Intermodal Transport System: Trucking Industry

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Abstract— **Goods Transportation is the physical movement of goods and people between two points. Generally there are five modes of the transportation of goods like Airfreight, Motor Carrier, Ocean Transportation, Railroad and Pipeline. All of the five modes of transportation exist because of certain attributes that provide one or more advantages other than any modes of transportation. The attractiveness of a particular mode depends on the following important attributes: cost, speed, reliability, capability, capacity, and flexibility. Among of the above mode the Road transportation or Motor carrier is important because it provide door-to-door service. The trucking industry provides an important service to the any nation's economy by transporting large quantities of raw materials, works in process, and finished goods over land, typically from manufacturing plants to retail distribution centers. So Road transportation by using of trucking industry is very crucial for the developing country. For efficient transportation of goods using trucks requires good communication between shippers and truck's driver. Till now the communication facility between user agent and actual broker was not implemented which results into increase in the actual cost of total transport system due to intermediate agents. So we are going to introduce new system where this collision will get avoided and agent will get fair cost for his transportation. It will provide further extension to smart intermodal transport system.**

Index Terms— **intermodal transport system, trucking industry smart intermodal transport system, Goods transportation etc.**

I. INTRODUCTION

Building intelligence into the intermodal transport system brings in the convergence of technologies providing a empirical study of transformation in the ones experience. ITS provides benefits in terms of reduce waiting time and uncertainty, increase the accessibility of the system, reduce the fuel consumption and emissions increase the safety of users, improve environmental quality and energy efficiency , reduce the operational costs, improve traffic efficiency, reduce traffic congestion, improve economic productivity. The ITS will encourage to the public transport and reduce the use of personal vehicles whenever possible. This concept provide successor transport system makes intelligent. This is important contribution to saving the environment from heavy vehicle pollution and reducing congestion on heavy traffic roads. There are various sub-systems under ITS which covers vehicle-to-vehicle communications, collision avoidance and crash detection system, monitoring traffic and controlling signal lights, electronic and speed limit signs, reversible lanes and other road safety components. Intelligent Transport System technology framework includes wireless communication, sensing technologies, inductive loop detection, video vehicle detection and electronic toll collection. The proposed ITS project implementation will include core components such as follows: Vehicle Tracking System, Real Time Passenger Information System and Central Control Station. Core technologies that are useful in ITS are Geographical Positioning System (GPS), Electronic Display Systems, and Information & Communication Technologies. The core objectives of the smart transport management includes:

a) Providing effective, safe solutions

b) Effective management by a Decision Support system by collecting, collating and storing information on real time basis of the transport system and its effectiveness using communication technology.

c) Establish meaningful and effective instant two-way interaction facility between Driver – and shippers.

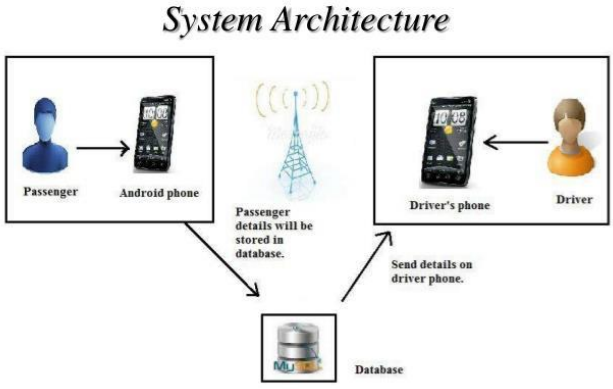
d) Obtaining on-line real time information on truck operations and management.

e) Reduce the transportation delay.

f) Avoid the intermediate agent.

g) Direct communication between shippers and carriers.

