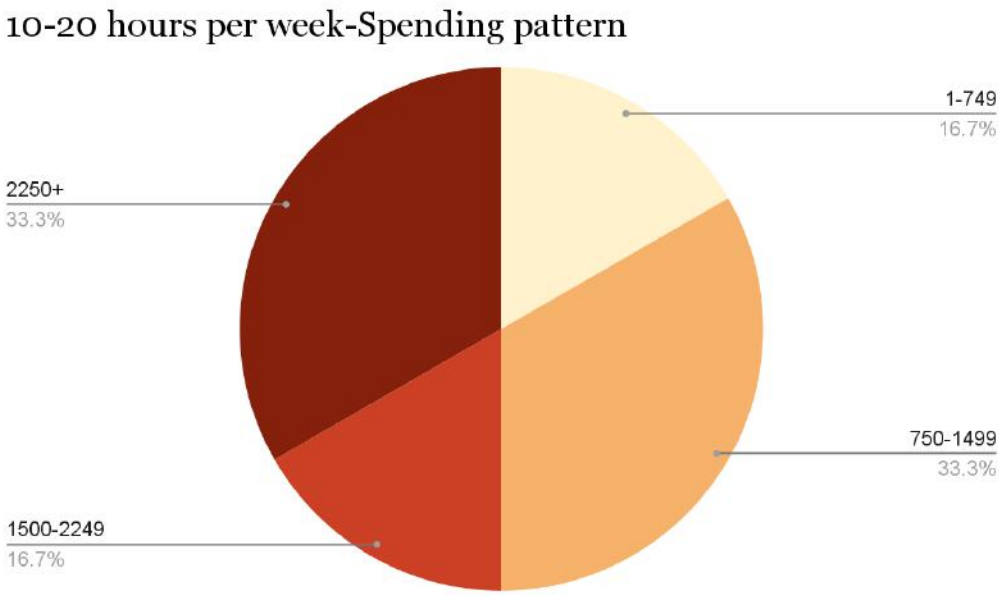
C.2.b 2-5 hours playtime-spending pattern

Despite moderate playtime, over 60% of this group reports no spending, suggesting gaming remains casual rather than consumptive.



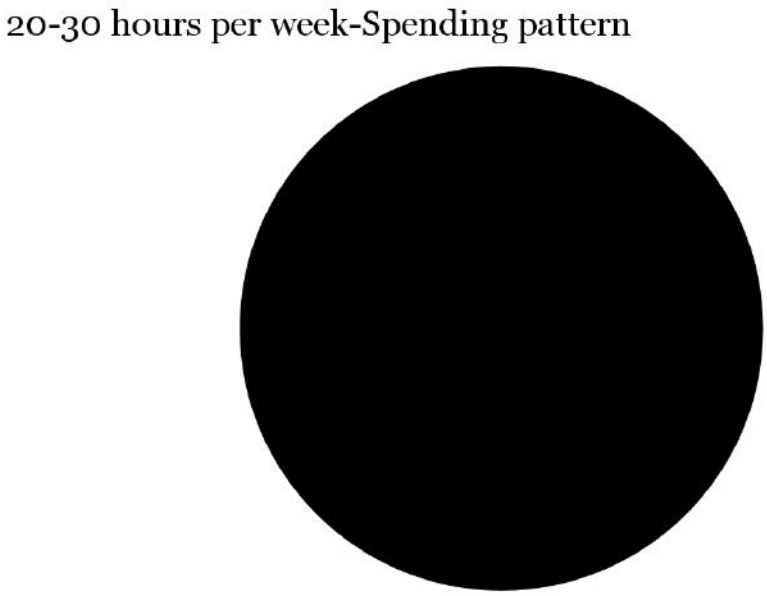
C.2.c 5-10 hours playtime-spending pattern

Spending diversifies in this range, with 30% spending ₹750–1499, showing increasing willingness to pay as playtime rises.



