

Analyzing The Growth of Entrepreneurship In The E-Rickshaw Industry In Jaipur Using PESTLE Technique

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Abstract

The E-Rickshaw, short for Electric Rickshaw is basically a three-wheeled category of vehicle and requires human control to be driven. The former works on the electric power supply that is regulated and consumed by a battery and has an advantage of reducing vehicular emission over conventional Engines. The evolution of the E-rickshaw market in India started since 2012 and gained market base post 2015, for the purpose of Electric Fleet in 2-tier and 3-tier cities. To the extent, E-rickshaw has recently been considered as the major market changer towards the development of zero emission Electric Fleet, and has reduced the use of Fuel Powered Auto-rickshaws in the transport industry and has also been proving itself cost efficient. Indian government has also worked out on policies that highlights the needs of Alternate Energy Transport. The scenario of working with green energy has resulted in development of Entrepreneurship opportunities at two stages, i.e. Seller as well as the User. A research study, conducted in New Delhi shows an increment of income by 400% amongst the Rickshaw Pullers and 300% amongst dealers over conventional auto-rickshaws. The proposed paper intends to analyze the role of E-Rickshaw in Entrepreneurship Development in the city of Jaipur using PESTLE analysis technique. PESTLE analysis technique is used to understand and identify the factors within the environment of the business operation and analyze how those PESTLE factors will influence the future performance of the business. The focus of the study would be to identify the Evolution of E-rickshaw in Jaipur and record the income based statistics amongst User and the Dealer end. Further, to suggest ways as to what strategies and technologies can be adopted to ensure the growth of E-rickshaw industry.



Key words: E-Rickshaw, Emissions, Green Energy, Jaipur, Electric Fleet, Environmental sustainability.

Introduction

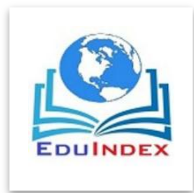
The origin of the word ‘Rickshaw’ lies in the hands of the Japanese language, namely ‘Jinrikisha’ which when translated means man-powered vehicle (Webster’s Unabridged Dictionary, 1913). The Rickshaw can be considered as one of the oldest modes of transport with its introduction leading to the period of late 1860’s (Saito T., 1979:52). The evolution of rickshaw showed various advancements with the earliest coming into existence being the Pulled Rickshaws. Further variations showed the development of Cycle-rickshaws, horse-drawn rickshaw, auto-rickshaw and the most recent being the concept of E-rickshaws (Electric – Rickshaws). The transportation needs in the urban as well as rural areas were being fulfilled by the use of public transport as well as Auto-rickshaws till the year 2010, with the first introduction in the city of Delhi during the Commonwealth Games 2010. The statistical abstract of the Rajasthan government transport shows a registration of more than 3000 rickshaws per year (Statistical Abstract, Rajasthan Transport Portal, 2016-17).

The application of E-rickshaw in the city of Jaipur has been observed since the year 2012. The recent statistics from the Rajasthan Transport portal shows a growth of more than 200% per year with the capability to phase in more than 12000 E-rickshaws (Rajasthan Patrika, 2019), employing more than 17000 registered E-rickshaw drivers in the city of Jaipur. This also contributes to the increment in number of E-rickshaw dealers in Jaipur city ranging above 65.

E-Rickshaw		E-Cart	
2015-16	2016-17	2015-16	2016-17
1370	3329	7	61

Table 1: Statistical data for the registration of E-rickshaws/E-cart in Jaipur

With the growing concerns of pollution and population, concerns regarding the mode of transport are also growing. Earlier before 2014, the battery operated E-rickshaws didn’t come under the ambit of the



Motor Vehicles Act, 1988 and weren't licensed. This led to absence of any government rules governing the actions of battery operated rickshaws and hence, the driver won't be prosecuted by the Traffic Police. As such, these vehicles were considered and deemed to be unsafe. As per the report prepared by TERI, 80% of passengers felt unsafe in an E-rickshaw [Indian Express 2014]. This in turn led to the regularization and registration of E-rickshaws, as the government authorities hold hands in the year 2015.

