Abstract
Innovation is the process and outcome of producing new items, having value. Innovation starts with finding of new ideas or elements, which undergoes developments useful for commercial purposes. Innovation is the ability to adapt by adopting new products, processes, marketing and organization, and promoted by one agency. Innovative technology attributes are: Relative Advantage, Compatibility, Complexity, Trialability and Observability. Telecommunication is the science of transmitting information by electromagnetic waves. Telecommunication has contributed a lot for human development. Digital Divide is due to inequitable access to telecommunication services. Due to its rapid growth, Information and Communications Technology sector has become a major source of revenue, for both public and private operators. Jio, Airtel, and Vodafone Idea had to increase prepaid tariff from 1st December 2019. Year 2020 will be more eventful, due to 5G spectrum allotment. Indian Telecom Industry went through a massive transformation, when Jio disrupted the telecom sector, with its free data and unlimited voice calls, from 5th September 2016. Airtel, Vodafone Idea and BSNL were forced to offer more data and unlimited voice facilities, at cheap rates. Introduction of Interconnect Usage Charges and the resultant tariff hikes created public unrest. Decisions to merge ailing BSNL with MTNL, and Vodafone with Idea, were to survive in the competitive market. Government of India will invest Rupees 29937 crore for the revival of MTNL and BSNL, with plans to monetize assets worth Rupees 38000 crore. Around 92000 employees, 54 percent existing of BSNL and MTNL together, have opted for VRS 2019, effective from 31st January 2020, resulting in saving of Rupees 8000 crore annual salary. In 2019 August, formation of Vodafone-Idea was announced, to improve the network and offer customers a better experience, becoming India’s largest telecom company, with 408 million active subscribers and Revenue market share of 32.2 percent. In 2019 September quarter, Vodafone Idea reported a loss of Rupees 50921 crore,
and Airtel 23045 crore. Hiking the prices will help telecom operators increase their ARPU. The Average data consumption of 800MB in 2015, increased to 8GB per month per user in 2019. This study is to understand the Innovations in Telecom industry, with special emphasis in Kerala. Analysis of the relationship between Private and Public Telecom Organisations is one of the major objectives of the study. The Indian Telecom Industry is now practically a four player market, Reliance, Vodafone Idea and Airtel grabbing the top positions, with 89 percent of the total revenue, and Government owned BSNL & MTNL together with 11 percent.

**Keywords:** Innovations, Telecommunication, Finance, Retirement, Schemes

**Introduction**

Innovation is the process of finding new ideas or elements, which undergoes developments resulting in useful commercial outcome. Innovation is the ability to adapt by adopting new *products, processes, marketing and organization*, and promoted by an agency. The Innovative technology attributes are: *Relative Advantage, Compatibility, Complexity, Trialability and Observability*. Telecommunication is the science of transmitting information by electromagnetic waves, and has contributed a lot for the development of human beings. Digital Divide is due to inequitable access to telecommunication services. Due to its rapid growth, Information and Communications Technology sector has become a major source of revenue, for public and private operators. Reliance Jio, Airtel, and Vodafone-Idea increased prepaid tariff from 1st December 2019, to improve their financial position. The Telecommunication Industry was subjected to major ups and down in 2019. Year 2020 will be more eventful, as it is said to be around 5G spectrum allotment and 5G services.

Indian Telecom Industry went through a large scale transformation, when Jio disrupted the telecom sector with its ‘free data’ and ‘unlimited voice calls’ introduced in India from 5th September 2016. Following Jio’s strategy, Airtel, Vodafone-Idea and BSNL started offering more data and unlimited voice calling facilities, at negligible prices.

Introduction of Usage Charges and the resultant tariff hikes created unrest. It was decided to merge the loss making BSNL and MTNL. Vodafone and Idea decided to merge and formed Vodafone Idea Limited to survive in the highly competitive market. Government will put Rupees 29937 crore for the revival of BSNL and MTNL, with the intention of monetizing
during the next three years, assets valued Rupees 37000 crore. 78569 BSNL employees (51.1 percent of 153786), and 14387 MTNL employees (78.1 percent of 18422), opted for VRS 2019, expected to save Rupees 8800 crore annual salary. Regular employees above 50 years, were eligible to opt for VRS, opened on 4 November 2019, till closure on 3 December 2019.

