

UNIVERSITY OF PETROLEUM & ENERGY STUDIES

DEHRADUN



Dissertation Report

On

“Challenges in Rail Freight Transportation”

Under the Guidance of:

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Declaration

I, Aditya Sharma, MBA-L&SCM (SEM 4), College of Management & Economic Studies, University of Petroleum & Energy Studies, hereby declare that the Dissertation Report titled “**Problems of Multi-Modal Transportation: affecting the exports of India**” is a thesis report submitted in partial fulfillment of Masters of Business Administration (Logistics & Supply Chain), and an original work carried out by me availing the guidance of my mentor.

This report has no resemblance with any other report to any University or Institute published Earlier.

Certificate Of Originality

This is to hereby state that this report is very original in every sense of terms and conditions and it carries a sense of credibility and belief and that no shortcuts have been taken and I remained both rigorous and attentive during the research work. I have put in my level best to keep this work as informative and precise as possible.

It may also state here that during the preparation of this report some information has been taken from a gamut of professionally shared information and knowledge, a detailed description of which has been mentioned in the references chapter of this report.

Dated:

Signature:

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Acknowledgement

On the very outset of this report, I would like to extend my sincere & heartfelt obligation towards all the personages who have helped me in this endeavor. Without their active guidance, help, cooperation & encouragement, I would not have made headway in the project.

I am ineffably indebted to **Mr. AmanDua** for conscientious guidance and encouragement to accomplish this assignment.

I extend my gratitude to College of Management & Economic Studies, University of Petroleum & Energy Studies (UPES), Dehradun for giving me this opportunity.

I also acknowledge with a deep sense of reverence, my gratitude towards my parents and member of my family, who has always supported me morally as well as economically.

At last but not least gratitude goes to all of my friends who directly or indirectly helped me to complete this project report.

Any omission in this brief acknowledgement does not mean lack of gratitude.

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Abstract

“Railways, perhaps along with post offices, are the only two institutions in India with a deep network which if tapped judiciously can create substantial improvements in the hinterland. Railways was always considered only as a mode of transport in our country, we want to see Railways as the backbone of India's economic development.”

ShriNarendraModi

Prime Minister of India

December 25, 2014

Indian Railways is the lifeline of the nation. It traverses the length and breadth of the country providing the required connectivity and integration for balanced regional development. The system never rests; it has been up and working unceasingly for the last several decades. It is an integral part of every Indian's being. It is one of the pillars of the nation.

In an earlier era, the Indian Railways have been described as “imperium in imperio”, an empire within an empire. The size and scale is gigantic. The United States, China and Russia are the only countries that have longer railway lengths, measured in kilometers.

Indian Railways has suffered from considerable under-investment during the last several years. As a consequence, capacity augmentation has suffered and so has the quality of service delivery decreased. Resources have been insufficient for improving customer satisfaction and introducing technological improvements. Investments in safety have also been insufficient. This is a vicious circle which I desire to convert into a virtuous circle by bringing in greater investments which will generate higher revenues and better service delivery.

The objective of this paper is to show the challenges that the organization is facing today. It also shows that Indian Railways is perched on a precipice but is capable of flying off and attaining great heights.

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Literature Review

Authors	Context	Inferences/ Parameters
Pankaj Chandra Nimit Jain	The Logistics Sector in India: Overview and Challenges	The challenges are found and describe some initiative that is taken by various firms to improvement their logistics infrastructure.
Mckeinsey	Logistics Infrastructure 2020- A report	This came up with the Balance Modal Mix and the National Integrated Logistics Park.
Girish Gujar	Growth of containerization and Multimodal transportation in India	It talks about the tasks and problems that India is facing and the various limitations in different logistics related infrastructures.

Authors	Context	Inferences/ Parameters
Pricewaterhouse Cooper	Transportation and Logistics 2030- Transport Infrastructure	This paper talks about the ability of transport infrastructure to keep up with the increase in freight transport volumes.
C.Thaller, N.Moraitakis, H.Roger, D.Sigge, U.Clausen, C.Pfohl, E.Hartmann, B.Hellingrath	Analysis of the Logistics Research in India – White Paper	Getting an overview of logistics infrastructure. This talks about the collaboration of Germans and Indian and their willingness for improving the situations.

Research Methodology

Business Problem

IR inability to meet the demands of its customers, both freight and passenger

Problem Statement

The problem statement from the above business problems can be “Indian Railways is falling behind in meeting the demands and changing market requirements of commercial cargo”.

Research Methodology

This is a systematic approach for solving a particular problem that your research faces. It includes various steps that the researcher follows to find out the difficulties faced by research.

Research Design

Design in a research is the way of collection of collecting data for the analysis. This research will have descriptive approach.

Objective of the study

- To identify the existing scenario of Railway Infrastructure Development in India
- To identify the problems faced by the customers and their expectations towards the railways service provider

Data Sources

For the secondary data it is being collected from internet, journals and research papers. For the primary data expert opinion is achieved through telephonic interviews.

Scope of the study

The scope of this particular research includes time place for the idea on which this research will be based on the logistics infrastructure. The time period of this study is from August 2014 to February 2015 and the place of the research is that of mainly near Dehradun and Kolkata.

Sources of Data	Primary, Secondary
Method of data collection	Interview with IR official , observations, research papers and articles

Introduction

Background

Indian Railways (IR) is an extraordinary national resource. A solitary transport system interfaces far flung ranges of the nation. It is one of the biggest transportation and logistics systems of the world which runs 19,000 trains. IR runs 12,000 trains to continue 23 million travelers every day interfacing around 8,000 stations spread over the sub-landmass. It is identical to moving the whole populace of Australia. It runs more than 7,000 cargo trains every day conveying around 3 million tons of cargo consistently. IR's system of 65,000 course kilometers is more than one and half times the periphery of the earth. It has joined the select club of nations including Chinese, Russian and United States Railways with a beginning cargo stacking of 1008.09 million tons (i.e. one billion or more) in 2012-13. Amid 2013-14, Indian Railways conveyed 1.05 billion tons of income acquiring cargo activity and is required to convey 1.1 billion tons in 2014-15.

Indian Railways (IR) is the state-claimed line organization of India having a complete forcing plan of action over the country's rail transport. Tracks are safe area transportation framework when stood out from diverse sorts of transportation. Route transportation is fit for abnormal state of traveler and payload use and vitality effectiveness, yet is frequently less versatile and more capital-escalated than parkway transportation is, when lower movement levels are considered. The essential wellspring of salary for line organization is from ticket income (for traveler transport) and shipment charges for load rebates and month to month passes are sometimes available for continuous voyagers. Cargo income may be sold every compartment opening or for a whole prepare. Now and again, the shipper claims the autos and just rents the haulage. Indian Railways makes 70% of its incomes and an extensive bit of its benefits from the cargo division, and uses these benefits as the cross-sponsorships for the misfortune making traveler part. On the other hand, rivalry from trucks which offer less extravagant rates has seen reduction in cargo activity recently. Since 1990s, Indian Railways has changed from little transfers to bigger holder development which has helped quicken its operations. A substantial part of its cargo income start from such rakes conveying mass products, for instance, coal, bond, sustenance grains and iron metal.

The use on Railways as a rate of aggregate transport use has declined impressively. Line consumption as rate of transport area use used to be around 56% in 7th Plan (1985-90). It has diminished to 30% in 11th Plan (2007-12). IR in most recent two decades has stayed under-contributed though the street division has seen a surge in ventures. The offer of IR in general GDP has been static at 1% and has, actually, gone down to 0.9% in 2012-13.

