Discovering Global & Local Effect
In B2B Networks⋆

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Abstract. Since the emergence of startup culture in Pakistan with Careem in 2012, there has been a peak in startups in Pakistan's business market. Everyday we hear about any idea raising millions of dollars as seed money and then it started investing to grow more. Growing in any form results in addition of new nodes and the profitability of any business depends upon two key factors behind this growth; (1) Quality of node being added (2) Frequency of nodes being added at any interval.

For any growing business, it needs to find quick hacks in order to exponentially increase its growth in terms of profitability. One way to achieve this is to find similarities-homogeneity within the network at different levels. The purpose does not only help the business to find mutual cohorts to attack with common strategies but it also identifies different which cohorts or clusters have uncommon idiosyncrasies.

This project is intended to find homogeneity in a newly founded retail distribution tech-based start up, Retailo. Some basic level similarities between global and local levels of the network were found and a specific behavioural pattern among individual player has also been highlighted.

Keywords: B2B · Networks · Homogeneity · Global Effect · Local Effect

1 Introduction - FARAZ

As the novel Coronavirus emerged it disrupted the networks specially between the small retailers that have small shops and no other income and the buyers where it was impossible to go to a local shop and buy something.This was an opportunity for a B2B network to arise and the retailers and buyers turned their attention towards this mode of buying things. A new network of retail distribution came into being in May 2020 where retailers started ordering via application instead of placing orders via agents who used to visit them daily. Homogeneous B2B networks refer to the fact that we use one single network architecture which is our survey questionnaire of the people's responses. B2B networks are growing rapidly as the need to buy online or order from a third party is much easier than wasting fuel and finding out that the product that we went their for is finished. B2B serves as a bridge between the third party supplier and buyer and makes lives and convenient.

2 Background and Scope - FARAZ

This brings us to the point where we can analyze how similar Global and local networks can be but before that we really need to understand the game theory which is vital in any business dealing

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and the same applies to a B2B marketplace. Simply put, game theory is the science of strategy and the optimal decision-making of independent and competing actors in a strategic setting.

We can look at a practical example of retailo, it surveyed that about 91 % of retail flows through retailers which you can find right near your street corner. Before start-ups like Retailo or Bazaar, retailers have to either visit Wholesalers like Imtiaz, Metro, Spar or they have relied upon nearest wholesalers/general traders in their area. The major areas of pain these retailers always faced were; poor inventory optimization, delay in deliveries, and fewer options in prices.

3   Literature Review - FARAZ

As we have talked about a B2B network and it's functionality we can therefore talk about the advantages of it as stated by an article, The advantages include: [4]

– Reduces searching cost by facilitating comparison of price products and services
– Reduces lead times
– Improves production and supply capabilities
– Improves personalisation of products

In an article by George Henry he talked about how different companies are turning towards B2B networks and he gave the reasons for it in much detail as well in which he outlined the following: [3]

– To eliminate the friction created by inefficient offline workflows including pen and paper appointment bookings, phone calls, and fax machines.
– These businesses also don't want to deal with the trouble of reporting to a senior or working on something that requires internal cooperation..
– They were taken aback by the fact that the product linked the company to a third party.

In a homogenous network, the network architecture and operating system are the same. A LAN with all machines running Microsoft Windows Server is an example. Another example is an enterprise communications system that is completely built on Microsoft Exchange Server. [2]

Fig. 3.1: Homogenous Network
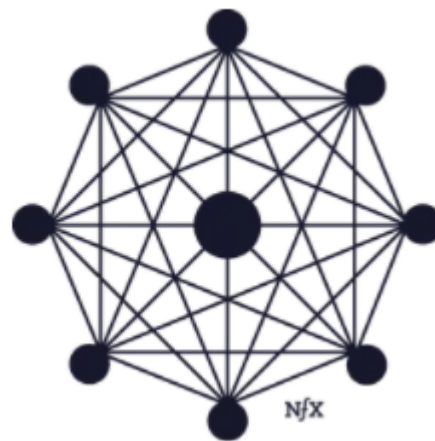
According to a article compared to local suppliers. It stated that the behavioural questions in their survey showed that 79.63 % people think that online buying is an efficient way to purchase B2B industrial products. Also another questionnaire suggested that 48.14 % respondents think that online buying would avoid hassle of purchase but offer less quality. [1]