Table 1
BSNL VRS-2019 in India (Total & Percentages)

<table>
<thead>
<tr>
<th>In India</th>
<th>Total</th>
<th>Group-A</th>
<th>Group-B</th>
<th>Group-C</th>
<th>Group-D</th>
<th>I/W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>153786</td>
<td>7211</td>
<td>37785</td>
<td>86757</td>
<td>21390</td>
<td>643</td>
</tr>
<tr>
<td>Eligible</td>
<td>104471</td>
<td>5661</td>
<td>11971</td>
<td>71007</td>
<td>15302</td>
<td>530</td>
</tr>
<tr>
<td>Opted</td>
<td>78569</td>
<td>4295</td>
<td>9010</td>
<td>54994</td>
<td>9936</td>
<td>334</td>
</tr>
<tr>
<td>Rejected</td>
<td>25902</td>
<td>1366</td>
<td>2961</td>
<td>16013</td>
<td>5366</td>
<td>196</td>
</tr>
<tr>
<td>Balance</td>
<td>75217</td>
<td>2916</td>
<td>28775</td>
<td>31763</td>
<td>11454</td>
<td>309</td>
</tr>
<tr>
<td>Total 50+</td>
<td>25912</td>
<td>1366</td>
<td>2961</td>
<td>16023</td>
<td>5366</td>
<td>196</td>
</tr>
<tr>
<td>Total 58+</td>
<td>8403</td>
<td>353</td>
<td>693</td>
<td>6362</td>
<td>916</td>
<td>79</td>
</tr>
</tbody>
</table>

Table 2
BSNL VRS-2019 in Kerala Circle (Total & Percentages)

<table>
<thead>
<tr>
<th>In Kerala</th>
<th>Total</th>
<th>Group-A</th>
<th>Group-B</th>
<th>Group-C</th>
<th>Group-D</th>
<th>I/W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>9387</td>
<td>547</td>
<td>2651</td>
<td>5768</td>
<td>421</td>
<td>0</td>
</tr>
<tr>
<td>Eligible</td>
<td>6671</td>
<td>469</td>
<td>913</td>
<td>4961</td>
<td>328</td>
<td>78</td>
</tr>
<tr>
<td>Opted</td>
<td>4596</td>
<td>378</td>
<td>647</td>
<td>3417</td>
<td>154</td>
<td>37</td>
</tr>
<tr>
<td>Rejected</td>
<td>2075</td>
<td>91</td>
<td>266</td>
<td>1544</td>
<td>174</td>
<td>41</td>
</tr>
<tr>
<td>Balance</td>
<td>4791</td>
<td>169</td>
<td>2004</td>
<td>2351</td>
<td>267</td>
<td>63</td>
</tr>
<tr>
<td>Total 50+</td>
<td>1650</td>
<td>79</td>
<td>206</td>
<td>1185</td>
<td>125</td>
<td>25</td>
</tr>
<tr>
<td>Total 58+</td>
<td>535</td>
<td>20</td>
<td>48</td>
<td>470</td>
<td>21</td>
<td>3</td>
</tr>
</tbody>
</table>
Some employees are likely to get a retirement package of above Rupees 90 lakh under the VRS. The effective date of VRS 2019 is 31 January 2020. The ex-gratia shall be equal to 35 days salary for each completed year of service, and 25 days salary, for each year of service left at the age of sixty years. VRS opted Employees will get 100 to 125 percent of the salary for the left out years of service, in addition to normal pension, based on the wage for January 2020. MTNL has recorded huge losses during nine years in the last decade. BSNL has been incurring losses from 2010 onwards. Vodafone Idea was formed in August 2019, to improve the network and offer customers a better experience, with 408 million active subscribers and Revenue market share of 32.2 percent. Vodafone Idea and Airtel suffered heavy losses this year. In 2019 September quarter, Vodafone Idea reported a loss of Rupees 50921 crore, widening from Rupees 4874 crore in 2018. Airtel reported loss of 23045 crore, from a profit of Rupees 118 crore in 2018. Jio had a profit increase of 45 percent during this period. ARPU is increased by hiking the prices. Jio, Airtel and Vodafone increased their prepaid tariff in five years. Per month average data consumption of 800MB in 2015, increased to 8GB in 2019. Jio, Airtel and Vodafone-Idea launched new tariff plans, and also increased the price of some of the existing prepaid plans. All tariff plans across all operators will come with IUC until January 2021. Airtel and Vodafone removed the cap on free and unlimited outgoing calls. But Jio retained the limits. Mobile consumers switch operators that offer better value for money. Wi-Fi calling is being brought in by all the mobile operators. 5G is the future in the Telecom Industry, and is already available in many countries. India will have 5G services in 2020. Jio, Airtel and Vodafone-Idea are already testing 5G in India. For Telecom industry, expenditure on energy is 20 to 40 percent of network operating expenses (Energy Efficiency: An Overview, 2020. London: GSM Association). The ICT services & applications by Internet of Things, supports the development of green economy, enhancing the capacity to monitor natural and human systems in real time, and manage these operations in more sustainable ways, through higher energy and material efficiency, and substitute with renewable resources. Government of India has decided to raise a sovereign bond of Rupees 15,000 crore for the revival of BSNL and MTNL. The cabinet decided to allocate 4G spectrum to BSNL to enable provision of broadband and other data services on par with Jio and Airtel. The finance cost of MTNL is almost half the total revenue. MTNL has identified assets worth Rupees 23000
crore for monitisng. MTNL has proposed to monetise Rupees 6200 crore assets, including 36 acres of land in Mumbai at Vasai Hill, Simpholi and Mulund, and shops or offices in seven DDA market complexes in Delhi, in addition to 36 residential quarters in Noida. With 14387 opting for VRS, out of the 18422, with annual saving of Rupees 1700 crore, and the proposed asset monetisation, MTNL will be profitable in the next fiscal. Around Rupees 7000 crore is aimed in 2020-21 through real asset monetisation, which will be used for debt restructuring and modernisation. MTNL hopes to generate around Rupees 500 to 600 crore annually, by renting out unoccupied building space.

