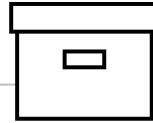Archeological Report

DVD Rental Shop
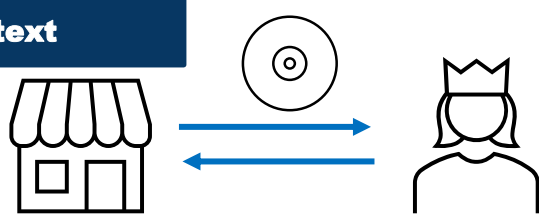
A Historical Business Form

- In 2022, archeologists evacuated an ancient dataset from the relics of world wide web >> PostgreSQL sample data.

- The dataset contains rent records in 2005-2006 of a DVD rental shop and other information related to the shop.

- The following slides aims to give a glimpse of the business to people of today based on quantitative data analysis.

How did the business work?
Rental Rate Groups with # of Inventories & # of Films

- Before Internet turned fast enough to support streaming services, DVD was the media to save and distribute films (a type of plastic discs with a hole in the middle and can store information).

- Upon receiving orders, shops mailed the DVD to customers through mails. Customers usually watched DVD on a domestic device, and then sent the DVD back.

Zoom in

The shop had

1k FILMS

This business had 2 physical shops, in Australia and Canada.

2 STORES

With multiple copies per film, it had a total of

4.5k COPIES

Films cost differently. There were 3 rental rates

3 PRICES

Rental Rate: price per rent (if DVDs returned in time), **0.99**, **2.99 or 4.99.**

Rental Duration: the max # of days that customers could keep the DVD so that to pay the unit rental rate. The duration varied between different films, usually **3-7days**. A delayed return would lead to higher fees.

Break down

# of Inventories & # of Films per rental rate

Rental Rates	0.99	2.99	4.99
Inventory #	1,595	1,481	1,505
Film #	326	312	320

There was a rather balanced distribution of rates across films.

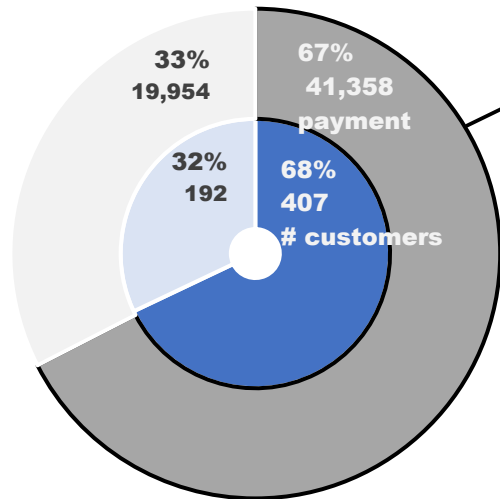There were 1/3 of films / inventories per category, and per film had appr. 5 copies.

Where were the customers?
Aggregate Customer # & Revenue per Country

OTHER vs. **TOP 20 COUNTRIES**

33%
19,954

67%
41,358
payment

32%
192

68%
407
customers

Context

Top 20 Countries accounted for **2/3** of Customer # & Revenue.

Break down

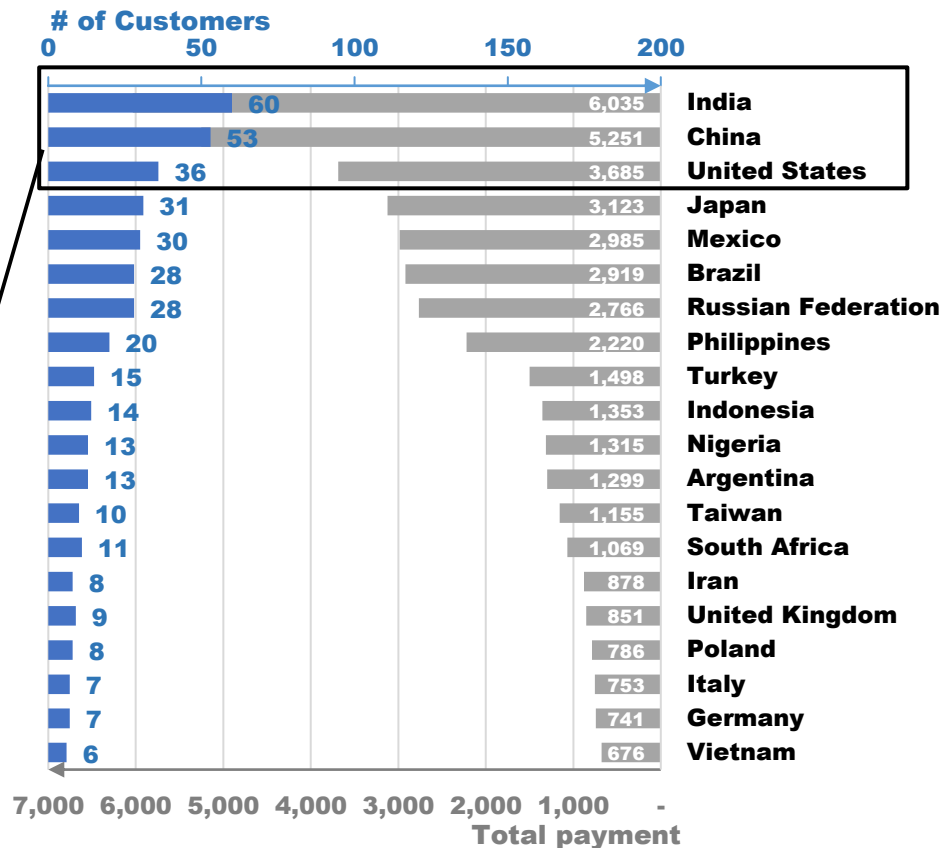Top 3: India, China, the US per Customer # & Revenue.