Share of Transport Sector in Overall GDP(%)

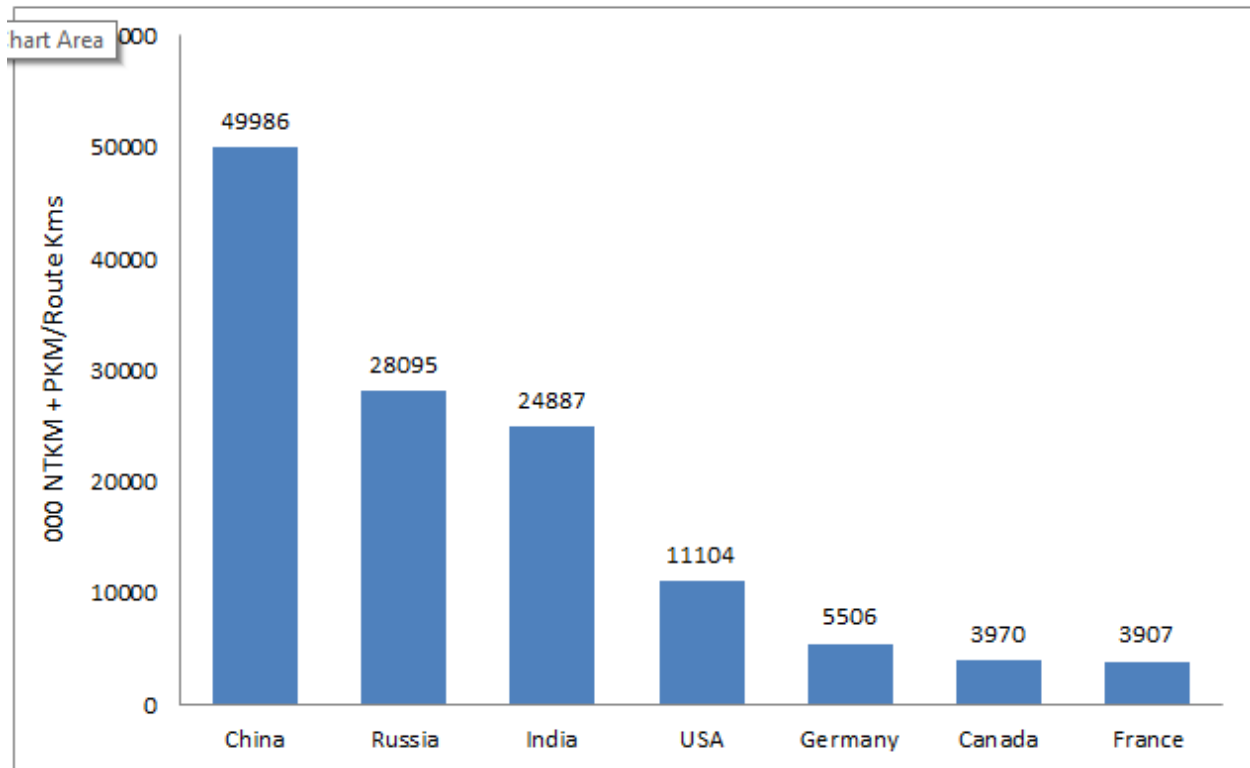
	2008-09	2009-10	2010-11	2011-12	2012-13
Overall Transport of which	6.6	6.6	6.5	6.6	6.7
Railways	1	1	1	1	0.9
Road Transport	4.7	4.7	4.6	4.8	4.9
Water Transport	0.2	0.2	0.2	0.2	0.2
Air Transport	0.2	0.2	0.3	0.3	0.3
Service incidental to transport	0.4	0.4	0.4	0.4	0.4

In the latest 64 years while the cargo stacking has become by 1344% and traveler kilometers by 1642%, the Route kilometers have become by only 23% and Doubling & Multiple course length by only 289%. The improvement story of Indian Railways, all through the latest 64 years, is gotten underneath.

Key Parameters									
Items	1950-51			2013-14			% Variation		
Route <u>Kms</u> (All Gauges)	53,596			65,806			23%		
	BG	MG	NG	BG	MG	NG	BG	MG	NG
	25258	24185	4153	58175	5334	229	(+)	(-)	(-)
Running Track <u>Kms</u> (All Gauges)	59,315			89,987			52%		
Total Track(<u>Kms</u>)	90,500(1964-65)			114,907			27%		
Double & Multiple Route Length(<u>Kms</u>)	5,127			19,887			289%		
Freight Carried(Million Tones)	73			1,054			1344%		
Wagon Turn Round(Days)	11			5.13			(-)54%		
Wagon Capacity(Million Tones)	4.14			13.65			230%		
Passenger Originating(In Millions)	1,284			8,420			556%		
Passengers <u>Kms</u> (In Millions)	66,517			11,58,742			1642%		
no. of Passenger Trains Run Daily(Base Year 1982-83)	6,392			12,874			102%		
Seat/Berth Capacity(Suburban)	87,986			15,28,124			1637%		
Seat/Berth Capacity(Non-Suburban)	8,54,678			36,43,423			327%		

The above development example has realized vast scale clogging of the framework, impacting the velocity of development, something that impacts traveler fulfillment. Notwithstanding the way that the activity thickness on IR is high as indicated by world measures, the development of the system is not proportionate with the development of the movement as can be seen from the going hand in hand with charts:

Traffic Density



Growth Pattern since Independence

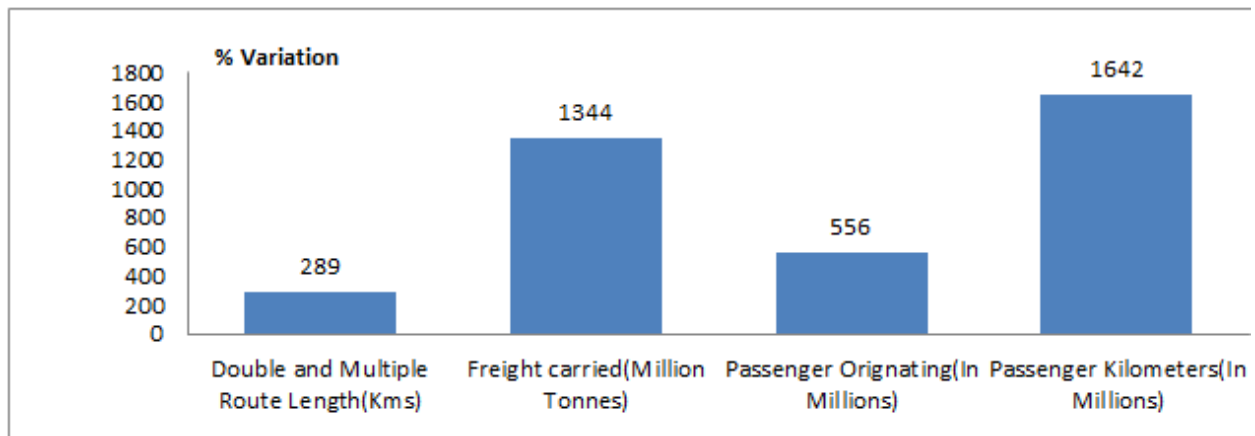


Table underneath demonstrate the financing example of the Plan speculation in the course of the most recent couple of year

	2009-10	2010-11	2011-12	% Share	2012-13	% Share	2013-14	% Share	(Rs. In cr) 2014-15	% Share
Budgetary support	1911	18385	20031	44%	24132	48%	27033	51%	30100	46%
Railway Safety Fund	805	1100	1323	3%	1578	3%	1983	4%	2200	3%
Internal Resources	12196	11528	8935	20%	9531	19%	9681	17%	15350	23%
Extra-budgetary resources	9760	9780	14790	33%	15142	30%	15085	28%	17795	27%
Total	39672	40793	45061		50383		53782		65445	

Investments in security have similarly persevered by temperance of low interior era of assets. Regardless of the way that the security record of Indian Railways differences well with other European countries, the truth remains that there is noteworthy chance to show signs of improvement. Unmanned level intersections are a significant region of concern divided from mishaps that rise on distinctive record

Freight Yields in some Major Economies

Country	Freight Yield US Cents/Total Tonne-KM at nominal prices	Freight Yield US Cents/Total Tonne-KM adjusted for PPP(India=1)
India	2.11	1
China	1.49	0.58
Russia	2.2	0.75
USA	2.28	0.51

Due to under-venture, there has been extreme blockage on the system and has come about the disappointment of the structure to suit more prepares and construct the pace of trains. Thus, the need of incredible significance is to endeavor a tremendous base extension and decongestion project coupled with up degree of innovation and prudent zap of tracks close by update of terminal limit. It is obvious that the primary issue today is the unlucky deficiency of physical limit over IR on key courses due to serious clogging and the incremental activity is being offered on the drenched courses just. The extensive impact of the above rises in the ranges system extension, customer fulfillment, task arranging and execution and wellbeing.

