

Title

The impact of the National Digital Communication policy on the
Telecommunications Industry

Research Question

“To what extent has the National digital communication policy of 2018,
with its aim of “broadband to all”, influenced Vodafone-Idea’s market
share in Mumbai city, Maharashtra, India?”

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Introduction

India is rapidly establishing itself as a significant player in the digital economy. Its digital economy is now larger and growing faster than most countries. The government and private sector are aiding in providing nationwide high-speed connectivity and the hardware and services required to connect Indian consumers and businesses to the internet. The government of India have been playing a role in promoting digital empowerment by launching policies and incentives.

In November 2018, the government of India launched the "***national digital communications policy***" which strives to unveil the “transformative power of digital communications networks to empower Indian citizens through digital means and enhance their quality of life.” It attempts to outlay several objectives, initiatives, procedures, and intended policy outcomes.

The primary objective of such a policy is to ensure that the implementation of innovative technologies is accessible to all citizens in an equitable and affordable manner while averting existing and emerging threats. It is especially important for a country like India to ensure that its communications infrastructure provides the foundation for the entire population since their demographics vary diversely across a multitude of indices, such as literacy, economic status, and urbanization.

A lot of time and effort has been invested by policymakers and scholars to understand the impact of this initiative on the stakeholders - government and consumers. On the contrary, the influence

of this policy on the private sector has not been researched to a great extent. Yet the altitude of the impact on the private sector seems to be elevated due to a multitude of factors.

Why did I choose this topic?

This study explores the implications of government interventions to foster citizens' welfare on the microeconomic goals of profit maximization. I grew interested in learning about macroeconomic policies while interning at the national investment promotion agency, 'Invest India'. I researched an array of policies and incentives and studied their effect on the digital sector. However, the research was limited to understanding the macroeconomic and trade implications. Hence I chose to study the microeconomic implications instead. Since I am a Vodafone Idea (VI) user myself, I choose to evaluate VI's market share in relation to government incentives, hence the research question, **"To what extent has the national digital communication policy of 2018, with its aim of "broadband to all", influenced VI's market share in Mumbai?"**

Economic theories used:

Multiple economic theories are utilised to evaluate market share in the telecommunications industry. This comprises 'Market share', 'Market structure: Herfindahl - Hirschman Index', 'Oligopoly: Price elasticity of demand', 'Price leadership' and 'Revenue'.

Hypothesis:

H_0 : There is no significant impact on VI's market share as a result of the policy

H_1 : The policy helped increase VI's market share marginally.

H_2 : The policy helped increase VI's market share drastically.

H_3 : VI's market share fell as a result of the policy.

Methodology - Primary and Secondary Data

Primary research using questionnaires was used to gather quantitative and qualitative data from a sample size of over 100 individuals consisting of users and telecommunication companies employees, obtained through stratified random sampling to better understand the market.

The questionnaire helped extrapolate the factors crucial for consumers and producers that establish demand and supply.

To evaluate consumer preferences, a sample of over 80 telecom service users from varying age groups were approached to respond to the questionnaire. **(Appendix A)**

Employees of telecom operators responded to a questionnaire **(appendix B)** designed to understand the key features of the individual firms that attracted consumers, as well as the growth of demand they've witnessed in the market since 2018. Through this data, we could

understand the variance in prices, demand and non-price factors since the establishment of the policy through the perspective of each market player.

Secondary data consisted of articles and papers published along with government statements. Several newspapers, reports, and websites were also included. Analytical tools such as formulas, graphs and diagrams were used to supplement the findings.

Background information

The Indian government assists in enabling technological growth since statistics show a strong correlation between a rise in GDP as technological advancements propel the country.¹ Telecom also generates the second highest revenue for the government of India after income tax.² As a result, it is a valuable resource for our economy. In Mumbai,

Along with policies like the national digital communications policy, the government has worked on initiatives such as digital India and the national telecom policy of 2012, amongst others, in order to promote digitalization, which subsequently contributes to economic growth.

¹*Knowledge, Technology and Complexity in Economic Growth*. (n.d.). Knowledge, Technology and Complexity in Economic Growth | Real Colegio Complutense.
<https://rcc.harvard.edu/knowledge-technology-and-complexity-economic-growth>

²“Telecom Sector: Issues and Challenges.” *Drishti IAS*, 5 Dec. 2019,
[www.drishtiias.com/to-the-points/paper3/telecom-sector-issues-and-challenges/print_manually.%20\(n.d.\).%20https://www.drishtiias.com/to-the-points/paper3/telecom-sector-issues-and-challenges](http://www.drishtiias.com/to-the-points/paper3/telecom-sector-issues-and-challenges/print_manually.%20(n.d.).%20https://www.drishtiias.com/to-the-points/paper3/telecom-sector-issues-and-challenges).

Each policy focuses on a set of objectives, the national digital communications policy, in particular, envisages three goals :³

- **“Connect India** - Establish reliable Digital Communications Infrastructure

Endorse Broadband for All as a tool for socio-economic growth while ensuring service quality and maintaining environmental consciousness.”

- **“Propel India** - Investing, innovating, and creating IPR to enable Next Generation Technologies and Services

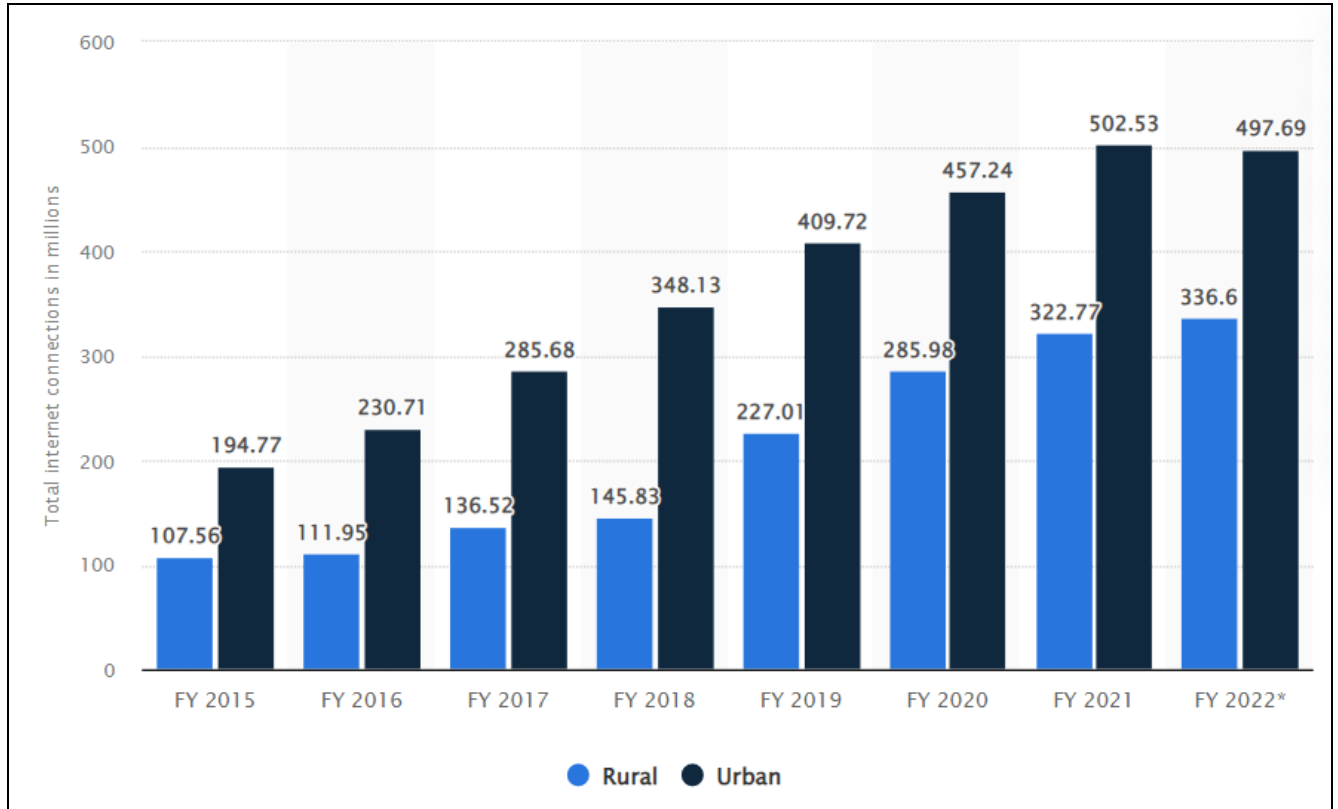
To optimize the potential of emerging digital technologies like 5G, AI, and the Internet - of - things, granting accessibility to future-ready goods and services augmented through cloud computing and big data; Catalyzing the growth of the fourth Industry by stimulating investments in research and development, innovation, and intellectual property rights.”

