FTDS // BUSINESS KNOWLEDGE

Hacktiv8 DS Curriculum Team

Phase 0 Learning Materials

Hacktiv8 DS
Curriculum
Team

Contents

Objectives

- able to understand basic business concepts
- able to translate business problems into data-driven solutions

The Primary Goal of a Business

- The primary goal of a business is to maximize the profits. Profits can be calculated by:

$$profit = revenue - cost$$

- To maximize the profit, we want to increase revenues/incomes and/or decrease costs/expenses.
- Expenses can be divided into two categories which are capital expenditures (CAPEX) and operational expenditures (OPEX).
- By nature, different departements tend to fall into two categories: revenue-maximizing or cost-minimizing.

Revenue Maximization - Products

In general, there are two main departements that maximize revenue which are Products and Marketing.

- A **product** can be a good, service, or idea and is created to satisfy a want or a need. However, in the case of business departments, product refers to all activities related to product R&D, development, and maintenance.

- Data Science serves two purposes:
  - Create new products
  - Enhance existing products

Revenue Maximization - Marketing

Marketing is formally defined as all activities related to promoting the buying or selling of a product. It includes things like advertising, pricing, and understanding one's target market.

Some examples of how data science involved in marketing:

- **Marketing Channels**
  Measure the impact of various marketing channels through methods

- **Pricing and Discount Optimization**
  Find the optimum price that maximize profit and buyers

- **Customer Segmentation**
  Find the characteristic of our customer to make marketing strategies

Cost Minimization - Operations

In general, Data Science role in cost minimization category is to make automations. The two main departements where data scientist plays huge role are operations and customer service.

Operations in business refer to the activities that a business engages in on a daily basis. Typically, the main goal in operations is to make tasks and processes as efficient as possible. This means maximizing time to complete things while minimizing errors.

For example:

- Autonomous defective products detection

Cost Minimization – Customer Service

Customer service refers to the support that a company offers to its customers. As a company grows in size, it's fair to assume that there will be a proportionate increase in the number of customers that will need support.

For example:

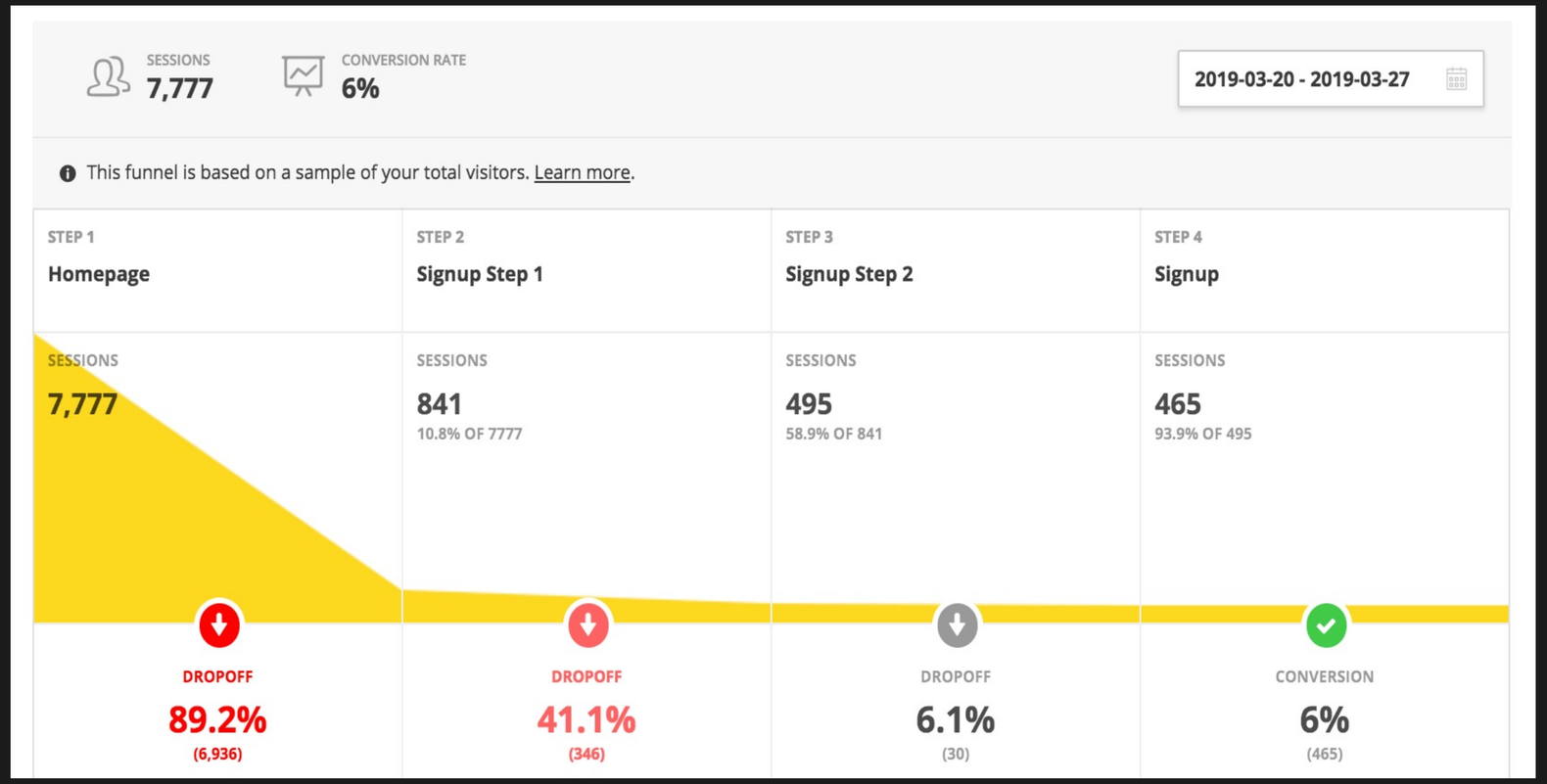
- Chatbot
- Predicting if the customers will want to use our new products