Financial Status

Financials of the IR system and outlook for the next three years

- In 1923, IR's working was separated from that of the General Finance of India and the strategy formalized by the Separation Convention of 1924 respected that IR would be accountable for its own financials while adding to the exchequer a profit for the capital put resources into it. This blueprint has so far endeavored to the satisfaction of both the gatherings. IR has sufficiently earned to have the ability to discharge its working costs, obligation adjusting, profit and all diverse liabilities including getting ready for speculations and devaluation. Beside that, IR has in like manner passed on an enormous social weight which it relentlessly discharges by either concessions or financed travel.
- Recent times, particularly after the Sixth Pay Commission have seen a downslide in the trusts of IR and on the off chance that it needs to assume a spearheading part in national improvement incorporating managing its own wellbeing, some new displaying of era of funds needs to happen so that absence of assets does not infringe upon the speculation arranging of IR

Structure of Indian Railway Finances

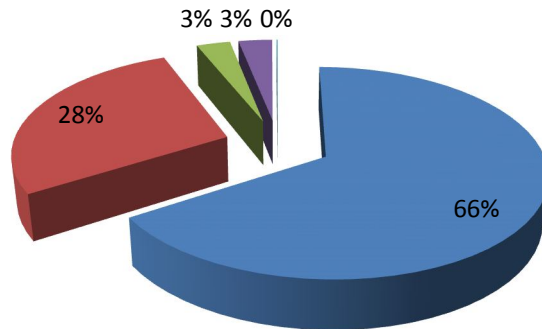
Revenue Expenditure

The charts given below indicate the flows into and out of the revenue expenditure:

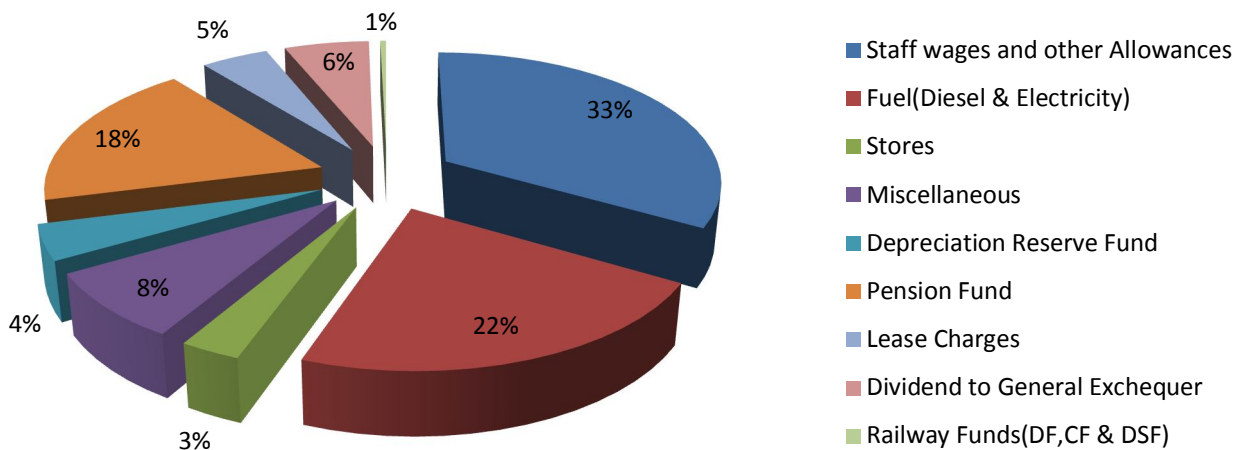
Revenue Expenditure

Revenue Budget- where the rupee comes from?(2014-15)

■ Goods Traffic ■ Passenger Traffic ■ Other coaching Earnings ■ Other sundry Earnings ■ Misc. Receipts



Revenue Budget- where the rupee goes?(2014-15)



All through the latest three years, the between offer of the diverse procuring parts has been practically at the levels delineated beforehand. This demonstrates that there is a sure measure of consistency as to where the income streams are starting from and approach producers tend to focus on these for development of incomes.

Revenue Share				
Year	2010-11	2011-12	2012-13	2013-14
Goods	67%	67%	69%	67%
Passenger	27%	27%	25%	26%
Total Traffic Earnings(Rs. In cr)	94,525	1,04,154	1,23,901	1,39,838

Contribution to Depreciation reserve fund:

As indicated by the IR Finance Code Vol. I, "Devaluation procurement concerning a benefit will be equivalent to the yearly installment to a Sinking Fund which together with the interest consequently at such rates when intensified every year will give the sum needed to the substitution of the advantage toward the end of the typical life" Nonetheless, the code moreover gives that financial plan gauge for DRF is in perspective of the substitution project including unfulfilled obligations of deterioration, if any, to be made incredible in the midst of the going hand in hand with year. This activity is a piece of the general asset arranging of IR. At this moment, there is an immaterial balance available in the store due to nonattendance of palatable surplus made to exchange to the trust to manage all repair and restoration exercises. Designation for DRF are dead set in the wake of considering the distributions for other submitted working costs, which limits the ability to completely accommodate this.

Dividend Payment to Ministry of Finance

Budgetary support from General Revenues, got for making of benefits, is held as capital-at-charge on the IR. The Railways pay the Ministry of Finance profit set as a rate of the capital-at-charge. The capital-at-charge is kept in the books of Railways at recorded estimation of the benefits made. In MoF, the Budgetary Support (i.e. capital-at-charge) is dealt with as advance stretched out to the Railways and the profit being paid as hobby. There is no diminishing in this capital unless it is amortized or compose back alterations are influenced by charge to inside produced assets of the Railways and hence is an advance in ceaselessness. Each time an advantage is supplanted, the authentic estimation of the benefit continues being reflected under capital-at-charge. Thusly, the total capital-at-charge of IR stands at Rs 1,74,625 cr as on 31.03.2014.

The rate of profit, modalities of its installment and exemptions are managed by the Railway Convention Committee (RCC) of Parliament in meeting with MoF and MoR. Certain portions of capital-at-charge are barred from installment of profit at source. Without further ado, the profit is obliged to be paid to the MoF at 5% of the profit bearing capital-at-charge beside the staff quarters where it is to be paid at 3.5%. Being un-beneficial, the profit payable on particular things of capital-at-charge speculations is paid back to Railways by the MoF.

In 2014-15, the profit payable has been evaluated at Rs 9,135 cr while the sponsorship is being attested at Rs 4,059 cr. Appropriately, on the net reason Rs 5,076 cr would be the outgo due to profit in 2014-15 (BE). Along these lines, the suitable rate of profit payable to MoF works out to around 2.5% of the profit bearing capital-at-charge. The issue of legitimization of profit arrangement has been raised with the Ministry of Finance.

