Freight Management in Logistic Sector Using ANDROID

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***Abstract*—** Logistics plays a major role in transforming a developing country to developed country. Since the business sector becomes very competitive, establishing communications between the customers and transporters is very important. This gives rise to a high economic status. Nowadays various difficulties such as unreliable load delivery, unorganized logistic sector etc. are encountered during transportation of goods in business communication. To ease these complexities faced by load owners in the transportation sector, an innovative mobile app has been developed; in turn, addressing the inefficiencies and fragments plays a major role in the unorganized logistics sector. This mobile app achieves transparency, standardization and reliability in the transportation industry. The work is implemented right from vendor selection, assigning vendors to carry load, matching the right trucks for different load requirements to monitoring load, handling payments till the depth of entire transportation. The proposed work carries out the transportation workflow and personally addresses them using technology to deliver the promise of shipment from its origin to destination in a reliable way with great customer service throughout.

Keywords-logistics; business sector; transportation network; load monitoring;

I. INTRODUCTION

India has progressed on enormous rate that many companies have establish themselves here. These companies have a huge work force. Arranging the transportation to such huge force is difficult task. This transportation is arranged through local transport vehicles on yearly basis. The vehicle management is a purposeful, organized activity which throughout all aspects of vehicle operating. There are various problems that has been faced by logistics , They are not able to get reliable transporters when they are in seek of transporting their goods. This issue can be overcome by making possible connections between the business man and the transporter by developing a mobile application through android. Android is a mobile operating system developed by Google and it is based on Linux kernel. It is an open source so the user can modify and customize. This app can be used to efficiently use the data to regulate the road transportation, and reduce the empty trucks from return haul. It connects the transports & clients owners in one click, and shares the data eventually to them. By connecting the load details with the transporters will save tons of money & time, and this will solve 75% of empty truck on the road. The app will be used by the Middlemen who work with Transporters and LoadOwners.

Freight exchanges are market places where offers for and demands after transport services find one another. Contrary to forwarders, which constitute the classic form of freight mediation, they themselves are no participants of the processing of transport services. They merely mediate transport services, regularly combined with freights or freight space, between shippers and carriers. Since their origination in the 1970s and 1980s the freight exchanges processed this umpiring primarily via the media telephone, telefax and BTX. The majority of the companies specialize in the mediation of truck freights. By

contrast, multimodal transports are being mediated fewest of all. With the advent of the internet in the 1990s and 2000s the rise of ecommerce platforms provided a greater range for customer acquisition.

The lasting internationalization of freight traffics leads to the decade-long search in logistics for a way to organize transports and their mediation more efficiently and sustainably. An idea emerging in this context time and again is the more efficient configuration and coordination of transport chains with the help of freight exchanges. Freight exchanges are market places where offers for and demands after transport services find one another.

This paper is organized with Section II containing the related work, Section III include the methodology and algorithm, Section IV shows the experimental setup, and Section V concludes the paper.

II. RELATED WORK

To implement the proposed work the following papers are referred as a survey.

In the year 2010 the multinational joint project CODE24 has been started within the framework of the INTERREG-IVB-NWE program of the European Union. For an overview of the project it is being referred to [4]. The primary goal of the joint project consists in the integration and advancement of the activities on the trans-European transport axis no. 24 in order to strengthen sustainably the rail freight traffic in Europe. This "Corridor 24" is not only the main railroad line through the Swiss Alps, but connects the harbors of Rotterdam and Genoa. The challenges here are manifold: Comprehensive and publicly accessible information on how many freight trains will use the corridor is currently missing. It is also uncertain how much this capacity can be improved through a higher utilization of the existing infrastructure. Finally, a considerable market non-transparency exists for forwarders that take a transport of their freight by rail into consideration, especially regarding the connection possibilities to freight transports in pre-carriage and on-carriage by means of trucks as well as inland or maritime vessels [12].

A central component of the work package 3 "freight transport and logistics" of the project CODE24 is the conception and implementation of an online freight exchange [11]. The Institute for Production and Industrial Information Management of the University Duisburg-Essen at first systematically ascertained the requirements of the essential logistical actors for an online rail freight exchange through the analyses of the relevant literature as well as interviews and workshops with industry experts [5, 7, 10]. Further analyses of user requirements were contributed by project partners of the institute [10, 12]. One of the most important conclusions was that a freight exchange which is one-sidedly tailored for the rail freight traffic has no realistic market potential. Detailed market analyses show that no such online freight exchange could establish itself on the European transport market in the long term [10]. Especially the transport carrier road has to be involved in order to be able to exhaust the potential of multimodal transport chains. The following elaborations provide a rough overview of the subsequently implemented software prototype ORFE ("online rail freight exchange") in its final version. It is elaborated in detail on the concept development in [8] and on the software development in [11].