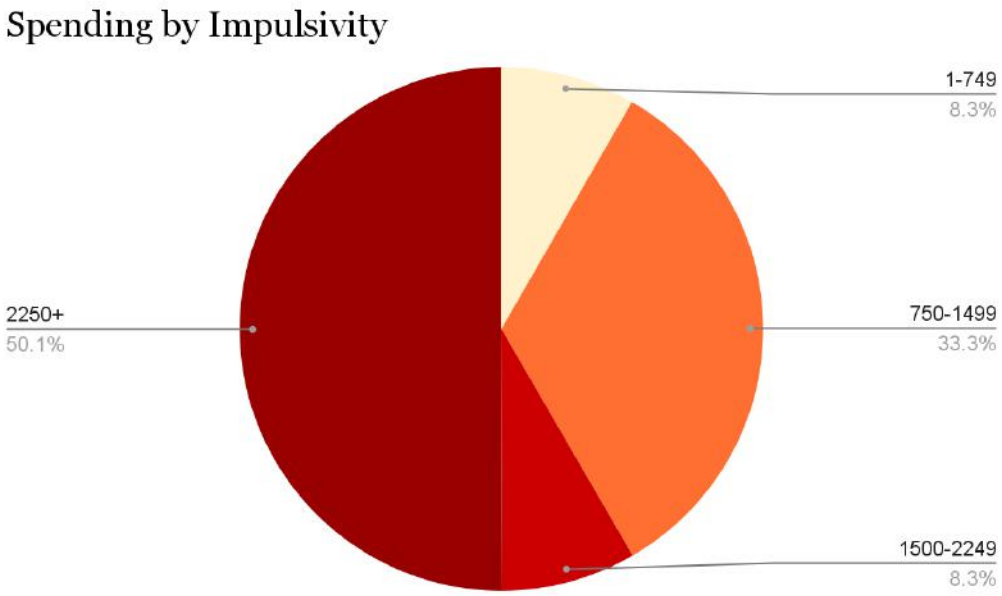
C.2.d 10-20 hours playtime-spending pattern

Spending peaks in the ₹2250+ range (33.3%), revealing a strong link between higher engagement and higher financial investment.



C.2.e 20-30 hours playtime-spending pattern

This group exclusively falls in the ₹20000+ category, highlighting that extreme engagement correlates with extreme spending.



C.3 Money spent on impulsive purchases
Half of impulsive buyers spend ₹2250 or more, showing that impulse-driven purchases often involve higher-value spending rather than minor add-ons.

A. Glossary

Terms used

Age-A demographic variable used to analyze spending patterns across different life stages, often influencing disposable income and gaming behavior.

Consumer Spending-The amount of money players allocate toward in-game purchases, reflecting individual economic decisions within the freemium model.

Discounts/-Price reductions on in-game purchases, designed to incentivize spending by appealing to perceived savings.

Employment Status-Indicates whether a respondent is currently working, relevant to their level of disposable income and ability to spend on games.

Free-to-Play (F2P) Games-Games that are free to download and play but generate revenue through optional in-game purchases.

Gameplay Duration-The total time a player engages with games, often measured in hours per week or years of experience.

Gender-A demographic category that may influence preferences, motivations, and spending behavior in gaming.

Impulsive Buying-Unplanned, spontaneous purchases often triggered by emotional cues, social influence, or limited-time offers.

In-Game Purchases (Microtransactions)-Digital transactions within a game, including cosmetic items, boosts, skins, or premium passes.

Limited-Time Offers-Special deals or exclusive items available for a short period, leveraging scarcity and urgency to drive purchases.

Minimum Playtime Requirement-A condition where players must dedicate a specific number of hours to unlock content, serving as an alternative to monetary spending.

Monthly Spending-The recurring amount players allocate to free-to-play games on a monthly basis.

Peer Influence-The pressure to make in-game purchases in order to match friends' items, skins, or progress.

Platforms-The devices on which games are played, such as mobile phones, PCs, or consoles.

Pre-Game Spending Intentions-The expectations players have about whether they will spend money before starting a free-to-play game.

Purchase Regret-Dissatisfaction experienced after making an in-game purchase, linked to buyer's remorse or perceived lack of value.

