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STORE
LUCK ROYALE
CHARACTER
VAULT
PET
COLLECTION
Predicting Video Game Sales and Pricing Trends
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START

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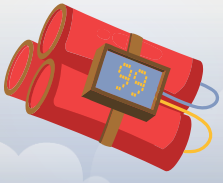


01

PROBLEM SPECIFICATION

02

UNDERSTANDING DATA

03

MARKETING ANALYSIS

04

CONCLUSIONS

What's the problem?

Imagine you're the Product Owner at a gaming company tasked with launching a new video game from scratch—there's no market data, no customer feedback, and no defined product features. How do you begin??

Dataset Details

Game Details

Name
Platform
Release Year
Genre

Review Data

Critic Score
Critic Count
User Score
Rating

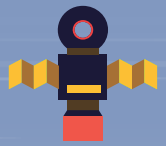
Sales Figures

Global Sales
EU Sales
NA Sales
Price

Why this dataset??

Manageable Data Size

- 2000 rows
- 18 features



Enables Multiple Analytical Approaches

- Conjoint
- Sales Modelling
- Sales Forecasting

Interesting Features

- Platform
- Global Sales
- Critic Score

The Right Approach....

As the Product Owner, your primary goal is to make strategic decisions that ensure a successful launch, balancing creativity with data-driven insights. But with so many factors in play (audience preferences, price sensitivity, competitive landscape, and forecasted demand), how do you chart the path forward?

The following question should trouble us -

- Who is the target audience, and what do they value?
- What features and pricing will attract the most buyers?
- How should we price the game to maximize profitability and accessibility?
- What is the projected demand, and how should we plan for it?


Let’s Begin the Team Hurdle...