- **“Secure India** - Ensuring Sovereignty, Safety and Security of Digital Communications

To secure citizens' interests and safeguard India's digital sovereignty with a focus on ensuring individual autonomy and choice, data ownership, privacy and security; while recognising data as a crucial economic resource.”

The policy's purpose is to benefit the citizens of the country. The extent of its effectiveness can be proven through the growth in internet users since its implementation.

³ “Department of Telecommunication | <https://dot.gov.in/node>.” *Department of Telecommunication* | <https://dot.gov.in/node>, 17 Mar. 2023, dot.gov.in.



⁴figure 1 - increase in internet users

The data presented above (figure 1) shows a slight increase in internet users from 2015 to 2018. Comparatively, there has been a substantial increase in internet users since 2018. Considering the policy was launched in 2018, the data signifies the policy's impact on the growth of internet users. Thereby, we can argue that the policy played a role in the evolution of India's digital realm. The outbreak of Covid-19 that initiated a pandemic in 2020 also served as a catalyst for societal adoption and increased use of internet technology. The world grew reliant on digital services, compelling it to be a necessity rather than a luxury.

⁴"India: Number of Internet Connections in Rural and Urban Areas 2022 | Statista." *Statista*, www.statista.com/statistics/1196721/india-internet-connections-in-rural-and-urban-areas.

Mumbai, being a metropolitan city, keeps growing in population and is constantly evolving as more digitally connected. Companies such as Jio, VI, airtel and others all provide services in Mumbai and have a massive consumer base residing there.

The figure below shows the growth in telecom subscribers in Mumbai specifically, hence, supporting the claim that the policy augmented growth in users.

Telecom Subscribers (In Million)							
At the end of March	Total	Wireline	Wireless	Rural	Urban	Public	Private
2008	16.32	2.69	13.63	0.00	16.32	4.03	12.29
2009	22.11	2.88	19.23	0.00	22.11	4.47	17.64
2010	29.43	2.95	26.48	0.00	29.43	4.65	24.78
2011	37.79	2.99	34.80	0.00	37.79	4.75	33.04
2012	39.29	3.01	36.28	0.00	39.29	4.84	34.45
2013	33.36	2.99	30.37	0.13	33.23	4.27	29.09
2014	33.95	3.06	30.89	0.35	33.61	3.00	30.95
2015	33.73	3.06	30.67	0.68	33.06	3.14	30.59
2016	34.84	3.04	31.80	0.84	34.00	3.13	31.71
2017	39.62	3.04	36.58	1.40	38.23	3.16	36.46
2018	39.51	2.99	36.52	1.85	37.66	3.09	36.42
2019	40.93	2.92	38.01	1.64	39.29	3.00	37.93
2020	40.69	2.86	37.83	2.12	38.57	2.88	37.81

⁵figure 2 - Telecom subscribers in Mumbai

⁵ "Department of Telecommunication | <https://dot.gov.in/node>." *Department of Telecommunication* | <https://dot.gov.in/node>, 17 Mar. 2023, dot.gov.in.

Theory and Analysis

Market share

“Market share is a metric for determining the relative size of a company in a market or industry based on the percentage of total output, sales, or capacity that it accounts for.” A

larger market share usually translates into higher sales and hence, revenue.

The telecom industry in India comprises four major players: Reliance Jio (referred to as Jio), Bharti Airtel (referred to as Airtel), Vodafone Idea (referred to as VI) and BSNL.

During the last quarter of 2018, the market share in the telecom industry was divided as such:

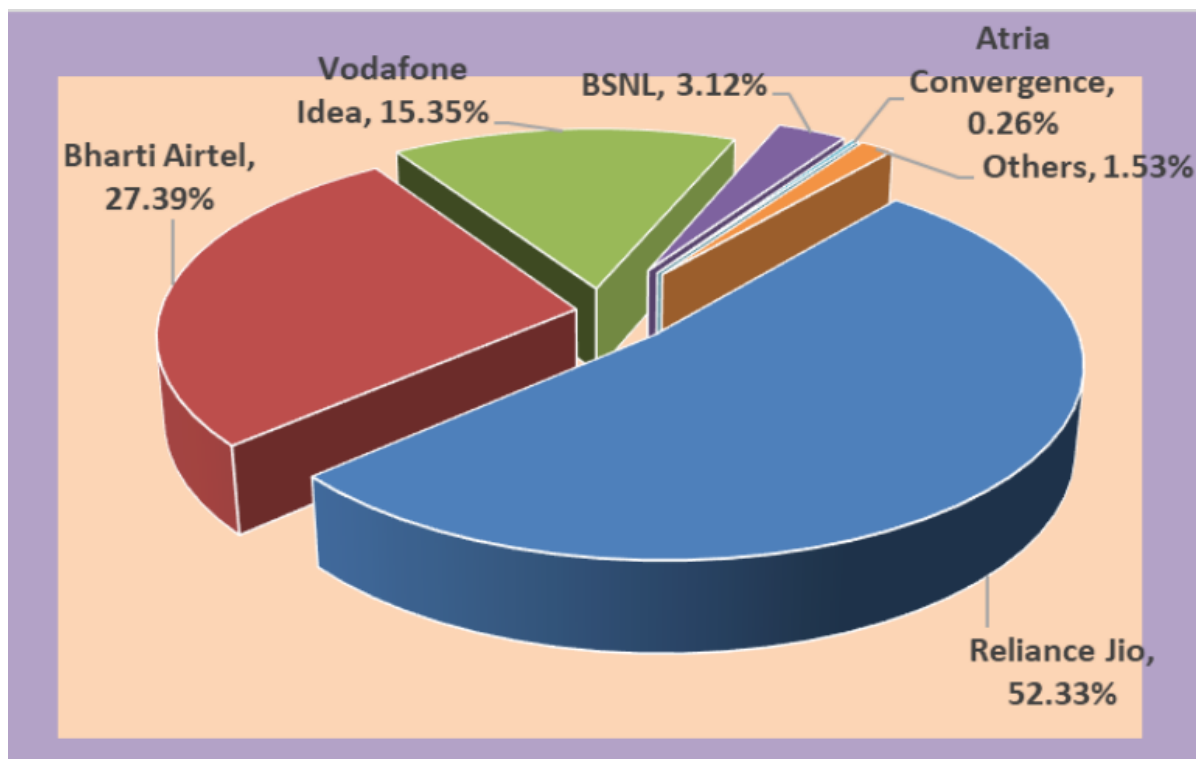
Service Provider	Subscriber base (millions)			Rate of Growth (%)	Market Share in QE Sep-18 (%)	Market Share in QE Dec-18 (%)
	Sep-18	Dec-18	Net Additions			
Vodafone Idea Ltd	435.22	419.03	-16.19	-3.72	36.53	34.98
Bharti	347.52	344.30	-3.22	-0.93	29.17	28.74
Reliance Jio	252.25	280.12	27.87	11.05	21.17	23.38
BSNL	124.69	125.81	1.12	0.90	10.47	10.50
Tata Tele.	23.85	20.86	-2.99	-12.52	2.00	1.74
MTNL	6.78	6.74	-0.04	-0.63	0.57	0.56
Reliance Com.	0.86	0.78	-0.08	-9.27	0.07	0.06
Quadrant	0.23	0.23	-0.01	-2.79	0.02	0.02
Total	1,191.40	1,197.87	6.46	0.54	100	100

⁶Figure 3 - Market share in 2018

⁶ https://www.trai.gov.in/sites/default/files/PIR_04042019_0.pdf

The data presented represents the market share in the telecommunication sector before the implementation of the policy. Through this data, we can deduce that VI had the highest market share in the industry, followed by Airtel, which had a similar market share to Jio.