From a socio-economic point of view, the registration and regularization of these vehicles led to development of financing options in the form of government as well as private authorities. Also, providing opportunities for insurance facilities to drivers as well as passengers.

This paper tries to evaluate the socio-economic profile of E-rickshaw drivers as well as E-rickshaw dealers in the city of Jaipur, considering the impact of the government regulations using the PESTLE Technique.

The PESTLE Technique could better be understood through the following table defined below:

POLITICS	<ul style="list-style-type: none">• Government body and their policy• Financial Support• Government Initiatives
ECONOMY	<ul style="list-style-type: none">• Inflation and interest rates• Labor and Energy Costs
SOCIAL	<ul style="list-style-type: none">• Population, Lifestyle, Culture• Education, Media
TECHNOLOGY	<ul style="list-style-type: none">• New Technology• Information and Communication System
LEGAL	<ul style="list-style-type: none">• Regulations and Employment• Government Law & Standards
ENVIRONMENT	<ul style="list-style-type: none">• Pollution, Weather, Waste, Recycling

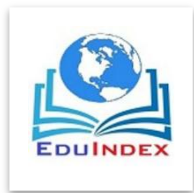


Table 2: Definition of the PESTLE method

Methodology

Selection of Areas of Study

The study has been divided into two parts to cover the different aspects of the functioning of E-rickshaws:

- a. The Socio-Economic impact of the battery rickshaw industry.
- b. Technological developments in the battery rickshaws.

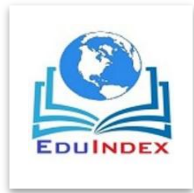
To conduct the socio-economic study as well as the political impacts, 4 different areas in the Jaipur city were taken to accumulate for the data samples, with a total of 120 E-rickshaws and 65 dealers [Jaipur E-rickshaw Welfare Association] being sampled. A common survey was taken out through all the dealers and E-rickshaw drivers across these areas to study the entrepreneurial growth among the individuals of the city. The areas for the survey were chosen as per the E-rickshaw demographics, and the location within the state. To avoid the selection bias, 4 areas with diverse parametric opportunities were considered. The areas in the city of Jaipur are:

- a. Galta Gate
- b. Subhash Chowk
- c. Shastri Nagar
- d. Mansarovar

The statistics created by Jaipur E-Rickshaw Welfare Association performing under the Jaipur Road Transport Office Authority was also analyzed to provide relevant details for the study.

For the Technological development, 4 E-Rickshaw manufacturing industries from Jaipur and 1 Delhi-based company with its dealer network strongly built in Jaipur have been interviewed. A common survey including a technical questionnaire was used to sample out this study.

The variables and parameters have been selected, as such to attain the objectives of the study.



Framework of the Study

The battery operated E-rickshaws have been introduced in the year 2010 for the Commonwealth Games (New Delhi) and had a projections of closely 4000 E-rickshaws by the end of that year.[Telegraph 2010].

With growing popularity, the number of E-rickshaws took an exponential growth in the period between October 2010 and November 2019 standing up to 1.5 Million vehicles working on the Indian roads. But the technology was not regularized and registered till early 2015.

Considering the safety standards, the ministry of road transport passed bill making amendments in the Motor Vehicle Act 1989 in the year 2014, which came into consideration in the year 2015. As such, making an impact on the Price inflation in the E-rickshaw industry.

Price before Amendments	Price after Amendments
60,000-1,10,000	1,10,000 – 1,40,000

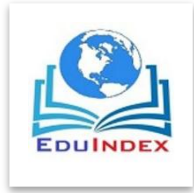
Table 3: Inflation in E-rickshaw prices due to amendments in Motor Vehicles Act

Socio-Economic Study

This section works out on calculating the impacts of the operation of E-rickshaw on the socio-economic terms by analyzing the data being accumulated from the 4 areas considered in the city of Jaipur.

