History of Rail Transportation and Importance of Indian Railways (IR) Transportation

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***Abstract*-Transportation is important part of people which is directly and indirectly connected with people. Its enable trade between people which is essential for the development of civilization. Various authors have described number of dimension regarding the Indian Railways. This study explains history of rail transportation and also describe journey of railway in India and discuss importance about rail transportation.**

***Keywords*- History of Rail Transport and Indian Railways, Organisation Chart of IR**

1. Introduction

Transportation is the backbone of any economic, culture, social and industrial development of any country. Transportation is the movement of human, animal and goods from one location to another. Now a day we are using so many method for transporting like air, land, water, cable etc. transportation is find installation infrastructure including roads, airway, railway, water, canels and pipelines and terminal (may be used both for interchange of passenger and goods).

2. Rail Transport

Rail transport is where train runs along a set of two parallel steel rails, known as a railway or railroad. Passenger transport may be public where provide fixed scheduled service. Freight transport has become focused on containerization; bulk transport is used for large volumes of durable item. Rail transport is a means of transferring of passenger and goods on wheeled running on rail, also known as tracks, tracks usually consist of steel rails, installed on ties (sleepers) and ballast. Railways transport is capable of high level of passenger and goods utilization and energy efficiency but is often less flexible and more capital intensive than road transport when tower traffic levels are considered.

3. History of Railway Transport

The oldest man/animal hauled railway date back to the 6th century BC in carinth, Greecs. Rail transport commenced in mid 16th century in Germany in form of horse powered funiculars and wagon ways. Modern rail transport commenced with the British development of the steam locomotives in the early 19th century. The railway system in Great Britain is the oldest in the world. Built by George Stephenson and his son Robert Company (Robert Stephenson and company). The locomotion No.1 is the first steam locomotive to carry passenger on the public rail line, the Stockton and Darlington in 1825. George also built the first public inter city railway line in the world to use only the steam locomotives all the rime, the Liverpool and Manchester Railways which opened in 1830. Steam engines a key component of the Industrial Revolution. Railway reduced the cost of shipping and allowed for fewer lost goods compared with water transport which faced occasional sinking of ship. The charge from canels to railways allowed for national markets in which prices varied very little from city to city. The spread of the railway network and the use of railway timetables, led to the standardization of time (Railway time) in Britain based on Greenwich Mean Time. The invention and development of the railway in the United Kingdom was one of the most important technological invention of the 19th century. The world's first underground railway the Metropolitan Railway (part of the London Underground), opened in 1863. In the 1880, electrified train were introduced, leading to electrification of tramway starting during the 1940s the non electrified railway in most countries had their steam locomotive replaced by diesel electric locomotives the process being almost complete by the year 2000. During the 1960, electrified high-speed railway systems were introduced in Japan and later in some other countries. Many countries are in process of replacing diesel locomotives with electric locomotives. Intercity trains are long-haul services connecting cities; modern high-speed rail is capable of speed up to 350 km/h, but this requires specially built track.

4. History of Indian Railway

Railway comes in India in year 1832 and after that so many work done in this field below in table 1 discuss year wise Indian railway development.

