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Indian railways: An analysis of literature review

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Abstract
Indian Railways is the best transportation facility provider and biggest economic payee of the Indian government as well as biggest social service providers for the nation. Indian Railways historically established by the Britishers through East India Company (EIC) for the Business and to rule the whole Indian continents. Numerous studies has been done so far now concerned to its union, labour, industry, employment etc. Here in this paper it has been tried to focus on decadal growth of Indian railways with the help of secondary data source e.i. time series data. The literature review and secondary data on statistical summary of Indian Railways has been analysed for the average annual growth rate, number of employees and officers, total employees' wages, railway stations, infrastructure etc.

Keywords: Indian railways, time series data, employment

Introduction

Indian Railways is the high quality transportation facility provider and the economic backbone of Indian transportation industry. It was historically established by the East India Company (EIC) and Great Indian Peninsular Railway (GIPR) for the purpose of business and for ruling the whole Indian continent. Transport is an important infrastructure for maintaining and developing economic activity. Rail transport occupies a very important place in surface transport. The statistical summary sheet-2016 has provided the statistical data on the number of employees of group C and D, gazetted officers A and B, electrified routes, total routes, total number of stations, earnings, expenditures, assets etc. The Indian Railways is oldest, cheapest and fastest mode of transportation and the backbone of the India. It provides the cheap fair for their transportation for passengers and freights along with many other facilities such as infrastructure, stations premises, coaches, transportations, cheap fairs, luggage facilities, cleaned railway stations, cafeterias, health centres, medical facilities in running trains, train enquiry facilities, passenger reservation systems (PRS), and new generation of ticket reservation system (NGet). It is state owned enterprise under the control of Ministry of Indian Railways (Railway Board).
Indian railways (IR) started its journey of 34 km journey between Bombay (now Mumbai) and Thane on April 16, 1853 with the 14 coaches and 400 passengers. Today it is not only the oldest but also the largest organization in terms of employment providing industry, production, investment and its contribution to the national income. The first passenger train was operated in 1853 and it was locomotive named Sahib, Sultan and Sindh. It is the finest transport organization of the country in the largest rail network in Asia and the world's second largest corporation under one management. According to the Johnson, M. 2019 [3], The first passenger trains steamed out of Howrah station destined for Hooghly, a distance of 24 miles on 15th august 1854. Indian Railways was nationalized in 1951 making it as a monopolist in the country. In 2014-15, Indian Railways had a revenues of 1634.50 billion Rupees, which consists of 1069.27 billion Rupees from freight and 402.80 billion Rupees from passenger transit Nick Thijs and Patrick States (2008) (cited in Johnson, M. 2019.) [3] "suggests that a good platform is required for the exchange of views. Experiences and good practices to improve the performance, competitiveness and quality of Indian Railways". In this paper, we have the studied the available literature review and examined the annual and decadal growths of statistical information (i.e., employees, stations, route in kilometers) on Indian Railways.

Materials and Methods

The secondary data from summary sheet of Indian Railways published in March 2016 on Railway Board (Indian Railways) website has been used. The review of literature has been done to write this research paper. The average annual and decadal growth rates percentages has been analysed. The data has been analysed using the Microsoft excel worksheet. The time series data from the Indian Railways Summary Sheet has been used to analyse for this study. The secondary sources are literature, research papers, Indian Railway reports, Railway board websites, journals, newspapers, etc.

Statement of the Problem

Indian Railway is the fast growing investment sector for development of infrastructure of railway stations, buildings, workshops, offices etc. So earning of the Railway must be increased and government should be eager to provide better facilities forits employees, officers, passengers and freights. So this study focuses on the employment, earnings, expenditures, etc. of Indian Railways from last several decades. The Indian Railway employees are little happy with their wages and other facilities provided by the Indian Railways.

Rationale of the Study

The Indian Railway is very old and premier organization for the country. It also contributes for the economic growth of the nation and largest employment provider for the nation.

So it is valuable to know that its employees are happy or not so to know through its time series data provided by Indian Railway becomes important.

