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Find Real Time Passenger Information using Intelligent Transportation System (ITS)

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ABSTRACT: Intelligent Transportation System (ITS) will cover core systems such as Vehicle Tracking System, Real Time Passenger Information System and Central Control Station. Core technologies include Geographical Positioning System (GPS), Electronic Display Systems, and Information & Communication Technologies. ITS Solutions worldwide has been prominent in the development of efficient, transparent and environmental friendly public Transport solutions resulting in growth of economies and transport. Public transport generally occupies less road space and causes less pollution per passenger-km than personalized vehicles. Public transport is a more sustainable form of transport. Hence, local authorities should promote investments in public transport and make its use more attractive than personalized vehicles. With ITS improving the efficiency and management of transport across city, improved training and two way communication capability between driver and operations staff it is expected to reduce accidents with the use of incident management facility in ITS.

KEYWORDS: ITS, Vehicle Tracking System, GPS and Electronic Display System.

1 INTRODUCTION

Interest in Intelligent Transportation System (**ITS**) comes from the problems caused by traffic congestion and a synergy of new information technology for simulation, real-time control, and communications networks [**1**]. Traffic congestion has been increasing worldwide as a result of increased motorization, urbanization, population growth, and changes in population density. Congestion reduces efficiency of transportation infrastructure and increases travel time, air pollution, and fuel consumption.

The United States, for example [**2**], saw large increases in both motorization and urbanization starting in the 1920s that led to migration of the population from the sparsely populated rural areas and the densely packed urban areas into suburbs. The industrial economy replaced the agricultural economy, leading the population to move from rural locations into urban centers. At the same time, motorization was causing cities to expand because motorized transportation could not support the population density that the existing mass transit systems could. Suburbs provided a reasonable compromise between population density and access to a wide variety of employment, goods, and services that were available in the more densely populated urban centers. Further, suburban infrastructure could be built quickly, supporting a rapid transition from a rural/agricultural economy to an industrial/urban economy. Recent governmental activity in the area of ITS, specifically in the United States is further motivated by the perceived need for homeland security. Many of the proposed ITS systems also involve surveillance of the roadways, which is a priority of homeland security. Funding of many systems comes either directly through homeland security organizations or with their approval. Further, ITS can play a role in the rapid mass evacuation of people in urban centers after large casualty events such as a result of a natural disaster or threat. Much of the infrastructure and planning involved with ITS parallels the need for homeland security systems.

2 BACKGROUND

In the developing world [**3**], the migration of people from rural to urbanized habitats has progressed differently. Many areas of the developing world have urbanized without significant motorization and the formation of suburbs. In areas like Santiago, Chile, a high population density is supported by a multimodal system of walking, bicycle transportation, motorcycles, buses, and trains. A small portion of the population can afford automobiles, but the automobiles greatly increase the congestion in these multimodal transportation systems. They also produce a considerable amount of air pollution, pose a significant safety risk, and exacerbate feelings of inequities in the society. Other parts of the developing world, such as China, remain largely rural but are rapidly urbanizing and industrializing. In these areas a motorized infrastructure is being developed alongside motorization of the population. Great disparity of wealth means that only a fraction of the population can motorize, and therefore the highly dense multimodal transportation system for the poor is cross-cut by the highly motorized transportation system for the rich.[**4**] The urban infrastructure is being rapidly developed, providing an opportunity to build new systems that incorporate ITS at early stages.

3 AIMS AND OBJECTIVES OF THE THESIS:

AIMS

In the present age of modern technology, every single system is converting into computer automated systems due to it's a lot of benefited features. The main aim of the thesis is to develop software for the automation of Intelligent Transportation System instead of present manual system. This automated system ensures appropriate computerized mechanism with proper security to store data.

OBJECTIVES

The objective of this system is to introduce with the idea of feasibility study of a problem domain of a system. These are:

a. Understand the necessity of automation.
b. Be aware of drawbacks of the manual system.
c. Know the whole overview of the present and proposed Intelligent Transportation System.