Reasons for Spending-The motivations behind in-game purchases, such as competitiveness, personalization, convenience, or status.

Total Expenditure-The cumulative amount of money spent on free-to-play games over time.

Glossary for Gaming Hardware

Consoles (PS, Xbox, Nintendo)-Home gaming systems connected to TVs, offering high-quality graphics, exclusive titles, and multiplayer options.

Handheld Consoles (PSP, Steam Deck, etc.)-Portable gaming devices designed for on-the-go play, balancing performance with mobility.

Glossary for In-Game Items

Skins / Cosmetics-Visual customizations that alter a character's or item's appearance without changing gameplay.

Battle Pass / Season Pass-A timed progression system where players unlock rewards, often blending free and paid tiers.

Loot Crates / Mystery Boxes-Randomized virtual boxes containing in-game items, purchased with real or virtual currency.

Extra Lives / Energy Refill-Consumable items allowing players to continue or extend play sessions without waiting.

Characters / Weapons-Playable avatars or tools used in gameplay, sometimes unlocked via purchase.

In-Game Currency-Virtual money used to buy items, skins, or upgrades, earned through play or purchased with real money.

To Skip Advertisements-A purchase option that removes ads, often in casual or mobile games, for smoother play.

Glossary for Games

Roblox-An online platform and game creation system where users design and play a vast range of community-made experiences spanning multiple genres, accessible on nearly every device and thriving with a diverse, global player base.

EA FC(Mobile)- A football simulation game offering a variety of play modes including head-to-head and tournaments, allowing players to compete with authentic clubs, teams, and friends in real-time matches.

Call of Duty- A first-person shooter game delivering a military simulation experience, focused on realistic combat scenarios, tactical coordination, weapon authenticity, and highly immersive environments across both solo and multiplayer modes.

PUBG / BGMI-Battle royale shooters where players drop into large maps, scavenge for gear, and compete to be the last person standing, known for tactical gameplay and strategic survival.

Fortnite-A battle royale game blending shooting and survival mechanics with unique building features, creating fast-paced, creative, and competitive gameplay.

Valorant-A team-based tactical first-person shooter where players pick unique agents with abilities, combining precise shooting mechanics with strategic team play.

CS:GO (Counter-Strike: Global Offensive)-A classic competitive tactical shooter emphasizing precision, strategy, and teamwork, widely recognized as a cornerstone of esports.

Candy Crush / Casual Games-Match-three puzzle and casual titles designed for quick, accessible play sessions, appealing to a wide range of players with simple yet addictive gameplay.

Marvel Rivals-A team-based superhero shooter that blends action and strategy, allowing players to control Marvel characters in coordinated squad battles.

PvZ (Plants vs Zombies)-A lighthearted tower defense strategy game where players place plants with unique abilities to defend against waves of incoming zombies.

Chess-A timeless strategy board game, available both physically and digitally, focused on critical thinking, planning, and anticipating an opponent’s moves.

Minecraft-A sandbox and survival game set in procedurally generated worlds, encouraging players to explore, build, craft, and survive creatively or competitively.

Real Racing 3-A mobile racing simulation game offering realistic cars, tracks, and events, known for its accessible yet authentic motorsport experience.

Mortal Kombat-A long-running fighting game franchise featuring one-on-one battles, special moves, and iconic finishing moves, known for its intense action style.

Clash Royale-A real-time strategy and tower defense mobile game combining collectible cards with competitive duels in quick, skill-based matches.

B. Genres of Games

Figure 1. Genre Table for Games

Genre	Games
Shooter	Call of Duty Valorant CS:GO (Counter-Strike: Global Offensive) Marvel Rivals
Battle Royale	PUBG / BGMI Fortnite
Casual / Puzzle	Candy Crush / Casual Games
Strategy	Chess PvZ (Plants vs Zombies) Clash Royale
Sandbox / Survival	Minecraft
Sports	EA FC (Mobile) Real Racing 3
Fighting	Mortal Kombat
Platform / Creation /Simulation	Roblox