Insights:
- The customers were distributed globally, despite that our two stores were in Australia and Canada.

Implications:
- The business also faced global competition.
- Languages, culture and copy-rights should be considered.

TOP 20 COUNTRYs

# of Customers

0	50	100	150	200

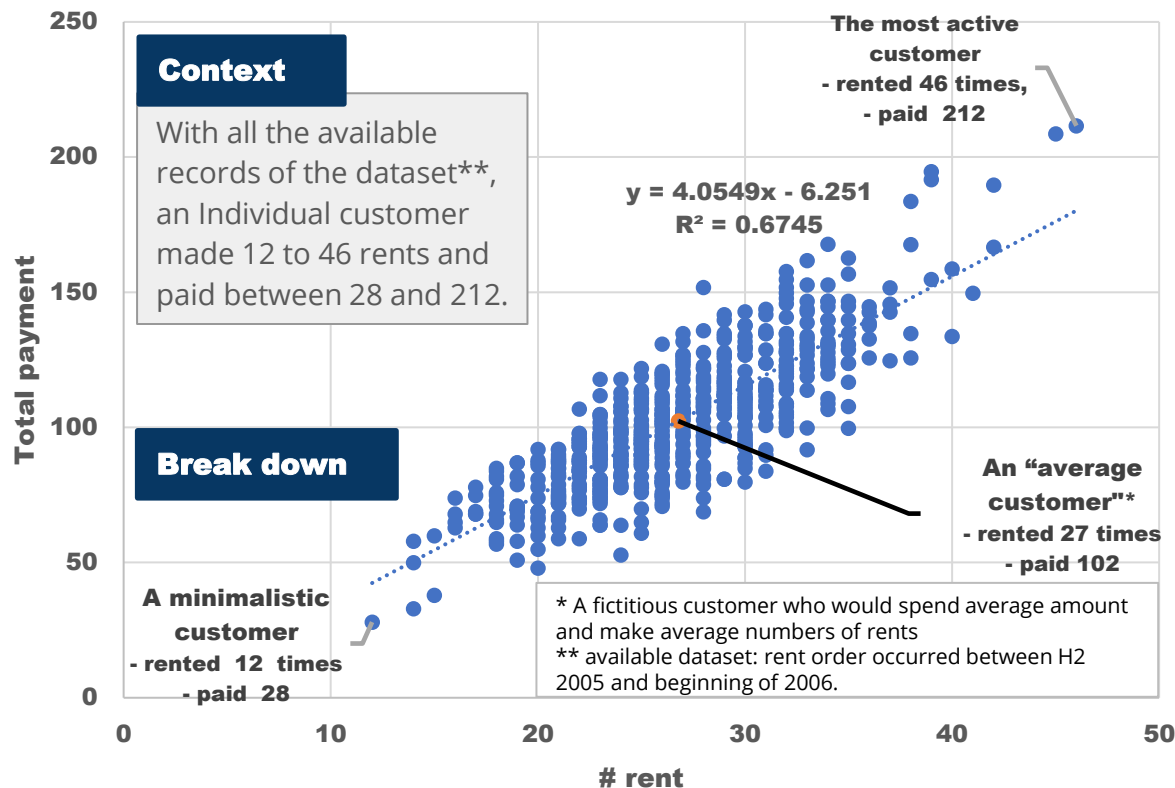| # of Customers	Total payment	Country
60	6,035	India
53	5,251	China
36	3,685	United States
31	3,123	Japan
30	2,985	Mexico
28	2,919	Brazil
28	2,766	Russian Federation
20	2,220	Philippines
15	1,498	Turkey
14	1,353	Indonesia
13	1,315	Nigeria
13	1,299	Argentina
10	1,155	Taiwan
11	1,069	South Africa
8	878	Iran
9	851	United Kingdom
8	786	Poland
7	753	Italy
7	741	Germany
6	676	Vietnam

7,000 6,000 5,000 4,000 3,000 2,000 1,000 -
Total payment

How much did each customer pay?
Aggregate _payment_ & _number of rental contracts_ per customer

TOTAL PAY / # of RENT PER CUSTOMER

Context

With all the available records of the dataset**, an Individual customer made 12 to 46 rents and paid between 28 and 212.