Table 1: History of Rail Transport in India

1832-1852: Industrial Railways	
Year	**Work Done**
1832	India's first railway proposals were made in Madras
1837	The Red Hill Railway, the country's first train, ran from Red Hills to Chintadripet bridge in Madras. It was hauled by a rotary steam-engine locomotive manufactured by William Avery. Built by Arthur Cotton, the railway was primarily used to transport granite stone for road-building work in Madras
1845	The Godavari Dam Construction Railway was built at Dowleswaram in Rajahmundry. Also built by Cotton, it supplied stone for the construction of a dam over the Godavari River.
8 May 1845	The Madras Railway was incorporated, followed that year by the East India Railway.
1 Aug 1849	The Great Indian Peninsular Railway was incorporated by an act of parliament.
17 Aug 1849	The "guarantee system", providing free land and a guaranteed five-percent rate of return to private British companies willing to build railways
1851	The Solani Aqueduct Railway was built in Roorkee. It was hauled by the Thomason steam locomotive, named after a British officer-in-charge of that name. The railway transported construction materials for an aqueduct over the Solani River.
1852	The Madras Guaranteed Railway Company was incorporated. In 1852 the Madras Guaranteed Railway Company was incorporated
1853-1924: Passenger Railways and Expansion	
16 April 1853	The country's first passenger train, which ran between Bombay's Bori Bunder station and Thane, was dedicated by Lord Dalhousie. The 14-carriage train was hauled by three steam locomotives: the *Sahib*, *Sindh*, and *Sultan*. Travelling 34 kilometres the train carried 400 people. The passenger line was built and operated by the Great Indian Peninsula Railway (GIPR).
15 Aug 1854	The first passenger train in eastern India ran from Howrah (near Calcutta) to Hoogly, a distance of 24 miles (39 km), on. The line was built and operated by the East Indian Railway Company (EIR).
May 1854	The Bombay-Thane line was extended to Kalyan with the Dapoorie viaduct over the Ulhas River (India's first railway bridge). That year, the GIPR opened its first workshops in Byculla.
1855	The BB&CI Railway was incorporated. That August, the EIR *Express* and *Fairy Queen* steam locomotives were introduced.
1 July 1856	South India's first passenger train ran from Royapuram-Veyasarapady (Madras) to Wallajah Road in Arcot, a distance of 97 km. It was built and operated by the Madras Railway. The Madras Railway's first workshop opened in Perambur (near Madras) that year, and the Bombay-Thane line was extended to Khopoli.
1858	The Eastern Bengal Railway was incorporated.
24 Feb 1873	India's first tramway (a horse-drawn tramway) opened in Calcutta between Sealdah and Armenian Ghat Street, a distance of 3.8 kilometres. The following year, the Great South Indian and Carnatic Railways merged to form the South Indian Railway Company.
9 May 1874	A horse-drawn tramway began operation in Bombay between Colaba and Parel.
1880	The Calcutta Tramways Company was incorporated, followed a decade later by the East Coast State Railway.
1897	Lighting in passenger coaches was introduced by many railway companies.
1902	The Jodhpur Railway was the first to introduce electric lighting as standard fixtures.
1920	Electric signal lighting was introduced between Dadar and Currey Road in Bombay.
1925-1950: Electrification and further expansion	
1925	The first railway budget was presented.
3 Feb 1925	The first electric passenger train in India ran between Victoria Terminus (VT) and Kurla on 1,500 V DC overhead traction. Cammell Laird and Uerdingen wagon fabrik manufactured the locomotives for this train. The VT-Bandra section was electrified (with an elevated platform at Sandhurst Road), the Oudh and Rohil khund Railway was merged with the EIR, the first railway budget was presented in the same year.
1926	The Kurla-Kalyan section was electrified with 1,500 V DC. Electrification to Poona and Igatpuri (both 1,500 V DC) over the Bhore and Thal Ghats was also completed, and the Charbagh railway station in Lucknow was built that year.
Jan 1928	The Bandra-Virar section was electrified with 1,500 V DC.
1928	The Frontier Mail made its inaugural run between Bombay VT and Peshawar. The country's first automatic color-light signals became operational, on GIPR's lines between Bombay VT and Byculla.
1928	The Kanpur Central and Lucknow stations opened. In this year the Grand Trunk Express began running between Peshawar and Mangalore, the Punjab Limited Express began running between Mumbai and Lahore, and automatic color-light signaling was extended to the Byculla-Kurla section.
1 June 1930	The *Deccan Queen* began service (hauled by a WCP-1—No. 20024, old number EA/1 4006) with seven coaches on the GIPR's electrified route from Bombay VT to Poona (Pune). The Hyderabad Godavari Valley Railway was merged into Nizam's State Railway and the route of the Grand Trunk Express was changed to Delhi-Madras that year.
1951-1983: Zonal re-organization and further developments	
1951	The re-organization of railways in India into regional zones