Data Preprocessing

Extracted game prices from various internet sources

Creating New Features for Revenue, Ratings etc

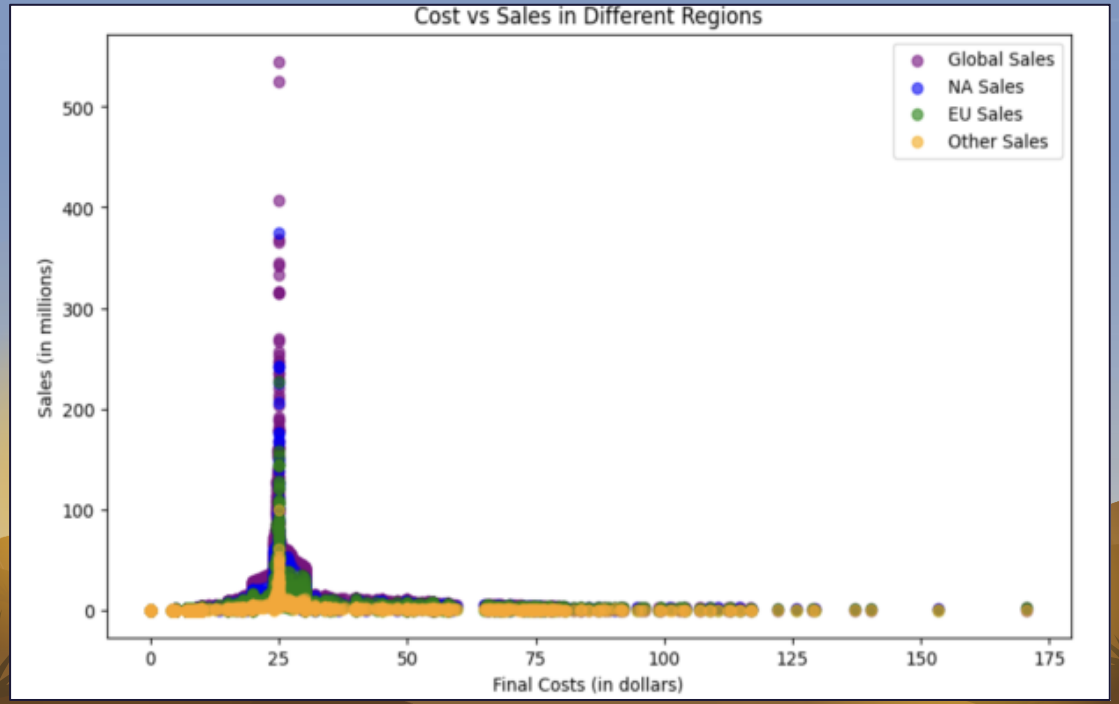
Dealt with the null values

Converting Categorical Variables to Numerical

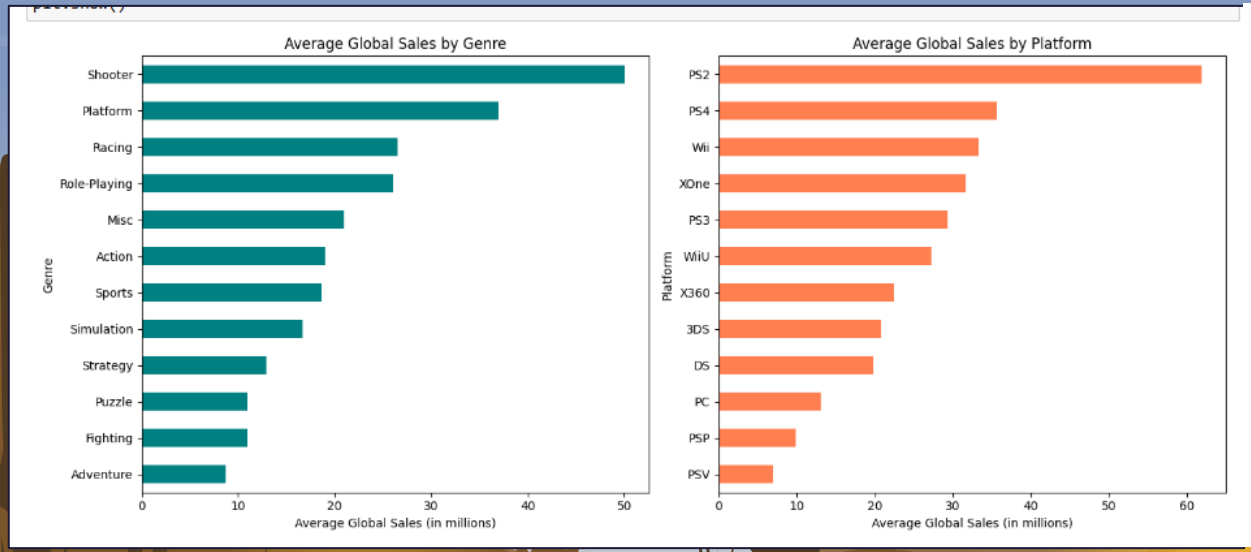
Exploratory Data Analysis

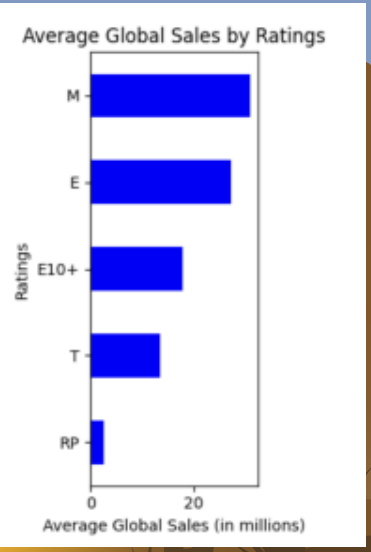
- Descriptive Statistics
- Data Visualization
- Correlation Analysis
- Customer and Market Insights
- Exploring Sales Based Trends

