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Strategical upturn of reverse Logistic in loop with Crowdshipping: Transportation explication for India

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Abstract

The behavioural buying preference of customers shifting from traditional buying to online which shows significant changes in purchasing of products. This shifting trend of e-commerce platforms generates additional packages and parcels. Meanwhile, collecting the returned goods and it is also becoming an issue of concern for sustainability especially in urban areas. This problem for returning of goods gives birth to the concept of reverse logistics. The purpose of the research is to suggest crowdshipping measures via a framework to reduce emissions. The efficient handling of traffic and problems related to transport is a major challenge for many countries due to insufficient shipping services which delays the growth of socioeconomic development in a country. The rapid growth in the urban sector has posted both challenges and scope for policymakers not only in the creation of a transportation design and logistics systems for freight but also in logistics charges which shows the impact in market. In this paper, the proposed solution is sustainable since it can concurrently decrease the shipping costs, lesser time, eco-friendly CO₂ emissions, and traffic blocking in a city. It will act as a compact catalyst in effect of online shopping caused by reverse logistic prevalent in urban areas. Crowdshipping is the concept of a supply chain in which the closest route is selected for delivery of products via interested crowd. This paper highlights the systematic literature review done till date and framework for Crowdshipping as an explanation that seeks to utilize the loading capacity and continuous agility.

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1. Introduction

The present Indian roads transport over 60% of the entire goods and 85% of the total passenger traffic. Urban areas are torchbearers of economic growth which provides infrastructure and transportation to support many activities and services. Presently, world's 750 biggest cities are responsible for more than 57% of the worldwide GDP and this figure is expected to amplify to 61% by 2030.

The urban population try to find out cost efficient solutions but it be sustainable that minimize essential flow of goods (Savelsbergh and Van Woensel 2016; Crainic and Montreuil 2016). In cities logistics support has a holistic

view of the transport activities considering impacts on both ways the negative effects pollution and congestion as well as the positive economic, safety and mobility. As a point of economic development, the Indian road transport industry owns a huge share in market. The products movement or shipping can be done by different modes of transportations. The countries are witnessing a significant growth in the E-commerce, social sector and agricultural production since the behavior and preferences of customers is increasingly shifting toward online (Chen, C., & Pan, S. 2016). The spread of e-commerce over the last years has radically changed the customer shopping experience and behavior. Consumers have become much more demanding in terms of service level (Lozza, R. 2016). This results many benefits concluding as they are easily available at low cost and appropriate for e-commerce platforms. This paved the way for success of the online shopping portals. According to (Bamiduro et al.), online retail platforms are proving to be a powerful and preferred medium for both merchants and consumers. The growth of E-commerce recently generates more parcels and packets for distribution of products (Ashe & Dylan 2017; Pan, S., Chen, C. and Zhong, R.Y., 2015). While on the other side, receiving of returned goods has also becoming an issue of concern and sustainability, especially in bigger cities. The idea of crowdshipping originated from crowdsourcing as distribution of the delivery tasks to group of interested registered individuals. So, it involves the idea of crowdsourcing and ICT (Information and communication technology) for information system of sending and retrieval, a creative explanation that requires to utilize the additional capacity and regular movement from freight carriers in big cities to assemble and deliver the return products from final delivery area to back to retailers (Özdamar, L.& Ertem, M.A., 2015). This strategic approach involves databases of GPS (Global Positioning System) suggestions and locations of loading the products to same city with follow of same route. The loading of products evaluated by an optimization algorithm which be an additional feature of Crowdshipping platform. The results suggest numerous valuable vistas and insights to the implement capacity and managerial implications of the idea. Crowdsourcing idea is a key point in perspective of Industry and social media as well as a promising promoter for active logistics process and concepts. The world is heading towards a more sustainable, flexible, secure and convenient market where the global supply chain plays a major role. So crowd shipping can be a cue for some of the problems but it is not prevalent to a large extent everywhere. A theoretical framework for crowdshipping for logistics has been developed which includes the concept of reverse logistics controlled by ICT. So, this research points out the flaws in the present system of transportation and fills the gap with unique ideas. A robust business model can be developed for real life transportation systems for the betterment and profit of all the stakeholders.

The World Bank Report 2016 on Logistics Performance Index (LPI), India shows significant development in overall logistics performance ranking 35th. This report also entails that the expected cover market range is about USD 215 billion in 2020, with CAGR of 10.5 per cent. Meanwhile, road transportation has developed as a leading sector in India contributing 4.8% in the GDP of India.



Fig. 1: Spend of logistic cost in GDP (%)

However the industry expenditure on logistics in India is little in unconditional terms. India's expenditure on logistics is around 19% of GDP whereas other major countries spend comparatively lesser like Indonesia (15.72%), UK (13.43%) and China (12.5%) depicted in Fig. 1 above. The loss is evident as this sad state of infrastructure and logistics increases the expenditure by an extra \$ 45 billion or approximately 4.3% of the GDP per year. This eye opening figures of loss paves the way for the Government to take quick and relevant actions to reduce the loss

incurred. The activities which are ongoing in transport sectors and sub sectors should be the focus for the government to take measures. The roads, airports, railways and ports are the sectors where constant monitoring is required. The private sector is also moving quite fast and the government needs to catch up with them for simultaneous results. Additionally, the environment will also be better and this will lead to sustainable development.