14 April 1951	The Southern Railway zone was created.
14 April 1952.	The Northern, Eastern and North Eastern Railway zones were created on
5 Nov 1951	The Central and Western Railway zones were created. The government of West Bengal also entered into an agreement with the Calcutta Tramways Company to take over its administrative functions that year.
1952	Fans and lights were mandated for all compartments in all classes of passenger accommodations and sleeping accommodations were introduced in coaches.
1 Aug 1955	The South-Eastern zone was split off from the Eastern Railway zone.
1956	A divisional system of administration was established for the zones. and the first fully air-conditioned train was introduced (between Howrah and Delhi).
1957	After successful trials in France, SNCF proposed 25 kV AC electrification for India's railways. Indian Railways decided to adopt 25 kV AC electrification, choosing SNCF as a technical consultant. The Main Line Electrification Project (which later became the Railway Electrification Project and, still later, the Central Organisation for Railway Electrification) was established that year.
1958	The Northeast Frontier Railway zone split off from the North Eastern zone.
1959	Raj Kharswan to Dongoposi was the first section electrified with 25kV AC traction.
1960	The first scheduled train using 25 kV AC traction ran on the Raj Kharswan-Dongoposi section
1966	The first containerized freight service began between Bombay and Ahmedabad and 25 kV AC electrification of several suburban tracks around Delhi, Madras and Calcutta was completed.
1979	The Main Line Electrification Project became the Central Organization for Railway Electrification (CORE).
1984- Present: Rapid Transit and Later Developments	
24 Oct 1984	India's first metro train ran from Esplanade to Bhowanipur (now the Netaji Bhawan station) in Calcutta and the Calcutta Metro was the country's first rapid-transit line.
1986	Computerized ticketing and reservations were introduced in New Delhi.
1988	The Shatabdi Express, India's fastest train, was introduced between New Delhi and Jhansi.
1990	The first self-printing ticket machine (SPTM) was introduced in New Delhi.
1993	Introduces Air-conditioned, three-tier coaches and a sleeper class (separate from Second Class).
16 Jan 1995	the first regularly-scheduled service with 2 x 25 kV traction began on the Bina-Katni line.
Sep 1996	The CONCERT system of computerized reservations began in New Delhi, Mumbai and Chennai.
1998	Coupon-validating machines (CVMs) were introduced at Mumbai CST.
18 April 1999	The CONCERT system became operational nationwide. the South East Central Railway zone was established and credit cards were accepted for tickets and reservations at some stations that year.
Feb 2000	The Indian Railways website went online.
6 July 2002	The East Coast, South Western, South East Central, North Central and West Central Railway zones were created.
3 Aug 2002	Indian Railways (IR) began online train reservations and ticketing
1 Dec 2002	Internet ticketing extended to many cities
5 Feb 2012	The Western Railway zone (WR) ended its use of 1,500 V DC traction, switching to 25 kV AC traction.
26 Sep 2013	The Tatkal system of ticketing was extended to all trains
5 April 2016	Gatimaan Express, India's fastest train with a maximum speed of 160 km/h, made its maiden journey from Delhi to Agra
11 April 2016	The Central Railway zone (CR) ended its use of DC traction in the Mumbai area and on the country's main-line rail network, switching to 25 kV AC traction
2016	Introduced India's fastest train Gatimaan Express
31 March 2017	IR announced that India's entire rail network would be electrified by 2022.

5. Indian Railway Zones

Indian Railways has been divided into 17 zones and 69 divisions. Table 2 describes Indian Railways zone formation in year, headquarter and their divisions.

Table 2: Railway Zones in India

Sl. No	Name	Code	Year of Establishment	Route KMs	Headquarters	Divisions
1	Central Railway	CR	1951	3905	Mumbai	Mumbai, Bhusawal, Pune, Solapur, Nagpur
2	Southern Railway	SR	1951	5098	Chennai	Chennai, Trichy, Madurai, Palakkad, Salem, Thiruvananthapuram