Social service obligations of Indian Railways

Tracks similarly bear social administration commitment of around Rs 25,000 crore reliably through passing on traveler and products benefits underneath expense. Reimbursement of this cost has been considered by Government and a Committee of Secretaries had endorsed that these be reimbursed to the Railways yet remains unresolved. Net Social Service Obligation borne by IR in 2013-14 is assessed at Rs 21,391 crore. This cost infringes upon the suitability of IR system.

The essential parts of Social Service Obligation of Indian Railway are incidents relating to:

- Essential things conveyed underneath cost key products of mass usage like foods grown from the ground, natural fertilizers, paper, charcoal, bamboos, cotton crude squeezed thus on are conveyed beneath expense of operation to contain their business part costs.
- Passenger and other training administrations including concessions, low duty particularly in the useless all add to the misfortunes.
- Operation of uneconomic branch lines: Despite facilitated tries to enhance income on branch lines, most of these lines remain financially unviable. The Railway Reforms Committee endorsed finish of 40 such lines however on account of strong open resistance and limitation by State Governments towards withdrawal of such organizations, only 15 lines have been closed always by the Railways. A review of the budgetary results of existing 88 uneconomic branch lines for the year 2011-12 exhibits that, on an extraordinary theory on these lines of the solicitation of Rs 1,719 crore, disaster in the midst of the year 2011-12 indicated to Rs 1,366 crore.

Indian Railways: Customer

- Indian Railways deals with two sorts of clients, viz. traveler and cargo. The huge issues regarding traveler satisfaction are accessibility of train accommodation, travel time, punctuality, cleanliness at stations and in trains, providing food administrations, reservation offices et cetera. In like manner, huge issues as for cargo clients are accessibility of suitable terminals for stacking and emptying, openness of moving stock and convenient and steady travel times of cargo trains.
- Apart from the way that absence of assets has been an essential issue in system extension and limit creation, the nature of administration conveyance moreover has been a scope of disillusionment. Different study have uncovered that unlucky deficiency of cleanliness is the essential concern took after by wellbeing and nature of nourishment. The low levels of venture have incited system blockage. This has limited the development of a higher number of trains on these courses differentiated from trading off on the velocity of existing trains.
- The low recovery of expense on the traveler portion and high cargo rates have incited an unevenness in the incomes from these two business sections. This is clear from table given undern.

(Fig. in paise)

	Coaching Service			Freight Service		
	Cost per PKM	Earnings per PKM	Ratio	Cost per NTKM	Earnings per NTKM	Ratio
1999-2000	35.83	22.21	62%	55.91	72.28	129.30%
2008-09	48.86	26.13	53.50%	63.74	96.9	152%
2009-10	52.87	25.96	49.10%	65.84	97.41	147.90%
2010-11	52.6	26.32	50%	67.63	100.44	148.50%
2011-12	54.38	26.99	49.60%	69.64	104.17	149.60%
2012-13	57.76	28.52	49.40%	75.28	123.27	163.70%

Freight Business

Freight business – some parameters

			2009-10	2010-11	2011-12	2012-13
Net tonnekilometres per wagon per day@		BG	9,222	9,274	9,261	9,267
		MG	624	663	632	554
Wagon kilometres per wagon per day @		BG	256	262	266*	265
		MG	30	32	33	29
Net tonnekilometres per engine hour	Diesel	BG	16,465	16,420	15,889	16,199
		MG	2,330	2,421	2,161*	2,390
	Electric	BG	24,672	24,436	24,049*	24,133
Net tonnekilometres per engine day on line	Diesel	BG	2,85,008	3,01,626	300,781*	3,03,200
		MG	26,469	30,552	25,012	24,088
	Electric	BG	4,43,386	4,50,282	4,29,193	4,49,110
@ From 2009-10 onward figure in terms of 8-wheelers						
*revised						

Route cargo clients are its spine and contribute more than one lakh crore to its incomes. The essential impediment in cargo operation is extreme clogging on exceedingly critical courses and terminal blockage. Ensuring the supply of wagons as per their need and transporting the products in time to the destination is the commitment of IR.

Earnings

Development in profit this financial is focused at 14.5%. The patterns in income portion savvy, are nitty gritty as under:

Year	Goods	Passenger	Sundry	Other Coaching	(In crore)
					Total
2011-12	69548	28246	3643	2717	104154
2012-13	85263	31323	4261	3054	123901
2013-14	93906	36532	5721	3679	139838
1014-15	105770	44645	5500	4200	160115

Good Earnings

The Year on Year development in Originating Tonnage, NTKMs, Freight Lead and income is nitty gritty in Table 28 underneath. Patterns show that under Tonnage, certain products like Raw Material for Steel Plants, Pig Iron and Finished Steel, Iron Ore & Food grains are foreseen to load not exactly the earlier year. Coal, Cement, Containers and Fertilizers is relied upon to get over the past FY. Normal Freight Lead has developed ostensibly this year in the wake of enlisting negative development in past two years.

Traffic Earning

TRAFFIC PLAN : GOODS

Commodity	Tonnes Originating (in million)				Net Tonne Kms. (in millions)				Earnings (in cr.)			
	2010-11	2011-12	2012-13	2013-14 (R.E.)	2010-11	2011-12	2012-13	2013-14 (R.E.)	2010-11	2011-12	2012-13	2013-14 (R.E.)
Total	921.73	969.05	1008.09	1051.55	625,723	667,607	691,658	654,395	62844	69548	85263	94000

TRAFFIC PLAN : GOODS

Commodity	Tonnes Originating MT)			Net Tonne Kms. (in millions)			Average Freight Lead			Earnings (in cr.)		
	Growth in 2012-13 over P.Y.	Growth in 2013-14 RE over P.Y.	Growth in 2014-15 BE over P.Y.	Growth in 2012-13 over P.Y.	Growth in 2013-14 RE over P.Y.	Growth in 2014-15 BE over P.Y.	Growth in 2012-13 over P.Y.	Growth in 2013-14 RE over P.Y.	Growth in 2014-15 BE over P.Y.	Growth in 2012-13 over P.Y.	Growth in 2013-14 RE over P.Y.	Growth in 2014-15 BE over P.Y.
1. Coal	8.9%	2.6%	4.0%	4.1%	-10.1%	4.4%	-4.4%	-12.4%	0.4%	27.4%	10.3%	12.6%
2. Raw Material for Steel Plants	7.5%	7.4%	4.5%	-0.4%	-3.4%	6.2%	-7.4%	-10.0%	1.7%	21.1%	11.8%	12.6%
3. Pig Iron & finished steel	0.5%	8.8%	5.4%	0.4%	1.6%	5.9%	-0.1%	-6.7%	0.5%	23.4%	17.0%	12.6%
4. Iron ore	6.4%	11.6%	8.2%	-5.5%	15.3%	8.4%	-11.2%	3.3%	0.2%	0.4%	19.1%	12.6%
5. Cement	-1.7%	2.0%	4.6%	1.0%	-6.1%	5.6%	2.8%	-8.0%	0.9%	24.8%	3.4%	12.6%
6. Foodgrains	5.7%	12.9%	4.8%	23.1%	-2.4%	5.0%	16.5%	-13.5%	0.2%	42.2%	9.7%	12.6%
7. Fertilisers	-12.3%	-0.7%	4.6%	-10.9%	-3.0%	5.2%	1.6%	-2.4%	0.6%	12.7%	12.3%	12.6%
8. P.O.L.	2.1%	1.7%	0.5%	9.2%	-0.7%	0.1%	6.9%	-2.3%	-0.4%	30.2%	16.5%	12.6%
9. Container Service	7.9%	4.8%	7.0%	10.3%	-3.3%	7.8%	2.2%	-7.7%	0.8%	18.9%	10.2%	12.6%
10. Balance other	-10.4%	3.6%	4.7%	-3.7%	-7.4%	5.7%	7.5%	-10.7%	1.0%	19.0%	-4.1%	12.6%
11. Misc.Earnings										-1.1%	12.1%	10.0%
Total	4.0%	4.3%	4.7%	3.6%	-5.4%	5.2%	-0.4%	-9.3%	0.4%	22.6%	10.2%	12.5%

Project Planning and Implementation

Trends in traffic

Railways activity is a decided interest. It emanates from the need of the developing populace of the country which has formally gone to 125 crore. This populace creates the interest particularly on the traveler side and by suggestion on the payload side.