4 PROCESS

My thesis working flow will revolute according to the steps of advanced Software Development Life Cycle (**SDLC**) which is stated at background point. To solve our problem domain and its sub problems, we have to at first perfectly study the problem and find its requirements. Depending on customer's requirements, we have to decide through which technique we will solve it. For this feasibility study is compulsory. The more efficient feasibility study, the more efficient, reliable and convenient software will produce.

My problem domain is automation of Intelligent Transportation System. To find a feasible solution we fix all the sub problems within it. According to solution we evaluate/analyze and take decision.

Through this feasibility study, I have determined with strong arguments that automation of Intelligent Transportation System is better than that of manual system. The feasible solutions of the present problems of the thesis are best and these will work efficiently to implement automated software for the transport. The solutions are considered as feasible depending on some software essential attributes- cost, maintainability, dependability, efficiency, usability and time preservations.

5 METHODOLOGY

Software is a complex artifact created by human being. The entire complex being is produced in a step-by-step procedure, which is called methodology for that artifact. Therefore, methodology is needed for software in order to build it with consistency.

Generally methods are techniques that used to perform some objective. It provides Techniques and tools for developing a software system. So methodology is required to develop our Intelligent Transportation System software. The software Development Life Cycle (SDLC) methodology is appropriate for developing Intelligent Transportation System software. Here we show an advanced Software Development Life Cycle system in **Fig. 1.**

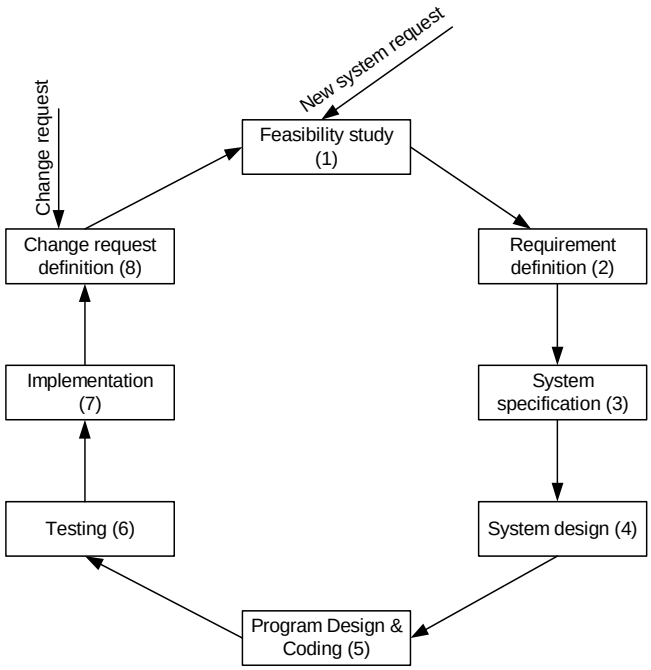

Fig. 1. Advanced Software Development Life Cycle system (SDLC)

5.1 SOFTWARE DEVELOPMENT LIFE CYCLE

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6 INTELLIGENT TRANSPORTATION APPLICATIONS

6.1 ELECTRONIC TOLL COLLECTION

Electronic toll collection (ETC) makes it possible for vehicles to drive through toll gates at traffic speed, reducing congestion at toll plazas and automating toll collection. Originally ETC systems were used to automate toll collection, but more recent innovations have used ETC to enforce congestion pricing through cordon zones in city centers and ETC lanes.

6.2 EMERGENCY VEHICLE NOTIFICATION SYSTEMS

The in-vehicle eCall is an emergency call generated either manually by the vehicle occupants or automatically via activation of in-vehicle sensors after an accident. When activated, the in-vehicle eCall device will establish an emergency call carrying both voice and data directly to the nearest emergency point (normally the nearest E1-1-2 Public-safety answering point, PSAP). The voice call enables the vehicle occupant to communicate with the trained eCall operator. At the same time, a minimum set of data will be sent to the eCall operator receiving the voice call.