Android Based Mobile Smart Tracking System **[3]**: Smart Tracking System is an Android based application for travelers to obtain the geo-location and tag it with multimedia features. This application allows users to create, store and view their Vehicles, Vehicle related information and all the memories that

bring with it. Vehicle Tracker Combines places visited, notes taken and the images captured, and display all this information on a map at the exact location. This application is developed to provide the users a rich user experience by having all the information in one place, easy-to-access and interactive. With the help of Google Maps, each Vehicle can be drawn out on the map with all the locations visited and the route taken. The user will also be able to view the description, the location address and the image captured any. Vehicle Tracker, developed in Android, provides extensive flexibility, supports many features and can be among the best travel friendly app.

III. FRIEGHT MANAGEMENT IN LOGIC SECTOR

A. Methodology

(i) Managing Transport providers

Occasionally the need arises, or the decision is taken to use external transport providers. In this event there has to be a structured approach to the selection (see contracting) and subsequent monitoring and control of the provider or providers selected. There are a number of important issues to be considered to ensure that a reputable provider, who will provide the required level of service, at an acceptable cost, is sourced.

(ii) Cooperative Freight Systems

The traditional delivery pattern of freight is fewer trips and more loads. The delivery companies usually maintained their business independently. It means two carriers might serve in the same area. Nowadays, the trends of urban freight transport towards to deliver “Just-in-time” and “door-to-door”. The operation of freight transport changes to have more trips but fewer loads in order to increase the efficiency differently. Without improvement, the transport costs will increase hugely to satisfy the current requirements. Cooperative freight systems are the ways which could be expected to solve this problem. Cooperative freight systems integrate the resources of the cooperating companies to optimize the economic benefits. The main benefits of the techniques are (1) properly increasing delivery trip loads; (2) reducing unnecessary trips, as well as pollution and costs; (3) reducing service area overlaps; (4) increasing service quality and company profits.

(iii) Freight villages (terminals)

The concept of freight villages (terminals) has been applied in several cities The goods are reorganized in the freight village before being delivered to the urban areas. This system can reduce the required number of trucks used for delivery and handling. The freight from outside of a city is sent to the freight village in order to classify and prepare for delivering to city area. This could increase the carrying load of vehicles and reduce unnecessary trips in the urban area. In addition, this integration benefits the private sector by reducing costs, and also the public environment by decreasing trips and air pollution.

(iv) Controlling transport load factors

Companies allowed to deliver freight in urban area must have high loading rates, and the vehicles have to conform to the environmental standards. The method of regulation is through publishing special certificates and giving the right for the companies to use particular transport infrastructure in the urban area, so reducing the complexity of urban transport.

(v) Intelligent Transport Systems (ITS)

Applications of ITS in transport systems are widespread. The most common techniques for logistics include Global Positioning System (GPS), Geographic Information Systems (GIS) and advanced information systems. GPS provides the service of vehicles positioning. It could help the control centers to monitor and dispatch trucks. GIS provides the basic

geographic database for the deliverers to enable to organize their routes easier and faster. Advanced information systems provide the real-time information for both managers and deliverymen to adjust their paths as new demands occur. The integration of GPS, GIS and advanced information systems provides a high maneuverability of transport systems. The benefits of the integrations are better service quality, reduced unnecessary trips, and increased loading rate.

This methodology adopts an approach with four main steps:

i. Trip Generation. The trips generated in each traffic zone are estimated.
ii. Trip Distribution. This step connects each of the trips generated in the previous stage with its destination. The result is a matrix travel between each pair of origin and destination (Origin Destination (OD) Matrix)
iii. Modal Split. It gives the transport mode that a trip uses (If in the case more than one transport mode is available for the trip).
iv. Traffic Assignment. This step gives the links of the network used for a trip.

