E-VEHICLE

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Abstract

E-Government provides 24/7 service to its citizens without bureaucracy within the scope of technological developments. Task of inspection shall be fulfilled as part of E-Government practices by making a different service presentation in this study. This task of inspection is to control school service vehicles via information system. This information system designed is called as E-Vehicle.

E-Vehicle is designed to compensate for the inspection gap in the school transporting procedures of e-school application of the Ministry of National Education Information Systems Modules. It has been intended that drivers and school service vehicles are inspected through the information system. Data belonging to the driver and school service vehicle, entered via e-school system, are linked to such information systems as TRAMER (Traffic Insurance Information and Monitoring Center), TÜVTÜRK (Technical Inspection Institution), POL-NET (Police Information Network) and UYAP (International Judicial Network Information System). Data belonging to the driver and school service vehicle, that must be inspected, can be accessed via the system, within the framework of the information obtained via these systems.

Data obtained by GPS receiver, which is positioned in school service vehicles, shall inform about the service vehicle's position, speed and etc. via digital maps in the e-vehicle section in the e-school module. Camera images shall be kept as to monitor inside of service vehicles via 3G connections by GSM operators. School bus drivers and vehicles shall be controlled and inspected efficiently without needing too many personnel thank to due to all this information received via information system. Thanks to this system; there shall be a substantial decrease in the number of accidents in which school service vehicles are involved, and all other things that may result in tragic events shall be avoided, and our students shall be transported safely to their schools.

Keywords: E-vehicle, E-school, E-government

1. **Introduction**

The globalization and age of internet change time-space perception of mankind and cause social structures change to a great extent. The recent developments in the field of information and communication technologies within this framework have also brought forward the need for a structural transformation in the public administration in Turkey. As a result of the developments having been made in information and communication technologies and progress having been made in order to integrate with the world, it is now possible to ensure efficacy, efficiency and transperancy in electronic services which are provided by using the said technologies.

Governments popularize internet and increase computer literacy in terms of electronic structuring, and develop policies and generate projects in regard to becoming a knowledge-based society. The recent developments have caused changes in the structures of governments and headed towards a new structure in which transactions are made more quickly, easily and cost-efficiently, differing from the government's former bureaucratic structures. This structure is called as E-Government, i.e. Electronic Government.

This transformation is not an issue which is only at Turkey's agenda. Lisbon strategy, aspiring to help European Union become the most competitive and dynamic knowledge-based economy in the world, is one of the most comprehensive examples for the efforts aimed to adapt to this change. Lisbon strategy, updated as i-2010 in 2005, has headed for new targets with such titles as knowledge, innovativeness and social inclusiveness. It is possible to say that there are similar quests also in world's other leading economies such as Japan, China and India (1).

These changes have also affected our country, thus, e-Government studies have begun in order to keep up with the preexisting developments in the world and to provide a better service to the citizens. It is indispensable to benefit from information and communication technologies in order to construct a stronger economy and political structure both by adaptation preparations to be done on the way to EU membership and permanent solutions to be found for social problems. With the help of these technologies, public services should be provided on electronic media, public business procedures should be revised with the citizen's point of view and public institutions should be enabled to work together more effectively and efficiently.

E-Government is a new transformation that shall bring great achievements to our country especially in financial terms. Now, it is a must to proceed to e-Government which provides great financial returns and contributes to settle the matters between the Government and citizen by having institutions work better. If e-Government practice succeeds enough, it shall be helpful in eliminating the problems that has been hindering and causing problems up until today since a great convenience shall be provided both for the internal public transactions and for the transactions between public and citizens (2).

Within the scope of "Turkey e-Transformation Project" which has been launched in order to move public operation into electronic media by facilitating transactions and procedures of the private sector and citizens with the Government to a great extend; it has been decided that e-School project shall be launched in order to provide a structure for school and student information, which is the same as the structure established by MEBBIS project to administer institutional and personnel information. The project has begun with the analysis, design and infrastructure works of

e-School system in 2006. The component of e-School system, which is intended for secondary school students, has been put into service in January 2009 and report cards have begun to be handed out via electronic media. Since then, e-School has become a huge system that covers all formal primary and secondary education students, including private school students, and independent nursery schools. Together with the e-School system; workload of the schools and their time and money spent for automation procedures shall be reduced, thus, more resources and time shall be spent to increase education and training standards (3, 4).