Since the policy's implementation in November 2018, the telecom industry's market share has shifted significantly. The graph below reflects the most recent data for the same. It shows that Jio acquired the highest market share dominating the industry with over 50% market share, followed by Airtel with only a quarter market share, and ultimately Vodafone Idea, whose market share has halved since 2018. Smaller companies, such as BSNL, now account for less than 5% of the market.



⁷Figure 4 - market share as of 30th June 2022

⁷ https://www.trai.gov.in/sites/default/files/PR_No.40of2022.pdf

Additionally, my primary research indicates that 78.2% of those who took the survey that worked in the telecommunications sector felt that the market share of VI fell. Amongst those who claimed that VI's market share fell, all of them suggested that it fell drastically as shown in figure 5.

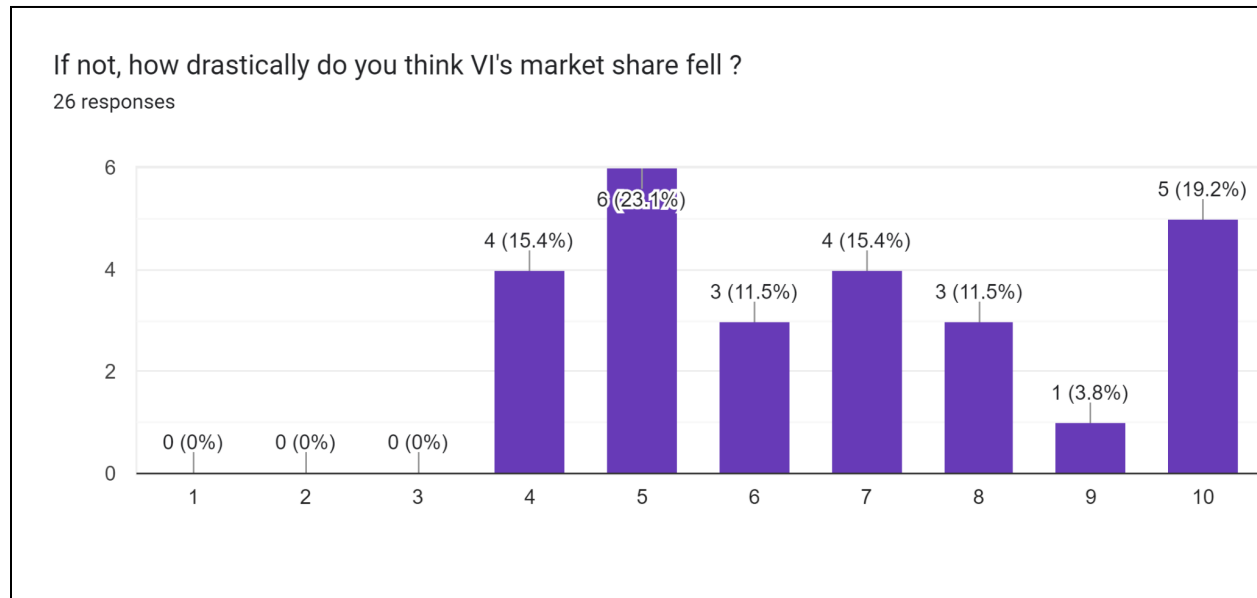


Figure 5 - primary research on VI's market share

Analysing both primary and secondary research, it is evident that the market share of VI fell since the implementation of this policy; hence, we accept the **fourth hypothesis**, “**VI's market share fell as a result of the policy**”. However, the variables influencing this decline in market share are still unknown.

Market structure

To understand the influence of the policy on VI, it is imperative to consider the market structure of the telecommunications industry. In economics, market structure refers to how different

industries are classified and differentiated based on the level and nature of competition for goods and services. It is based on the characteristics that influence the behaviour and outcomes of businesses in a particular market. Market structure is impacted by variables such as the volume of buyers and sellers, the degree of concentration, the degree of product differentiation, and the ease or difficulty of entering and exiting the market.⁸ There are four market structures in economics: monopoly, oligopoly, monopolistic and perfect competition.

Herfindahl - Hirschman Index

The Herfindahl-Hirschman Index, also known as the HHI score, is a gauge of market concentration that reveals the degree of competition in a given sector. The HHI Index formula helps determine whether a particular industry is highly concentrated, on the verge of becoming monopolistic, or is being affected by competition. It is calculated by first squaring each firm's market share in a market and then adding the resulting figures. It can range from close to zero to 10,000.⁹

A market with an HHI of less than 1,500 is considered a competitive market, a market with an HHI of 1,500 to 2,500 is considered a moderately concentrated market and a market with an HHI of 2,500 or greater is considered a highly concentrated market. As the number of market competitors decreases and the size disparity between those companies increases, the HHI grows.

⁸ "Market Structure." *Corporate Finance Institute*, corporatefinanceinstitute.com/resources/economics/market-structure.

⁹ "Herfindahl-Hirschman Index (HHI) Definition, Formula, and Example." *Investopedia*, 21 Nov. 2022, www.investopedia.com/terms/h/hhi.asp.

The HHI of the telecommunications industry in India before the implementation of the policy using the data of market share in September of 2018 is as follows:

$$36.53^2 \text{ (VI)} + 29.17^2 \text{ (Airtel)} + 21.17^2 \text{ (Jio)} + 10.47^2 \text{ (BSNL)} + 2^2 \text{ (Tata tel)} + 0.57^2 \text{ (MTNL)} \\ + 0.07^2 \text{ (Reliance Com)} + 0.02^2 \text{ (Quadrant)} = \mathbf{2474.4498}$$

An HHI of 2474 is close to the HHI of 2500, however, the market still qualifies as moderately concentrated. By the market concentration level, we can infer that the market structure qualifies as an Oligopoly. *“An oligopoly occurs when a small number of large firms dominate a market.”*¹⁰ The market share gained by the dominant companies in an industry becomes an impediment to new competitors. As a result, new firms face high barriers to entry.

Since the implementation of the policy, the market share has changed significantly, subsequently altering the HHI. The calculations below show the HHI of the market posts the policy.

$$53.33^2 \text{ (Jio)} + 27.39^2 \text{ (Airtel)} + 15.35^2 \text{ (VI)} + 3.12^2 \text{ (BSNL)} + 1.53^2 \text{ (Artia)} + 0.26^2 \text{ (Others)} \\ = \mathbf{3842.0664}$$

The HHI of 3842.0664 can be claimed to exhibit *monopolistic tendencies* since a market with an HHI of 2,500 or more is regarded as being highly concentrated, regardless, it won't qualify as a

¹⁰(*Oligopoly Markets* - OECD, n.d.)

monopoly unless it has an HHI value close to 10000. In a monopolistic market, a single seller can control price changes and create barriers for competitors to enter the marketplace. The characteristics of a monopoly could be similar to a market with high concentration, as proven by the HHI. This could entail high barriers to entry and low competition. Due to the low level of competition, the firms in the industry have the power to set their own prices. Considering its a highly concentrated market, the number of firms would also be limited.

Higher concentration in the market could translate to higher market share for individual companies, this is because the share in the market would have to be distributed to fewer firms. Hence each company receives a higher proportion of the market as it becomes more concentrated.