1.1 Crowdfunding

Crowdfunding is a subcategory to more crowdsourcing association. Basically, these functions on repetition of technology which involve rationalizing a large group of people to complete assign task. These assignments accomplish with the distribution of space, through self-described crowd shippers. The activities can be divided in subgroup with means of transformative prototypes to procuring individuals who already moves from points A to B to carry a package with them and drop it off with their destination. The taxis attempt parcel express shipping services on the same day to destination while dropping passengers (Chen C et.al 2014). The innovators or first movers who use technological expertise and cues from some social media to fasten deliveries to independent individuals are different in their ways of doing the business. The crowdshippers brand their processes as social networks which boast of being fast and spreading to all levels. It delivers to customers mostly due to its social outreach rather than commercially oriented. Social capital theory explains that social capital matters a lot for an startup's ability to require financial capital when they are at nascent stage (Florin, J., Lubatkin, M. and Schulze, W., 2003). The startup who initiated these type of services are in action to spread their ventures at most speedy. For taking a case as example, the startup venture Zipment can be taken in which frequently same hour courier facility is targeted. Small venture are the target audience and they are charged as amount of around \$10 to make use of an app or website to request for a delivery via a specific courier and follow the status of orders. A feedback is also taken which asks to rate the performance of the transporter. Crowd shipping is a subset of crowd logistics. (Rai, H.B et.al 2017) explains crowd logistics as information enabled marketplace idea that relates supply and demand with respect to logistics services. Not only courier goods but many other services like eating delivery etc have thought of crowdsourcing to rely for the transportation capacity (Yildiz, B. and Savelsbergh, M., 2018). In other terms if the crowd connects hand with traditional logistics approach then it has a great potential (Carbone, V., Rouquet, A. and Roussat, C., 2015). E-retailers see an opportunity to outsource these tasks to any stakeholders of transportation as it is a subsidiary in nature. In the process the crowd or anybody interested will have the motivation to earn surplus money for the fulfilment of order on same city.

1.2 Crowdfunding market in India

According to the report by Deloitte on logistics and infrastructure, the market volume of the logistics sector in India is predicted to be around USD 90-125 billion whereas the economy has a growth of over USD 1.73 trillion (Deloitte Report 2013, Logistics and infrastructure: Exploring Opportunities). This estimation and gauging can be below the real size of the industry as figures may vary. The industry provides employment to an estimated 45 million people and the growth rate is 15%. The growth of the sub-sector is an approximate 30-40% per annum. As the figures reflect, the logistics sector of India is targeted as having a huge scope and very attractive in the world. The government has framed upcoming policies which will definitely attract a positive growth for logistics in the coming time. But only the positives are not to be seen and get attracted to as the logistics sector in India has several complexities and problems which have the potential to reduce the business opportunity. The problems include major inefficient transportation, poor condition and infrastructure of storage facility, recent tax structure which are quite complex, outdated technology usage and also minimum rate of technology adoption. The human factor involved is the poor skills of the employees involved in the process and their reluctant nature to learn something new. All these factors combined give a major jolt to the booming business expectations.

2. Literature Review

The growth of ecommerce creates a chance to use latest technology for important connections between ventures and customers. This provides the opportunity to control and utilize the collective intelligence of business groups which online (Mohamed, E., & Ndiaye, M. 2018). India viable energy resource is based on meagre which associated with

it, According to present trends India's transportation energy usage is expected to propagate at the increasing proportion in the world be around 5.5% related with the world average of 1.4% per year.

The literature review has been done in the various aspects of e-commerce and logistics issues which need to be studied to understand the current scenario of transportation and expected solutions. The shipping industry is gradually entering in digitization transformation using technology that provides outline to new distribution ideas and concepts. The world expects newer and newer technologies and it is one of the serious ingredients to expand the existing performance (Macharis and Kin 2017). The main advantages and drawbacks regarding crowdshipping are different for its stakeholders. From the side of the senders, advantages are the extra features such as flexibility, tracking facility and transparency in the process of pick-up and delivery. The shipping costs also get lowered and this is a big plus point. The prospective carriers are able to increase their income while reaching their place of commute while exchanging or picking up a product (Miller et al., 2017). The companies rendering service have advantages of crowdshipping is the form of less operating costs when differentiated with traditional or basic logistics operators. The reason for such low cost lies in the fact that the flexibility of assets like facilities of storage, transport vehicles and drivers (Rougès & Montreuil 2014). The horizon of profit and improvement also has social angle as it will help in reduction of traffic (McKinnon, A.C. 2016). It offers a way of adding the names of individuals who already traverse from points A to B to carry a package with them and can make a stop to deliver. A proper planning is required for understanding the route suitable to the persons and then assigning them the tasks of delivery (Punel & Stathopoulos 2017). This permits the delivery of packages at very low marginal cost, in economic and environmental terms via individuals who have the opportunity to earn some extra money. A few of them can also have the helping angle as they are satisfied by helping their local neighbourhood or vicinity for a social cause. Online crowdshipping platforms emphasise the contribution they can make to a local economy.