Review of Literature

"Railways being a strategic industry, it was very important for the freedom struggle to involve the Railwaymen in the agitation against British Imperialism. British government started negotiations with the Federation from 1928 and half-yearly meetings were held between the AIRF and the Railway Board which was then headed by the Chief Commissioner of the Railways. During these negotiations, there were several achievements to the credit of All India Railwaymen's Federation and its affiliated unions-to improve the service conditions of the Railwaymen" (History of AIRF-90 Glorious Years of Struggle, nd.). Transportation is a key arrangement in keeping the upward monetary bustle. Train carriage lodges a crucial position in exterior carriage, moreover in a nation like India, which is not abled with much of waterways and has a greater physical infrastructure space. Train transportation has a great value country like India, mainlyin view of limited resources of natural oil and rich availability of coal, a power base is easily consumable for train transportation. In the form of direct or indirect via electric or coal energy. Indian Railways has a constructiveedge over motorway, being since its birth in India more energy efficient" (Operating Department, Southern Railways Website, 01/01/2021) [10].

The new technology was improved to train the manpower of Indian Railway and also improved the safety standards. The importance of safety over 13 million passengers every day in Indian Railways. Indian Railways runs more than 13000 trains every day from the 7, 349 stations across the India (Analysis, Railway Technology, June 2018) [8] AIRF. Indian Railway is grappling with overstretched infrastructure, inadequate capacity, a dwindling market share in the freight sector and huge unmet passenger demand. In this context, India Railways has decided to leverage new technology to improve the efficiency of the system in order to run more trains. One such initiative is a Real Time Train information System (RTIS), which is used to track the location of trains in real-time through GPS devices installed in the locomotives (Kumar, Jain AndAkhouri, 2020) [4]. The state of the art technology is being deployed to improve rolling stock operations on the country's overstretched infrastructure. According to the Gomatheeswaram, and Sivakumar, 2014, [2] Indian Railways has been a vital component of the social, political and economic life of the country. Indian railways transportation network has played a key role in weaving India in to a nation. This network has not only integrated markets but also people across length and breadth of the country. It has bound the economic life of the country and helped in accelerating the development of the Industry. Indian Railways is one of the fast growing service sectors which operate trains in and around different parts of the country. Now due to mechanisation and technical advancement through mobile application many works is done in a very short period of time staying in own office or home have made easy business and customer oriented services. The facilities such as train running status and online enquiry at .indian rail.gov.in. and online ticket booking etc is a tremendous achievement (Indian Railway Year Book, 2018-19) [6]. The paper less tickets attracts new generation more which saves time and provide better facility than standing in que and waiting for printed ticket. Especially in Metropolitan cities. All transaction is done via mobile and if any issue persist one gets SMS and customer care facility solve the issues in less times and via QR code scan and booking is also becoming popular. (Indian Railway Year Book, 2018-19) [6]. The currency coin-cum Card Operated Automatic Ticket Vending Machines (ATVMs) was launched at New Delhi. This machines issue unreserved tickets and accept cash as well as Smart Cards for payment.

In place of the manual system, Parcel Management System (PMS) nowthe computerised system for booking, labelling, tracking, and loading/uploading and delivery of parcel packages is being executed. Computerised Parcel Management System has been implemented at Delhi-Howrah, Delhi-Mumbai, Delhi-Chennai, Howrah-Mumbai and Howrah-Chennai corridors. Many little distance trains called as local trains fulfil the little long distance requirement of the people and luggage facility makes it popular among the different type of passengers.

Novel Developments

Services for unreserved passengers- The Antyodaya Train Service with full facility without ticket reservation with second class facility runs during special occasions for long distances. Multiple other facilities are also provided in the same train such as cusion bed, charger pin points, racks for keeping baggage etc. (Indian Railways Year Book, 2018-19) [6]. DeenDayalu Coaches: The DeenDayalu coaches is general second category coaches for unreserved passengers with further lfacility like cushiony bags racks, hand hold in entry space, provision of J hooks for hanging carry baggage, Bio-toilets, increased mobile charging facility, water level indicator, Pleasing interiors, improved exterior colour scheme and polymerized floor coating in coaches (Indian Railways Year Book, 2018-19) [6].