Foundation for e-Vehicle system, being discussed herein, has been laid with the School Transportation system module set within e-School in 2011. This system has commenced to prepare documents, which each principal had delivered by hand by making separate lists, from a single center with the help of information system. Thereby; it became possible to control from a single center, bureaucracy and unnecessary waste of time have been prevented by avoiding too many schedules at the same time, and people are enabled to complete their transactions in a shorter period of time. Desired information and statistics can now be accessed rapidly. In this project, inspection and controlling of school service drivers and vehicles have been activated and enabled to be done via the system by having developed the e-transportation information system modeling. These controls and inspections are being performed within the scope of School Vehicles Service Regulation of the Ministry of Transportation.

3.   E-Vehicle

In 1997-1998 Education Period, the Ministry of National Education has started Transported education in the pilot regions that is had chosen in each province. Until 2004, transportation service had been provided by the drivers and vehicles, operating in the province where students shall be transported. After this period, transportation service has been provided by tour companies bidding with their own vehicles. Therefore, national education personnel has preferred tour companies, which drivers came together and established, to the school service drivers with whom they had to deal with respectively. Thus, the problems encountered have been solved rapidly with the intervention of the the officials from tour company. For instance, in case of a failure in the student transportation service due to some of the problems as vehicle failure, accident, driver's excuses, other drivers and vehicles can take on the transportation service, thanks to the tour companies.

In many parts especially rural regions of our country, students are still being transported by School Service Vehicles that are not designed especially for students. In addition to student transportation, drivers and vehicles are also doing passenger transportation and using their vehicles for private purposes after completing their shifts. Our country's economic government does not allow for allocating sufficient budget for the transportation of our students with special-designed vehicles. Therefore, transportation fees do not satisfy school service drivers but encourage them to do extra jobs. It is even worse in the rural parts. As there is no vehicle that is transporting to the far mountain villages, drivers and vehicles which are dealing with transportation therein are providing service for the students, though not convenient.

There are approximately 45.000 school service vehicles throughout the country. Without an information system, it is extremely difficult to control such a huge fleet of vehicles and drivers. Departments in the Ministry of National Education organize and monitor this fleet in each education and training period. School service vehicles are tender designated and controlled by means of the principals and in coordination with the Provincial/District Directorates for National Education. Tender requirements, inspection and controlling tasks are determined in accordance with the provisions in the School Vehicles Service Regulation dated/numbered as 28.08.2007/26627

Figure 1. E- Vehicle Communication Scheme

Ministry of National Education (Provincial/District Directorates of National Education) performs inspection, in terms of the operation requirements, on the tour company, owner of the school service vehicle that has won the tender due to being in accordance with the standards governmentd in the technical specification,. The other inspections related to the traffic are carried out by the current law enforcement forces (by the traffic police, gendarmerie traffic personnel) and, though having not become effective, by officials from the Ministry of Transportation. In 2011, transportation procedures were transferred partially to the information system after Transported School Procedures were added to the e-School system National Education Directorate's procedures module. Transported education procedures section was added into the e-School Institutional Procedures Module for our schools that give transported education. In this project, transportation procedures, which have been transferred to the system, shall be presented. Things that are missing and should be added to the system shall be determined. System shall be developed.

3.1. E-Vehicle National Education Directorate Procedures Module

National Education Directorate's (MEM) Transported School Procedures Module is the module used in e-School system by the personnel of the Provincial/District Directorate of National Education.

3.1. 1. E-Vehicle National Education Directorate Procedures

With the help of transported school procedures section added to the e-School National Education Directorate Procedures (MEM) module;

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It is now possible to determine the transportation center, to add transported student information to the system, to plan the transportation route, to confirm the transportation tender results, food allowances, number of days of transportation, the amount carried forward from the previous year, transportation map loading, data input status, accrued transportation fees, accrued food fees and the procedures for accrued amounts.