Growth in e-commerce boosts the potential for crowdshipping as it scales up the profit (McKinnon, A. C. 2016). Customer to customer (C2C) and business to customer (B2C) business models are mostly used in crowdshipping endeavours (McKinnon, A. C. 2016). The platform entrusts to connect good services from senders to recipients and it is the vital factor for delivering shipment as it functions on a freelance basis (De Stefano, V. 2016). A citizen traversing from point A to point B becomes a crowdshipping agent when the agreement for carrying any item for others is done. The points in this i.e. the Sender, recipient and crowdshipping platform are mostly connected through an interface and the ad hoc drivers can earn through it (Arslan et al 2016). Some platforms use algorithms and some other techniques to match delivery requirements with crowdshipping trip convenience. Crowdshipping interface can put up their daily requirement on a virtual board or interface and then wait for a prospective sender to use the service. Crowdshipping is a win-win solution for everybody involved in the process. The sender and recipient both save money due to cheaper transport rates (Marcucci et al 2017).

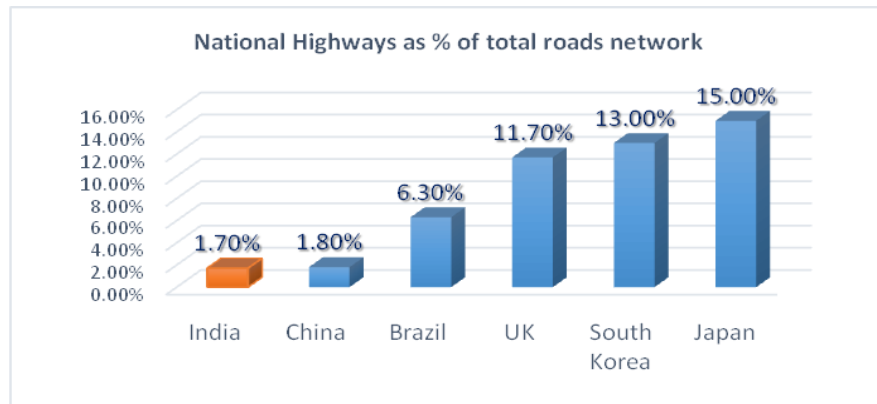
(Sharma et al. 2011) suggested that Indian manufacturer have started reverse logistic practices due to increased awareness environmental issues among society. Despite of this, the concept of reverse logistic is yet not widely accepted in Indian SMEs because of involvement of lot many barriers for its successful implementation. (Govindan et al. 2012) identified and evaluated the contextual relationships among attributes of third party RL (Reverse Logistics) providers. A hierarchical interpretive structural model of attributes was proposed for finding the most superior third party RL providers among various third parties. (Lee & Lam 2012) proposed a sustainable business marketing framework of recent requirement of sustainable operation by taking a case example of a medical product manufacturer. The findings suggested that the application of information, communication and technology for RL improves the business process apart from providing value-added process which helps in retention of customer.

After the careful and comprehensive literature review it was found that various problems were evident in this area. The present scenario and related problem statements have been discussed below.

2.1 Transport congestion:

The road network of India is the second biggest in the world. It covers a whopping 5.47 million km across national and state highways and also includes district and rural roads. As a TERI report (2015) depicts, India's road density is 1.66 kms/sq.km of area. This figure is higher than that of Brazil (0.18 km/sq.km), Japan (0.91 km/ sq km), China (0.46 km/ sq. km), USA (0.67 km/ sq km) and Russian Federation (0.08 km/ sq km). The road transport adds approximately 3.1% to the country's economy. This contribution is via direct/indirect revenues which originate from

sectors like road tax. The roads sector is reeling under severe pressure and depreciation as it carries around 60% of freight and 85% of the overall traffic. The disadvantage or weak area of the country regarding the road sector is the poor percentage of national highways which are a mere 1.70% of the total road network (Fig. 2). This ratio is very poor when compared to other countries. Interestingly, it handles 40% of the traffic depicting how burdened and voraciously used it is in the country.



Source: Basic road statistics of India, “Ministry of Road Transport and highways

Fig. 2: Road Scenario: National Highways as % of total roads Network

The government has taken initiatives in electronic and green ways as these are important factors of the development. Under this initiative, E-tolling will be established, state-of-the-art real time Project Monitoring and Information System (PMIS) will be installed which will monitor the developments of the ongoing projects. INFRACON is a National Portal for Infrastructure Consultancy Firms and Key Personnel has also been established. The process of E-tolling has been planned across 300 national highways in the beginning and further it will be increased gradually. Many Indian cities are dealing with heavy congestion on their roads. Average speeds in 10 Indian cities were in the range of 12–23, 11–27, and 9–17 km/h for two wheelers, cars, and buses, respectively (Sharma et al. 2016). About 10–26 per cent driving time is spent idling and more than 4–29 per cent with speeds less than 5 km/h. An annual loss of more than Rs 3,800 was estimated in the 10 cities on account of idling fuel losses. ASI (Avoid, Shift & Improve) approach needs to be adopted for effective control of vehicular emissions. While the Avoid strategies aim to reduce travel demands, the Shift strategies attempt to move the modal shares from private/motorized modes to public/ non-motorized options. Shift towards more efficient modes such as from road to rail are also covered within this. Finally, Improve strategies focus on enhancement in quality of fuels, technologies, and strengthening of the systems for control of pollution.