Reserved Passenger Trains

The Humsafar, Tejas and Uday trains are highly technologies. This train has the GPS, CCTV, GPS, passenger announcement system, and dusbin in every coaches for cleanliness, LCD, Electronic Reservation Charts systems, , Fire and smoke detection system, Superior toilet fittings, sealed vestibules, LED lights, CCTV, Aesthetically pleasing colour scheme etc. Uday trains: Utkrisht Double Decker Air-conditioned Yatri (UDAY) trains have been assumed as double-decker rakes with better quality facility such as, a enthusiastic vending machine with dining facilities in each of the four coaches in the rake, Decorative vinyl wrapping on both exterior and interior of the coach, Water borne solar reflective coating on the roof and PU painting on the end walls, High quality and high aesthetic passenger friendly fittings in the toilets, Defused LED lighting, powder coated seat frames and snack table, Aesthetically designed seat covers, All luggage racks are spray painted for aesthetics look, All foot steps are buffed and powder coated, Vinyl floor provided with clear coat, All stainless steel items like passage door, vertibule door, moldings etc. Are buffed, PIS and infotainment system with Wifi, 7 dedicated LCD screens provided in coach and Dining table and chairs in middle deck etc (Indian Railways Year Book, 2018-19).

Safety Measures Evolution

Fire detection and suppression system in all newly

manufactures power cars and Pantry Cars. Fire and Smoke detection system in all newly manufactured AC coaches, Double Acting AC compartment doors in all newly manufactured AC coaches, Fire extinguishers in all newly manufactured coaches, automatic plug type doors in all newly manufactured Humsafar and Uday train coaches (Indian Railway Year Book, 2018-19) [6].

Parry A. S. and Kadakol, M.A, (2017) [9], Indian Railways began its journey from Mumbai to Thane it was 53 KM distance on April 16, 1853 and today it is one of largest Railway network in the world. Actually it is the lifeline of Indian economy which is spread over 109,221 Km. Covering 6909 stations. Now India has the world's fourth largest rail network and second largest under single management, operates more than 19,000 trains every day. It has 2, 29, 381 wagon 59,713 coaches and 8,417 locomotives. Parry and Kadakol, (2017) [9], Indian Railways have joined the select club of countries comprising Chinese, Russian and United States Railways with an originating freight loading of 1008.09 million tonnes (i.e. one billion plus) in 2012-13. During 2013-14, Indian Railways carried 1.05 billion tonnes of freight and carried 1.1 billion tonnes in 2014-15.

Indian Railways is primarily financed through Gross Budgetary Support from the union budget, its own internal resources (freight and passenger revenue, leasing of railway land etc.) and extra budgetary Resources (market borrowings, institutional financing, etc.). The share of internal resources in Railways financing has been deckling from past some years. Modernization of Railway infrastructure is a priority. According to the Ramesh Nanaji (2002).

Says most of the railway fatalities were accidental in nature and in the bread earning age group particularly among the males.

The increasing number of population, overcrowding in the trains, reckless and careless behaviour of the passenger of the passengers, pedestrians and the train drivers towards safety norms are the consultant causes of railway fatalities. The high level of the railway fatalities male a strong case for the necessary accident control interventions. Public as well as the railway authorities must take some measures to bring down these fatalities.

In such a case there is a need of huge investment to prevent such fatalities. Johnson, M. (2019) [3]. Transport or Transpiration is the movement of people, animals and goods from one location to another.

The different modes of transport include air, rail, road, water, cable, pipeline and space. Transport infrastructure consists of the fixed installations including roads, railways airways, waterways, canals, pipelines and terminals such as airports, railway station etc.

Transportation in infrastructure assumes a great in developing countries since all the sectors of the economy are closely dependent upon the existence of suitable transportation network. It contributes to the development and growth of the economy.

Analysis, Results and Discussions

Highest employment providing industry decadal growth has been represented in table 1.

Table 1: Employees in Indian railways

S. No.	Year	Group A & B	Group C	Group D	Total
1	1950-51	2300	223500	687800	913600
2	1960-61	4400	463100	689500	1157000
3	1970-71	8100	583200	782900	1374200
4	1980-81	11200	721100	839900	1572200
5	1990-91	14300	891400	746100	1651800
6	2000-01	14800	900300	630200	1545300
7	2010-11	16900	1079200	235900	1332000

Source: Statistical summary sheet, 2015-16, Indian railways (Railway Board, Ministry of Railways).