The shift in HHI since the introduction of the policy is a reflection of the market becoming more concentrated. Consequently, a higher market share would be acquired by the companies that are still operating in the industry. Considering VI remained in the market even post the growth in concentration, we can conclude that VI's market grew as a result. **Henceforth supporting the second hypothesis.**

Oligopoly

Firms in an oligopolistic market structure cannot prevent other firms from gaining significant market dominance. However, given that only a selected number of firms have a significant market share, each firm's behaviour can influence the other due to its *interdependence*. As a

result, the demand curve is more elastic since a rise in price by one firm would compel their customers to switch to other lower-priced firms, diminishing the revenue for the higher-priced firm. If the company lowers its price, the other companies will almost certainly follow in order to maintain market share. Because all of the firms work together, this section of the demand curve is much more inelastic. This causes a kink in the demand curve, with demand shifting from elastic at higher prices to inelastic at lower prices.¹¹

Price elasticity of demand

“The price elasticity of demand is the ratio of the percentage change in quantity demanded as a result of the percentage change in price for a product.”

$$\text{Price elasticity of demand} = \frac{\% \text{ change in demand}}{\% \text{ change in price}}$$

Price Elasticity of Demand (PED) is always negative, indicating that the relationship between price and demand is inverse. This is as a result of the two variables' ratio of changes being skewed in opposite directions; as a result, when the price increases, demand diminishes and the change turns negative.¹²

The numerical value of the PED coefficient can range from zero to infinity. When the PED is less than one, demand for a good is said to be inelastic (or relatively inelastic): price changes

¹¹ <https://www.economicshelp.org/blog/glossary/kinked-demand-curve/>

¹² “Price Elasticity of Demand Meaning, Types, and Factors That Impact It.” *Investopedia*, 30 Aug. 2022, www.investopedia.com/terms/p/priceelasticity.asp.

have a less-than-proportional effect on the quantity demanded. When a good's PED exceeds one, its demand is said to be elastic (or relatively elastic), because price changes have a greater than proportional effect on the quantity demanded.

The kinked demand curve hypothesis states that a company operating in an oligopolistic market is confronted with a demand curve that kinks at the current price level. The curve shows that a price decrease is more likely to elicit a response than an increase in price because it is more elastic above the kink and less elastic below it.

It is difficult for oligopolistic firms to determine their product price and marginal revenue because the quantity of products that can be sold at a given price depends on product prices set by other oligopolistic firms and their production quantity. This is supported by game theory, which claims that in an oligopoly, firms are influenced not only by their own production decisions but also by the production decisions of other firms in the market.

Because of the demand-price principle, if all firms produce too much, the price of the product falls below their average total costs, and all firms lose. On the other hand, the group can maximise their profit if they work as an unified entity and limit their common quantity to the point at which marginal cost equals marginal revenue.

When oligopolistic firms coordinate together, they will have a dominant strategy based on the decisions each firm makes to maximise profit and thus achieve a Nash Equilibrium. Firms

sometimes form cartels to maximise profit and efficiency by agreeing on a profit-maximizing output and selling at the optimal price.¹³

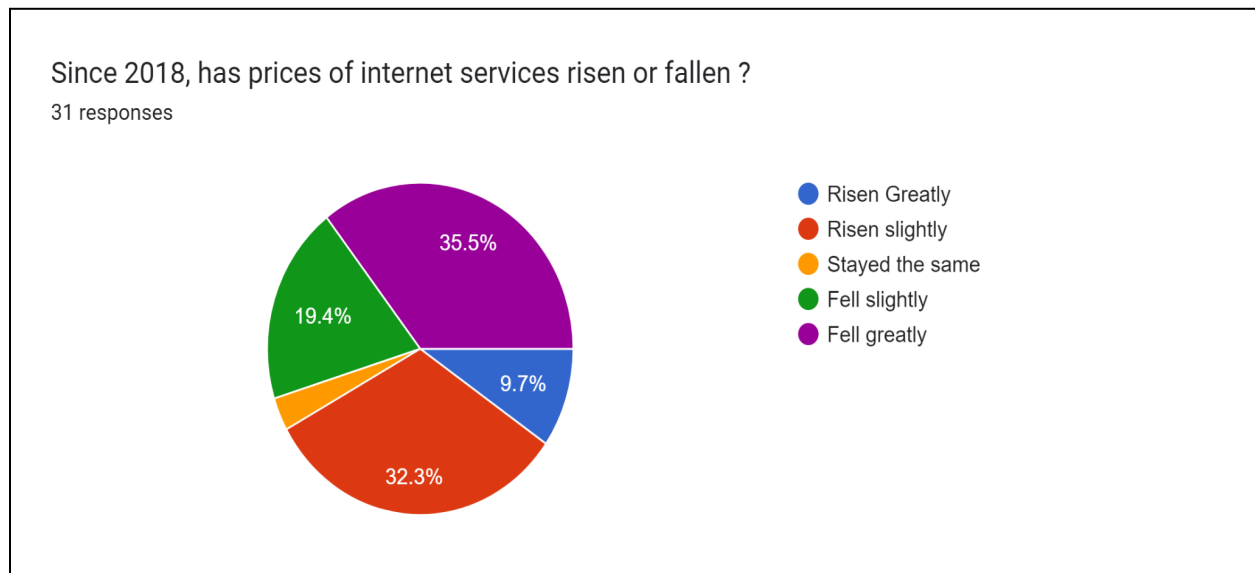


Figure 6 - prices of internet services

A total of 54.9% of those who filled out the questionnaire insisted that prices fell with most suggesting it fell greatly. Hence, through primary research, we can establish that prices in the market fell. This could've influenced other factors such as revenue and market share.

Revenue

*Revenue is the total income earned by a company from the sale of its goods or services to customers.*¹⁴ It is calculated by multiplying the quantity of goods sold by the price of the goods.

Considering a company's market share is its revenue measured as a percentage of an industry's total revenues. A change in revenue would directly influence market share. The relationship

¹³ "Kinked Demand Curve." VEDANTU, www.vedantu.com/commerce/kinked-demand-curve.

¹⁴ "What Is Revenue? Definition of Revenue, Revenue Meaning - the Economic Times." *The Economic Times*, economictimes.indiatimes.com/definition/revenue.

between revenue and market is directly related, *ceteris paribus*. As revenue grows, market share is expected to increase.

By understanding the change in the revenue of VI, we can derive the impact on its market share.

As discussed above, an oligopolistic market structure has two variances in regard to price elasticity. Consumers are more likely to react to a fall in price rather than a rise.

Price leadership

Pricing of products is one strategy that an oligopoly company can use, in which demand for a company's products is determined by the price of that company's product as well as the price of the competing company's product.

Each company has the option of playing with either a high or low price, while the demand for a company's product is determined not only by its chosen strategy, but also by the strategy chosen by the competitor.

“A price war manifests when two or more competing companies lower the prices to acquire customers from their competitors and gain market share.” Price wars come with a disadvantage since it diminishes the company's profit margins in the short term.

In a price war, the market is non-collusive in nature. This refers to a situation where the firms compete with each other while following their own price and quantity independent of their rival firms.

Jio used varying pricing strategies to take advantage of the price elasticity structure in the oligopolistic market. Henceforth, it initiated a price war.

Jio entered the industry with its 'Jio welcome offer,' which included free data and voice services. It attracted a large number of customers by charging nominal rates for high-speed data. They raised their prices to earn profits after gaining market share.

Many companies use similar pricing strategies to gain market share. This pricing strategy is referred to as "penetrative pricing." Penetration pricing is a marketing strategy used by businesses to attract customers to a new service or product by initially offering it at a lower price. A lower price facilitates the market entry of a new product or service and draws customers away from competitors. Market penetration pricing is based on the principle of setting low prices at first in order to increase consumer awareness of a new product. The substitution effect, which states that when the price of a product increases, consumers will switch to less expensive substitutes, causing a drop in sales for competitors, is the premise of this strategy.¹⁵

The price penetration strategy aims to capture and maintain a substantial market share with the expectation of retaining new customers once prices return to normal ranges.

¹⁵ "The Basics of Penetration Pricing Strategy." *The Basics of Penetration Pricing Strategy*, www.productplan.com/learn/the-basics-of-penetration-pricing-strategy.

This pricing strategy threatened competitors to lower their prices because failure to do so would result in a loss of market share. Furthermore, if the competitor is a smaller market player, they will eventually be pushed out of the market due to the losses incurred from price cuts.

