

Ready Mixed Concrete Truck Dispatch Management System

Scenario

With the global depression, Taiwan has expanded domestic demand to promote the domestic economy. Since construction has been an essential index of economic development, the government agencies started to build considerable infrastructures to boost construction industry. The construction industry needs a number of raw materials, and Ready Mixed Concrete (RMC) is the indispensable raw material for constructions.

Ready mixed concrete is manufactured in a RMC factory, and the jobsites order the RMC according to the design. Then, the RMC would be delivered to the jobsite. However, the dispatch in RMC factories, now, is still operated by experiences and radioing. A RMC factory generally needs to dispatch RMC to 5 to 10 work sites per day, and large RMC factories need to dispatch to much more work sites. Therefore, the dispatchers hardly fully track the status of trucks so that the work site sometimes might need to be suspended and wait for the RMC. Moreover, sometimes there are too many trucks in a work site, and the dispatch becomes disorder easily. As a result, not only the progress of the construction but also the quality of RMC would be affected.

Consequently, the project intended to apply GIS and GPS technologies to build up a dispatch management system to help dispatchers manage the trucks between the RMC factories and work sites. Thus, the efficiency of dispatch operation can be improved, and the work efficiency can be optimized.

Solutions

Ready Mixed Concrete Truck Dispatch Management System combines GIS, GPS, Automatic Vehicle Location (AVL), communication system and electronic detection technologies. The system enables the dispatch center to effectively track each truck's real-time status and operation; thus the dispatch center can adjust the delivery intervals based on the current status. In order to enable the trucks to provide the real-time information, each truck needs to be equipped with two devices, On Bound Unit, and Discharge Sensor.

Once the system receives the information of the trucks, the dispatchers can apply the GIS functions to dispatch the trucks. The system adopts SuperObjects to develop each GIS function. SuperObjects is a SDK based on COM objects; its library is composed of more than 100 interfaces. As a result, developers can utilize the objects and interfaces to develop the needed functions and build up a geographic information system to satisfy the requirements.



Ready Mixed Concrete (RMC) is the indispensable raw material for constructions, and would be delivered to the construction sites by ready mixed concrete trucks.

Solutions

- Apply SuperObjects and collaborate with GPS, Automatic Vehicle Location (AVL), communication, and electronic detection technologies to build up a GIS management system.
- The GIS management system effectively enriches the data for the dispatch, allows to track the truck's status more easily, and raise the efficiency of truck dispatch.

Results

The purpose of Concrete Mixer Truck Dispatch Management System is to assist the RMC factories in tracking and managing the truck dispatch. There are 6 sub systems of the management system: truck monitoring system, jobsite monitoring system, truck event examination system, truck operation procedure system, delivery scheduling system, and statement reporting system.

- 1. Truck Monitoring System:** The system primarily assists the dispatchers in tracking the trucks' status. With the system, the dispatchers can monitor the trucks' driving status, driving route, and the status of the trucks within the factories. For example, the truck is being uploaded, maintained, cleaned, on standby, etc. Furthermore, the system also applies the GPS data recorded in OBU on the trucks to understand when the truck leaves and returns to the factory.
- 2. Jobsite Monitoring System:** The system enables dispatchers to query each jobsite. While using the system, dispatchers need to utilize the electronic maps of the jobsites to track the vehicles on jobsites. The system provides the mapping function for dispatchers to map the extent of the jobsite. Then, with GIS and GPS technologies, the system displays the vehicle status on each jobsite clearly. As the number of vehicles is higher than the reasonable number, the system will automatically show the notice to remind the dispatchers to adjust the delivery intervals.
- 3. Vehicle Event Examination System:** The system has several examination functions which allow dispatchers to understand and control the events, like the time vehicle parked, etc. Therefore, dispatchers can prevent some abnormal events, such as discharging concrete incorrectly, vehicles moving abnormally and so on.

- 4. Truck Operation Procedure System:** The system mainly assists the dispatchers in knowing the time the trucks leaving and arriving the factory and construction site. In addition, the system can predict the time the truck arrives at according to the distance between the construction site and the factory and the speed of the trucks. Thus, the dispatchers can dispatch their fleet more conveniently.
- 5. Delivery Operation System:** As the RMC is delivered, the system will deduct the volume of delivered concrete and the number of trucks. Moreover, when the concrete is being delivered, the dispatchers can calculate the best delivery interval according to the relevant data provided by the system, for example, the number of trucks going to the construction sites and returning, the number of parked trucks, the number of trucks unloading, etc. The calculated delivery interval can be the references for dispatching the fleet.
- 6. Statement Reporting System:** The system applies GPS and GIS technologies to analyze the information of each truck, including fuel consumption, utilization, etc. As a result, the related information can be the references for dispatchers to dispatch the fleet.

Ready Mixed Concrete Truck Management System improves the lack of the information of ready mixed concrete trucks. The status of each construction site and truck, therefore, can be accurately ascertained by the dispatchers; the dispatchers' capabilities of dispatching the fleet can be greatly enhanced as well. Meanwhile, the dispatchers can solve the problems which may occur in everyday business to deliver the concrete to the jobsite on time. Consequently, the overall working efficiency of the factory can be effectively raised.

Results

- Ready Mixed Concrete Truck Dispatch Management System integrates kinds of technologies to facilitate dispatchers to track each truck's information. According to different situations, the managers can flexibly adjust the truck dispatching.
- Ready Mixed Concrete Truck Dispatch Management System not only offers the information of the trucks but also enhances the utilization of the data.

Software Used

SuperObjects