Cost vs. Sales Analysis Across Regions

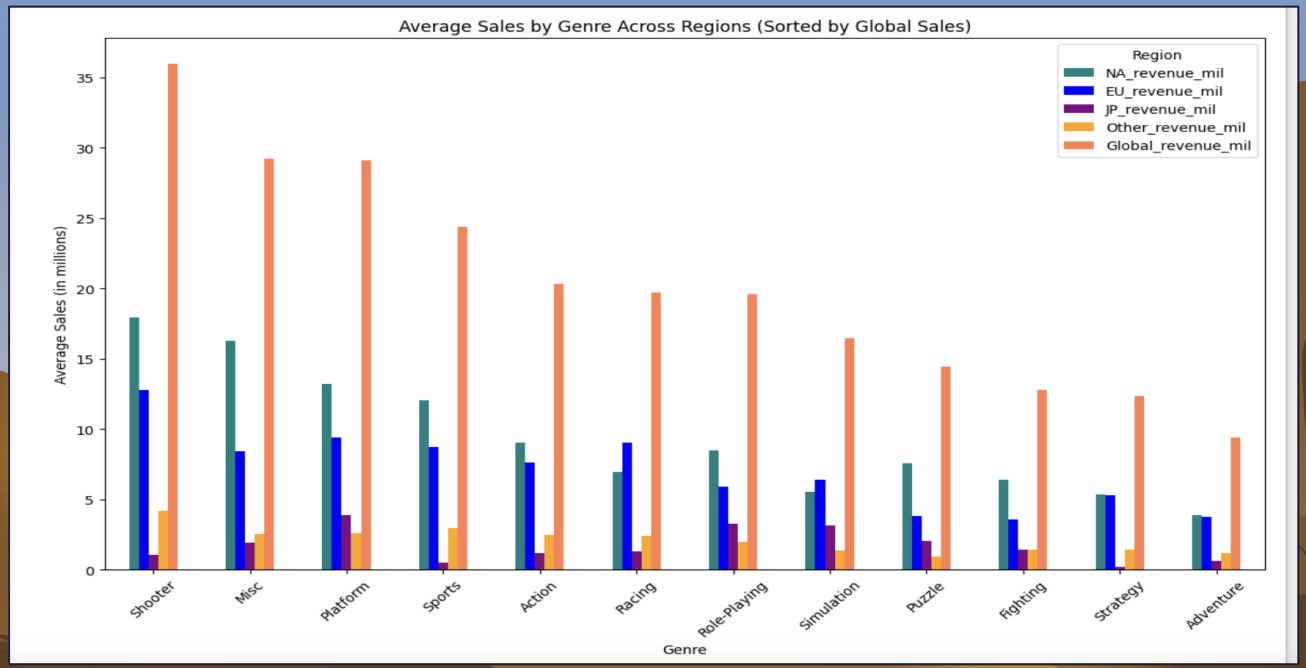


Global Sales Trends by Genre, Ratings and Platform

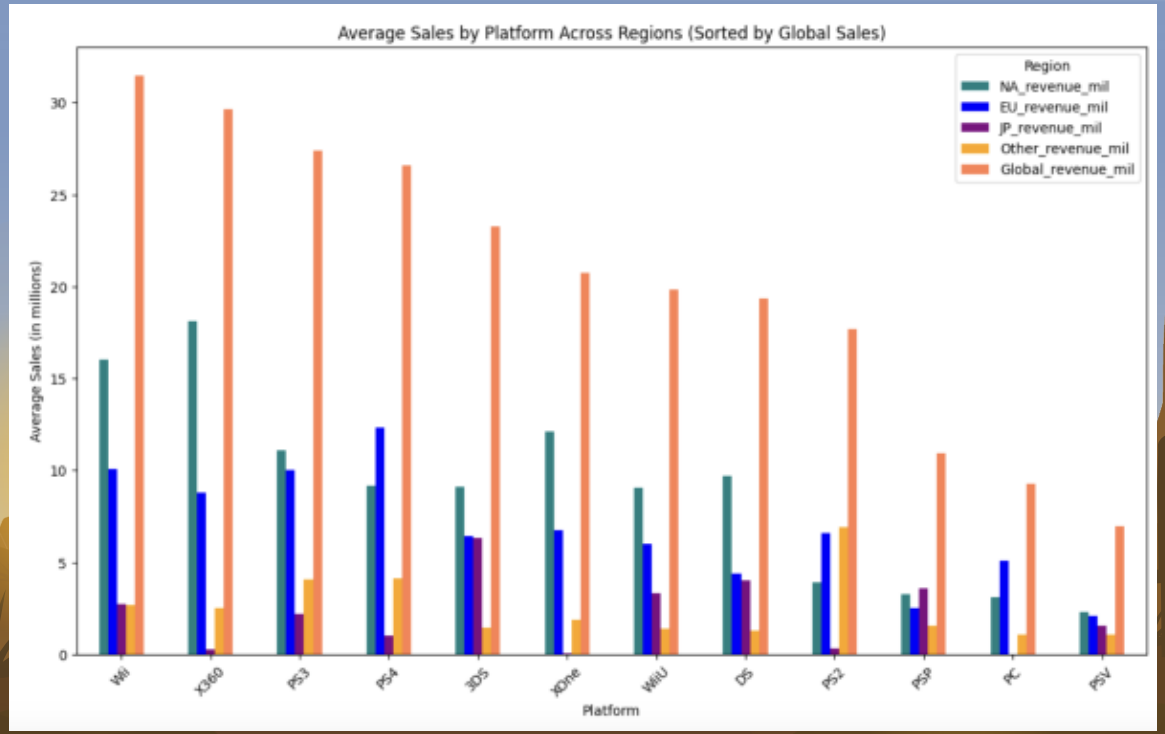




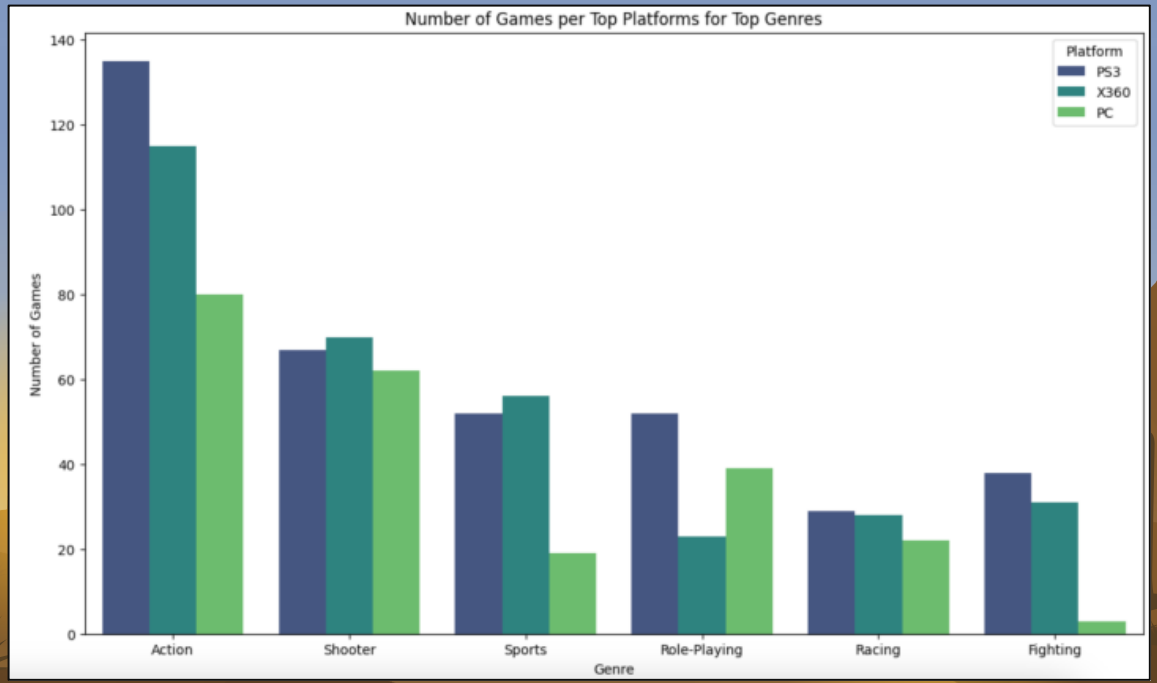
Sales Analysis Across Regions

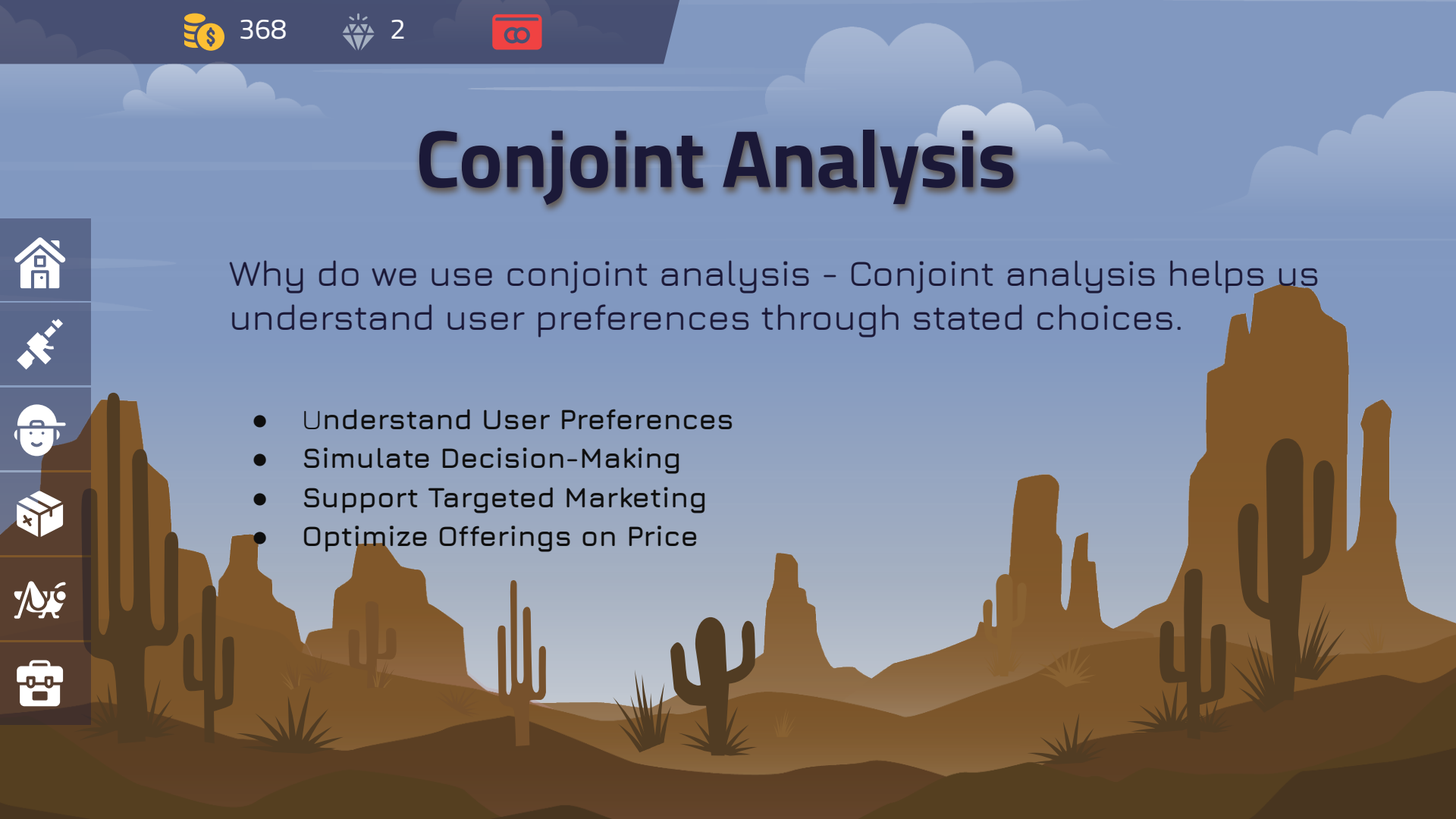


Sales Analysis Across Game Platform



Top Platforms per genre

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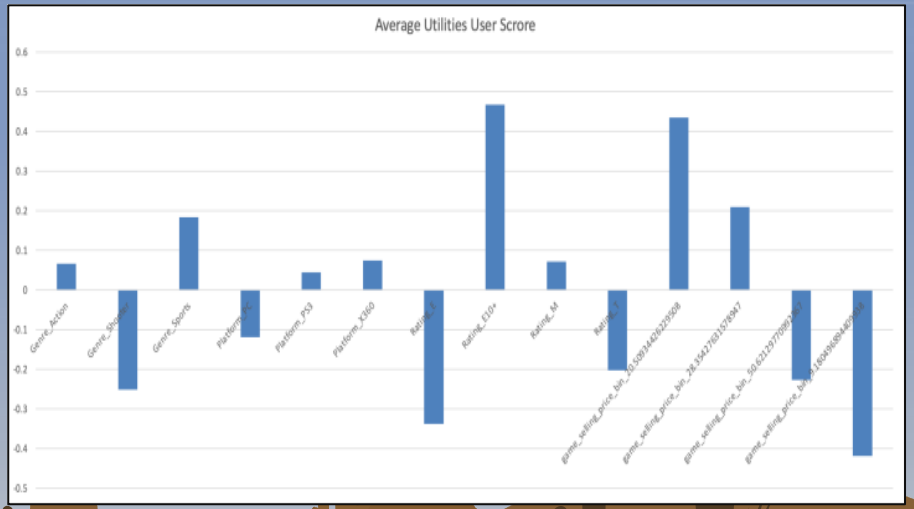
Conjoint Analysis
Why do we use conjoint analysis - Conjoint analysis helps us understand user preferences through stated choices.
Understand User Preferences
Simulate Decision-Making
Support Targeted Marketing
Optimize Offerings on Price

Conjoint Description

- Calculated **Beta coefficients (utilities)** for each user who rated using genre, platform, rating, and selling price (we took the average of the bins as SP was continuous) to estimate market share.
- Developed **four product lines** based on these features to analyze market share for P1 product line.
- Kept **Product Line 1 Base line** and calculated **elasticities** for getting optimal price for baseline
- Checked price 9, 20, 28 and 50 to get the the highest market size of P1 product.

	P1	P2	P3	P4
Genre-Action	1	0	0	0
Genre-Shooters	0	1	0	0
Genre-Sports	0	0	1	1
Intercept	1	1	1	1
Platform-PC	1	0	0	1
Platform-PS3	0	1	0	0
Platform-X360	0	0	1	0
Rating_E	1	0	0	0
Rating_E10+	0	0	0	1
Rating_M	0	1	0	0
Rating_T	0	0	1	0
game_selling_price_bin_20.50934426229508	0	0	0	1
game_selling_price_bin_28.35427631578947	0	0	1	0
game_selling_price_bin_50.62129770992367	1	1	0	0
game_selling_price_bin_9.180496894409938	0	0	0	0