Indian Railways entered the Billion Club in cargo stacking in 2012-13 by achieving 1,008 million tons of beginning stacking. The stacking target settled for 2014-15 is 1,105 million tons which is 4.9% higher than the achievement of 2013-14. The XIIth Plan projections of cargo stacking in the terminal year of the Plan (2016-17) are 1,405 million tons.

Indian Railways conveyed 8,425.6 million travelers in 2013-14 which is around 1,430 million higher than the populace on the planet set up together. The yearly center for traveler movement in 2014-15 is 8,645 million, which is 2.6% higher than in 2013-14. The XIIth Plan target is 11,710 million voyagers in the terminal year of the Plan. The development of traveler activity over latest 5 years is given in table

Trends in Traffic Growth

	2009-10	2010-11	2011-12	2012-13	2013-14	CAGR(2009-2014)
Freight Loading(Million Tonne)	887.79	921.73	969.05	1,008.09	1,053.54	
<u>YoY growth</u>	6.53%	3.82%	5.31%	4.03%	4.51%	3.48%
NTKM(million)	6,00,548	6,25,723	6,67,607	6,91,658	6,74,790	
<u>YoY growth</u>	8.90%	4.91%	6.69%	3.60%	-2.44%	2.36%
Originating passengers	7,246	7,651	8,224	8,421.00	8,425.60	
<u>YoY growth</u>	4.71%	5.59%	7.49%	2.40%	0.05%	3.06%
Passenger kilometers(million)	9,03,465	9,78,508	10,46,552	10,98,103	11,10,000	
<u>YoY growth</u>	7.81%	8.31%	6.95%	4.93%	1.08%	4.20%

Congestion over Indian Railways

Railways movement is a decided interest. It emanates from the need of the developing populace of the country which has authoritatively gone to 125 crore. This populace creates the interest particularly on the traveler side and by suggestion on the load side.

Line Capacity Utilization on IR

Railway	<80%	80-100%	100-120%	120-150%	>150%	OTOS*	Total
Central	34	9	11	12	7	1	74
East Coast	16	9	9	16	2	4	56
East Central	16	13	19	22	16	5	91
Eastern	22	22	41	1		3	89
North Central	11	3	7	22	2	1	46
North Eastern	12	6	12	6	6		42
North Frontier	18	10	4	14	3	11	60
Northern	70	26	29	23	10	4	162
North Western	39	7	6	3	1	4	60
South Central	20	32	23	8	9		92
South Eastern	24	13	14	17	1	2	71
South East Central	9	6	9	7	2		33
Southern	53	38	25	15			131
South Western	38	12				1	51
West Central	1	4	7	6	3		21
Western	32	18	17	21	4	48	140
Total	415	228	233	193	66	84	1219

OTOS:- One Train Only System

Line Capacity Status of High Density Network on IR

Railway	<80%	80-100%	100-120%	120-150%	>150%	Total
Central	12	4	7	12	5	40
East Coast	5		6	8	1	20
East Central	1	5	4	3	3	16
Eastern		3	7			10
North Central		1	5	19	1	26
Norht Eastern	1	3	6	1	3	14
North Frontier		3		5	1	9
Northern	3	4	5	7	2	21
South Central		14	2	2	2	20
South Eastern	2	2	6	6		16
South East Central			3	5	1	9
Southern	5	8	4			17
West Central	1		2	2	2	7
Western		9	2	9	2	22
Total	30	56	59	79	23	247

It would be seen that an expansive bit of the Zonal Railways are in the extent of perfect and higher than perfect utilization of line limit. Further, 161 out of total 247 Sections i.e. 65% of the segments are running at 100% or above line limit on High Density Network (HDN) course.

Network Expansion

During the latest four years, while new lines have enrolled an advancement of 74%, Doubling and Electrification have developed at 167% & 21% person

Network expansion during last 5 years

Year	2009-10	2010-11	2011-12	2012-13	Total
New Lines(km)	258	709	725	501	2643
Gauge Conversion(km)	1516	837	855	605	4217
Doubling(km)	448	769	750	705	3380
Railway Electrification(km)	1117	975	1165	1317	5924

The head-wise break-up of requirement of funds is seen in table given below:-

Throw-forward of priority projects

Plan Head	Projects (no.)	Length (km)	Cost Rs. In	Anti. Exp. Crore	Outlay (original estimated cost)	Balance cost)
New line	154	17105	173448	42330	9210	121907
Gauge conversion	42	9704	41803	20308	2476	19020
Doubling	166	9272	53134	13414	4931	34789
Traffic facility	560	0	9537	3781	733	5023
Signal & Telecom	517	0	9459	3205	604	5649
Railway electrification	36	10004	10686	4166	1134	5386
Workshop	479	0	26464	7499	2684	16281
Total	1954	46086	324529	94703	21773	208054

The rack of tasks with Indian Railways has been masterminded with a point of view to giving focused thought and ensured financing to different classifications. With the present levels of subsidizing, the prioritized undertakings may take anyplace in the scope of 3 to 13 years to finish.

Categorization of projects

Category	Nature of Classification
A1	National Projects
A2	Cost Sharing
A3	Critical Projects
A4	Sub-critical Project
A5	Important Projects
B	Other Projects
C	Least important projects

As of now, there are 362 number of supported tasks of new lines, multiplying and gage change which are joined in the table above. It is basic that Indian Railways on need sustain essential rail hallways to get the point of interest of enhanced limit in a period bound manner. In this manner, certain hallways have been recognized on the reason of action illustration and ordinary paces. The typical speed on a huge part of these corridors is low showing serious clogging on the system. Beside the beforehand expressed undertakings of New Line, Gage Conversion and Doubling, there are essential embraced works of Traffic Facility, Signal & Telecom, Workshops, Electrification, Track Renewals and Bridges that need to be endeavored on requirement for bracing of the hall.

Alternative Financing Option

In the latest couple of decades there has been noteworthy underinvestment in rail framework in this way diminishing the attempts expected to broaden, reinforce and modernize the Railways. Regardless of the way that, arrangement of Rail Infrastructure post-Independence has overwhelmingly been done by the administration, endeavors had been made in the past to incorporate private area underway of base which has been met with obliged accomplishment. Unfortunate lack of a self-ruling regulatory part, no impact over operational framework & whimsical toll, instability of tariff emergence and defers in decision making procedures has created little assurance among the financial specialists.

Counting clients in building rail lines especially for ports and mines have been a compelling test on Indian Railways. IR has viably included speculators in building rail reconciliation to ports. Prior to 2012; Rail network to ports of Pipavav, Mundra, Mangalore, Kandla, Dahej, Krishnapatnam and Dhamra has been invigorated getting private investment rail area. Private speculations have also been delivered through wagon venture/ leasing plans, private operations of holder trains, and progression of private cargo terminals and private sidings. Tries are moreover being made to make private speculations through setting up of train processing plants and redevelopment of stations.

For productive execution of PPP ventures; proper apportioning amidst open and private needs to be done. Experience exhibits that private part is reluctant to taking all development, financing and movement hazard in rail base activities.