Fig. 3.2: Results
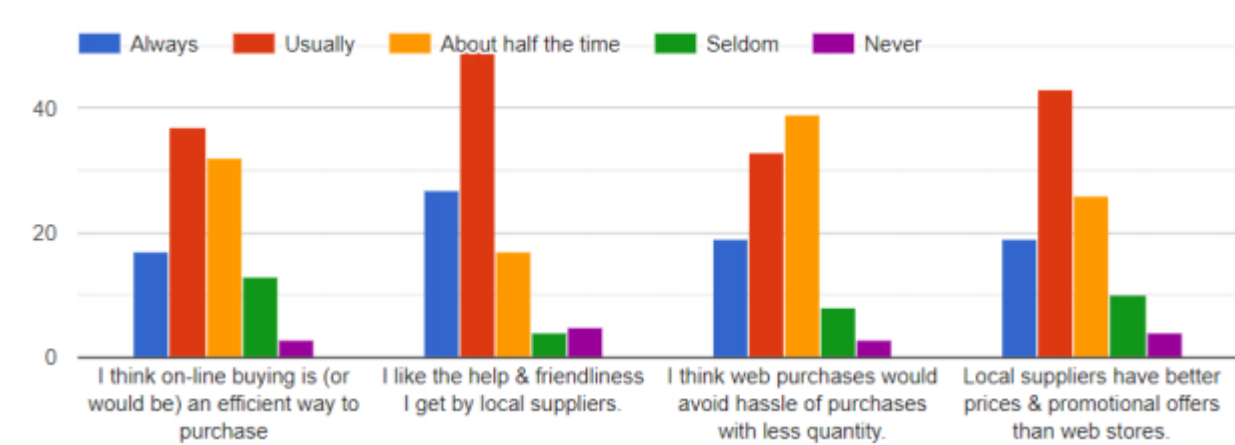
4   Application to a Contextualized Case Study & Hypothesis

Retailo is a B2B retail distribution marketplace for retailers where they can buy goods via an application. Currently there are serving two cities; Karachi and Riyadh. Here, we will consider their customers' network in Karachi. Our aim is to analyses the behavior of this wide spread network on three different levels.

– Global Level (Karachi)

– Local Level (Specific socio-economic region)

– Player to Player (Retailer Vs Retailo Sale Agent)

As discussed above, any business spread widely over a region has to focus upon each constituent cluster as they might depicts a different behaviour. There is always a possibility that the global effect might evade the local effect and thus such smaller segments gets ignored by business runners. A narrowed and precised view is always required whenever dealing with a customer network. Literature on local clusters has long highlighted how geographical proximity and social embeddedness foster interaction and cooperation within business networks [5]

It is mandatory for business to deploy a strong surveillance on the local networks to strengthen the global network   [6]. Sensibly, we understand that local impact would never weight out any global impact but the purpose of this effort is to analyse the similar idiosyncrasies on all levels of a network.

The objective behind this study of a B2B network is to see are there any similar traits between global network and a local view of the same network.

Then we will be studying the behavior of how local network of this particular B2B developed and then analysing it on 1x1 level.

5   Methodology

Over here we in the global network we will consider the each and every user who has at least ordered one from Retailo in Karachi. While the local network consist of a region picked on the basis of socio-economic class which includes the shops in Pehlwan Goth.

Fig. 5.1: Global Network

Fig. 5.2: Local Network

5.1   First Level: Global VS Local

On the first level, we have the data available of all transaction made between Retailo and its customers. One transaction means one order placed by the customer on the app and then it being delivered to the shop as well. We have access to the following data,

– Customer Id, Name, Geo location & Phone
– Order Value (the amount of order placed) & placed date

5.2   Second Level: Local Network & Its Expansion

On the second level, we only targeted the local network and conducted a qualitative research methodology on this cohort. The purpose behind this research was to find how does this specific B2B networks spread, similarities between retailers on the basis of their behaviour. This survey aimed to discover the homogeneity at a local level and the results in the next section would further elaborate on this as well (Survey Form).