Utility Comparison



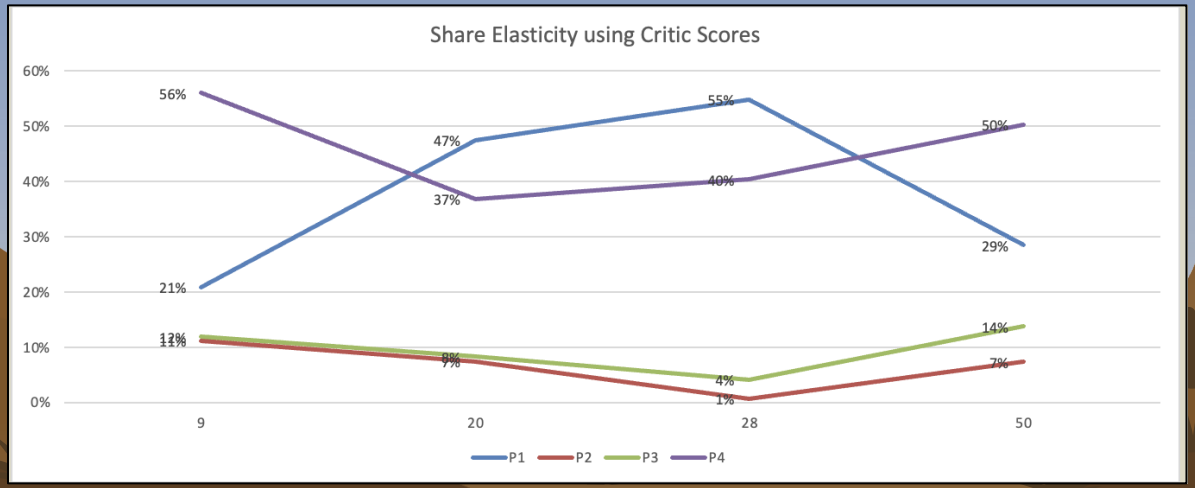
Attribute Importance

Critic Score		User Score	
Rating	31.70%	Genre	27.80%
Platform	24.00%	Platform	24.90%
Price	21.90%	Price	21.90%

Critics Population Survey Results

Product ID	Genre	Platform	Ratings	Game_selling
P1	Action	PC	E	9
P2	Shooter	PS3	M	50
P3	Sports	X360	T	28
P4	Sports	PC	E10+	20

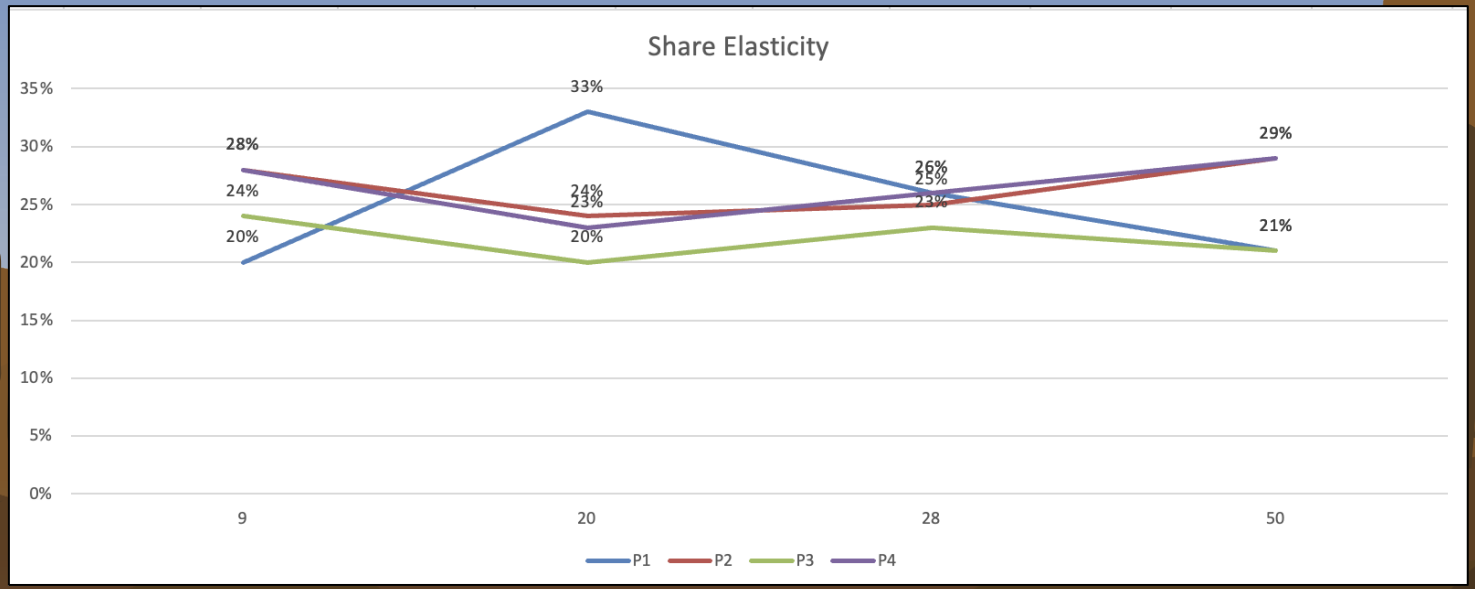
	Action, PC, E (P1)				%change	elasticity
	9	20	28	50	139%	
P1	21%	47%	55%	29%	31%	0.2221503
P2	11%	7%	1%	7%	-41%	-0.293457
P3	12%	8%	4%	14%	15%	0.1072828
P4	56%	37%	40%	50%	-11%	-0.077858



Consumer Population Survey Result

Product ID	Genre	Platform	Ratings	Game_selling
P1	Sports	PS3	E10+	9
P2	Action	PS3	T	28
P3	Sports	X360	E	50
P4	Shooter	X360	M	28

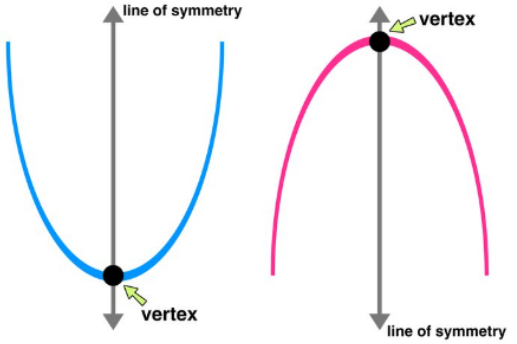
	Sports PS3 E10+ (P1)				%change	elasticity
	9	20	28	50	139%	
P1	20%	33%	26%	21%	5%	0.035
P2	28%	24%	25%	29%	4%	0.025
P3	24%	20%	23%	21%	-13%	-0.096
P4	28%	23%	26%	29%	4%	0.025
sum	100%	100%	100%	100%		



Sales Price Modeling

Sales are assumed to be a function of price, following a quadratic relationship with price and related variables. While a log-normal distribution could provide a more detailed representation, a quadratic function is chosen here to simplify the analysis and improve interpretability.