3. 1. 2. Planning the transportation route

In order to determine transportation fees, transportation route must be determined and its distance from school must be calculated in kilometer. If this is under-calculated, School Service Driver shall be paid less, if it is over-calculated, our Government shall pay more. Therefore, route planning is very important. Transportation center should be the shortest and the most secure way to the school. School Bus Route is determined in accordance with this plan, the fee is designated by calculating the kilometer and the inspections are being made on these routes. School Service Drivers may sometimes go out of the route in order to save fuel by reducing kilometer.

3.2. Benefits of E-Transportation Procedures Module

Transactions made in transportation procedures have become fast since the transportation procedures are entirely being made via e-School system – Transportation Procedures Module. Now, it is pretty easy to have access to statistics. Score cards and vehicle operating days, prepared manually by the primary school principals, are entered into e-school system and offered via the system for the approval of the Provincial/District Directorate of National Education personnel responsible for transportation procedures. After controls have been made via the system, the approved score cards and working days are being charged a fee, thus, avoiding delays in the payments.

Primary School Principals are coordinating with the personnel from Provincial/District Directorate of National Education, thus, data are being transferred to the system more accurately and safely.

Overpayment and underpayment have been avoided due to the fact that the transportation distance covered by School Service Vehicles, which provide transportation to the central schools, are determined more accurately via the system.

The number of working days is now much easier to be determined and controlled. The unearned payments that the School Service Drivers receive (in non-working days due to heavy snow, epidemic, etc.), although they do not provide service, has come to an end.

Students have been placed to School Service Vehicles as per the number of seats, thus students are not being transported as standing up in the vehicle, any more.

As a result of the fact that route planning is made via the system, distribution of the students to the School Service Vehicles going the same route have been made stabile. Thus, it has become possible to save money by avoiding transportation by more than one vehicle.

Information of the transporting vehicles and drivers can be kept updated since all the school service vehicles and drivers are registered into the system. Thereby, controls are made through

updated lists and those drivers who transport with different vehicles or use other unsuitable drivers instead are identified and penalized.

Since the information in this system is constantly updated, the Ministry has avoided the allocation of a surplus-budget or shoestring-budget by way of budgeting via the system.

3.3. Inadequacies of the E-Transportation Procedures Module

No matter how late it is, Transportation Procedures Module, placed in the e-School system in 2011, has disciplined transportation procedures despite its many inadequacies. Although Turkey was introduced the notion of transporting students to the central schools 12 years ago, it was not able to follow a successful policy to control vehicles either during or after the tender process. Once paper controls of the vehicles have been done, the standards related to student transportation have been ignored. Followings must be included to fill the gap;

- There is no data except the registration plate and capacity of the school service vehicles.
- There is no data in regard to the fact that school service vehicles are being inspected once every 6 months.
- There is not sufficient information about the school service drivers in the module.
- There is no data related to the driving license and other documents (SRC, etc.) of the school service drivers in the module.
- There is no data related to the health certificates of the school service drivers in the module.
- There is no data related to the criminal record of the school service drivers in the module.
- The seating chart of students in the school service vehicle can be entered into the module.

As it is understood from the inadequacies, there is no data in regard to the Control and Inspection in the module, although it is clearly specified in the School Vehicles Service Regulation and Tender Specifications. There happened many fatal accidents into which School Service Vehicles got involved in our country, because of the inadequacies in controlling and inspection processes. When a Google search is made with the words "Okul Servis Araç Kazaları", there appears 1.940.000 results. Even this simple fact indicates how much the current situation is important. It is of vital importance to control efficiently these school service vehicles that transport our students, our hopes for the future.

3.4. Developing E-Transportation Procedures Module

It is mentioned above that the biggest inadequacy in the transportation procedures module is that there is no study in regard to Controlling and Inspection and it is not known what kind of studies must be included. The main objective of this project is to monitor vehicles and drivers via the system, thus, fulfilling inadequacies to a great extent. The aim is to avoid unpleasant incidents, if impossible, to reduce it to a reasonable level by disciplining school service drivers