Jio soon changed its approach to competitive pricing. Competitive pricing essentially implies aligning prices to that of rival companies, thereby minimising loss and retaining existing customers.

By leveraging these strategies, Jio was able to establish a competitive advantage enabling growth in their market share, consequently generating profit. Primary research also confirmed that Jio acquired the greatest market share (**figure**). By doing so, they acquired the market share of their rivals and pushed out smaller competitors from the market itself.

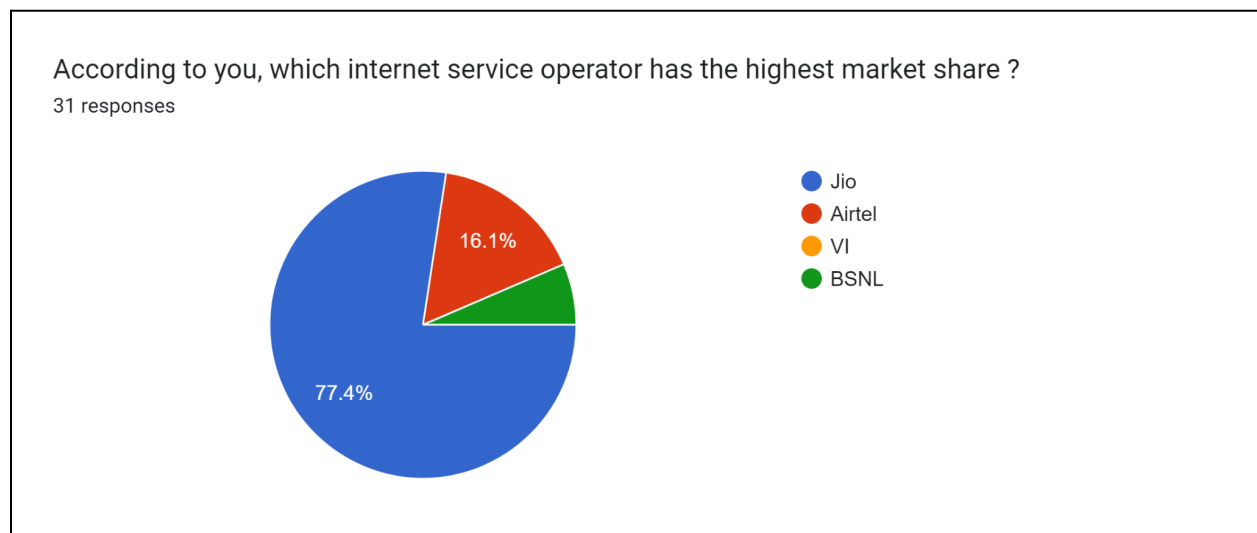


Figure 7 - market share of telecommunication companies

It had an adverse effect on their rivals, including VI, **hence supporting the claim that Vi's market share declined since the policy's launch.** However, the influence of Jio's growth is

acclaimed as an extraneous variable and is not directly related to government policies. Therefore we can not draw conclusions regarding the influence of the policy on the market share considering these findings.

Evaluation

The research managed to evaluate most variables that influence the parameter - demand - which determines market share. Although the research has led to a conclusion supported by evidence, as reflected by the data analysis of the primary research, several limitations of the survey must be acknowledged.

The research was greatly reliant on primary data and secondary sources. Due to the limited resources and time constraints, the primary data largely consisted of a restricted sample of Mumbai. However, since the acquired secondary data took into consideration the entire population of India as a sample, it may not be a valid representation of the data of Mumbai. The data derived from the survey - primary data- was also of limited certainty. Considering the population of Mumbai is over 23 million, a sample size of around 100 users can not be an accurate reflection of the larger population. Hence, the primary data may be reliable but not precisely credible.

One of the surveys had responses solely from employees in various telecommunication companies. This may enable biases such as in-group biases, which suggest that individuals will be biased towards the institution they're employed to. Since all questionnaires are subject to

prejudice and biases to some degree, the qualitative data can be relatively unreliable in comparison to secondary data.

Additionally, factors such as changes in income weren't utilized to evaluate the changes in demand.

Considering extraneous factors such as rival companies had more of an effect on the dependent variable rather than the independent variable, reporting bias arises. Biases in reporting occur when the nature and direction of research findings influence their dissemination. Hence, a cause-effect relationship couldn't be established either.

Conclusion

The primary data suggested a growth in demand and consumer base of internet users as a result of the National digital communication policy of 2018. The secondary data confirmed the findings of the primary data. Furthermore, primary and secondary data both show a fall in VI's market share over the years, whilst a growing dominance of Jio was witnessed in the telecommunication market in India.

Theoretically, the policy should've influenced a fall in prices to facilitate affordability and a rise in demand. This was evidently inferred from the objectives mentioned by the policy. Consequently, VI's revenue and market share should've grown as a result. However, the price wars caused by Jio's pricing strategy influenced VI's market share to decay. This was supported by game theory and the decision-making of firms in an oligopolistic market.

Considering the factors mentioned above, VI's market share was most influenced by Jio dominating the market, eliminating the influence of the policy itself. Hence, in regards to the research question, ***"To what extent has the National digital communication policy of 2018, with its aim of "broadband to all" influenced VI's market share in Mumbai city, Maharashtra, India"*** the economic analysis supports **the hypothesis suggesting that the policy implemented had no substantial influence.**

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Appendix

Appendix A - survey sent to consumers

Which telecom data service operator are you subscribed to ? *

- ☐ Jio
- ☐ VI
- ☐ Airtel
- ☐ BSNL
- ☐ Other: _____

According to you, what is their highlighting feature ? *

- ☐ Low prices
- ☐ Complimentary access to exclusive content (TV subscription, news subscription etc)
- ☐ Speed of data
- ☐ Other: _____

How long have you been availing their data service plan ? *

- ☐ over a month
- ☐ over a year
- ☐ over two years
- ☐ over five years

What is the cost of your current data service plan monthly ?

- ☐ Rs. 0-100
- ☐ Rs. 101-200
- ☐ Rs. 201-300
- ☐ Rs. 300+

What offers do you recieve as a part of their subscription ? *

Your answer

Did you have a different Internet data membership before the current one. If so, *
which operator ?

- ☐ Jio
- ☐ VI
- ☐ Airtel
- ☐ Other...
- ☐ N/A

If so, what prompted you to switch Internet Service providers ?

Your answer

What was the price of your data service plan before 2018 ?

Your answer

Do you think government initiatives such as Digital India and others promoted internet accesibility ? If so, explain.

Your answer

Appendix B - Survey sent to employees

Which Internet service operator do you work for ? *

- ☐ Jio
- ☐ Airtel
- ☐ VI
- ☐ BSNL
- ☐ Other: _____

According to you, which internet service operator has the highest market share ? *

- ☐ Jio
- ☐ Airtel
- ☐ VI
- ☐ BSNL
- ☐ Other: _____

In regards to the previous question, what do you think attracted customers to their brand ? *

- ☐ Low prices
- ☐ Complimentary access to exclusive content (TV subscription, newspaper subscription etc)
- ☐ Speed of data
- ☐ Other: _____

Which service operator grew the most in the past 5 years ?

- ☐ Jio
- ☐ Airtel
- ☐ VI
- ☐ BSNL
- ☐ Other: _____

In regards to the previous question, what do you think led to their growth ?

Your answer _____

Which telecom service operator is earning the most profits currently ? *

- ☐ Jio
- ☐ Airtel
- ☐ VI
- ☐ BSNL
- ☐ Other: _____

Since 2018, Do you think the market share of VI has grown ?

- ☐ Yes
- ☐ No

If yes, how drastically do you think VI's market share grew ?

	1	2	3	4	5	6	7	8	9	10	
very slow growth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	extremely fast growth/more than doubled

If not, how drastically do you think VI's market share fell ?