Vertex of a Parabola



To find the vertex point of a parabola of the form:

$$f(x) = ax^2 + bx + c$$

1.) Use the formula below to find the x-coordinate value

$$x = \frac{-b}{2a}$$

2.) Input the x-coordinate value into the function to find the y-coordinate value

Breakeven Sales

- Average Fixed Production costs of Sports Games = $150 Million (Fifa Avg) - internet source
- Average Fixed Production costs of Shooter Games = $150 Million (Call of Duty) - internet source
- Average Fixed Production costs of Action Games = $100 Million (Assassin's Creed Odyssey) - internet source
- Marketing Costs usually range from 1 to 5 Million dollars adjusted for inflation
- Maintenance costs range from $250k to $2 million a year

Coefficients and p-values:

	Feature	Coefficient	p_value
0	const	558992.088341	0.011903
1	game_selling_price	39615.450932	0.000948
2	game_selling_price^2	-525.135906	0.000044

$37.72 is the optimal price of a game

Sales Forecasting

1. We selected the three most popular game categories/genres: Sports, Shooter, and Action
2. For each category, we calculate mpq values, where:
    a. m represents the market size (based on genre market data)
    b. p represents the adoption rate
    c. q represents the imitation rate
3. The mpq values are derived from industry benchmarks and adjusted with the understanding that the average game lifecycle is 8 to 10 years.

For Sports: m= 24 million, p=0.135, q=0.635

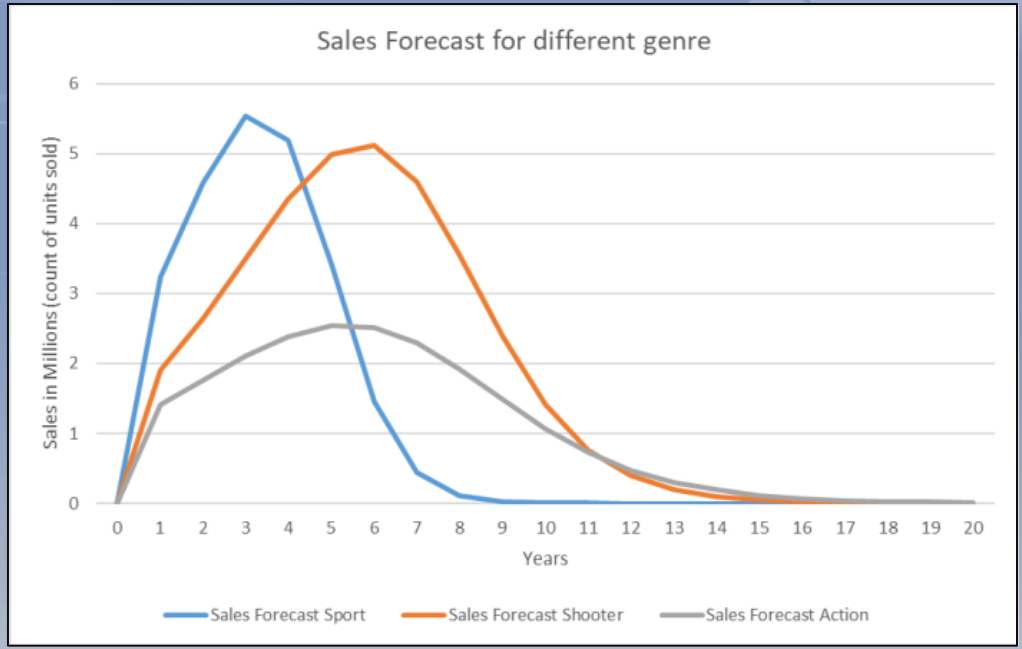
TOTAL SHARE % (Sports)	
Innovators	44.91%
Imitators	55.09%

For Shooter: m= 36 million, p=0.053, q=0.46

TOTAL SHARE % (Shooter)	
Innovators	30.26%
Imitators	69.74%

For Action: m= 21.5 million, p=0.066, q=0.33

TOTAL SHARE % (Action)	
Innovators	39.75%
Imitators	60.25%



Results

Time Period	Price	MARGIN FOR SPORTS CATEGORY			MARGIN FOR SHOOTER CATEGORY			MARGIN FOR ACTION CATEGORY		
0	**37.72**	**15%**	**20%**	**22.5%**	**15%**	**20%**	**25%**	**15%**	**20%**	**25%**
1		18.33	24.44	30.55	10.80	14.39	17.99	8.03	10.70	13.38
2		44.26	59.01	73.76	25.72	34.30	42.87	18.00	24.00	30.00
3		75.56	100.75	125.93	45.49	60.66	75.82	29.90	39.87	49.84
4		104.97	139.96	**174.96**	70.13	93.50	116.88	43.40	57.87	72.34
5		124.26	**165.68**	207.10	98.36	131.15	**163.93**	57.78	77.04	**96.30**
6		132.52	176.69	220.86	127.34	**169.78**	212.23	72.00	**96.01**	120.01
7		134.99	179.99	224.98	**153.34**	204.46	255.57	84.98	113.30	141.63
8		135.60	180.81	226.01	173.44	231.26	289.07	**95.85**	127.80	159.75
9		135.75	181.00	226.25	186.89	249.19	311.49	104.26	139.01	173.77
10		135.78	181.04	226.30	194.87	259.83	324.79	110.33	147.10	183.88
11		135.79	181.05	226.32	199.22	265.63	332.03	114.46	152.62	190.77
12		135.79	181.06	226.32	201.47	268.62	335.78	117.17	156.22	195.28
13		135.79	181.06	226.32	202.60	270.13	337.66	118.89	158.52	198.14
14		135.79	181.06	226.32	203.15	270.87	338.59	119.96	159.95	199.93
15		135.79	181.06	226.32	203.43	271.24	339.04	120.62	160.83	201.03
16		135.79	181.06	226.32	203.56	271.41	339.27	121.02	161.36	201.71
17		135.79	181.06	226.32	203.63	271.50	339.38	121.27	161.69	202.12
18		135.79	181.06	226.32	203.66	271.54	339.43	121.42	161.89	202.36
19		135.79	181.06	226.32	203.67	271.56	339.46	121.51	162.01	202.51
20		**135.79**	181.06	226.32	203.68	271.57	339.47	121.56	162.08	202.61

Recommendations

- With a baseline cost of $37.72 and a 15% margin, releasing a sports game typically results in an average loss due to high production costs
.
- Average production costs require 4-7 years to break even, depending on the game genre and profit margins.