The ventures manageable to trade system for financing would join improvement of New Lines, Doubling, Gage Conversion, advancement of Dedicated Freight Corridors, High Speed Corridors, setting up of assembling/upkeep units for moving stock, headway of traveler and cargo terminals, tasks of jolt and flagging, activities of non-conventional vitality sources, setting up of testing offices, specialized preparing foundations and mechanical responses for enhancing security at level intersection doors. The practicality of the individual task could center the different option for be rehearsed for coordinating the vital accounts. In such way, Railways would be obliged to set out particular benchmarks for examination which would be qualified to the business sector to engage the material ventures to be financed.

Challenges

- The most noteworthy test defying Indian Railways today is its inability to meet the appeals of its customers, both load and explorer. Beside the quantum of endeavor, nature of movement is in like manner an issue. Cleanliness, constancy of organizations, wellbeing, nature of terminals, farthest point of trains, nature of sustenance, security of explorers and straightforwardness of booking tickets are issues that need squeezing thought.
- Indian Railways has encountered ceaseless and critical under-theory as a delayed consequence of which the framework improvement and modernization has not happened at the fundamental pace provoking a deterioration of the offer in national freight and voyager development. There is an unmistakable affirmation of the route that for serving as the lifeline of the nation and making a pledge to the country's improvement, the affiliation needs to end up operationally and financially stable.
- Indian Railways is attempting to overhaul its bit of the general business and upgrade the way of organization to ensure that rail travel is an experience past distinctive systems for travel. This can be finished by shedding breaking point bottlenecks which oblige advancement, improve productivity of points of interest and capability of operations and perfect control of its benefits including human capital.
- The high thickness frameworks of the Indian Railways are facing exceptional farthest point impediments coupled with a low explorer tolls accordingly provoking additions in freight assessments to cross supporter voyager livelihoods. Regardless, that just enables recovery of costs and does not leave enough resources for enthusiasm for framework advancement and substitution of advantages.
- As the improvement in the economy gets in the years to come, IR will have a testing task ahead because of line and terminal utmost necessities in transporting the incremental development. Thus, there is prerequisite for discriminating enthusiasm for the framework, especially the HDN courses and its feeder and other indispensable courses. This would join composed farthest point overhaul meets expectations, for instance, increasing/tripling/quadrupling and development office works like Intermediate Block Sections, evades, longer circles for running long haul trains. The Goods sheds along these courses would in like manner need to be strengthened. The point of confinement of Workshops needs to be moved up to indulge greater volume of backing of wagons and coaches. In this way sorted out zap and hailing & telecom works are in like manner of noteworthiness for reasons of security and viability.
- There is a far reaching rack of pending ventures which is evaluated at Rs. 4,91,510 crore on the reason of at first evaluated costs Of these, store essential for the composed works, for instance, reproducing, new lines, gage transformation, activity offices, signal & telecom works, workshops and zap is assessed at Rs 2,08,054 crore. Such prioritization of fills in as per developmental necessities can promise an upheld stream of trusts for such ventures consideration can be given for in front of timetable satisfaction and charging of these works. These will have a direct bearing hanging in the balance limit which consequently will promise higher wage and perfect utilization of benefits.

- Further, there are reliable appeals for new lines. From the point of view of remote area incorporation and dealing with the appeals of only for access to rail travel, advancement of new lines moreover acknowledge essentialness. Nevertheless, these solicitations don't decipher into viable exercises from the point of view of Railways. Therefore, a far reaching number of socially appealing exercises have been approved in the past making huge hurl forward commitment and shaky spread of trusts. A significant part of the time, IR passes on the heaviness of setbacks from operations if such exercises are grasped. To offer impetus to execution of these socially appealing endeavors, association with State Governments would be the course forward.

- Projects have been moping for an extensive timeframe in view of nonattendance of ensured financing. Concede in execution of assignments prompts time attacks and cost overpowers. This has an impact on the achievability of the assignments once they are done. The available resources are ordinarily spread out pitifully over every supported endeavor. In the current year, endeavors have been sorted out and financing ensured for all the endeavors that can be taken up for right.

Data Analysis and Findings:

- **Porter' Five Forces Model**

Indian Railways:

India Railways has their monopoly in the country. There is no other company present to provide transportation by this mode. This creates lucrative chances for the industry to prosper and improve their value provided to the customer.

Threat of the New Substitutes:

Services of Indian Railways are unique. There are no other service providers in the industry. This gives the consumers zero to minimum choice for selecting different services. This makes switching suppliers impossible for the consumers. This positively affects Indian Railways.

Threat of New Competitors:

In case for new entrants in the market, they need to possess very high investment capacity to start and sustain in the market with no guarantee of success. High entry barrier for a new competitor makes the whole Indian Railways an edge over competitors. It positively affects Indian Railways.

Bargaining power of the Customer:

Customers for this industry include passengers and company who requires freight transportation. They have little or no chance of bargaining because of the monopoly in the market. Indian Railways has a monopoly and gives economic services for the same.

Bargaining power of the Supplier:

Indian Railways is the sole service provider in the country. The company holds full authority to bargain which is expected to fetch them ample opportunities over the next ten to fifteen years, but will have a negative effect on the whole entity. Less competitive environment makes the whole system led back.

If an organization is planning to enter this market, they need very high capital to start with no guarantee of success. So it can be deduced that Indian Railways have created a high barrier for a new competitor to enter the market.

Customers here are the people who seek for the service of freight transport. The customers here have little or no chance of bargaining because they don't have options to provide them with service. Indian Railways has a monopoly for the matter of fact

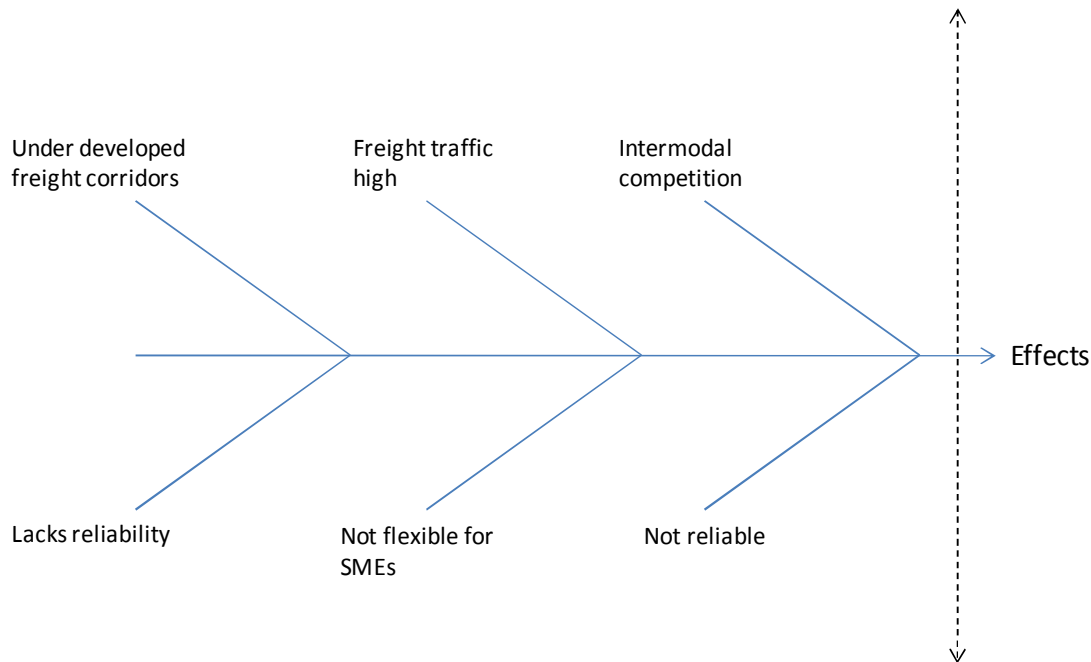
Indian Railways follows monopoly in the market and have ample opportunities for them to prosper and recheck on its value that it provides to its customer

The supplier here is the Indian Railways who provides the service. The supplier has the full authority to bargain which will fetch them an ample lot of profit, but will have a negative effect on the whole entity

The services provided by the Indian Railways are unique; the services cannot be by other service providers so the customers don't have other services to compare with to provide with their needs. Hence there is less chance for them to switch

- **Fishbone Analysis**

Fishbone diagram is an analytical tool to determine the root causes of a problem. It is also known as Ishikawa diagram. Dr Kaoru Ishikawa, a Japanese quality control expert, invented this analytical tool. This technique is used to brainstorm all the possible potential causes behind a problem. Fishbone graph works from right to left. Each large "bone" of the fish branches out to include smaller bones consisting of detailed analysis.