The introduction of E-rickshaws aimed towards replacing the physically powered cycle rickshaws and to some extent bail out the conventional concept of fuel powered Auto Rickshaws. As such, the study will also concentrate on the factors whether the replacement has been proved beneficial on economic terms or not.

The major aim of the section is to define how the E-rickshaw industry is providing the growth of Entrepreneurship opportunities in the city of Jaipur.



The parameters that were considered for the study includes Education, Previous Employment, and the change in income with profession. Also, to understand the Entrepreneurial growth, various other factors like the operational system, culture, union and the living standards of the drivers and dealers were considered. For that purpose, a subjective questionnaire was prepared with an intention to understand the operational system, and Yes/No component to observe the living standards, security, union problems.

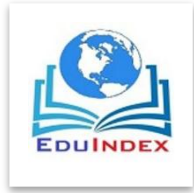
Operational System Description

The E-rickshaws in the Jaipur city, are generally owned by the drivers, or they are rented to the drivers on a daily basis by a contractor. The major population driving the E-rickshaw belongs to the BPL segment who have migrated over in Jaipur. The contractor system provides the opportunities to the migrated people to earn their livelihood, in return earning their own daily wage. Earlier, there were no financing options available. But with the registration of E-rickshaw by the government has led to the development of financing facilities. As a result, a large increment could be seen in the registration of E-rickshaw in the Jaipur city.

Considering the travelling parameters, these rickshaws run for short distances, majorly covering a range of 5 Kms in a to and fro manner, ferrying passengers on sharing basis at a nominal cost. As there is no system regulating the rates, a local union form their own pricing system as per the distance and place. For other routes, the charging is done as per individual basis.

The dealer system works out to perform the trade of E-rickshaw and its spare parts and accessories and also providing the servicing options. A major draw in the system is that one dealer is involved with the trade of products from more than one company.

Depending on the customer profile, the dealer tends to sellout the E-rickshaw considering the budget as well as the paying capability, keeping his own preferred margin. They also workout to provide services like repair, monthly service and facilities as described by the company and trading out the spare parts involved with the product.

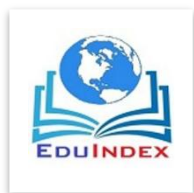


The parameters chosen will help out to create a break even report in which a dealer as well as a driver is able to work out in the E-rickshaw industry.

Socio-Economic Conclusion

The data accumulated on analysis showed a good reason behind the growth of E-rickshaw increment on the roads. The E-rickshaws proved to be a better alternative over cycle rickshaws and auto rickshaws. From the study, it came out that 41% of the E-rickshaw drivers were previously unemployed or rickshaw pullers. This has in turn created an era, where people have started to develop earnings and employment for their own livelihood. Other 15% were previously factory workers and 9% of the daily wage labors, who do have registered a growth in their incomes.

Considering the profile of the dealers, most of them accounting to 32% were previously property dealers, and had normal living standards, 26% account to the recently graduated individuals, who have started to generate their own employment, another 31% belong to the fabricators, cloth sewers, two wheeler service employees. The data evaluated shows 89% of the dealers have been involved in earning a great margin.



Results of the Socio-Economic Study

Table 4: Rented Rickshaws

Parameter	Average Values
Daily Rent	293
Daily Earnings	872
Net Profit	579

Table 5: Self-owned Rickshaws

Parameter	Average Values
Initial Investment	1,30,000
Daily Maintenance Cost	85
Daily Earnings	872
Net Daily Profit	787
Net Daily Savings	537
Battery Replacement/Other Annual Costs	20580
Breakeven Time Period	281 days (Approx.)