	1	2	3	4	5	6	7	8	9	10	
very slightly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	extreme fall/more than halved

Since 2018, has prices of internet services risen or fallen ? *

- ☐ Risen Greatly
- ☐ Risen slightly
- ☐ Stayed the same
- ☐ Fell slightly
- ☐ Fell greatly

Has demand for internet services grown since 2018 ? *

- ☐ Yes
- ☐ No

What factors influences demand in the telecom industry ? *

Your answer

What strategies has the company you're working for adapted in order to cope with * such rigorous competition in the market ?

- ☐ Lowered Prices
- ☐ Improved quality - speed of data, unlimited calls etc
- ☐ Other:

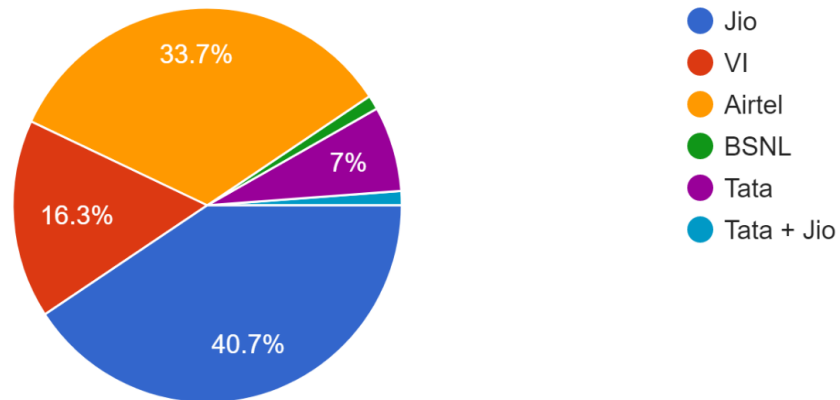
Which Internet service providers are most accesible to remote locations ?

- ☐ Jio
- ☐ Airtel
- ☐ VI
- ☐ BSNL
- ☐ Other:

Appendix C - responses (survey 1: survey to consumers)

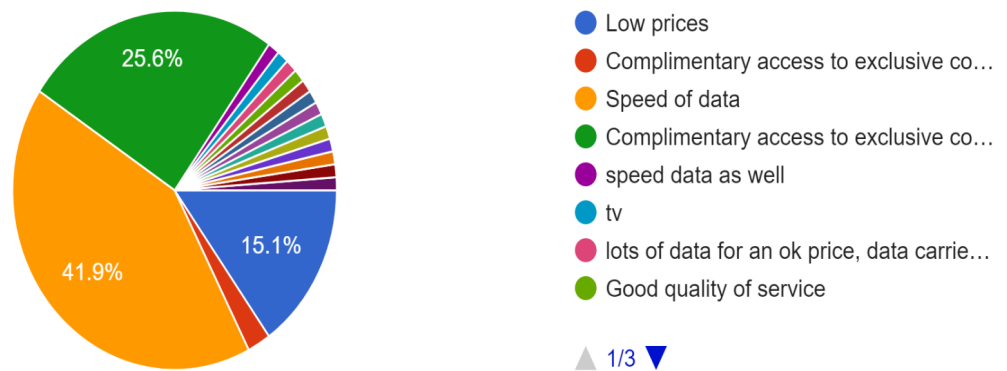
Which telecom data service operator are you subscribed to ?

86 responses



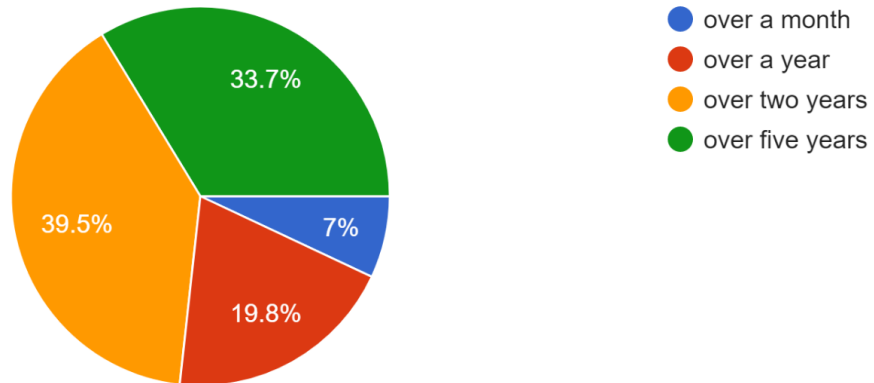
According to you, what is their highlighting feature ?

86 responses



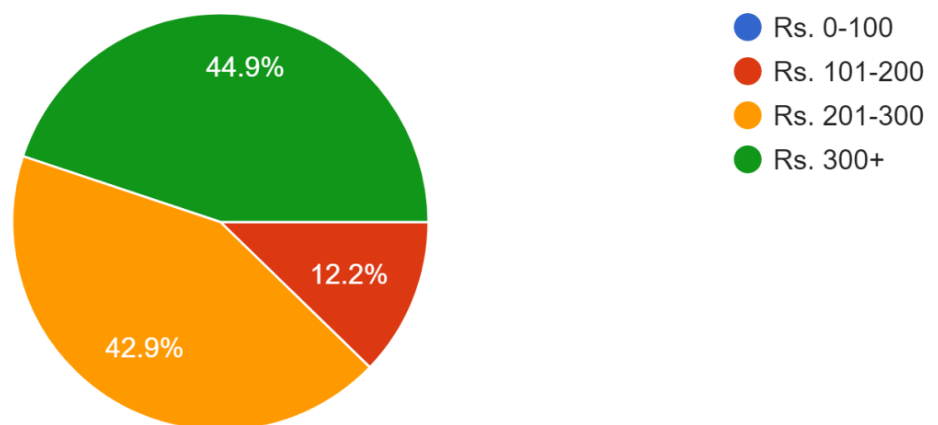
How long have you been availing their data service plan ?

86 responses

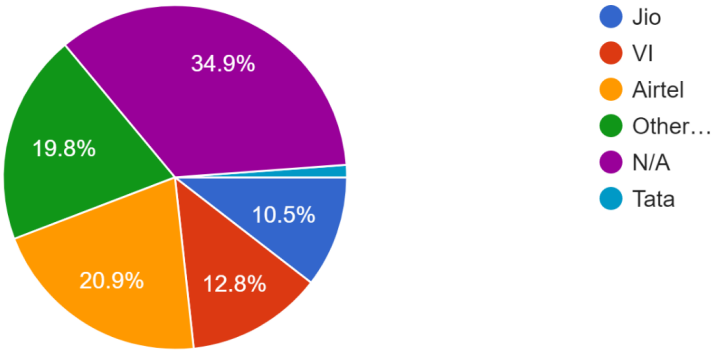


What is the cost of your current data service plan monthly ?

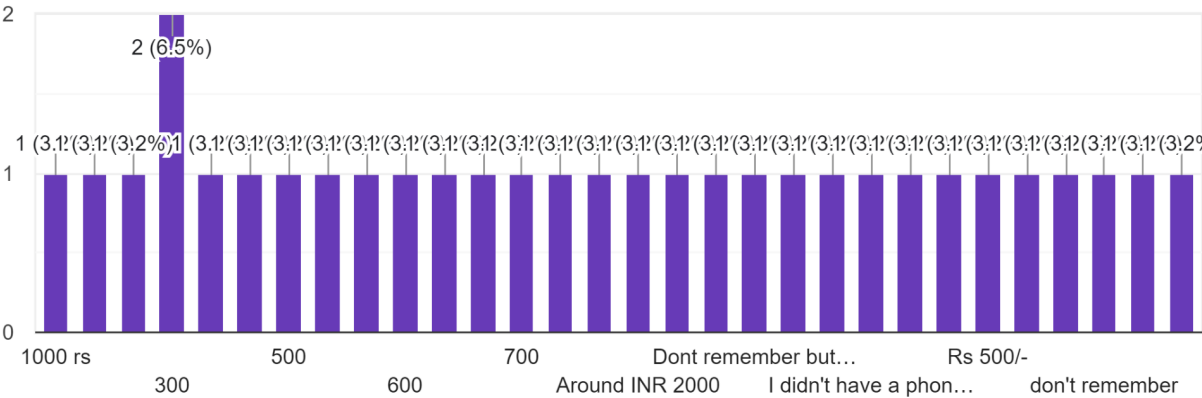
49 responses



Did you have a different Internet data membership before the current one. If so, which operator ?
 86 responses