6.3 CORDON ZONES WITH CONGESTION PRICING

Cordon zones have been implemented in Singapore, Stockholm, and London, where a congestion charge or fee is collected from vehicles entering a congested city center. This fee or toll is charged automatically using electronic toll collection or automatic number plate recognition, since stopping the users at conventional toll booths would cause long queues, long delays, and even gridlock. The main objective of this charge is to reduce traffic congestion within the cordon area.

6.4 AUTOMATIC ROAD ENFORCEMENT

A traffic enforcement camera system, consisting of a camera and a vehicle-monitoring device, is used to detect and identify vehicles disobeying a speed limit or some other road legal requirement and automatically ticket offenders based on the license plate number [**5**]. Traffic tickets are sent by mail. Applications include:

- Speed cameras that identify vehicles traveling over the legal speed limit. Many such devices use radar to detect a vehicle's speed or electromagnetic loops buried in each lane of the road.
- Red light cameras that detect vehicles that cross a stop line or designated stopping place while a red traffic light is showing.
- Bus lane cameras that identify vehicles traveling in lanes reserved for buses. In some jurisdictions, bus lanes can also be used by taxis or vehicles engaged in car pooling.
- Level crossing cameras that identify vehicles crossing railways at grade illegally.
- Double white line cameras that identify vehicles crossing these lines.
- High-occupancy vehicle lane cameras for that identify vehicles violating HOV requirements.
- Turn cameras at intersections where specific turns are prohibited on red. This type of camera is mostly used in cities or heavy populated areas.

6.5 COLLISION AVOIDANCE SYSTEM

Japan has installed sensors on its highways to notify motorists that a car is stalled ahead. **[7]** The Collision Avoidance System prevents collisions between vehicles and vehicular collisions with pedestrians, trains, and stationary objects by monitoring, controlling, documenting, and reporting the speed and position of vehicles. The system guards against speeding violations, moving violations, and particular safety hazards by invoking a reduction of vehicle speed or by restricting vehicle movement to control its position. This is primarily accomplished with the activation of a controllable road perturbation. A computer is used to determine if the vehicles are adhering to the traffic laws or other safety concerns. Alarms may accompany the system output to inform the operator what must be done to prevent a collision.

6.6 DYNAMIC TRAFFIC LIGHT SEQUENCE

Intelligent RFID traffic control has been developed for dynamic traffic light sequence. It has circumvented or avoided the problems that usually arise with systems such as those, which use image processing and beam interruption techniques. [**6**] RFID technology with appropriate algorithm and database were applied to a multi vehicle, multi lane and multi road junction area to provide an efficient time management scheme. A dynamic time schedule was worked out for the passage of each column. The simulation has shown that, the dynamic sequence algorithm has the ability to intelligently adjust itself even with the presence of some extreme cases. The real time operation of the system able to emulate the judgment of a traffic policeman on duty, by considering the number of vehicles in each column and the routing proprieties.

7 CONCLUSION

The term **Intelligent Transportation System** (ITS) refers to efforts to add information and communications technology to transport infrastructure and vehicles in an effort to manage factors that typically are at odds with each other, such as vehicles, loads, and routes to improve safety and reduce vehicle wear, transportation times, and fuel consumption. I will try my best to automate manual **Intelligent Transportation System** (ITS). Due to my several limitations some features are not focused perfectly. I am still working for this thesis. In future I must recover my leakages. Finally I want to say I try to best and work hard to develop this software. I implement the knowledge which i learned when study about software.

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BIOGRAPHY

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I was born and grew up in Bangladesh. I am a recent graduate of the department of Computer Science and Engineering at the University of Chittagong, Bangladesh. I joined as a Lecturer in Computer Science and Engineering department at Sylhet Agricultural University, Bangladesh. I am a believer in life-long learning and I am passionate about the natural language processing, semantic knowledge base, compiler design, operating system and bioinformatics.