2.2 Environmental Control:

World Bank in 2004 conducted a limited scale study for cities of Delhi, Kolkata, and Mumbai, which found diesel combustion, road dust re-suspension, and biomass burning contributing significantly to PM_{2.5} concentration, with smaller contributions from gasoline and secondary particulates. The study also pointed out inter-city variations and confirmed that each city has its own characteristics and needs to be dealt differently.

Higher registration taxes/fees can be used by the government to promote low carbon, fuel-efficient vehicles and penalize inefficient and polluting vehicles. Countries such as the Netherlands, Latvia, Portugal, etc. imposed taxes at the time of registration or during renewal of registration, which takes into account age of the vehicles and emissions. The Netherlands imposes registration tax based on purchase price and CO₂ emissions. Low emission vehicles are exempted. Latvia takes into account only the vehicle-specific CO₂ emissions to calculate motor tax. India has coverage in total of 5.6 million kilometres of roads where daily freight is carried out from one city to another with different modes in single running. This brings into concern the high amount of air pollution and shipping cost. It is evident that most pollution is initiated by motor vehicles in which main content is gasoline which contains 0.54 g/L.

2.3 Emissions Estimation:

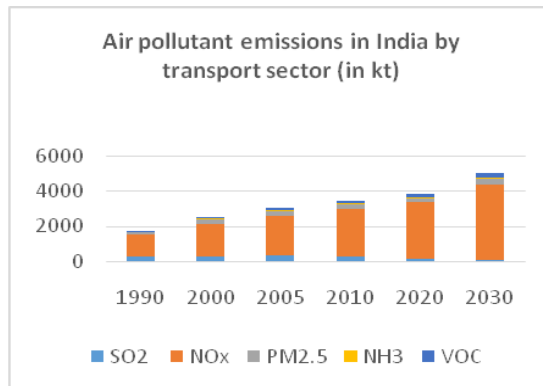
TERI Report 2015 clearly shows the various emissions due to transport pollution and estimates the emissions till the year 2030. Various emissions like NO_x, NH₃ and VOC are expected to increase to a large extent till 2030. PM_{2.5} i.e. the air pollution particulate is a vital indicator of the pollution and it expected to soar to 361 till the next decade. The below Table 1 depicts the prediction of transport pollutants year wise in India.

Table 1: Estimation of various emissions due to transport year wise

Transport (in Kt)	1990	2000	2005	2010	2020	2030
SO ₂	265	296	299	241	135	79
NO _x	1240	1825	2290	2706	3238	4289
PM _{2.5}	160	305	325	319	266	361
NH ₃	0	2	5	8	18	24
VOC	46	84	103	125	191	280

Source: TERI Report 2015

The air pollution emission in India by the transport sector has been depicted in Figure 4 and it can be graphically interpreted that all the hazardous gases and emissions are increasing linearly. The other part of the Figure 4 compares the greenhouse gas emissions in India with China and South Korea.

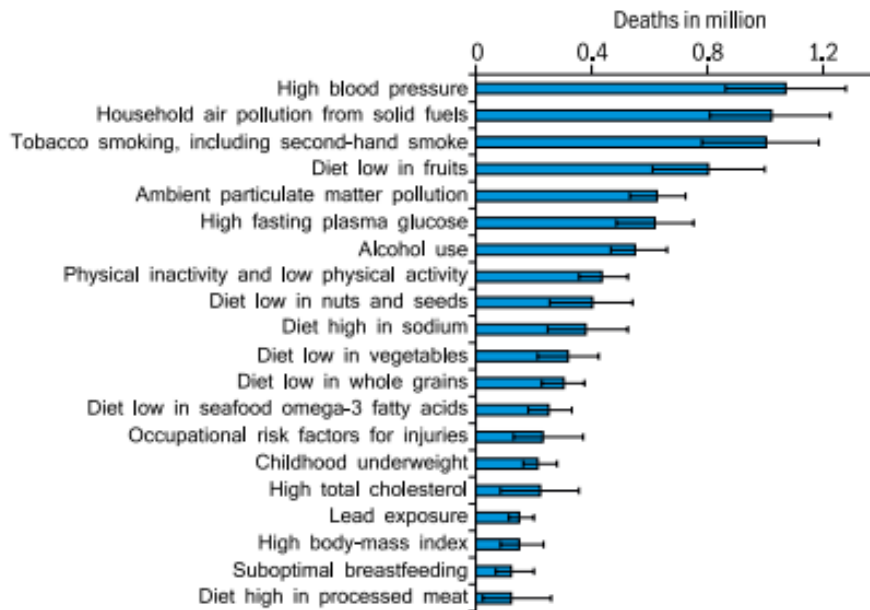


Source: TERI Report 2015

Fig. 3: Air pollution emission in India and Greenhouse gas emissions country wise