6   Analyses and Findings

[1]

The total universe (Global) of 9172 retailers were considered and 48 retailers in local network.

6.1   Results on Level 1:

1. We analysed each order placed by a customer on the basis of its value against the customer itself. Duplicates on customers were not dropped and each of their order was considered for this experiment.

Fig. 6.1: Global: Order Sizes per Customer

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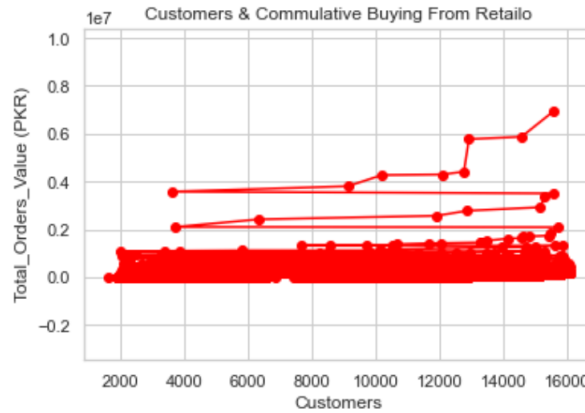
[1] Code Link)

Figure 6.1 shows the distributions of order values with respect to customers on the x-axis.
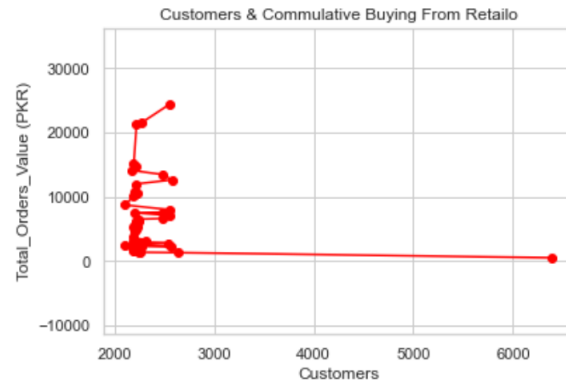
Fig. 6.2: Local: Order Sizes per Customer

Figure 6.2 shows a similar distribution like Figure 6.2 just on different scale. The analysis would be defined once we adjust the scale for 6.1 with respect to our purpose.

Fig. 6.3: Global: Order Sizes per Customer (Adjusted)

Now, we can observe that most of the customers in the global network have placed orders of less than 10,0000 PKR. We can see same behaviour in local view as well where all the customers lie below 30,000 PKR. We just dropped few outliers which were not even 0.1% of the total global view and we got a homogeneous behavior between the two networks.

2. Moving on, we analyzed the frequency of orders with respect to their order size. Which means that how many XX PKR value orders have been placed. The purpose behind this was to see that does the global also follow the trend at local by having similar frequencies of valued orders as local network.

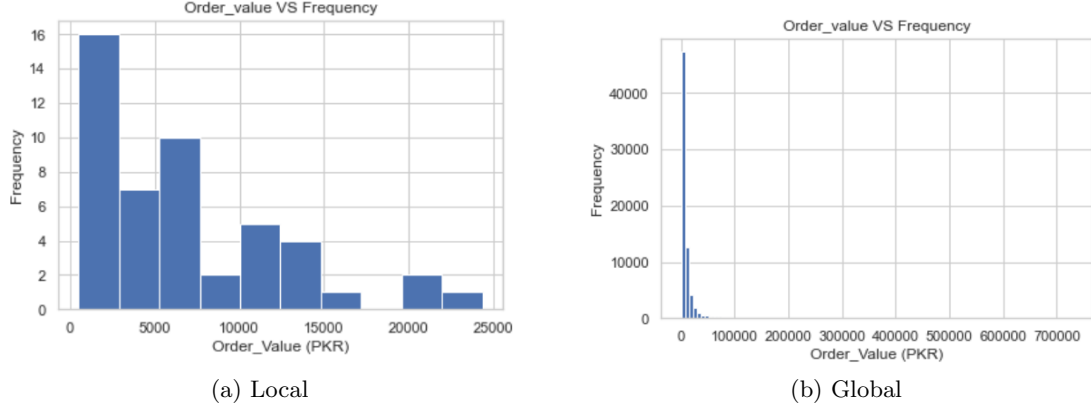(a) Local   (b) Global

Fig. 6.4: Local Vs Global on Order Value Frequency

This can easily be concluded from Figure 6.4 how a similar skewness of data can be seen in both graphs.