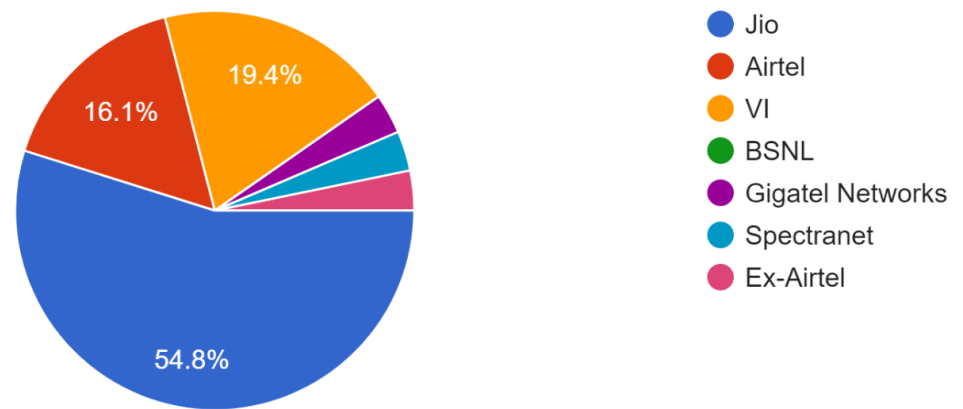
What was the price of your data service plan before 2018 ?
 31 responses



Appendix D - responses (survey 2: survey to employees)

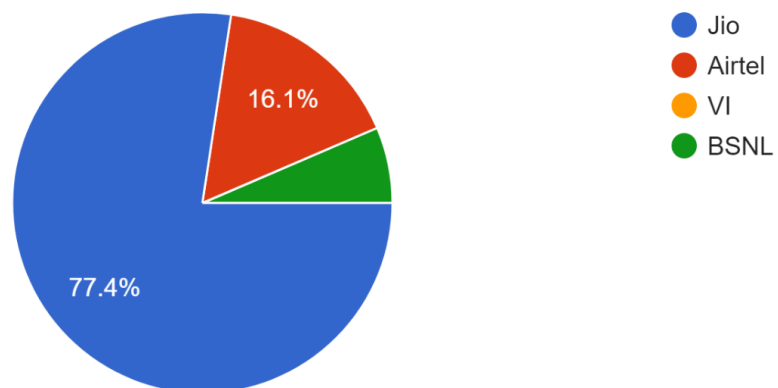
Which Internet service operator do you work for ?

31 responses



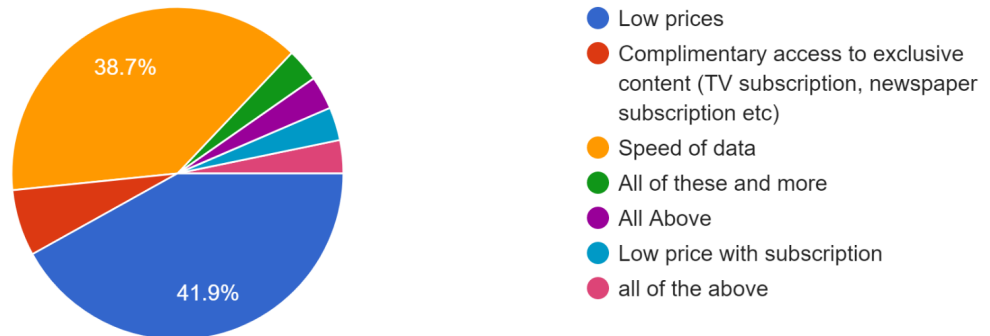
According to you, which internet service operator has the highest market share ?

31 responses



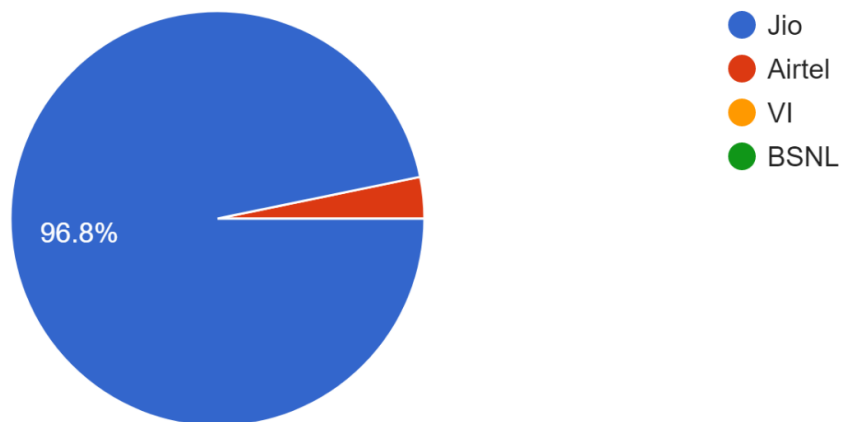
In regards to the previous question, what do you think attracted customers to their brand ?

31 responses



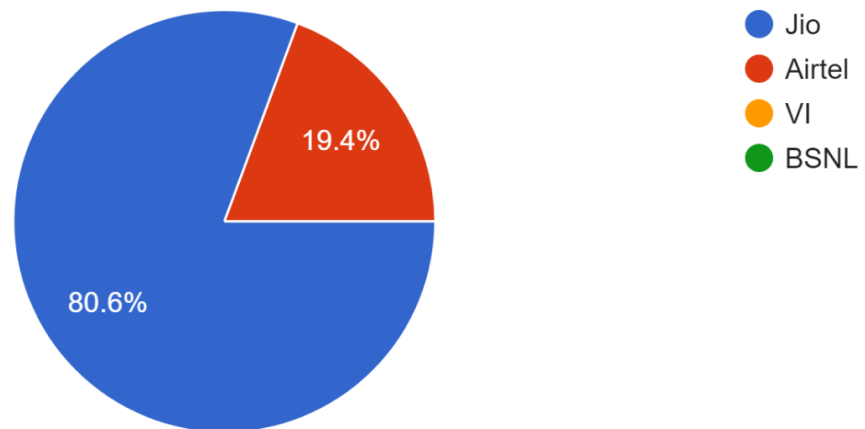
Which service operator grew the most in the past 5 years ?

31 responses



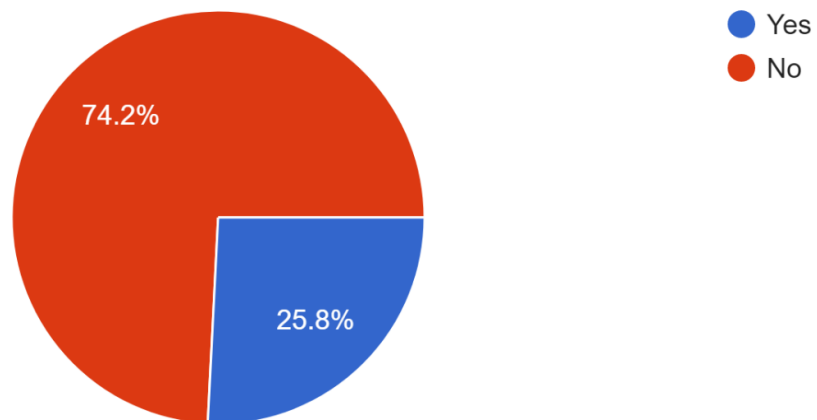
Which telecom service operator is earning the most profits currently ?