- Sports games experience high early adoption by innovators, followed by a plateau in demand over time.

- Recommended release cycle: sports games every 3 years, action games every 12 years, and shooter games every 10 years to maximize market engagement and profitability.

- The typical game lifespan is 8-10 years, with players prioritizing genre while critics place greater emphasis on ratings.

Conclusion

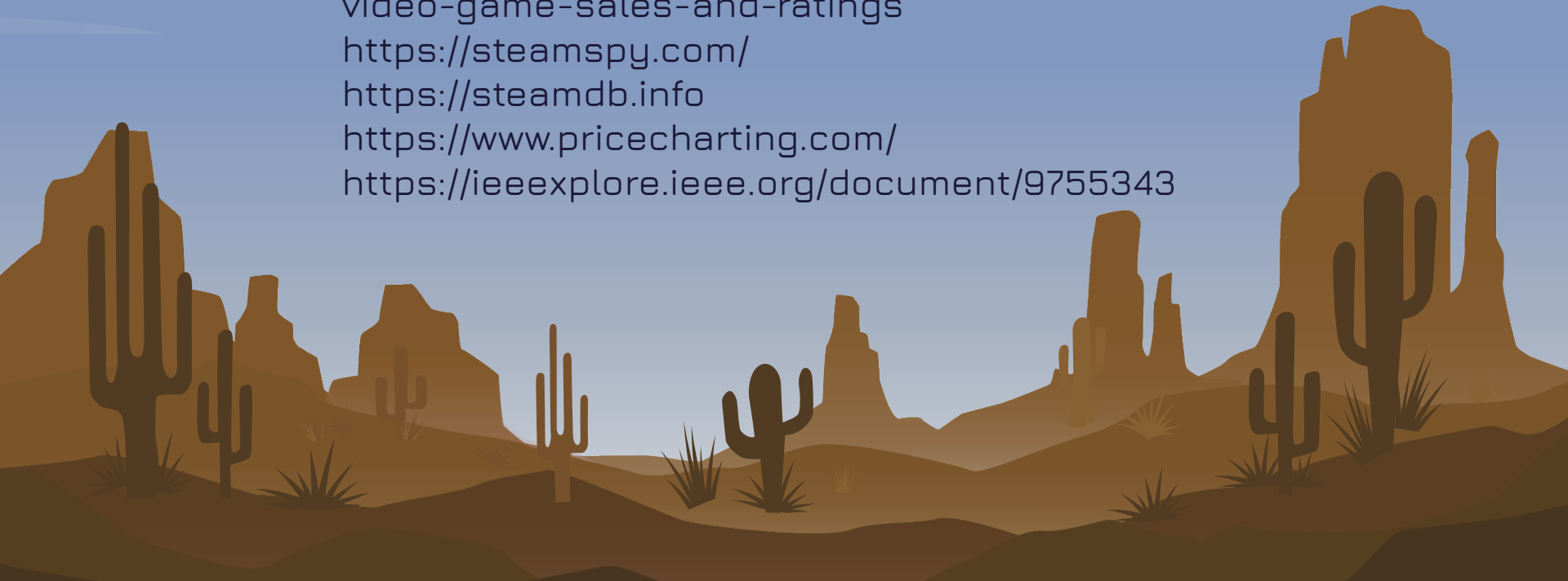
To summarize, insights from conjoint analysis, pricing models, and sales forecasts enable strategic decisions on product features, pricing, and financial planning. By pinpointing customer priorities, setting optimal prices, and forecasting value, I'm positioned to drive a successful launch and maximize profitability over the product's lifecycle.

