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# HOMEWORK04 – PANDAS

## HEROES OF PYMOLI

For this homework, I analyzed the Purchase profile of the Heroes Pymoli Game. The information contains a lot of details like Purchase ID, SN, Age, Gender, Item ID, Item Name, and Price. Since I am talking about an online game, typically the items are bought individually, it means Qty = 1, therefore Price = Sales at the individual level of each Purchase ID. It is essential to mention it since I have considered several times the Total Revenue as the sum of all prices.

As overall metrics around the purchases shows:

### 01. TOTAL NUMBER OF PLAYERS

Although the database accounts for 780 records, the total number of different players who have purchased at least one item is **576** different players.

### 02. TOTAL PURCHASING ANALYSIS

Following on the overall analysis of the databases, other important measures are:

- *Number of Unique Items:* **179**
- *Average Price:* **\$3.05**
- *Number of Purchases:* **780**
- *Total Revenue:* **\$2,379.77**

Just by looking for these metrics, it is understandable the fact that some of the players have similar items (number of unique items vs. number of different players). Another highlight is the overall Average Price of the items is less than \$5.00 what somehow connects with the nature of the business – online free gaming. These business models rely on creating an extensive player database with "small purchases amount" to drive their business. Otherwise, they will have a lot of problems to develop sales within the game. On the other hand, by looking for the total number of players, the total number of purchases, and total revenue, it is possible to deduct that the game owners will need to continue working on increasing their player databases.

### 03. PLAYER DEMOGRAPHICS

An interesting point to analyze in this database is the demography of the players in what concerns Gender and Age.

#### a. GENDER DEMOGRAPHICS

The number of males playing Heroes of Pymoli surpasses the number of females by more than **400%**, counting for **84.03% of the total game population** (an absolute number of 484 male players) compared with the **14.06% of female** players. Another 1.91% decided not shared/disclosure their gender.

#### b. AGE

In what concerns Age Demography, the data is divided into 5years" bins. The range of the analysis as between 10 and 40 years old.

	Total Count	Percentage of Players
Age Bins		
<10	17	2.95%
10-14	22	3.82%
15-19	107	18.58%
20-24	258	44.79%
25-29	77	13.37%
30-34	52	9.03%
35-39	31	5.38%
40+	12	2.08%

The majority of the players (+75%) have between 15 and 30 years. More in detail, the group between 20-24 years represents almost 45% of the total number of players. Once again, it is connected with the nature of the business model related to online games since typically are the younger generation who have the time to play it.

Connecting the dots, it makes all sense that the average price is an amount below \$5, allowing the low-income player population (players between 15 and 25 years old, probably still students) spent their money on the game. Although elasticity was not part of the data or the objective of the report, we can "extrapolate" and assume it is very high for any possible Average Price increment.

## 04. PURCHASE ANALYSIS BY DEMOGRAPHIC VARIABLE

### a. GENDER

The overall Purchasing profile by Gender is the one on the figure below:

	Purchase Count	Average Purchase Price	Total Purchase Price	Avg Total Purchase per Person
Gender				
Female	113	\$3.20	\$361.94	\$4.47
Male	652	\$3.02	\$1,967.64	\$4.07
Other / Non-Disclosed	15	\$3.35	\$50.19	\$4.56

Somehow there is an alignment between Player Demographics and Purchase Analysis, with males accounting for more than 80.0% of all purchases (Purchase Count). It will, of course, drive the Total Purchase Revenue amounts.

By looking for the Average Purchase Price and Avg Purchase per Person, we identify that Female players spend more money on average compared with Male Players. By knowing it, Heroes of Pymoli Marketing Team can address specific market campaigns or somehow incentivize those items to female players who have not bought any item.

## b. AGE

	Purchase Count	Average Purchase Price	Total Purchase Value	Avg Total Purchase per Person
<b>Age Bins</b>				
<10	23	\$3.35	\$77.13	\$4.54
10-14	28	\$2.96	\$82.78	\$3.76
15-19	136	\$3.04	\$412.89	\$3.86
20-24	365	\$3.05	\$1,114.06	\$4.32
25-29	101	\$2.90	\$293.00	\$3.81
30-34	73	\$2.93	\$214.00	\$4.12
35-39	41	\$3.60	\$147.67	\$4.76
40+	13	\$2.94	\$38.24	\$3.19

From the table above, we can understand the majority of the purchase count is around 20-25, aligned with the same tiers of the players' demographics showed above. The same concepts can be translated to Total Purchase Value and across the remain bins of the age division compared with the players' demographics.