Table 6: Educational Profile of E-Rickshaw Drivers in Jaipur

Educational Qualifications	Percentage of Drivers
Higher Education	1.2%
High School	8.6%
Middle School	25.2%
Primary School	41%
No Schooling	24%

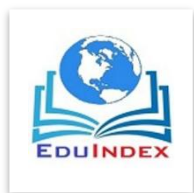


Table 7: Dealer Prices from E-Rickshaw Companies in Jaipur

S.No.	Company	Dealer Prices
1	Yatri	1,10,000
2	Lawat	1,00,000
3	Kuku	95,000
4	SSB	98,000
5	Sarthi	1,10,000

Table 8: Dealer Profile & Earnings in Jaipur

Parameter	Average Values
Initial Investment per month	10,02,600
Monthly Running Cost	55,000
Average Registration Charges	1,20,000
Average Sales per Month	10
Average Sales Turnover per month	13,26,000
Net Profit per month	1,48,400
Average Spare Parts Initial Investment	95,000
Average Spare Parts Earnings	1,23,500
Total Earnings	1,76,900

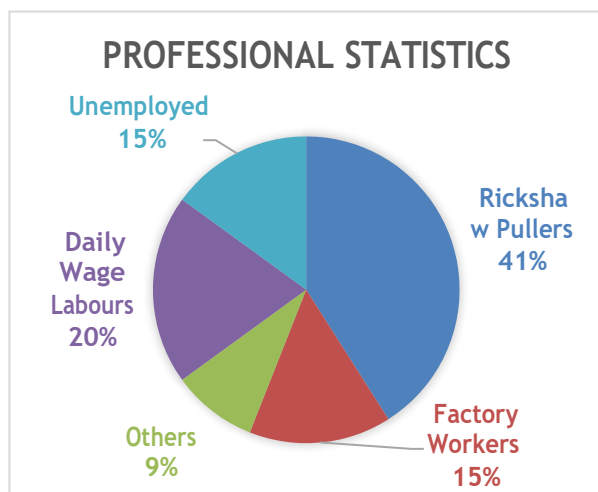


Fig.1: Previous Employment of E-rickshaw Drivers

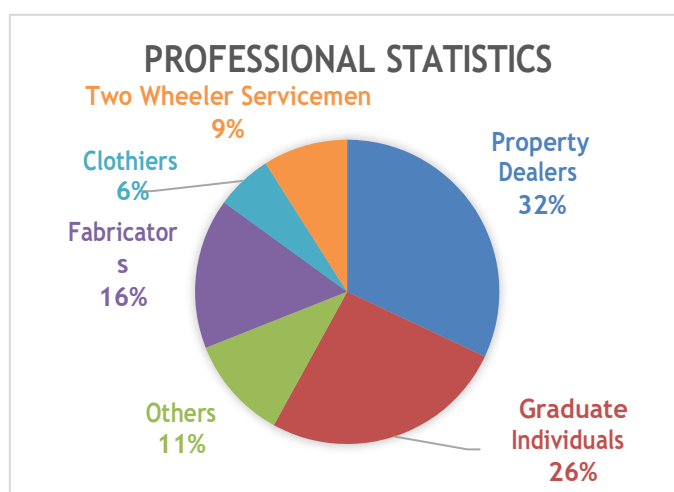
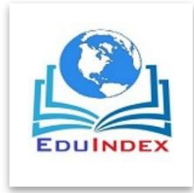


Fig.2: Previous Employment of E-rickshaw Dealers

The conclusions of the socio-economic part of the study help us in determining the importance of the battery rickshaws in the city of Jaipur and the growth of Entrepreneurial era among the individuals. The important ones have been summarized below:

- 89% of respondents had an increase in their salary from previous professions.
- 41% of respondents were either unemployed, or cycle rickshaw pullers.
- 26% of graduate Individuals got opportunities to face the Entrepreneurship era and develop employment opportunities.
- An estimated 1,00,000 can contribute to the government revenue.
- Approximately 1.5 million people in the country depend on the profession including the manufacturers, the workers and families.
- The Government of India has recently reduced the GST rate on E-rickshaw vehicles from 12% to 5%, as to accommodate the sale of Electric Vehicles under the 'FAME-II' scheme and providing opportunities to many startups to market their own manufactured vehicles.
- Recently, the Government of Rajasthan has quoted a target sales of 40,000 E-rickshaws throughout the state of Rajasthan.
- 80% of the respondents traveled to-and-fro from the Metro Stations as well, thus adding to the transport eco-system of the city.
- 43% were migrants from various states in East and North-East India.