2.4 Pollutant Cause:

There is a huge impact on the humans due to the air pollution emitted by the transportation every day. Their consequence are though gradual but deep and long lasting within as it slowly creates problems the body and the plantation due to its harmful effects. Few life threatening diseases like high bp (blood pressure) and high cholesterol and underweight poses a major hazard to the humans as well as animals as shown in Fig 4. The plantation is also affected as it induces low diet in nuts and seeds, fruits, various vegetables and whole grains. It also has an effect on the high cholesterol and high body mass index which are very serious diseases. In particular high blood pressure has taken the death toll to around 1.1 million followed by household pollution from select fuels and tobacco smoking which cause around 0.9 million deaths as depicted in Fig. 4.



Source: Lim et al (2012) (Global burden of disease) & TERI 2015

Fig. 4: Mortalities attributed to PM_{2.5} concentrations in India in 2010, 2031, 2051.

2.4.1. Clean Air Mission (CAM) India

The Clean India (Swachh Bharat) mission was the initiative taken by the present government to move towards a cleaner and healthy India. Experts have commented that the Government should go deeper and also launch a Clean Air Mission to clean the air in India so that the coming generations can breathe cleaner air. Clean Air Mission (CAM) at the National scale is to draft and implement national level strategies for reduction in air pollution levels at urban scales. The objective of the mission is expected to achieve the air quality standard which has been prescribed by the agencies in the country in a fixed timeframe. Several ministries which deal in transport, power, construction, agriculture, rural development, and environment will have to come forward to complete this huge task. The main targets for the CAM-INDIA are the pollutants defined in the National ambient air quality standards and primarily the particles referred to as PM_{2.5} to PM₁₀ and Ozone. Control of PM and ozone will ensure virtual control over other pollutants, which act as precursors for their formations through secondary pollutant formulations. Because of long range transport capabilities of these pollutants, it is essential to have national policies for reducing background concentration of pollutants in the country, which will eventually lead to reduction in city level concentrations also.

CAM India should focus on reducing ambient air pollution levels in a stipulated time frame. The mission should focus on reducing overall background levels in the country by strategies prescribed at the PAN-India scale. However, due to presence of air quality monitoring stations in urban locations only, the concentrations measured there will be used to assess the reductions made in pollutant levels in India. Presently, a significant number of cities violate the prescribed standards, mainly for PM₁₀. In absence of PM_{2.5} and ozone data in all the cities (which should ideally be the pollutants to be considered), PM₁₀ data should be used for setting up interim milestones and final targets for air quality improvement in the country.

2.5 Transport Policy

The transport policy of India is planned and designed by the various ministries in such optimum manner such that the emissions can be reduced to the maximum extent. The Ministry of Petroleum and Natural Gas has targeted 100% for the BS-VI vehicle emissions and norms for fuel quality in India. The shifting of freight transport from road to

rail is being monitored by Ministry of Railways and the targets have been phased out by 5 year gaps starting from 2015 to 2020 and then to 2025 to 2030. The percentage shift is expected from 36% to 38% and 42% to 45% in the respective years. So gradually the change in the mode of transport for the goods will lessen the air pollution to a significant level as the trucks plying for the transport of freight will decrease. The task of modernization of the fleet and setting up scrappage centres is being undertaken by Ministry of Road Transport and Highways as the old or inoperative vehicles can be scrapped or transformed for better usage. A roadmap for setting up such scrappage centres in districts has been targeted with an aim to cover all districts till 2030. The introduction of electric vehicles as passenger vehicles which are not polluting in nature have been targeted to reduce the pollution. The reduction of VIC emissions have also been planned to be brought down by 100% till 2030 and the Ministry of Petroleum and Natural Gas is the responsible agency for it (Table 4).

Table 2: Strategic Planning of Govt. Of India regarding transport.

Sectors	Strategies	Baseline	Interim Target –I (2020)	Interim Target – II (2025)	Final Target (2030)	Responsible agencies
Transport	Shifting freight transport from road to rail	36%	38%	42%	45%	*MoR
	Introduce BS-VI vehicle emissions and fuel quality norms in India	BS-IV norms introduced in 2017	100%	100%	100%	*MoPNG, MoRTH
	Fleet modernization -Setting up scrappage centres and supportive policies	0	50 districts with highest vehicular numbers	200 districts with highest vehicular numbers	All districts	*MoRTH
	Electric vehicles (passenger vehicles)	~5%	-	-	50%	*MoRTH *MNRE
	Reducing fugitive VOC emissions at petrol pumps		50%	100%	100%	*MoPNG

Source: TERI report (2018): Measures to Control Air Pollution in Urban Centers of India: Policy and Institutional framework:

*MoR (Ministry of Railways), *MoPNG (Ministry of Petroleum and Natural Gas), *MoRTH (Ministry of Road Transport and Highways), *MNRE (Ministry of New and Renewable Energy)

The below Table 3 depicts the year wise literature review according to author framework related to Crowdshipping.