In order to enhance the view and justify the similarity between these two networks; the same distribution can be observed in different scope. Lets consider, the frequency of orders with respect to number of customers which would mean that if 3 orders have been placed 10 customers then 10 would be the frequency of 3.

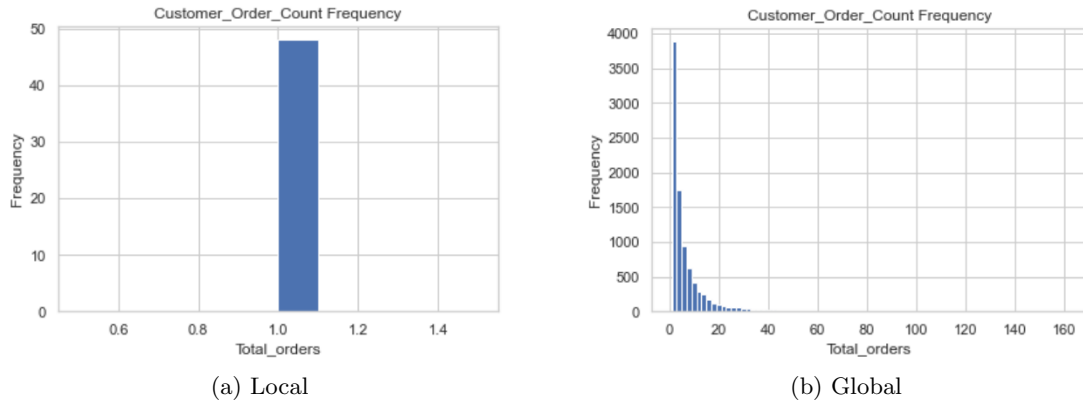(a) Local   (b) Global

Fig. 6.5: Local Vs Global on Customer-wise Order Frequency

3. Lastly, in search of detecting behavioural similarities between a larger group and its own sub-group we also analysed the pattern of sales daily basis. For this purpose, we marked each order with it the day of the week it was placed at and then we sum all the values of orders placed on that day.
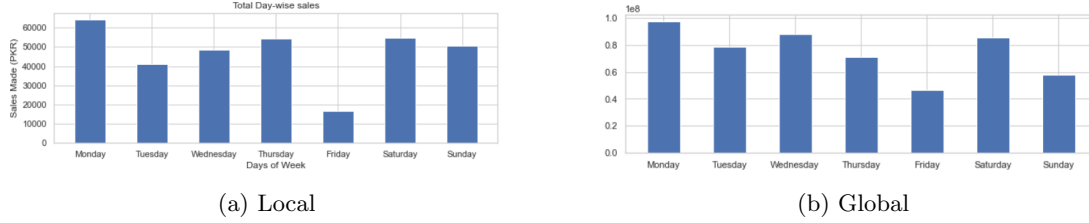

(a) Local   (b) Global

Fig. 6.6: Local Vs Global on Day-wise Sales

Now if we just analyse the the behavior of customers on global level and on local level; one fact is evident that they almost follow a same pattern. You see business performances on each day for both networks and it highlights a significant similarity between the two networks.

After diving deep in both of the networks, we can have noticed surprising similarity between between a cohort of over nine thousands customers and then a smaller chunk of it consisting only 48 retailers. This however proves our hypothesis that a B2B network would have ground-breaking similarities between at global and local level.
[1]

6.2   Results on Level 2:

At Level 2, we attempted to study the behaviour with-in the local network and searched for two questions:

– Q1: Does word of mouth is impactful in spreading the network of customers just like how Careem or Uber spread with referral schemes?
– Q2: Are there any other underlying similarities between these retailers who have started doing business with Retailo?