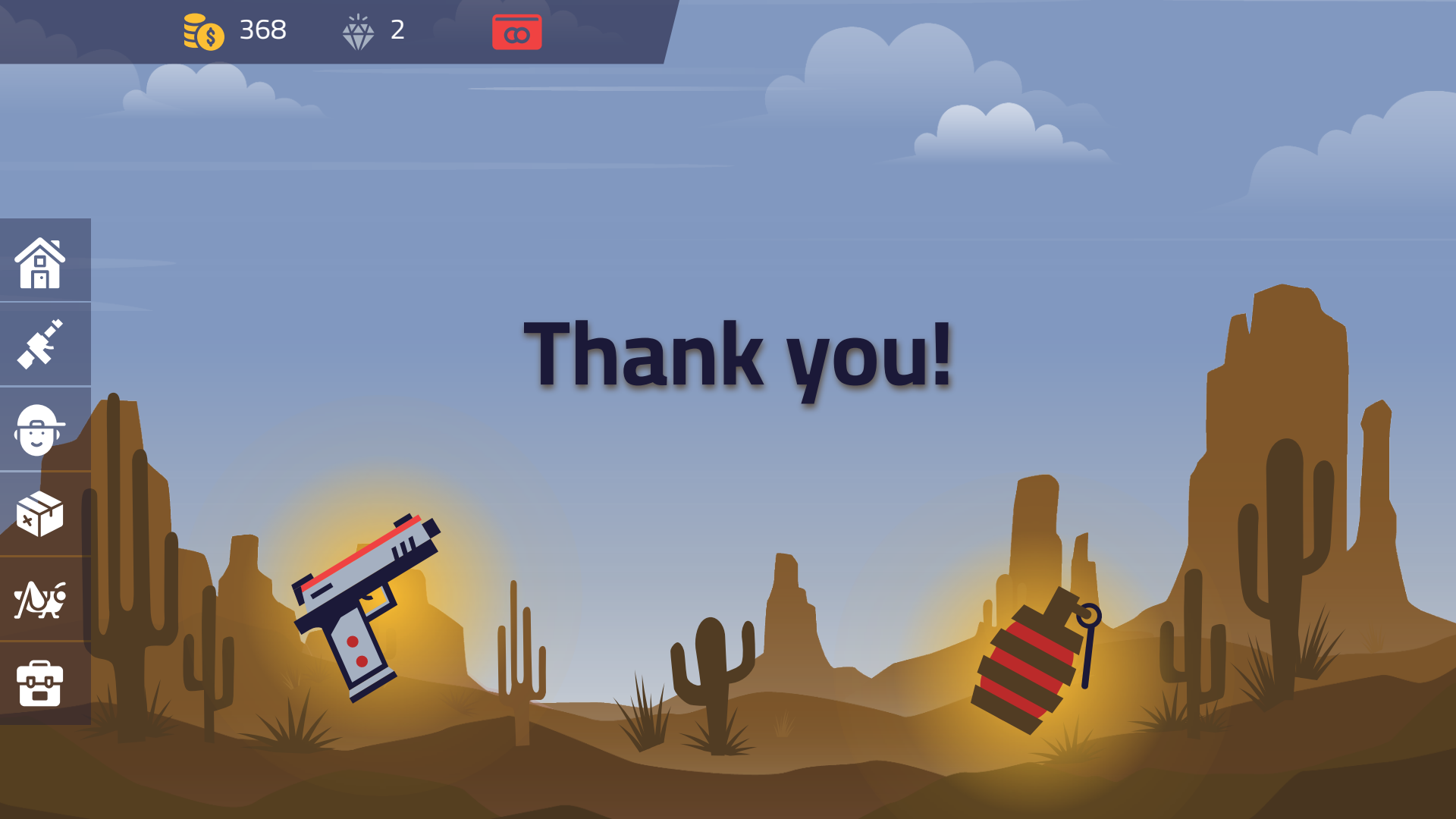
Future Scope of Work

- Comprehensive Cost Analysis
- Pricing Optimization
- Scenario Analysis
- Enhanced Forecasting

References

https://www.kaggle.com/datasets/thedevastator/video-game-sales-and-ratings
https://steamspy.com/
https://steamdb.info
https://www.pricecharting.com/
https://ieeexplore.ieee.org/document/9755343

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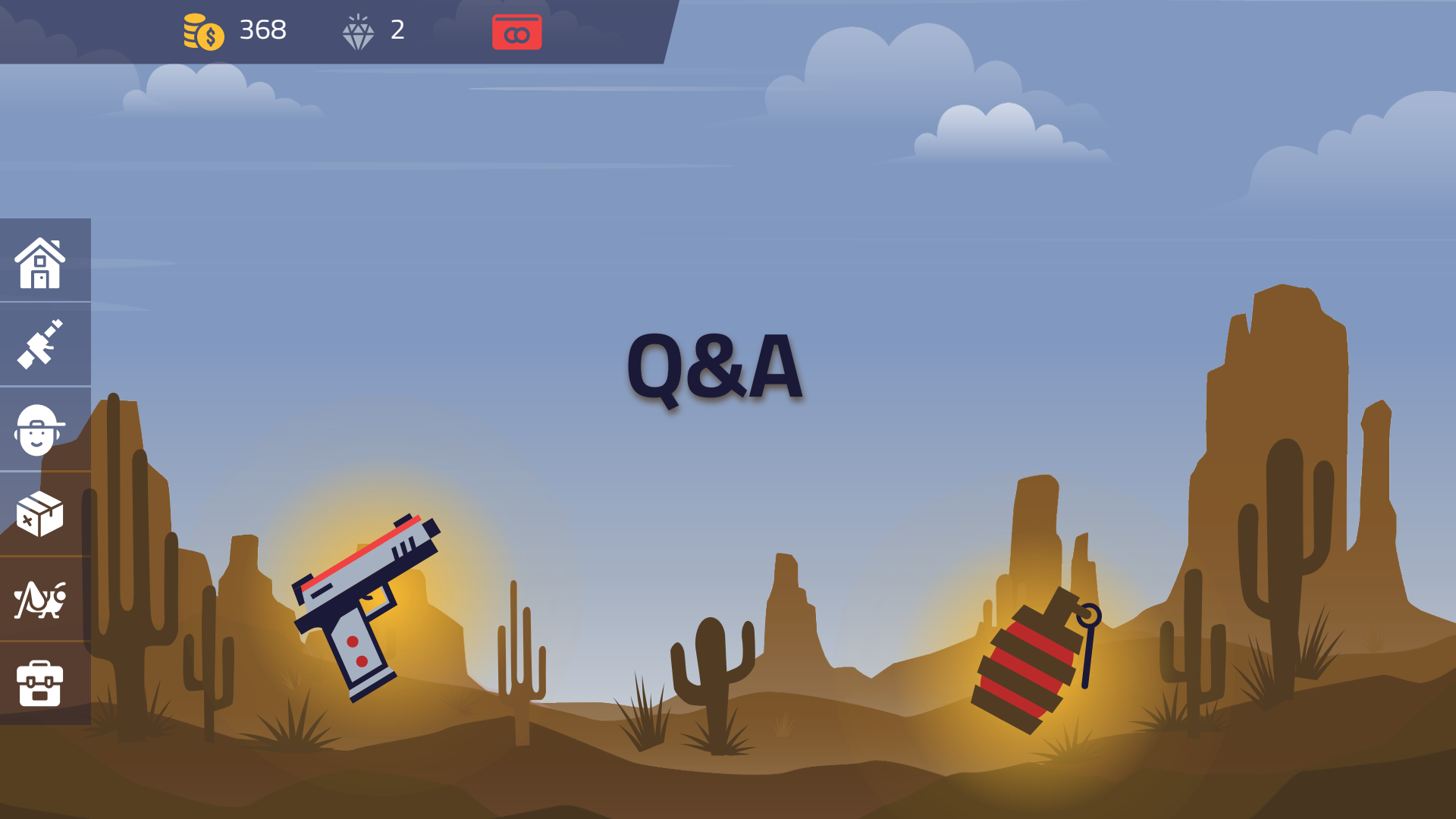
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Q&A