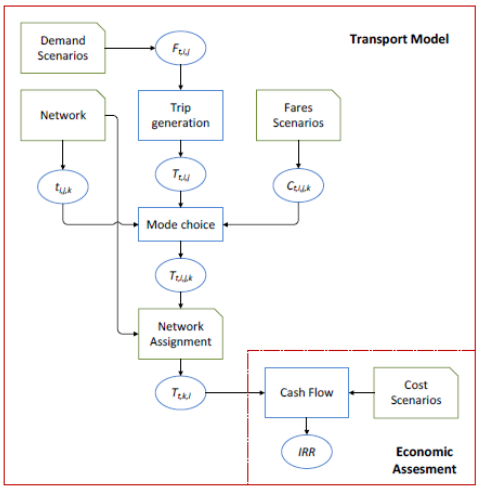

Fig: III.A.1. Transport Model Diagram

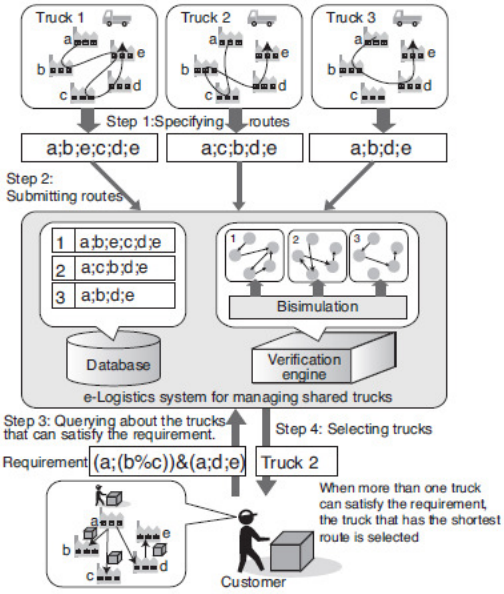

Figure III.A.2. Basic structure of logistic sector

B. Algorithm

Algorithm : Optimization Algorithm
Input Data.

The traffic analysis zones (TAZ)

The Origin Destination (OD) matrices.

/*They contain the total cargo in tons shipped from each origin TAZ to each destination TAZ. They were obtained from historical data and their future values are generated assuming constant rates. */

The transport network cartography.

/*It contains all the links and nodes in the transport network with their travel times, distances and associated costs */

Step1: Trip Generation.

The first step of the model requires the transformation of the OD matrices in tons of freight into OD matrices of trips. In this case it is assumed that all the cargo will be trans-ported by containers. Containers constitute a standardized unit of transport which represents a high intake of the global trades.

Step 2: Modal Split.

In the modal split step the fraction of the flow between each origin-destination pair per transport mode is obtained by analyzing the fare.

The following costs were considered:

The fare per kilometer and unit of cargo charged to the shipper for using the route are calculated indirectly including the following cost:

- Capital cost:
- Maintenance (Insurance and Repair costs
- Crew Costs:
- Fuel cost.
- Tollgate operation cost:
- Inventory cost for waiting:
- Road taxes

Step 3: Network Assignment

In the network assignment step, the total flow that travels through each link of the network is obtained. As long as congestion effects in the network can be omitted or are not significant, an All or Nothing Assignment can be applied. Then, all the traffic flows between origin and destinations pairs can be assigned by the shortest path method in terms of either time, length, cost or a generalized cost function. As a result, the total number of trips (containers) that travels through each link of the network using the mode is stored in the table.

Step 4 :Economic Assessment.

$Fare=Costs+Net\ Profit$ (3)

$Income=Fare \times \Sigma Tt_{,,ll} \in MR$ (4)

$Earnings\ \ Before\ \ Taxes = Income - Costs$ (5)

$Earnings\ \ After\ \ Taxes = (Income - Costs) - Taxes$ (6)

$CashFlow=EarningsAfterTaxes+Depreciation$ (7)

Output

Economically generated and utilized network for freight exchange.

IV. EXPERIMENTAL SETUP

A. *ANDROID OS*

World is contracting with the growth of mobile phone technology. As the number of users is increasing day by day, facilities are also increasing. Starting with simple regular handsets which were used just for making phone calls, mobiles have changed our lives and have become part of it. Now they are not used just for making calls but they have innumerable uses and can be used as a Camera , Music player, Tablet PC, T.V. , Web browser etc . And with the new technologies, new software and operating systems are required.

One of the most widely used mobile OS these days is **ANDROID**. **Android** is a software bunch comprising not only operating system but also middleware and key applications.

Android applications are composed of one or more application components (activities, services, content providers, and broadcast receivers)

Each component performs a different role in the overall application behavior, and each one can be activated individually (even by other applications)

The manifest file must declare all components in the application and should also declare all application requirements, such as the minimum version of Android required and any hardware configurations required

Non-code application resources (images, strings, layout files, etc.) should include alternatives for different device configurations (such as different strings for different languages)

B. *IMPLEMENTATION*

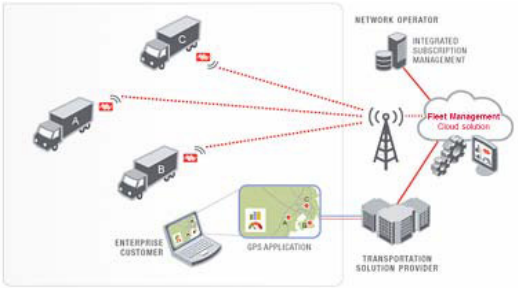

Figure IV.B.1 Overview of Freight Management

V. CONCLUSION

The paper at hand addressed the efforts to establish a freight exchange for road transport services. The proposed work has the following implicit advantages in contrast to conventional approaches: (i) Fairness – all members of the freight exchange are subject to the same rules of action. (ii)Efficiency – the usage of the two-sided combinatorial allows for optimal solutions for pricing through the deployment of mathematical models. (iii) Transparency – from the point of view of the software at both the ends of load owner and transporters the conditions are completely transparent.

As future work it is planned to improve the existing system, and the first step is to gather more insights from businesses by conducting interviews with different companies and executives with main focus on transport and logistics.

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