Proposed System Architecture:



System Architecture with internet access

There are challenges in implementing an smart Transport System –

a) Sustainable transport is not just a case of increasing the infrastructure available; it is also a question how to maximizing the use of existing infrastructure and of maximizing the efficiency and interoperability of all transport assets.

b) Implementing ITS solutions gets more and more complex based on the size of the transport network to be addressed and the size of the city and complexity of traffic conditions. Changing the traditional transportation scheme to a fully automated and intelligent transportation network is a substantial up gradation of the scheme. The main problems that are hampering this upgrading to materialize are not just

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technological limits, but cultural, conceptual, social, emotional, political and economical hurdles. In case of managing the large number of vehicles this becomes more complex.

II. LITERATURE REVIEW

Freight transport modeling

The first freight transport models date from the early 1970s. Over the years, number of dedicated freight transport models have been proposed (e.g., Ben-Akiva et al., 2013; Chow et al., 2010; De Jong et al., 2004; Liedtke, 2009; Tavasszy, 2006). It is important that the four-step model, initially developed for modelling passenger transport, has been widely and successfully adapted for model freight transport (De Jong et al., 2004).

1) Models of production and attraction of freight.

These models are targeted to estimate the amount of freight production and consumption at every zone within a spatial context. Several types were developed. Trend and time series models use historical data to building the correlation function and to extrapolate future values. Multiple methods were proposed for building the correlation functions (such as the growth factor method or autoregressive correlations) (Garrido, 2000). A similar method – Zonal Trip Rate Models –relies on collected data on traffic volumes leaving or entering the zones in question. Economic models (such as input–output and related models) rely on regional economic activity to estimate the production and consumption of goods in each zone (Cascetta, 1996, 2009).

2) Models for choice of mode

These models allocate freight flows to the available transport services . The transport services can be either contain single-modal (e.g train or sea, road.) or intermodal (e.g., road and sea ,or road and train.). There is wide set of models are available.Oum (1989) presents a model by use of neoclassical economy. Ben-Akiva and De Jong (2013) presents an aggregated– disaggregated–aggregated freight transport model in which logistic decisions are made from
study of disaggregated level. However, since they working with average values, they provide little information about the causal effects underlying the results. An example of this application can be found in 1998 by Blauwens and Voorde .

3) Models for assignment of trip

The purpose of these models is that allocate vehicle trips to the transport services. Many models do not include this most important step and most other models include only trucking industry assignments (De Jong et al., 2004). As well as passenger and freight trips are mostly assigned jointly, since many commonly used transport infrastructures (e.g., road or rail) are shared between both types.

4) Models for distribution of trip

These models determine the flow of goods between each pair of zones. The results are normally presented like a table format designated as an Origin–Destination Matrix . Gravity Models are the most frequently used methods. The flow Xij between a pair OD is the function of the product of the production at the origin – Oi – and the attraction of destination – Dj – divided by the impedance to moving the freight form Oi to Dj. Production and Attraction are normally measured by using the above Models for Production and Attraction of Freight. Conversely, the scope of including explanatory variables is limited as well as the number of calibration parameters is also limited (Erlander and Stewart, 1990). The SMILE model were developed by Tavasszy and his colleagues (1998), deploys a Gravity Model. Economic Models are other methods for determining the distribution of the flows. However, it requires a substantial amount of data with respect to a level of detail that is generally difficult to obtain (Cascetta, 2009). The multi-regional input–output model was invented by Cascetta (1996) is an good example of an economic model.

III. CONCLUSION

This paper deals with easy communication between the two ends. By using this application it could improve the time efficiency of rental history data transmission compared to web based transport management information system. The time gap in delivery becomes shorter to seconds compared to not using a web application. Data storage which is already computerized will make easy the process for company in storing the data, retrieval and report, where the whole data stored in a database that provides data security and data processing process so that rental data which is stored neat, clear and not lost or spilled. Intermodal transport research is one of the emerging research fields. It is still in a plagiarism phase, but is evolving now a days and will soon be regarded as a lawful branch of scientific research.

IV. FUTURE SCOPE

The agent-based model was applied to a running intermodal transport service as well as used to simulate a hypothetical road transport service. The development and deployment of an agent-based model is per se a contribution to the literature survey. Future improvements to the model should include the addition of multiple goods forwarders and rail carriers and reverse flows calculations.

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