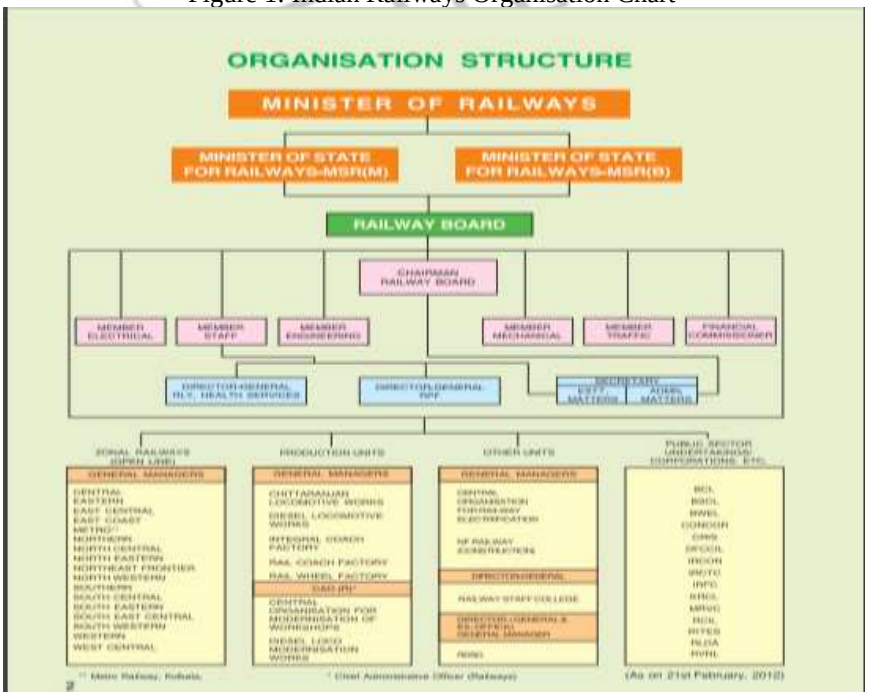
3	Western Railway	WR	1951	6182	Mumbai	Mumbai Central, Ratlam, Ahmedabad, Rajkot, Bhavnagar,Vadodara
4	Eastern Railway	ER	1952	2414	Kolkata	Howrah, Sealdah, Asansol, Malda
5	North Eastern Railway	NER	1952	3667	Gorakhpur	Izzatnagar, Lucknow, Varanasi
6	Northern Railway	NR	1952	6968	Delhi	Delhi, Ambala, Firozpur, Lucknow, Moradabad
7	South Eastern Railway	SER	1955	2631	Kolkata	Adra, Chakradharpur, Kharagpur, Ranchi
8	Northeast Frontier Railway	NFR	1958	3907	Guwahati	Alipurduar, Katihar, Rangia, Lumding, Tinsukia
9	South Central Railway	SCR	1966	5803	Secunderabad	Secunderabad, Hyderabad, Guntakal, Guntur, Nanded, Vijayawada
10	East Central Railway	ECR	2001	3628	Hajipur	Danapur, Dhanbad, Mughalsarai, Samastipur, Sonpur
11	East Coast Railway	ECoR	2001	2572	Bhubaneswar	Khurda Road, Sambalpur, Visakhapatnam
12	North Western Railway	NWR	2002	5459	Jaipur	Jaipur, Ajmer,Bikaner, Jodhpur
13	North Central Railway	NCR	2003	3151	Allahabad	Allahabad, Agra,Jhansi
14	South East Central Railway	SECR	2003	2447	Bilaspur	Bilaspur, Raipur, Nagpur
15	South Western Railway	SWR	2003	3177	Hubli	Hubli, Bangalore, Mysore
16	West Central Railway	WCR	2003	2965	Jabalpur	Jabalpur, Bhopal,Kota
17	Kolkata Metro Railway	KNR	2009		Kolkata	Kolkata

Last Updated on: November 13, 2014

6. Indian Railway Organisation Chart

Figure 1 describe Indian railways organization chart. So many departments working under this organization. In India have separate rail department which is called Minister of railways. Minister of railways supervises, monitor and guide all kind of work which is done by different railway zones. All rail departments play importance role for successful rail transport operation.

Figure 1: Indian Railways Organisation Chart



6. Conclusion

Today road transportation sector face big problem for transport goods from one place to another place due to increase population on road traffic and affects so many other factors. Railway is a big organization in the transportation sector. In rail transportation we can easily transport bulk of goods from one place to another place in less expected time and less goods charges. Rail goods department encourage to people to transport more or more goods by rail. Benefit of rail transport like no weather affect for goods like rain, fog etc. railway is better organized for transportation because it has fixed routes and schedules. According to speed it is the best choice for long distance traffic. Rail transport carrying heavy and bulky goods over long distance. It is cheaper mode of transport as compared to other modes of transport. Railway is the safest from of transport. The chances of accidents and breakdown of railways are minimum as compared to other modes of transportation. Carrying capacity of railway is extremely large moreover its capacity is elastic which can easily be increased by adding more wagons.

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