INCENTIVES IN MARKETS

Introduction

Markets have been an integral part of any civilization since ancient times. But, markets of the 21st century are quite different from the one detailed in history. Basic process has been the same i.e. transactions or exchanging goods and services with some other resource or assets. Difference lies in the platform where these transactions occur. From the concrete roof stores to some small machine. This revolution, in a broad way, can be credited to the advancements in computer technology. Therefore, within this module, our motive was to explore markets which could not seem happening without today's computer world, their flaws, algorithms they use for smooth functioning and so on.

Amazon, Google, Facebook, Upwork, and Tinder are some names which strike our mind at first when we start talking about 'computer markets'. Amazon is the biggest digital market platform today. It has provided a wide range of options for the customers. No travelling, all genres of products etc. are also some features. However, consumers remain doubtful regarding the quality of the product. Also, Google and Facebook have become the biggest platforms for advertising. Statistics show that they earn a major share of their revenues from this only. With upwork and tinder included in the list , it seems as if our mind would end up suggesting the items which could be presented in a digital way but this list would never end. From daily maintenance services to dating, from lifts to fooding everything is available online.

Centralised and Decentralised Markets

A market is centralized if the transactions that get executed are dictated by a third party. An extreme example would be many markets in the former Soviet Union. Communist party of Soviet Union (The then Government) had not left many options for the consumers to choose from. The government had its own stakeholders which run the industries and people are bound to buy from them. Therefore, the third party was defining transactions here. Conversely, in a decentralized market, participants are free to transact directly. College admissions in the U.S. are decentralized, in that neither the actions of different applicants nor of different colleges are coordinated by any centralized mechanism. Most of the markets are decentralised today except a few. Uber and lyft are centralised mechanisms. Riders just select the location of boarding and alighting and accordingly a particular driver is automatically assigned.

However, if we analyse the mechanism, we would see that it is a mix of both centralised and decentralised. Amazon, for example, gives you some recommendations based on your past searches and your possible transaction partners. We could choose from them. It has also made the process easy and efficient.

Batched transactions

A second way to interpolate between the extreme points of decentralization and centralization is to *batch* subsets of transactions for centralized processing. Uber is one such market which realised the importance of this algorithm in 2017 and changed its manner of functioning. Before 2017, Uber was more on a greedy side. It collected information about the rider and assigned him the nearest available driver. In this mechanism, riders might have to wait for a longer duration. But if we take an interval of 1 second to save the data of riders and drivers, we may find a ride which reaches sooner than the previous one. This grouping of information is called batching.

New York stock exchange (NYSE) again seeks some need of batching. Here, the high frequency trading appears to be unjustified for some. The people who are in proximity of the main transaction executing server find themselves on an advantageous side. To give one example of how this comes up, imagine that you submit an order to buy one share of Facebook stock at a price of $200. Suppose the order remains outstanding, say because all standing sell orders are at prices $210 or higher. Now imagine that the Cambridge Analytica scandal hits, and you suspect that Facebook's stock price is about to drop dramatically. The race is on: you want to cancel your standing buy order, while opportunistic sellers want to beat you to it and clear your order (at the now-lucrative price of $200). Whether or not the transaction gets executed depends on who gets to the market first.

Could we redesign the NYSE to mitigate the incentive to engage in high-frequency trading? Budish, Cramton, and Shim propose an elegant solution: to collect transactions into batches and compute all the trades in a batch at the same time. For example, imagine that we break time into one-second intervals. At the end of each second, the exchange considers all the standing buy and sell orders (possibly submitted during the preceding second, or possibly submitted earlier and not yet executed or canceled), and removes any orders that were canceled in the preceding second. With the remaining buy and sell orders, the exchange executes as many trades as possible, all at a common price, subject to the buyers paying no more than their bid and sellers receiving at least their ask.

Types of market failure

There are plenty of things which can go wrong in the market. We have discussed four of them.

Timing issue :- NYSE is a good example of this problem as we have seen earlier. On the NYSE even a fraction of a second can influence the market. Imagine if Stanford and other schools start admitting students on a first come first basis then what will happen? What will the reputation of schools remain in the next five years??

Safety issues :- This issue arises when customers do not feel safe to do transactions with the market. It becomes a serious issue for the markets which engage in face-to-face meetings like dating platforms.

Not thick enough :- If a customer finds it’s desired trading partner easily then that market is considered as thick and otherwise it is thin. Amazon and ebay are good examples of a thick market.
The main reason behind the thin market is that not enough people show up or one can find it’s desirable trading partner easily. In this case technology , your design, keeping transaction cost minimum , offering transactions to multiple parties at once can help you to solve this problem.
Despite all this, thickness is not always good. Let’s say you are selling a car and the market is thick now from the buyer's perspective he is happy because he is getting more options and definitely he would end up getting a good deal but from the seller perspective he is unhappy because the chance of losing a sale to his competitor increased.

Congestion :- This type of problem arises when a customer has too many options for his trade.For a centralized market, as the market grows bigger and thicker, Formulating and communicating preferences definitely gets harder for the participants,the more options you have to rank, the more onerous the task.For decentralization, let's say you are buying shoes from amazon then you have plenty of choices and one can not simply go through all of them and compare them to find his best deal but a good search functionality or a good recommendation system can solve this problem. The problem gets harder for some markets or platforms like dating. In dating platforms famous profiles get all the attention.A natural idea is to push back against thickness and low transaction costs, so that an offer to transact becomes meaningful again-hunting for a sweet spot between the thinness and congestion problems. One possible solution for this problem is signaling.

Digression

Network Effects :- The main reason behind congestion or thinness of market is network effect. It is the effect that one user of a good or service has on the value of that good or service to its other users. Most of the time the network effect is assumed to be good. For example we never get worried about the less no. of social media platforms because we want a platform that everyone is using and this leads to a single platform getting much more attention that is suffering from congestion and others suffering from thin-ness.

Antitrust Regulation :- It is Digression within digression. Sometimes the government imposes regulations on tech companies because when there are strong network effects, a platform with many users can exploit its users' high switching costs by failing to innovate, raising prices, or engaging in anticompetitive behavior. In 2001 U.S imposed charges on Microsoft they claimed that Microsoft was exploiting its dominance in the operating systems market to also dominate the Internet browser market by bundling Internet Explorer with Microsoft's operating system.

Signaling

Signaling is a solution to the congestion problem where participants are overwhelmed by the number of options. One approach to exporting more information and guidance to participants is to allow a limited amount of signaling. For example, you can signal your qualifications in a college application (grades, test scores, letters, etc.).
For example in dating platforms the most popular profiles receive far too many messages to reply to. So one can play a smart game by sending messages to not so famous profiles in order to get a response from them but this generates a new problem, some profiles can slip through the cracks with no response from anybody who incorrectly guessed that the applicant was out of their league. In order to solve this problem Korean dating site did an experiment, users were given two "roses" per week. A user could send a large number of messages, but could attach a rose to at most two of them.The roses were especially effective when sent to someone with a similar or non-famous profile (who might otherwise think the sender was out of their league). This experiment increases the probability of message acceptance (from 15% to 18%, averaged over all cases), and also increases the overall number of messages.