Interesting to mention is the lack of a trend in what concerns the Average Purchase Price and in Avg Total Purchase per Person. Despite that, it is worth noting the surprisingly high amount of the Avg Total Purchase per Person under the bin of "<10" and "10-14" since typically those users do not have income. Probably in those cases, they have been using some money from one of their relatives.

## 05. TOP SPENDERS

Another interesting point to understanding is to understand who has incurred on the high amount of purchases and how much purchases they have done.

	Purchase Count	Average Purchase Price	Total Purchase Value
<b>SN</b>			
<b>Lisasia93</b>	5	\$3.79	\$18.96
<b>Idastidru52</b>	4	\$3.86	\$15.45
<b>Chamjask73</b>	3	\$4.61	\$13.83
<b>Iral74</b>	4	\$3.40	\$13.62
<b>Iskadarya95</b>	3	\$4.37	\$13.10

As detailed, Lisasia93 with the highest amount of Purchasing, spending almost \$19. Another point to highlight is: no player is spending a considerable amount of money in the game (a clear outlier).

## 06. PURCHASE ANALYSIS BY ITEM

## a. MOST POPULAR ITEMS

For the most popular items, there is a little bit more information to get from it. On average, we can assume that each unique item as at least four purchases (179 unique articles out of 780 purchases). Although, if we look into the table below, we can see the two most purchased items have three times more purchases than an average article. Even looking for the remaining top 5 items, we are talking about at least two times the average.

Despite it, we cannot assume there are “preferred items” since the item that has a high number of purchases only accounts for 13 out of 780 total purchases. Maybe this is a strategy of the company to have a portfolio that is not dependent on a few SKUs but in the broadest range of products to keep a broader selling scope.

Item ID	Item Name	Purchase Count	Item Price	Total Purchase Value
92	Final Critic	13	\$4.61	\$59.99
178	Oathbreaker, Last Hope of the Breaking Storm	12	\$4.23	\$50.76
145	Fiery Glass Crusader	9	\$4.58	\$41.22
132	Persuasion	9	\$3.22	\$28.99
108	Extraction, Quickblade Of Trembling Hands	9	\$3.53	\$31.77

The same idea is reflected under the Total Purchase Value, where we don't see any item surpasses the \$60 out of the more than \$2000 total sales.

## b. MOST PROFITABLE ITEMS

Item ID	Item Name	Purchase Count	Item Price	Total Purchase Value
92	Final Critic	13	\$4.61	\$59.99
178	Oathbreaker, Last Hope of the Breaking Storm	12	\$4.23	\$50.76
82	Nirvana	9	\$4.90	\$44.10
145	Fiery Glass Crusader	9	\$4.58	\$41.22
103	Singed Scalpel	8	\$4.35	\$34.80

This table illustrated there is a correlation between Top Spenders and Most Profitable Items since three out of the five most selling items are the most profitable ones. It induces the idea of growing revenue through volume. Another critical point highlight of this analysis comes from the fact that the most valuable items have prices above \$4.00, what gives some insight to the Heroes of Pymoli to an opportunity to raise the prices on a couple of items to a value closer or slight above \$4.00 and therefore drive more sales. I believe it would not impact the Most Popular Items since the majority of them are already above this threshold, and the dependence of one or two items is not huge.

## 07. CONCLUSION

In summary, the revenue streaming of Heroes of Pymoli is very well spread around more than 150 SKUs, where each one of them is playing an average role in the total contribution. Nevertheless, the company is not being able to collect a massive amount of money out of that, since the majority of the products “low income” products.

Furthermore, the number of players purchasing items in the game is relatively low for an online game, where it is expected to have a broader player database. However, here lies an opportunity to increase the Revenue by launching tactics of getting and gain more users. At this point, Heroes of Pymoli should focus their strategy around males age between 15 and 30 years old since they are the largest tier of the current players.

Still connected with the first paragraph of this section and by analyzing the purchase profile in terms of items, there is one action that may drive more sales and therefore more profit to Heroes of Pymoli: slight increase the price of the more average items to a price close to \$4.00 per SKU. Since there is not much dependence on one or two products, the company can test these price increases and understand how their customers will respond to it (studying elasticity).