Table 3: Discussion related to Crowdshipping framework

Authors	Year	Title	Source	Methodology	Focus
Chen, Zhang, Han, Sha	2014	TaxiExp: A Novel Framework for City wide Package Express Shipping via Taxi Crowdsourcing	The 11th IEEE International Conference on Ubiquitous Intelligence and Computing (UIC'14)	Simulation	Crowdsourcing Logistics
Mladenow, Bauer, Strauss	2015	Crowdsourcing in Logistics: Concepts and Applications Using the Social Crowd	ICPS - International Conference Proceedings Series	Framework	Crowdsourcing Logistics
Pan, Chen, Zhong	2015	A solution to collect e-commerce reverse flow in metropolitan areas	HAL	Simulation	Crowdsourcing Logistics
Mehmann, Frehe, Teuteberg	2015	Crowd Logistics - A literature review and maturity model	Innovation and Strategies for Logistics and Supply chains	Mixed	Crowdsourcing Logistics
Chen, Pan	2015	Using the crowd of taxis to last mile delivery in e-commerce: a methodological research	HAL	Analytical Model	Crowdsourcing Logistics
Slabinac	2015	Innovative solution for a last mile delivery: an European experience	15th international scientific conference Business Logistics in Modern Management	Framework	Last Mile Delivery

Seidel, S., Marei, Blanquart	2015	Innovations in e-grocery and logistics solutions for cities	The 9th International Conference on City Logistics,	Framework	Last Mile Delivery
Lettenmeier, Paltheimo, Waris,	2015	Transport reduction by crowdsourced deliveries - a library case in Finland	Journal of Cleaner Production	Framework	Crowdsourcing Logistics
Cohen B., & Munoz, P.	2016	Sharing cities and sustainable consumption and production: towards an integrated framework	Journal of Cleaner Production	Framework	Crowdsourcing Logistics
Weinelt	2016	World Economic Forum White Paper Digital Transformation of Industries: Logistics	World Economic Forum	Framework	General, Crowdsourcing Logistics
Xiao, J.	2017	Development of City Logistics in China. In Contemporary Logistics in China	Springer, Singapore	Framework	Last Mile delivery

Source: author compilation

These problems discussed above paved the way for specific literature review and the proposed framework was introduced.

3. Methodology

The methodological approach includes by means of a systematic literature review and framework. A systematic literature review is a systematic, explicit and reproducible method for identifying, evaluating and synthesising the existing body of completed and recorded work produced by researchers, scholars, and experts Fink A. (2013). Conducting research literature reviews from the internet to paper, we captured the knowledge that is available to date with available popular data sources Science direct, Taylor & Francis, Emerald Insight. In table 4 used spreadsheet file to compose a comprehensive analysis using AND operator in ‘crowdsourcing, ‘transport’ and ‘logistic’ concluded with ‘environment’ descriptions, defining characteristics, involved parties and their activities, strengths and weaknesses. Non duplicate citation screened 47 in Literature was found using Mendley by using keyword "crowdsourcing" AND "transport" AND "logistic" AND "environment" AND "e-commerce" which as an open and extensive database was fit best for researching this novel search. Additionally, the online databases results Science Direct (109), Taylor & Francis (56), &Emerald Insight (56) were checked but did not result in major additional material. Several keywords were used and are listed in Table 4. The literature search thus provided an input of 39 relevant and accessible papers.

Table 4: Systematic literature review and selection of literature keyword and findings