Table 2: Average annual growth rate of employees in Indian Railways in percentages

S. No.	Year	Group A & B	Group C	Group D	Total
1	1950-51				
2	1960-61	6.70	7.56	0.02	2.39
3	1970-71	6.29	2.33	1.28	1.74
4	1980-81	3.29	2.15	0.71	1.36
5	1990-91	2.47	2.14	-1.18	0.50
6	2000-01	0.34	0.10	-1.67	-0.66
7	2010-11	1.34	1.83	-9.36	-1.47

Source: Statistical summary sheet, 2015-16, Indian railways (Railway Board, Ministry of Railways)

Table 2 presents the average annual growth rate of employees and officers in Indian Railways such as group A, B, C and D. Results states that in the year of 1960-61more higher percentage of employees in group C and comparably little less in group A and B. In the group D employee's growth rate was in high in the year of 1970-71. Comparably, employees are less employments in the group A and B till 2000-01 then little more employment was done in the group A and B in 2010-11 but comparably very less employment was done from the 1960 to year till 2010-11. According to the table, more employees was in the years of 1960-61 but in the years of 1970-71, 1980-81, 1990-91 and 2000-01 and comparably little more employment was done in the years of 2010-11. In the year of 1960-61 very less employment was generated in group D but little high in 1970-71 and comparably year wise employment was decreasing till 2010-11. Comparably, very less employment was generated in group D as compare to group C the group A and B. The reason behind the deceasing the employment in the categories of group C, B, A and D was decreasing year wise till now was the technology up-gradation in Indian Railways, government policy behind less employment in Indian Railways, less expenditures spends by administration of Indian Railways, less recruitment in reserved categories in various departments of Indian Railways, more works are done by contract workers in less money with more exploitations of the workers for the officers and employees individual interest for promotions and transfers according to their facilities, privatizations of works or jobs, introducing public private partnerships, days per day Indian Railways employees are less because of job cut policies in Indian Railways.

Indian Railway administration is trimming the Jobs and job position in Indian Railways, Indian railways killing the job positions, restructuring the job position and works in Indian railways and freeze the jobs. The decreasing the permanent employment of Indian Railways employees are the major reason for the maximum work of cleaning was out sourced by the contractors. The some works are privatized by the Indian Railways.

Table 3: Number of employees

S. No.	Year	No. of Employees(in thousands)	Wage Bill (in Crore)	Average Wage Per Employees(in Rupees)
1	1950-51	914	113.8	1263
2	1960-61	1157	205.2	1799
3	1970-71	1374	459.9	3398
4	1980-81	1572	1316.7	8435
5	1990-91	1652	5166.3	31864
6	2000-01	1545	18841.4	121281
7	2010-11	1332	51776.57	394112

Source: Statistical summary sheet, 2015-16, Indian railways (Railway Board, Ministry of Railways)

Table 4: Average annual growth rate of number of employees in percentages

S. No.	Year	No. of Employees(in thousand)	Wage Bill (in Crore)	Average Wage Per Employees(in Rupees)
1	1950-51			
2	1960-61	2.39	6.07	3.60
3	1970-71	1.73	8.40	6.57
4	1980-81	1.36	11.09	9.52
5	1990-91	0.50	14.65	14.21
6	2000-01	-0.67	13.81	14.30
7	2010-11	-1.47	10.64	12.51

Source: Statistical summary sheet, 2015-16, Indian railways (Railway Board, Ministry of Railways)

Table 4 presents the data regarding number of employees, wages and average wage per employees. According to the data more employees was in 1960-61 and less wages and averages wages per employees are also very less. Year wise employees are decreasing and wages are increasing per employees because of pay commissions, more pay demands of employees and officers by Unions, associations etc, expenditures of employees and their families expenditures etc, economy of the nation was also increased comparably from the year of 1960-61 to 2010-11.

Table 5: Total number of stations

S. No.	Year	Total Stations
1	1950-51	5976
2	1960-61	6523
3	1970-71	7066
4	1980-81	7035
5	1990-91	7100
6	2000-01	6843
7	2010-11	7133

Source: statistical summary sheet, 2015-16, Indian railways (Railway Board, Ministry of Railways)

Table 6: Average annual growth rate of total number of stations in percentages

S.No.	Year	Total Stations
1	1950-51	
2	1960-61	0.88
3	1970-71	0.80
4	1980-81	-0.04
5	1990-91	0.09
6	2000-01	-0.37
7	2010-11	0.42

Source: Statistical summary sheet, 2015-16, Indian railways (Railway Board, Ministry of Railways)

Table 6 gives the perceptions regarding the total number of stations in Indian Railways.
As compare to the 1960-61 and 1970-71 more railway stations was constructed for railway transportation and facilities for publics of India. But comparatively very less Railway stations was constructed in the years of 1980-81, 1990-91 and 2000-01 and some stations was constructed in the year of 2010-11because of budget provided by the central government.