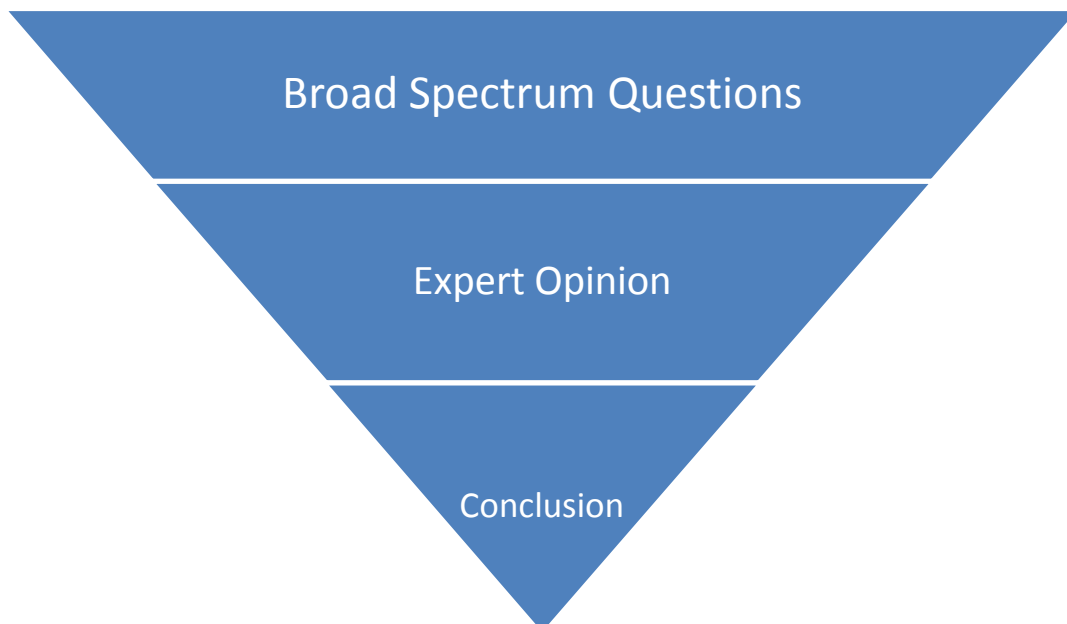
Causes:

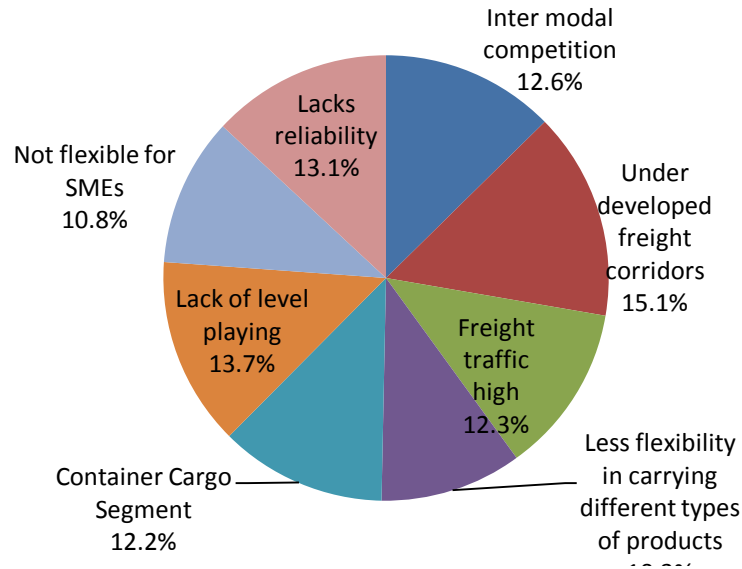
- I. Competition from various other modes of transportation makes the railway service dicey. India' freight transport highly depends on roads. Changing the mindset requires lucrative services from the railways to gain attention from the customer base.
- II. As cross-subsidies are given to the passenger tariff the freight tariff goes very high. This makes the freight transportation less feasible for small to medium enterprises.
- III. Over saturated and under developed freight network. There are no dedicated corridors for freight and more importance is given to the passenger traffic than the freight traffic making the delivery systems less reliable
- IV. Indian railway prefers companies which will hire the full train load. This makes the railway freight transportation mode not feasible for the medium to small companies interested for the same.

- V. The Indian railways do not have the proper tracking system which makes it less reliable. There were not many technological improvements and less scope for improvement in delivery systems.
- VI. Lack of equality due to improper mechanism used.

Funneling Technique

The funneling technique is a tool used for analysis which narrows down the spectrum of issues that the fishbone analysis helps in finding out. It consists of direct questions to the employees and they are open ended which means it's sort of knowing what they actually think is calling the problem is noted down. When there are countable numbers of respondents these types of analytical tools are used.





Problems	Rates
Inter modal competition	8.2%
Under developed freight corridors	9.8%
Freight traffic high	8.0%
Less flexibility in carrying different types of products	6.7%
Container Cargo Segment	7.9%
Lack of level playing	8.9%
Not flexible for SMEs	7.0%
Lacks reliability	8.5%

Potential Solutions

Computerization of Goods Terminal:

A client neighborly Terminal Management System (TMS) was introduced in 2005. With TMS presented in sidings, it has wound up workable for the client to know the whereabouts of his stock on a consistent reason. Issue of line receipts (RR) has wound up less troublesome and faster after the - TMS has been displayed. At present, 99.9% of total stacking is gotten in TMS.

Method of Payment:

76% of the cargo clients make installment electronically through the dealing with a record system getting rid of the prerequisite for either bringing cash or premium drafts making the portion secure. Quickly, 763 records have been launched till April 2014. With a bit of the banks thinking about a portion section whereby cargo client not on e-portion mode can pay clearly from their money related equalizations, the extent of customers is obligated to go up.

Wagon Registration Fee (WRF):

Putting an interest for wagons incorporates installment of wagon enlistment cost. IR has now exempted installment of WRF by head customers who pay more than Rs.10 crore consistently.

Cargo Incentive Schemes:

IR has an a lot of arrangements for its cargo clients, where concessions in cargo rates are given to gather additional income by delivering additional volume of development. The arrangements range from stacking stuffed away moves in open wagons, stacking in empty stream bearing, inspirations for incremental action, driving forces for cargo forwarders, downsized rakes, two point rakes and multi point rakes et cetera. The arrangements have met with deficient accomplishment.

Terminal Infrastructure:

The condition of the railroad products sheds is awful. Different works have been embraced under works program for improvement to items sheds. Rapidly there are 70 works in progression costing Rs. 635.34 crore, which still need another Rs. 325 crore for completion at original costs. In 2007, models for all kindnesses at stock/sheds were situated down.