3.5. Sections Required for the Development of E-Transportation Procedures Module

Controlling and Inspection Module must be added to the Transportation Procedures Module.
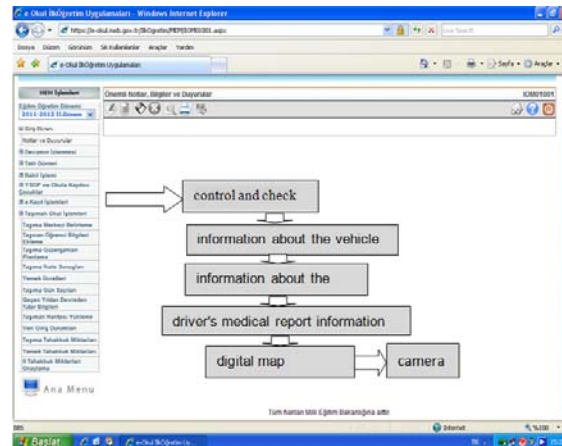
Figure 2 - Development of Transportation Procedures Module

Controlling and Inspection Module is comprised of the following subtitles:

1. **Vehicle Information** (Shall be comprised of 6 titles in itself)

    - Registration plate – make – engine no – color of the vehicle
    - Are there safety belts in each seat in the vehicle?
    - Does vehicle door open and close automatically?
    - Are vehicle windows fixed as not to be opened?
    - Has the first 6-month inspection of the vehicle been done?
    - Has the last 6-month inspection of the vehicle been done?

2. **Driver Information**

    - Driver's name and surname
    - Driving License class – no – place and date of issue
    - Driver's ID no.
    - Driver's health certificate information
        1. Health problems, if any (Favorable/Unfavorable)

3. **Digital Map (**Transportation route and speed info of the vehicle and the driver's ID is identified through map)

4. **Camera** (It is controlled whether students sit as provided by the seating chart and whether passengers other than the students are being picked up, by connecting to the vehicle)

Subsequent to entering these data into system, the following information shall come out as a result of linking each data to another system automatically.

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3.5.1. When School Service Vehicle Information is linked to the "Pol-Net" system:

System automatically controls the accuracy of School Service Vehicle information, registration plate, engine no and color information of the vehicle. System shall inquire age of the vehicle and give warning if the vehicle is older than 12 years. It shall warn in an unfavorable situation if the school service vehicle is seized, stolen, drawn or disqualified from traffic. System shall transfer seat capacity data to e-school system automatically. Students that are to be transported shall be planned according to this data. Students exceeding the seating capacity of the vehicle shall not be transported.

3.5.2. When School Service Vehicle Information is linked to the TÜVTURK" Inspection Station System:

Whether the vehicle inspection has been done or not shall be controlled from the registration plate and engine no. System shall give warning when inspection period is expired.

3.5.3. When School Service Vehicle Information is linked to the "TRAMER" Traffic Insurance Center system:

Traffic Liability Insurance and Seat Insurance of the school service vehicle shall be controlled automatically from the registration plate and engine no of the vehicle and driver's ID no. System shall give warning when Traffic Liability Insurance and Seat Insurance expire.

3.5.4. When School Service Vehicle Information is linked to the "Pol-Net" system:

Driver's penalty points are checked from the driving license no and place of issue. System shall give warning when the driver has 100 penalty points or has his driving license confiscated by the Court for having involved in a death accident due to alcohol or genuine fault. In this case, driver shall be disqualified from traffic.

3.5.5. When School Service Vehicle Information is linked to the "UYAP" International Judicial Portal system:

Criminal record of the school service driver shall be checked from the driver's name, surname and ID no. System shall give warning when the formal criminal record of the driver and the new crimes that he can commit are detected. People who have committed infamous crimes especially the sexual abuse of little children, sexual assault, molesting, etc., cannot be the school service driver.

3.5.6. Digital Map

GPS (Global Positioning System) shall necessarily be mounted in each school service vehicle. Location of any vehicle across the globe can be identified, with a little deviation ratio, by GPS-based vehicle monitoring systems. Hence, it shall suffice to mount a device in the vehicle and communicate with the satellites in GP system.

Figure 3. Opeation of GPS

Tender Specification shall require GPS device to be mounted in each school service vehicle, and Transportation fees shall be increased in regard to the cost of these devices. GPS data shall be displayed in the digital map, created in the e-School system. Official personnel from the Provincial/District Directorates for National Education and Primary School Principals shall follow system through this module. This system shall be transferred to Data Informing Module, thus, parents shall be able to monitor the school service vehicle transporting their children from anywhere with internet access. Speed limits that the school service vehicles must obey shall be regulated. Drivers who violate the speed limit shall be reported via the system.