31 responses



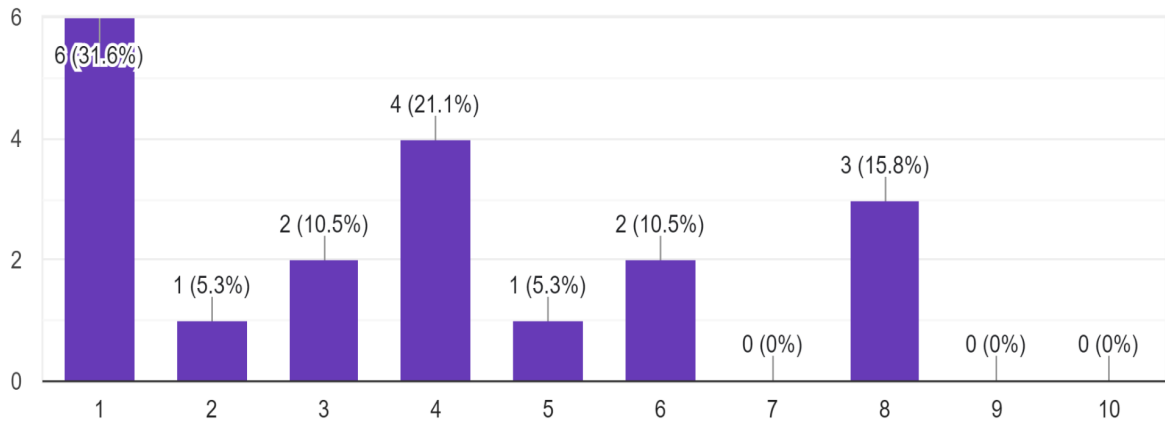
Since 2018, Do you think the market share of VI has grown ?

31 responses



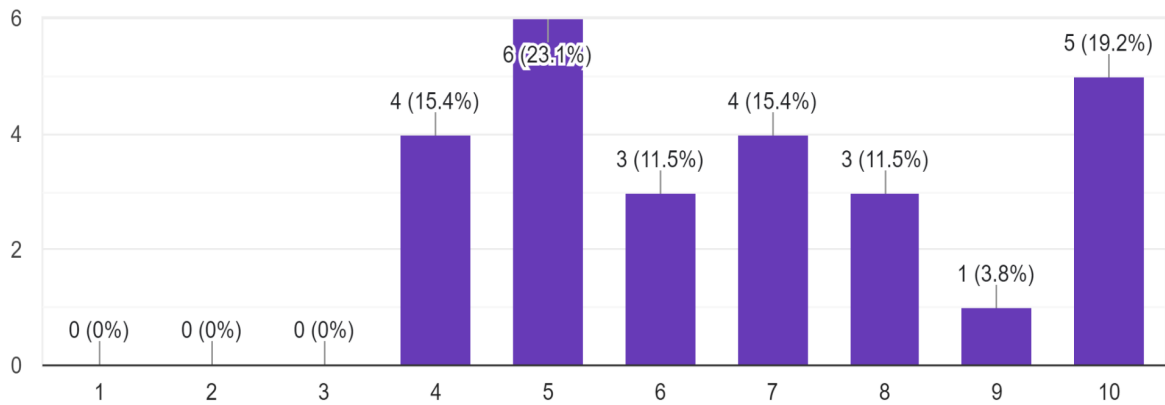
If yes, how drastically do you think VI's market share grew ?

19 responses



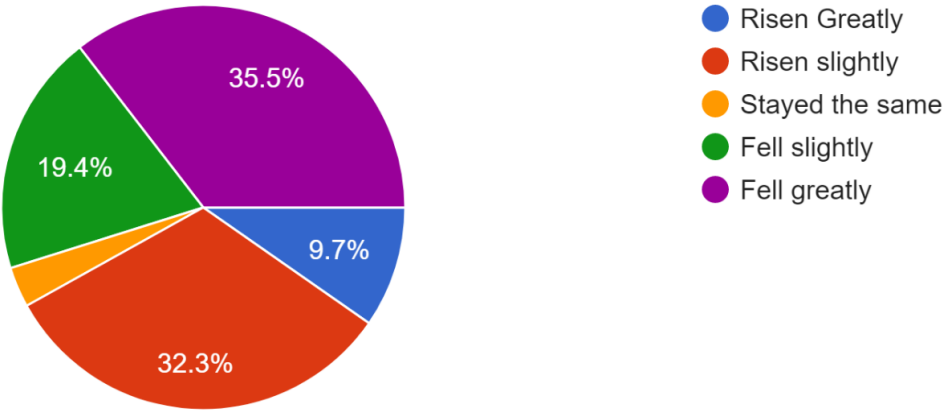
If not, how drastically do you think VI's market share fell ?

26 responses



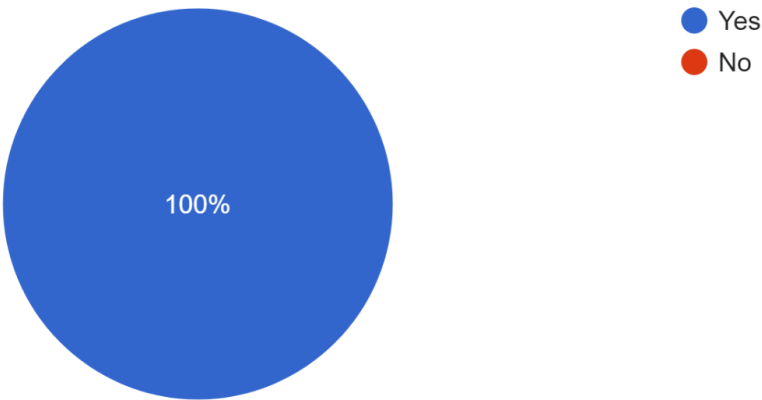
Since 2018, has prices of internet services risen or fallen ?

31 responses



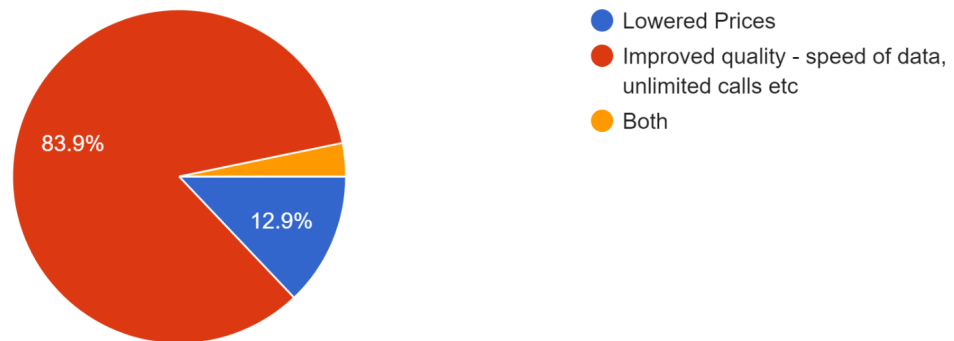
Has demand for internet services grown since 2018 ?

31 responses



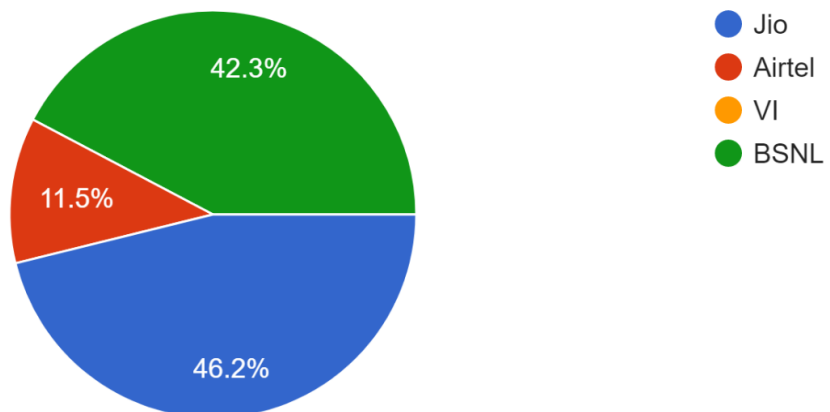
What strategies has the company you're working for adapted in order to cope with such rigorous competition in the market ?

31 responses



Which Internet service providers are most accesible to remote locations ?

26 responses



Appendix D : Map of Mumbai



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¹⁶ "Mumbai Map." *Mumbai Map PowerPoint*, www.sketchbubble.com/en/presentation-mumbai-map.html.