Break down

The most active customer
- rented 46 times,
- paid 212

$y = 4.0549x - 6.251$
$R^2 = 0.6745$

An "average customer"*
- rented 27 times
- paid 102

A minimalistic customer
- rented 12 times
- paid 28

* A fictitious customer who would spend average amount and make average numbers of rents
** available dataset: rent order occurred between H2 2005 and beginning of 2006.

Total payment (y-axis): 0, 50, 100, 150, 200, 250
 # rent (x-axis): 0, 10, 20, 30, 40, 50
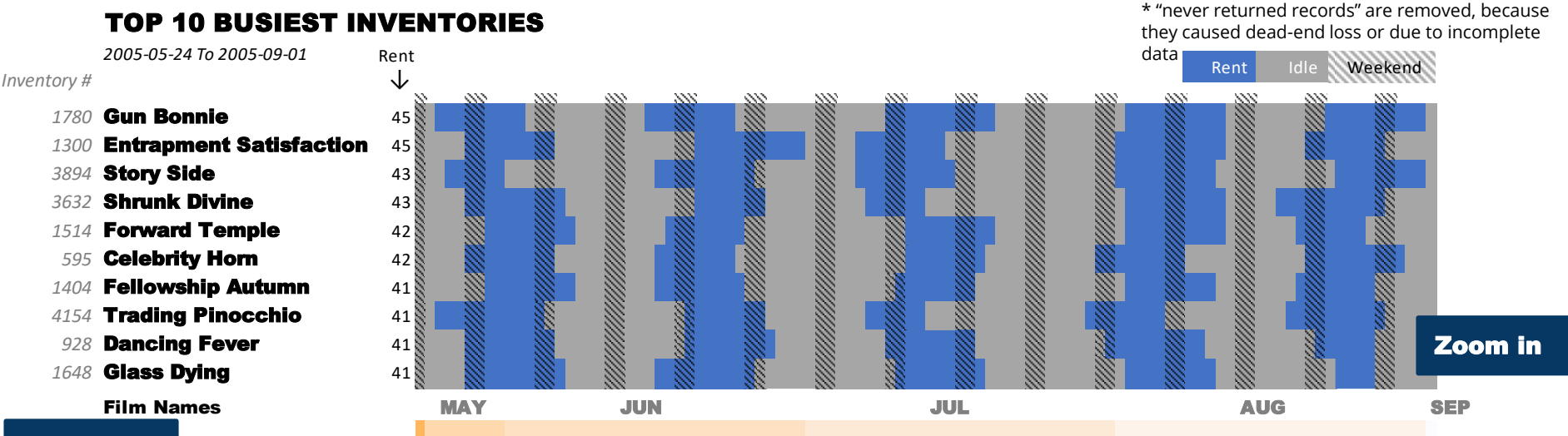
Insights:
- An "average (but fictitious) customer" would place 27 rents and pay a total of 102.
- A linear model advises that statistically, each rental contract would bring in a payment of 4. This is a "rule of thumb" estimation.

Implications:

- For the same numbers of rent, customer spending varied. Other factors could be:
  1) customers rent duration
  2) rental rate of specific films

- Potential improvement advise if we travel back to the past:
Due to limited leisure time of individuals and transportation effort (like us, people back then also only had 24 hours per day!), increasing customer number would be more realistic than increasing spend per capita.

How fast did Inventories move?
Aggregate <u>Rent Status</u> per Inventory for a given window

TOP 10 BUSIEST INVENTORIES

2005-05-24 To 2005-09-01

Inventory #

		Rent ↓
1780	**Gun Bonnie**	45
1300	**Entrapment Satisfaction**	45
3894	**Story Side**	43
3632	**Shrunk Divine**	43
1514	**Forward Temple**	42
595	**Celebrity Horn**	42
1404	**Fellowship Autumn**	41
4154	**Trading Pinocchio**	41
928	**Dancing Fever**	41
1648	**Glass Dying**	41

Film Names

* "never returned records" are removed, because they caused dead-end loss or due to incomplete data

Legend: Rent | Idle | Weekend

Zoom in

MAY | JUN | JUL | AUG | SEP

Context

DVDs generated revenue when they were rented out. Idling time brought no revenue.
The graph above shows the rent-out status of the top 10 inventories based on <u>Total Rent Out Days</u> between May 24, 2005 and Sep 01, 2005.

Insights:
- Even the most popular inventories stayed unrented 60% of the time (only rented 41-45 out of 101 days).
- Weekend was usually the time when people rented or returned. While customer behavior is also impacted by allowed rent duration.

Implications:
Possible reasons of the long idling time need to be confirmed with further investigation:
- **Hypothesis 1:** Delivery time. If so, the shop should have focus more on regions closer to the shop.
- **Hypothesis 2:** Delayed information. If so, the shop could consider boost turnover of films via notifications, so that interested customers could rent a DVD as soon as a product is available.