In 2018-19 MTNL recorded a loss of Rupees 3388.07 crore, against revenue of Rupees 2085.41 crore, and the accumulated debt was Rupees 20000 crore. Debt of BSNL was also Rupees 20000 crore. A seven-member Group of Ministers were identified to accelerate and monitor the implementation of the Rupees 68,751 crore worth revival plan for BSNL and MTNL, which includes 4G spectrum allocation and VRS to the employees, to become profitable in two years. Till the merger is completed in 24 months, MTNL will operate as a subsidiary of BSNL.

The revival, consists of allotment of Rupees 20140 crore for the price of 4G spectrum, Rupees 3674 crore for GST payable. BSNL & MTNL will raise Rupees 15000 crore in debt on sovereign guarantee. Government of India will fund Rupees 17169 crore for VRS and another Rupees 12768 crore for pension liability gratuity and commutation. BSNL has identified of 14 properties valued Rupees 20,000 crore, in Mumbai, Chennai and Trivandrum, for asset monetisation. BSNL land, priced about 2000 crore at ALTTC Ghaziabad, is offered to the Ministry of Skill Development. BSNL has started negotiations with the CBSE for sale of land at various places. BSNL intends to issue sovereign guarantee bonds, which could be issued in February 2020.

The Government has issued LoC of Rupees 30000 crore to BSNL, to take loans for its capital expenditure, as BSNL will be rolling out 4G services, for which at least Rupees 12000 is required. BSNL owes Rupees 10000 crore to the vendors. For urgent Capital Expenses, BSNL is likely to get a loan of Rupees 4000 to 5000 crore from SBI. Airtel shareholders gave clearance on 3 January 2020, to raise Rupees 21,000 crore, as equity of Rupees 14000 crore and a debt of Rupees 7000 crore. Supreme Court had directed in November 2019, all telecom companies to pay Adjusted Gross Revenue (AGR) dues amounting to a total of Rupees 92640
crore. Airtel also decided for secured or unsecured redeemable non-convertible debentures with or without warrants, and issuance of foreign currency convertible bonds. Jio had a 60 percent increase in net profit, at Rupees 1578.2 crore in 2019 October to December quarter, for the ninth successive quarter, with good customer growth and 2.6 percent increase in ARPU, reaching Rupees 123. Airtel and Vodafone Idea expects their 2019 October to December quarter losses to Rupees 1490 crore and Rupees 4324 crore respectively, with reasonable ARPU of Rupees 129 and Rupees 107. Airtel had a loss of 23045 crore. Vodafone Idea the loss was Rupees 50922 crore, in 2019 July to September quarter, after provisioning for adjusted gross revenue (AGR) loss. Jio could make a net profit increase of 45 percent for September quarter.