Technical Study

The technical parameters are aimed at censuring the safety of the e-rickshaws in operation, as well as reducing the weight as well as efficiency characteristics of E-rickshaws. The technical study also tried to assess the efficiency of the e-rickshaws. This would help in suggesting the recommendations for the manufacturing policies that can be adopted by the state government. Recently, the entry of bigger players, i.e. Mahindra Electric, Jindal Steel, etc. have led to a great improvement in design standards as well as the manufacturing processes considering the safety standards as well as employing a whole lot of Research and Development team.

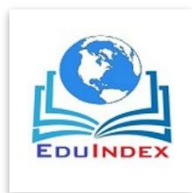
Operational System Description

Earlier, the E-rickshaws were not designed and developed within the country. Instead, these were imported into the country from China, in dismantled form at an overall cost of Rs. 60,000 after paying the taxes as well as the assembly. But, with the government starting to involve in Electric Vehicles with the introduction of schemes like 'FAME' (Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles) and 'Make in India', a lot of manufacturing industries have started to manufacture their components as well as whole assembly structure within the country itself.

Recent, interviews with various manufacturing companies shows a reflection of the development of technologies that focus towards the efficiency improvisation. Out of 5 manufacturer companies having their sales in Jaipur, one of the major market competitor is working upon the concept of Lithium ion batteries, a technology that can reduce the weight of the vehicle to great extent along with higher energy density, at the same offered price as the conventional E-rickshaws, providing major benefits and advantages over other companies.

The technical study work out around the parameters that workout in the operational strategy depending on the comparison between the conventional and the introduction of new technologies.

General Objective	Parameters	Variables
To study the technical characteristics of the battery operated e-rickshaws in Jaipur	Vehicle Parameters	<ul style="list-style-type: none">• Motor Power• Battery – Voltage, Capacity• Weight, Seating Capacity
	Operational Parameters	<ul style="list-style-type: none">• Travel Speed,• Cost (covered in the previous section)



	Life Cycle Parameters	<ul style="list-style-type: none"> • Battery Recycling Time • Durability • Safety Ratings
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Table 9: Technical Parameters for the study of E-rickshaw

Conclusions

The study and analysis of the technical data provides a fair amount of information on the operation of E-rickshaw industry in the country along with the comparative research data.

Table 10: Conventional Lead Acid Batteries

Technical Parameters	Designated Values
Motor Power	850W
Battery Voltage	48V
Single Battery Capacity	140Ah
Maximum Load Capacity	360 Kg
Vehicle Weight (Approximate Figure)	350 Kg (Including Batteries)
Maximum Speed	23.47 Kmph
Charging Current	15A
Charging Time	8 Hours 12 Minutes
Distance Covered (1 Charge)	105 Kms
Battery Recycling Time Period	8 Months

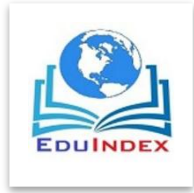


Table 11: Lithium Ion Batteries

Technical Parameters	Designated Values
Motor Power	850W
Battery Voltage	48V
Single Battery Capacity	85Ah
Maximum Load Capacity	360 Kg
Vehicle Weight (Approximate Figure)	256 Kg (Including Batteries)
Maximum Speed	23.47 Kmph
Charging Current	20A Fast Charging Mode
Charging Time	4 Hours (Approximately)
Distance Covered (1 Charge)	98 Kms
Battery Recycling Time Period	8 Months

It was seen only one company, out of the 5 were able to manufacture a cost efficient and fast charging E-rickshaw. As such, the E-rickshaw driver in Jaipur was able to work out two shifts and able to create more earning as compared to the conventional E-rickshaws.

Moreover, the requirement and development of Lithium ion batteries, has led to startups that deal with the development of Lithium ion Batteries. As such, 2 companies were seen to be growing in the field of Lithium Ion batteries in the city of Jaipur as well.

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