Table 7: Route kilometers

S.No.	Years	Electrified	Total
1	1950-51	388	53596
2	1960-61	748	56247
3	1970-71	3706	59790
4	1980-81	5345	61240
5	1990-91	9968	62367
6	2000-01	14856	63028
7	2010-11	19607	64460

Source: Statistical summary sheet, 2015-16, Indian railways (Railway Board, Ministry of Railways)

Table 8: Average annual growth rate of route kilometres in percentages

S. No.	Year	Electrified	Total
1	1950-51		
2	1960-61	6.78	0.48
3	1970-71	17.35	0.61
4	1980-81	3.73	0.24
5	1990-91	6.43	0.18
6	2000-01	4.07	0.11
7	2010-11	2.81	0.22

Source: Statistical summary sheet, 2015-16, Indian railways (Railway Board, Ministry of Railways)

Table 8 provides the data regarding the routes kilometres of Indian Railways. This table shows that in 1970-71 more routes are electrified and comparatively less kilometres of routes are electrified because of less budget. Electrified routes provide the faster facilities for the passenger trains and freight trains. The total tracks was in routes in kilometres was constructed in 1970-71 and 1960-61.

Table 9: Assets

S. No.	Year	Capital-at-charge(in Crore)	Total Investment (in Crore)
1	1950-51	827	855.2
2	1960-61	1520.9	1868.6
3	1970-71	3330.3	4099.4
4	1980-81	6096.3	7448.4
5	1990-91	16125.8	22200.5
6	2000-01	43051.88	63341.01
7	2010-11	143220.57	231615.25

Source: Statistical summary sheet, 2015-16, Indian railways (Railway Board, Ministry of Railways)

Table 10: Average annual growth rate of Assets in percentages (As on March 31, 2011)

S. No.	Year	Capital-at-charge(in crore)	Total investment (in rore)
1	1950-51		
2	1960-61	6.28	8.13
3	1970-71	8.15	8.17
4	1980-81	6.23	6.15
5	1990-91	10.22	11.54
6	2000-01	10.32	11.05
7	2010-11	12.77	13.84

Source: Statistical summary sheet, 2015-16, Indian railways (Railway Board, Ministry of Railways)

Table 10 shows the perceptions regarding the assets of Indian Railways. The Capital at Charge means the current revenue of Indian Railways. Compare to the total invest of Indian Railways year wise revenue was in loss because of expenditure is more and income was less and operating ratio are very less that's why Indian railways was in loss or in very less profit . In the year of 1960-61 total investments are 8.13 and expenditure are 6.28. As per the data in this table total investment and expenditure was increasing and capital at charge was also increasing but overall current revenue was increasing. Indian railways was losses because of expenditure in Indian Railways, Less business by Indian Railways, corruptions, employees and officers salaries was increasing because of pay commission but income of the India Railways was not generated as per the need or till profit level of Indian Railways.

Conclusion

Revenue of the Indian Railways was increased decade wise because an investment in infrastructure was done time to time by government. Because of developing infrastructure of Indian Railways more freight are carried and passengers. The prices of luggage and freights were increased and passenger tickets prices were also increased. According to the data table which shows that electrified routes were developed in 1960-61 and 1970-71 and Total tracks was also more developed in 1960-61 and 1970-71, but comparably less electric routes and total routes was developed in other decades. The constructions of Indian Railways Stations was more in the decades of 1960-61 and 1970-71 and compare to this decade very less stations was constructed in 1980-81, 1990-91, 2000-01, then only few stations constructions was done by Indian Railways. As compare to previous decades of railways employees are decreased till now because of technology improvement in Indian Railways but their wages or salaries are increasing more because of the pay commissions by the government of India. The pay commission are based on the employee's works, time, expenditures, health, salaries, bonus, market prices, and family expenditures. In the group of A and B officers employment was decreased decade wise but in the group of C and D employments are decreased much more because of works are outsourced by the Railways Administrations. The reason behind the out sourced the works are some permanent employees works less and corruptions in the tenders and with the exploitations of contractual worker more works are completed by the contractors. As per the analyses of the data Indian Railways invests more but comparably profits are less because of less price rate for the passenger tickets in all the reserved and unreserved tickets. The decreasing permanent employment of Indian Railways employees are the major reason for the maximum work of cleaning was outsourced by the contractors or contractual works. The some works are privatized by the Indian Railways by Public Private Partnership and investment of Foreign Direct Investment (FDI) in Indian Railways.

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