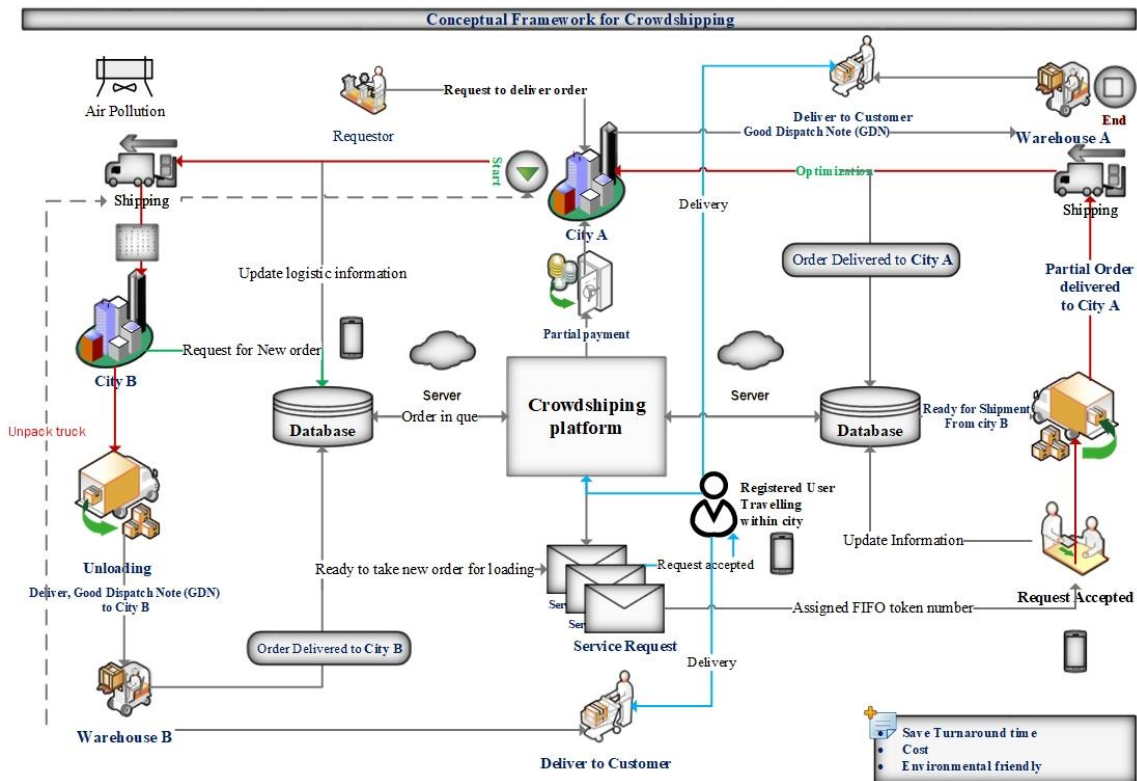
Data Source	Search Syntaxes	Number of results obtained
Taylor and Francis	Title Search="crowdsourcing" AND "transport" AND "e-commerce" AND "environment" AND "logistic"	56
Science Direct	Title Search= “Generation Z” AND “Travel behaviour” AND “Crowdsourcing” NOT “e-commerce”	109
Emerald Insight	Title Search="crowdsourcing" AND "e-commerce" AND "environment" AND "logistic"	56

Source: Author compilation

4. Proposed Framework: Transportation Optimization

The methodology of the research involves developing a framework to understand the overall process of transportation. The proposed method of using crowdshipping can be very effective. Every day a huge number of transportation for business purpose takes place throughout globe. Transportation can be related to the transfer of goods after production to the market place or it can be shifting of goods from one place to another. This results in emissions of loads of carbon fuels and results in pollution. There can be mechanism of reducing this movement

across roads such that the pollution can be decreased to some extent. With the help of ICT a framework can be designed in which the information of movement is shared between the transport parties like transport companies and the drivers of the vehicles so that they can upload the goods while returning thus reducing movement. This idea of reverse logistics can be attributed to the problem of empty transportations which are a waste from each angle. In Figure 5, an example has been taken in which if a vehicle moves from City A to City B with full of material and delivers the products so while returning from City B to City B if he gets an advance booking that can help not only in less movement but also enhanced profits for the driver and the company involved along with the customer because the payment will be made for one side only. This communication can happen over an I.T. enabled platform which can quickly transmit the information of demand to the transport personnel. He receives a Goods Dispatch Note (GDN) to City B. The database maintains the record of the transactions and orders the queue of the products. With the help of crowd shipping platform the message is floated for getting received. The process needs to be hassle free and for avoiding the queue FIFO (First in First Out) rule can be applied. And a FIFO number can be assigned with partial payment. Another special and limited service can be added in the overall framework that the local movement can be trapped and utilized. The small vehicle, be it commercial or private registered with the crowd shipping platform can be informed of any movement and thus the delivery can be done easily and with accuracy. The extra income can be the motivation for the transportation. The prevalent system of batch to batch transfer of goods can be modified and one on one transfer can be done if communication has been done beforehand. This way the air pollution can be reduced within the city as the movement of the vehicles will be comparatively lesser. The lowered time and cost are the other benefits which can be achieved by applying this framework which is depicted in blue line in the below Fig. 5. The case study discussed below shows how only the online platform is used but resource optimization is not efficient cost wise. The proper usage of interested crowdshippers is also not targeted. In our proposed framework these limitations have been addressed and proper utilization of part time or full time human resource has been proposed. Various other websites and upcoming Logistic service provider like lorryguru, freightbazar etc. have some unique business models but not the concept of Crowdshipping that too with such efficiency and optimization which leads to saving time and overall cost.



Source: Author own

Fig. 5: Propose conceptual framework of Crowdshipping

Case Study

India is an emerging market for organized transportation. There are few stakeholders involved in the process of transportation. These include load providers i.e. the customer who requires the service of his goods being transported in least travel time and least cost along with desirable dates. The transporter is the service provider who searches for business opportunities and holds a typical physical office for it. A truck owner owns one or few trucks but doesn't know who requires it and when. Typically, a transporter charges for both sides of the trip because of the uncertainty of business while returning.