Statement of the Problem
Telecommunication has emerged as a key factor of economic and social development, in an increasingly knowledge intensive global scenario. India needs to play an effective role to ensure accelerated equitable and inclusive economic growth by providing affordable and quality telecommunication services in rural and remote areas. Managing Human Resources in Telecom Industry no longer remains to be a smooth affair. Radical changes are inevitable to ensure competitive advantage. The employees are to be curtailed and enlightened to maximize the revenue and reduce the expenditure.

Objectives of the Study
India has been utilizing Telecommunications & ICT for the benefit of the citizens. Optical fiber is extended even to the remotest villages in India, enabling high speed internet connectivity at affordable rates. Mobile offers the benefits of remote delivery of Government services and information to the common man. Mobile Internet provides new avenues to the citizens to interact with the Government and other agencies.

The following objectives are defined for the study:

1. To identify the factors, relevant to organizational context, which influence the Innovations in Telecommunication Industry in India.
2. To find out the prevalent Innovations in Telecommunication Industry in India, and to derive relationship between these Innovations carried out.
**Methodology of Study**

This is a fact finding study which is descriptive in nature. The study analyzed the past research works, on the impact of Innovations in Telecommunication. This paper is based on review of literature and secondary data collected from various websites, Annual Reports, journals, magazines, newspapers and reference books.

**Academic Approaches to Telecommunication in India**

Indian Telecom Industry consists of telephone, Internet and television broadcast. Telecom Industry has grown over twenty times in just a decade, from under 36 million subscribers in the year 2001, to over 846 million subscribers in year 2011, and 1204.85 million on 31st October 2019. Overall Tele-density in India is 91.17, with Rural Tele-density of 58.21 and Urban Tele-density of 161.27. The Tele-density in Kerala is 128.75. Indian Telecom Industry is the largest in the world, after China, by the number of telephone users. India has one of the lowest call tariffs in the world, enabled by mega telecom operators, and hyper-competition among them, with 1183.40 million Mobile subscribers, 21.45 million Fixed Line Subscribers, and 644.08 million Broadband Subscribers. According to London-based telecom trade body GSMA, Indian Telecom Industry will contribute 145 lakh million Rupees to the economy, and support 30 lakh direct jobs and 20 lakh indirect jobs by the end of 2020.

**Suggestions**

Addressing the Human Resources issues in Telecom Industries is vital. The study is supposed to provide inputs for the effective managements of Telecom Industry in India. Monetary rewards continue to play a prominent role in keeping the workforce active and energetic. The present study, conducted in the four major Telecom Operators, provides valuable insights into the role of Innovations in Telecom Industry. Attempts were made to assess Innovations in Telecom Industry in India, with respect to both Intrinsic Innovation and Extrinsic innovation.

**Conclusion**

Telecom in the modern era is the science and practice of transmitting information by electromagnetic means. Telecom involves the use of electrical devices such as Fixed Phone, Mobile Communication, Radio, Television, Microwave Communication, Fiber Optics, Wi-Fi Communication, Leased lines, Data Centre Services, Disaster Recovery, Orbiting Satellites,
Internet, IOT, Machine Learning and Artificial Intelligence Mobile phones have had a significant impact on telephone networks.

Optical fibers are smaller in size, do not suffer from crosstalk, and enables exponential growth in data capacity. Telecom has a significant social, cultural and economic impact on the modern society. Companies have used telecom to help build global business empires. The Digital Divide is due to the inequitable access to telecom services amongst the various countries of the world.

The present study, conducted in the four major Telecom Operators in India, provides valuable insights into the role of Innovations in Telecom industry. Attempts were made to appraise Innovations, with respect to Intrinsic Innovation and Extrinsic innovation. The present study would elicit the management to capitalize on Innovations.

Telecommunication users must trust other individuals and organizations they deal with online, and to be assured that their privacy and other rights will be protected in the virtual world of cyberspace, just as they are in the physical world, creating industry codes of practice that will help protect consumers against cybercrime and other forms of online abuse, and by creating tools that will allow internet users to manage their online identities.

References