Private Freight Terminal (PFT):

This approach was pushed as a major PPP activity in 2010, to attract private enthusiasm for setting up of cargo terminals. As an inspiration, 50% of terminal charges were made open to the examiners. With the subsequent subsuming of terminal charges in freight, this inspiration is no more open to the PFT examiners and in reality, an offer of the pay @ Rs.16 each ton is right now recognized from the PFT budgetary pro. The plan is being examined to make it all the more charming for speculators.

E-Demand module of the cargo Operation Information System:

Enlistment of wagon demand by the client can now be done on-line; without the necessity for passing by items shed therefore.

Cargo e-Diversion framework:

The coal rakes among the force houses and organization of power board can now be diverted, if necessary, through the new "e-redirection system" on continuous reason. Distraction solicitations and notices can be issued electronically for speedier execution.

Private Participation in Building Rail Connectivity

MOR arrangement on rail integration and limit growth ventures of December 2012 has supported cooperation of the private division in giving last mile network to ports, expansive mines, bunch of businesses for building rail network and limit enlargement. The approach had proposed the accompanying five models:

- Non-Government private line model
- Joint Venture
- Capacity expansion through financing by client
- BOT
- Capacity enlargement through annuity model

The starting three models incorporate cooperation of vital speculators/clients and impact the need of such budgetary pros and lines for having last mile system. The other two-models are flawless PPP models. All the models give an unmistakable income stream to the speculators for making the connectivity ventures bankable. Three Model Concession Agreements for private line model, joint endeavor and BOT have been endorse and put openly space. The understandings for the other two models are under bolster process.

These assentions have endeavored to change the threat parcels amidst private and open area. Under this strategy, rail system to Dhamra Port has been approved. tasks of rail integration to Tuna Port, Jaigarh Port and coal network extend in Chhattisgarh are under execution divided from four undertakings under client subsidized model. Seven ventures have been given " on a fundamental level" Approval by MoR. An Appraisal of the tasks being realized through non Railway speculation shows that exercises worth Rs 2800 crore have been delegated between 2002- 2012 which included port incorporation to Pipavav, Mundra, Kandla, Mangalore, Dahej, Krishnapatnam and Dhamra.

Ventures worth Rs 15,800 crore are under execution or have been conceded "on a fundamental level" endorsement by MOR. The points of interest are given in the table below:-

Details of projects under PPP

	No. of Projects	Length(km s)	Railway(km s)	Non-Railway(R s. Cr.)	Total(R s. Cr.)
Commissioned	7	950	545	2257	2802
Sanctioned/under construction(NGR/JV)	7	793	322	9557	9879
Sanctioned/under construction(customer funded)	5	466	400	1728	2128
In-principle approval granted	7	264	70	3740	3810
Total	26	2473	1,337	17,282	18,619

The accompanying undertakings have been authorized and are under usage under the participative approach 2012:

- 17 km Gandhidham-Tuna Port line to be authorized by April 2015 (Private Line Model –Rs.142 crore)
- 35 km Jaigarh-Digni New line authorized in July'14, to be charged by 2017 (JV Model – Rs 771 crore)
- Two extends in Chattisgarh (Raigarh-Mand and Gevra Road-Pendra Road) have been affirmed under JV with IRCON, State Government and SECL. Separate SPV for both ventures have been framed for tasks worth Rs 4000 crore.

Under client financing model of participative approach 2012, Rs 902 crore have been gotten from NTPC for the accompanying 4 tasks:

- Bhaktiyarpur-Karnauti Flyover and 3rd line from Bhaktiyarpur to Barh- Rs 250 crore (100% financing).
- Manpur-Tilaiya –Bhaktiyarpur (132 km) Electrification – Rs 140 crore (100%).
- Katwa- Balgona GC (30 km) – Rs 112 crore (100%)
- Hutgi- Kudgi- Gadag (284 km) Doubling – Rs. 400 crore (50% financing of 134 km Hotgi-Kudgi segment).

Further NMDC has conferred Rs.826 crore for multiplying of Jagdalpur-Kirandul (150 km) area.

Outside Direct Investment (FDI)

Vide Notification No. S.O.2113(E) dated August 22, 2014, Government of India has opened up the accompanying exercises of Indian Railways for FDI- development, operation, support of :

- Suburban hall extends through PPP- :
- High pace train ventures
- Dedicated cargo lines
- Rolling stock including train sets, and trains or mentors assembling and upkeep offices :
- Railway Electrification

- Signaling frameworks
- Freight terminals
- Passenger terminals
- Infrastructure in mechanical park relating to rail line lines or sidings including charged railroad lines and network to primary rail route lines; and
- Mass Rapid Transport Systems

Definite Sectoral Guidelines on FDI have been issued which give acceptable regions and conditions of engagement. As against commitment, FDI incorporates enthusiasm for worth which incorporates more genuine threat for the monetary master inverse commitment and, thus, furthermore yearning of higher returns. Considering the positive BOT assention; - speculation should stream in these tasks as and when they are dispatched. An Investors meet was composed on 5th December'14, wherein a booklet on "Outline of Framework for Participative Models of rail system and Domestic & Foreign Direct Investment" was released.

Business usage of Surplus Railway land

The aggregate zone of area under Railway system is 4,58,589 hectares, out of which approx. 46,409 hectare is empty (as on 31.03.2014). The empty area is generally as limited strips along tracks, which is required for redesigning and upkeep of track and other foundation. The empty railroad area is similarly utilized for execution of distinctive infrastructural exercises for meeting future advancement needs of Railways and fuses endeavors like Doubling, Traffic Facilities, Rail Coach and Component generation lines, et cetera. The unfilled range, which is not required by Railways for its incite operational needs, is utilized for business change, wherever achievable, to collect extra money related assets through Rail Land Development Authority (RLDA).

As being what is indicated, 102 destinations measuring 916 hectare of Railway area has been invested to RLDA for business progression. Out of 102 districts, 62 destinations totaling 597 hectares are managable for business progression.

Station Re-improvement by PPP

It is wanted to redevelop at railroad stations and basic intersection to global gauges through PPP or Government to Government co-operation. 5 stations were supplied to Indian Railway Stations Development Corporation (IRSDC) viz. Habibganj, Chandigarh, Bijwasan, Shivaji Nagar and AnandVihar for which Draft Master Plans and Feasibility Reports have been orchestrated and are under statutory supports with neighborhood bodies. Supports have been gotten for Habibganj. For Shivaji Naga

Surat station has been supplied to IRSDC for redevelopment for which consultancy contract has been rewarded. Gandhinagar station has been endowed to Rail Land Development Authority (RLDA).

New Bhubaneswar and Baiyyappanahalli (Bengaluru) stations are recognized for prefeasibility considers by China Railway Construction Engineering Group to their detriment under a MOU between Indian Railways and National Railway Administration, Government of the People's Republic of China.



Conclusion

The Government needs to make an open mindfulness for the administrations gave by the railroad. Indian Railway (IR) needs to take fundamental Integration for expanding IT related advancements. Freight transport is a key incomes driver for Indian Railways, making up to 70 percent of incomes and it is becoming quickly. Until the devoted cargo hall is operational, they have to concentrate more from their current rail foundation to meet the progressing ascent popular for cargo limit. It's been comprehended that Indian Railway's necessities is giving a test framework that matches rail line's details. The improvement of this weariness test apparatus is awesome open doors for us to show our mastery in creating test frameworks that can help transportation frameworks extricate more execution from their current and future framework. Individuals truly charmed to work with Indian Railways on this task and are certain that this test framework will help them expand their cargo payload limit. The high payloads and the broad tests RDSO requires are very exceptional and speak to another venture for rail routes. The IR as of late gave electric activation to tilt control on high velocity prepares, for example, the Shinkansen in Japan. In future IR procure more benefit through the cargo through take after new procedures.