OKRs and KPIs

- **OKR** is short for **Objectives & Key Results** and it is a framework for defining and tracking objectives and their outcomes — you can think of them as goals. Typically, each department has its own OKRs that they set every quarter. For example, the marketing department might have an OKR to increase conversions from X to Y.

- **KPI** is short for **Key Performance Indicators** and they are essentially metrics that show how effectively a company is achieving its business objectives. Continuing with the marketing example, a KPI for the objective above can be an increase in website traffic or an increase in marketing ROI (Return on Investment).

Conversion Funnel – Lead & Conversion Rate



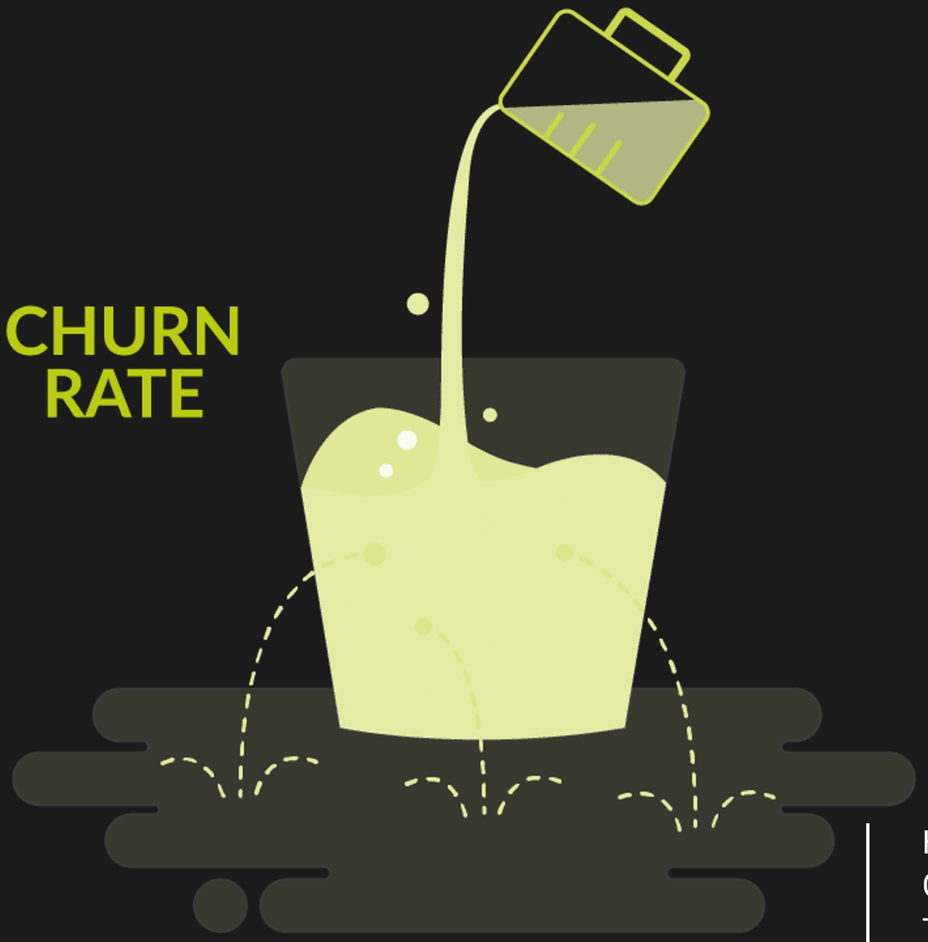
Conversion funnel is a way to detect bottle necks of our customer journey to reach our goal.