With the help of this system;

- School service drivers shall not be overpaid or underpaid since school distances shall be net calculated.
- Drivers cannot go out of the transportation route since the school service vehicle's route shall constantly be monitored.
- School service driver shall have to be careful not to exceed speed limit since the school service vehicle's speed data shall be monitored.
- It shall be controlled whether the school service vehicle picks up students in a timely fashion or not.

3.5.7. Camera

Along with the GPS system, camera systems which are compatible with 3G system shall also be mounted inside the school service vehicle as to see the interior thus enabling to monitor those students in the school service vehicle, after signing contracts with the mobile phone operators (Turkcell, Vodafone, AVEA) in Turkey. School service driver shall be prevented from transporting passengers other than the students in the vehicle, with the help of this camera system. This system shall also be transferred to Data Informing Module, thus, parents shall be able to monitor their children in the vehicle from anywhere with internet access. All these oncoming features shall enable us to control and inspect school service vehicles and drivers efficiently without needing too much personnel and vehicle. Controls shall be made in the transportation route with the help of a computer in the work office. There shall be a great reduction in the accidents in which school service vehicles get involved, besides all other incidents that may cause bad results shall be prevented. Our students, our hopes for the future, shall be transported to their schools and homes safely. Student's parents shall believe in and feel greater commitment and loyalty to the Government.

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4. CONCLUSION AND SUGGESTIONS

Public institutions, which aim to provide service with the notion of a modern and human-centric government and duty, must maximize their service quality by forming an infrastructure with the help of information technologies. While government uses this information technology, citizens should also be able to use technological features. The provided services shall become beneficial day by day. Our country, having adopted e-Government model, became electronic in many governmental institutions in recent years. The institutions, adopting e-Government model, avoided the slow bureaucracy, and reduced bureaucracy by cutting down on the paper transactions. They made progress in the relations with citizens by benefiting from communication and information technologies in the best possible way. This progress, not limited to citizens, improved communication channels among institutions by linking technological infrastructures of other institutions with its own system. Thus, information exchange accelerated and transactions were concluded more rapidly and efficiently. These institutions saved time and money by using the technology and began to use its personnel effectively and efficiently.

With the help of information technologies, Ministry of National Education, which has broken a new ground within the scope of e-Government applications by putting Integrated Government Information System into practice, must endeavor to develop modules created within MEBSIS constantly. These modules should grow, multiply and develop like living organisms, since practices in the field of education change constantly. System must also be made suitable for inspection. The Ministry, having started transported education activities in 1997-1998 education period in the pilot regions it had chosen, has just commenced a new module with regard to these activities within e-school information system in 2011-2012 education period. In this newly started module, it is intended to facilitate transported education procedures. Hundreds of accidents, into which school service vehicles get involved, occur every year in our country. In these accidents, our students die, get injured, become disabled and cannot continue their education afterwards. Despite these fatal results, Ministry of National Education is guilty for it does not take necessary precautions that shall reduce the number of accidents, by using information technology. There is an urgent need for adding the sections that shall control and regulate school service vehicles and drivers to the module in e-school system. In this project, information is given about the sections that are planned to be run in e-vehicle system and their functions. E-vehicle module must be developed as soon as possible.

References

 [1] Acar, M.- E. Kuvas (2008). "Türkiye'nin Dönüşüm Sürecinde Anahtar Bir Mekanizma Olarak E-Devlet, E-Dönüşüm ve Entegrasyon Standartları", 2. Ulusal İktisat Kongresi, 20-22 Şubat, DEÜ BF İktisat Bölümü, İzmir/Türkiye.

[2] Arifoğlu, A., A. Körnes, A. Yazıcı, M.K. Akgül ve A. Ayvalı (2002), E-Devlet Yolunda Türkiye, Türkiye Bilişim Derneği: Ankara. s.12

[3] Selim İSMAİL Sakarya Üniversitesi Yönetim Bilişim Sistemleri Yüksek Lisans e-Devlet Ders sunumu (e-Okul) Sakarya 2011.

[4] E-Okul Kılavuz www.eokul.meb.gov.tr.