SOURCE: <http://www.truckbhada.com/Home>

Fig. 6: User interface of truckbhada.com

A typical case of transportation can be seen in one of the recent website www.truckbhada.com. The website has tried to connect the various parties involved in the process of transportation. The freight charges from New Delhi to Mumbai for a typical 17 feet 6 wheel truck is Rs. 54833.40/-. The distance between these metro cities is around 1400 kilometres. This concludes that the transporter charges around Rs 39-40 per kilometre whereas the mileage of the truck is around 12 kms per litre. If the other expenses like toll taxes, driver charges, repair charges etc are deducted then also the cost incurred to the customer is much more. This high cost also involves the return cost involved due to uncertainty of business as discussed earlier. This problem can be mitigated by applying the idea of reverse logistics with ICT in the application process. Truckbhada.com has tried to digitalize the process but only in the areas like booking by website or app, tracking the vehicle via GPS etc (Fig. 6). The concept of reverse logistics can also be digitalized and with the help of the interface communication can be made quick, transparent and thus the overall transportation can help in cost reduction, increase in business opportunity for the driver, lesser pollution, reduced movements of vehicles etc. The other players in India and their service type have been mentioned in the Table 5 below. Their service types vary from providing information about the transportation and rates to providing the service of loading the goods. The loading order can be partial to full loading. The full order is the service from good pickup to the final destination whereas the partial service provides limited or left over space for lesser goods for intermediary stations. These service providers only have an online presence but have not innovated in the crowd shipping domain. With the inclusion of this novel concept an optimum solution can be attained for the transportation problems.

Table 5: Online Logistic service providers in India

Logistic service provider	Service Type
FreightBazaar.com	Online Transport Service - Information provider
Trucksuvidha.com	Full and partial loading order
Lorryguru.com	Full and partial loading order
ReturnTrucks.in	Online Transport Service - Information provider
porter.in	Full and partial loading order
logisticsjunction.com	Online Transport Service - Information provider
safexpress.com	Full and partial loading order
vtransgroup.com	Online Transport Service - Information provider
tempohire.com	Online Transport Service - Information provider

Source: Author Compilation, 2018

4.1. Green Transport:

For improvement and greening of the transport sector in India, it requires a holistic strategy and herculean effort. This would include plans and regular interventions to cross check the developments from time to time. The size of investment is also huge. Planning for specific infrastructure growth needs to be done. A data management system with a place for constant monitoring of transport data needs to be set up. This regular monitoring will help to understand the change of quantum and type of data. Fuel efficiency and fuel quality are the areas which need to be researched and worked upon for improved results. This is also help in reducing pollution and move towards a greener planet.

4.2. Secure Delivery:

The guarantee of the delivery brings in a secure and safe transportation for all the stakeholders involved like customers and the manufacturers. The crowd shipping platform provides the features of the total transport which depicts that the vehicle is registered, online tracking through GPS and stringent social know how of the transporter or the service provider. The name and social security of the service provider should be in positive such that the risk can be minimized.

4.3. New space for start-ups:

Entrepreneurs want to expand and they have the option to explore in India due to the market size. Self-sufficiency theory explains how the profit is retained by the entrepreneur himself and delivering funding for the intention that all social lives have major emotional needs to be capable, independent, and related to other stakeholders. (Deci, E.L. & Ryan, R.M. 2012). In these areas the opportunity is increasing day by day at a high level due to digitalization.

4.4. Save Turnaround time:

Turnaround time (TAT) is the time taken to fulfil a requisition of transport. The double time or the turnaround time taken by the transporter can be reduced to exactly half if the framework is adopted. The lead time can be fastened as the delivery will be quicker.

5. Impacts :

The direct impact of the framework is the reduced movement of the vehicles due to better coordination and communication between the various parties involved in the process. The implementation of this framework will reduce the pollution to a great extent as the transportation will be less in volume. The reduced transportation will result into lesser emission rates of the fuels. It also will create employment opportunities to the crowdshippers who can do it as a part time chore for some extra earnings. The array of diseases discussed will also come down to some extent as the air pollution will be comparatively mitigated. The payment of the driver will also increase as he is loaded during reverse movement and thus reverse logistics has promising returns if practiced with I.T. so that the communication can be shared between the stakeholders. The crowd shipping platform will deliver to the present day requirement of an interface between the customers and the transport companies. It will help in lowering time and saving lot of energy. Further developments in this field will help in maintaining the ecological balance and overall sustainable development.

6. Conclusion

The research work can be concluded by summarizing the opportunities and challenges in crowdshipping. With the help of the crowdshipping platform the various stakeholders can be connected to each other for better coordination with each other. When the stakeholders are digitally connected and information is stored in the database, it saves a lot of effort and time along with cost for the delivery of the product. The initiatives of ICT (Information and

Communication Technology) in Reverse logistic provides speedy business growth with saving of cost and time. On other hand, the environmental concerns have gained more attentions as effort is made to identify and priorities the crowdshipping platform in reverse logistic with the help of above technique. It will also help in generating part time employment to students or any other interested person who can spare some time for Crowdshipping. With less transport and least congestion on the roads, air pollution will definitely touch a new low as the world can move towards a more greener and sustainable planet which will make it a better place to live in.

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