There are two key points:

- **Leads** is a number of potential customers.
- **Conversion Rate** is a ratio of customer that reach our goal over the total potentials.

Churn Rate

$$\frac{\text{Customers at the beginning of a time period – customers at the end of time period}}{\text{customers at the beginning of a time period}} = \text{CHURN RATE}$$



Churn rate is basically talks about how much we loss customers.

Customer Retention

Customer Retention is the process of engaging existing customers to continue buying products or services from your business.

Increasing customer retention rate:

- Set sales goals
- Map customer journey to detect unexpected problems
- Reduce friction
- Give a great impression
- Engage the customers
- Understanding customer’s problems and ask for feedbacks
- Over a valuable upsell
- Do A/B test

Gross Merchandise Value

Gross merchandise value (GMV) is the total value of merchandise sold over a given period of time through a customer-to-customer (C2C) exchange site.

It is often used to determine the health of an e-commerce site's business because its revenue will be a function of gross merchandise sold and fees charged. It is most useful as a comparative measure over time, such as current quarter value versus previous quarter value.

GMV = Sales Price of Goods x Number of Goods Sold

Determine Business Goals

A Data Scientist plays role in a business to solve their problem using data science solutions. How do we translate business problems into data-driven solutions?

We can ease our works to set the goals by using these steps:

- Describe the problem to be solved
- Specifiy all the business questions as precisely as possible
- Determine any other business requirements, such as not losing a customer while increasing cross-sell opportunities
- Specify the expected benefits in business terms, such as reducing churn among high-value customers by 10%

Determine Data Analysis Goals

After the business goals are clear, you need to translate them into data analysis goals and activities. For example, if the business objective is to reduce churn, you might set these analysis goals:

- Identify high-value customers based on recent purchase data.
- Build a model by using available customer data to predict the likelihood of churn for each customer.
- Rank customer based on churn propensity and customer value.

A key question to answer in follow-on activities is whether the data from the customer contains the correct information to answer the business problem. It's also important to consider how you might act on the results of this analysis to support the business goals. How do you consume and deploy the results of the analytics, and what action do you take within the business?

Example

The bank collects a large amount of data for each approved loan: 146 fields. These fields can be split into a few distinct groups:

- Loan demographics, such as the amount, the term, the interest rate, and the reason for loan.
- Applicant demographics, such as age, salary, employment length, and home ownership.
- Numerous risk factors, such as the number of public records, credit card delinquency, and bankruptcy.