As mentioned in the previous section 5.2, a survey was conducted on the local network to gather some qualitative data to help us find answers.

Out of 48 retailers in this local network located in Johar, we succeeded to attain 20 quality responses.

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[1] Survey Responses Link)

Fig. 6.7: Testing: Word of Mouth
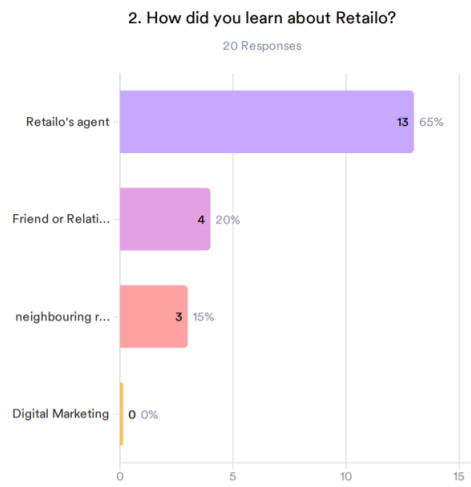
Based on the above analytic, we can confidently answer our first question that Retailo's B2B model is not dependent upon 'word of mouth' and it is fueled by the efforts of human agents (Retailo's sales persons).

Although, this primary research did not support our hypothesis but the responses contributed to strengthen our primary research question of this project. The survey led us to discover more common grounds between these nodes like;

1. Most of these customers also uses other e-commerce app like, Bazaar, Dastagyr (Other) and Hum Mart (14 out of 20).

Fig. 6.8: E-commerce Penetration
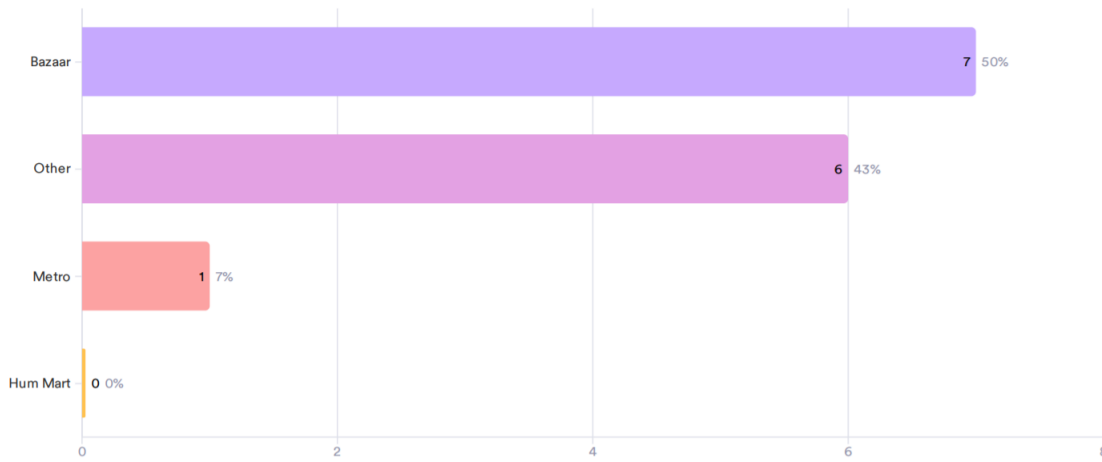
7   Conclusion

A human-centred network in a common eco-system which here is retail distribution may not fit any particular network model directly like Watts-Strogatz, Barabasi model. But we did find a homogeneous behavior in our networks based on both quantitative and qualitative analysis. Retailo's B2B business network tends to follow a rigid pattern where the the local behavior is just mimicked on the larger scale when it comes to global effect. This homogeneous property of this network could help the business in optimizing the processes and activities with respect to it. We can hereby claim that if we incorporate more areas in the consideration than we might have clearly seen a Pareto distribution here as well. Thou we did see few distributions following a similar distribution like Pareto's.

8   Bibliography - to be changed - FARAZ

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