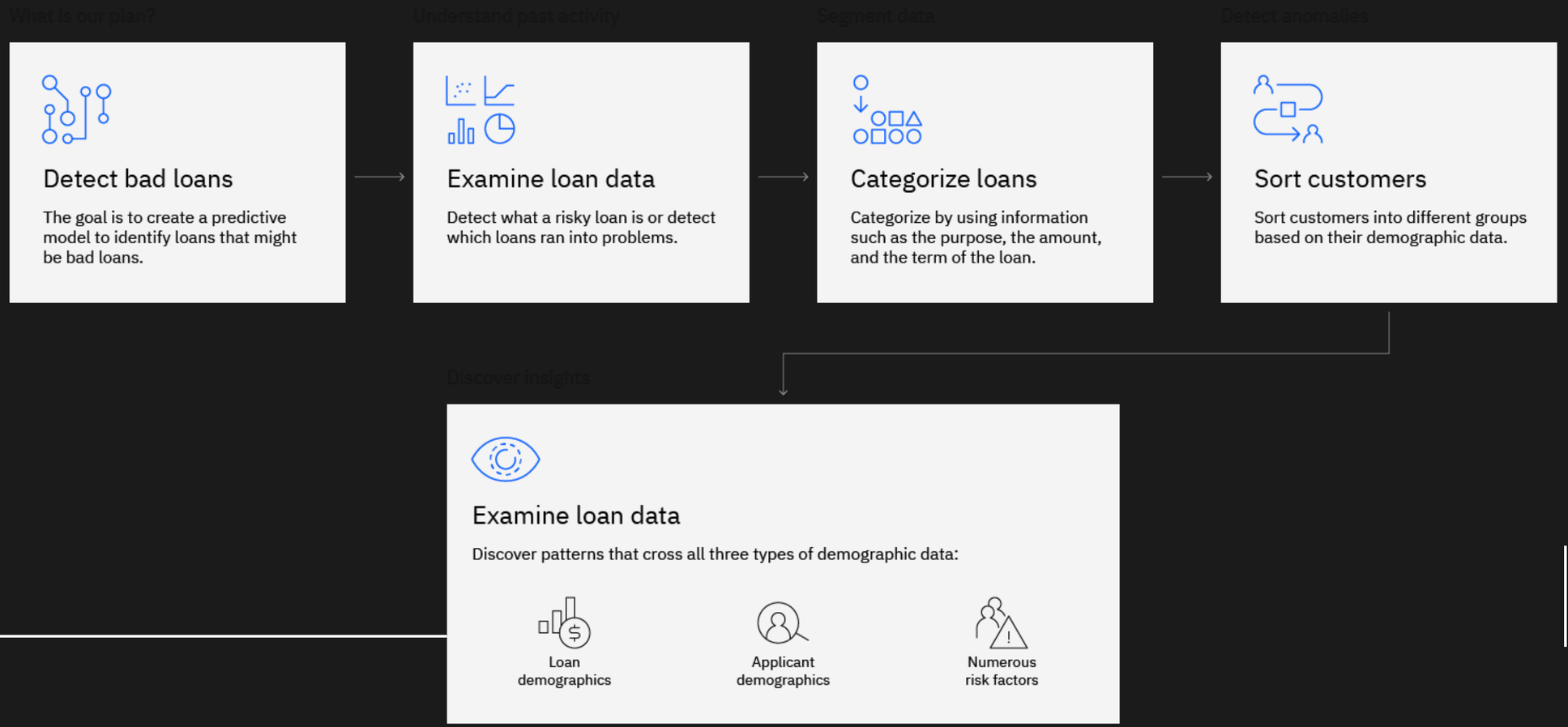
Roughly 70 sparsely populated risk fields cover these risk factors.

The goal is to create a predictive model to identify loans that might be bad loans. However, in the raw data, no one field indicates whether the loan is good or bad.

Rachel, a data scientist, sits down with the customer to understand the customer's business problem. Her first goal is to articulate the overall business problem: “Can I detect attributes about a person or a type of loan that can be used to flag a risky loan that needs to be processed by my loan underwriting team?”

Example

A bank wants to optimize its loan underwriting procedures. Currently, it applies filters on loan applications that automatically reject the riskier ones. However, the bank is still approving too many applications that run into repayment issues.



Solving Cases!

To wrap up your understanding, we will discuss several problems and determine what your solutions that you will suggest to the stakeholders?

1. You have segmented your customers by using clustering algorithm and the results are stored in the labels column. What promotion strategy you'll recommend to the marketing division? *(Data can be accessed here)*
2. Your company want to expand their business to USA. Could you recommend to your supervisor whether they expand to USA or do you have any recommendations which country that they should expant to? *(Data can be accessed here)*