



System of Assistance to the Exploitation of Information

MOBILITY ADO

Mobility ADO as a leading company in the passenger transport sector, has stood out for bringing simplicity to daily life through comprehensive mobility solutions, which is why through its innovation and technology management department, they decided to design a concept of System of Assistance to the Exploitation of Information (SAE-ADO). This new system should be able to analyze information from various technological solutions contained in the bus, either as a whole or individually, compare it with patterns, process it and graphically display it in an easily understood interface, to minimize response time and decision making of the operations of the Mobility ADO control center, as well as the driver in the bus.

Due to the collaboration in other projects with Mobility ADO and the trust developed, we are asked in September 2016 to review the design of SAE-ADO to evaluate the realization and implementation of said project, which would initially be implemented in one of its main routes with a total of 56 units.



MOBILITY ADO

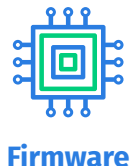
About the client

Autobuses de Oriente or better known as ADO, is a renowned Mexican bus transportation line. Established since 1939, it has positioned itself in Mexico as one of the main bus transport lines, covering 15 states of the Mexican Republic, in which 35% of the population of all of Mexico lives and that represent little more than the quarter of the national territory.

In 2018, it renewed its identity as MOBILITY ADO and currently has a presence in Spain, Portugal, Guatemala and Mexico, operating more than 8,000 vehicles, including urban, intercity and BRT busses, transporting more than 500 million passengers annually.

Part of the modernization of Mobility ADO has been reflected in its continuous effort to be at the forefront of technology, looking for new and better mobility solutions, integrating different modes of transport to make the lives of its customers simpler.

Based on the documentation provided by Mobility ADO, the breakdown of the activities had to be analyzed with the didcom engineering team, this due to its complexity since it involved different areas of technology to be developed, so the project was divided into 3 areas.



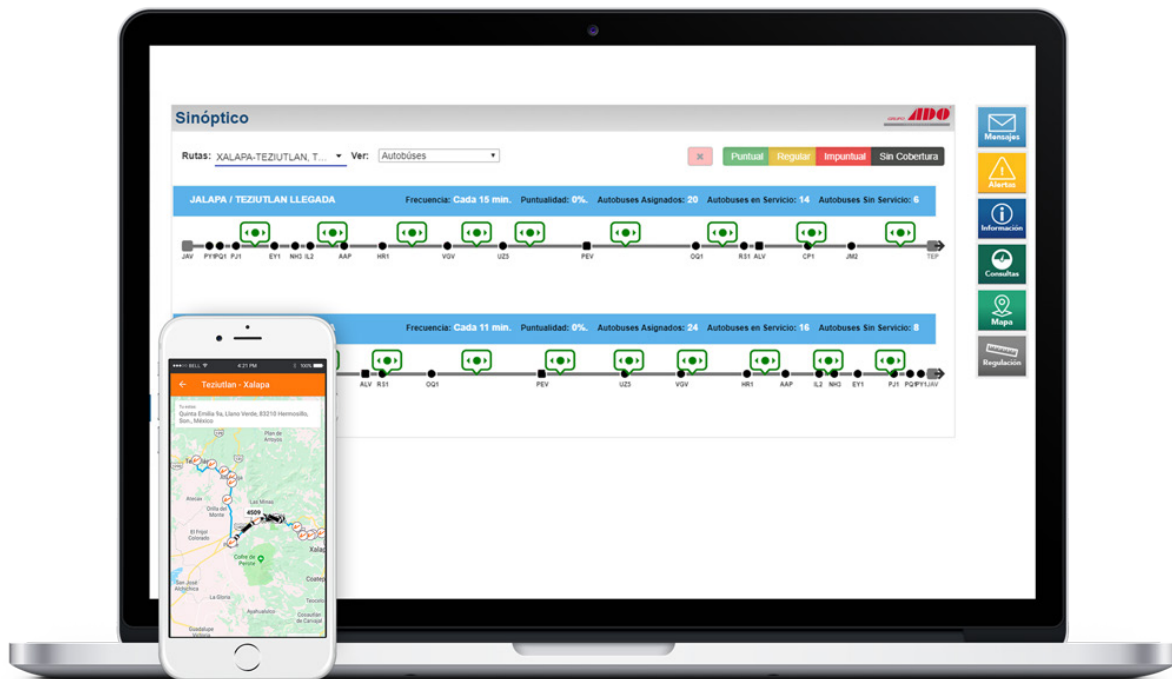
Mobility ADO is a company that always seeks to optimize its resources and developments, with the clear vision of offering a better customer service, so in addition to the result of the technological development of didcom, it should be able to integrate two internal solutions for its correct functionality:

1. Management System
2. Integral On-Board Information System

Both solutions are key in the day-to-day operation, so their integration should be in real time to know the origin and destination of the route at all times, as well as to establish communication and feedback with the driver in real time.

“This new system should be able to analyze information from various technological solutions contained in the bus, process it and graphically display it in an easily understood interface”





Like any new project, the implementation approach must be hand in hand with the operational viability and the results that will generate a considerable improvement in the business, therefore the importance of generating such indicators was fundamental.

“Development should be integrated into existing solution”

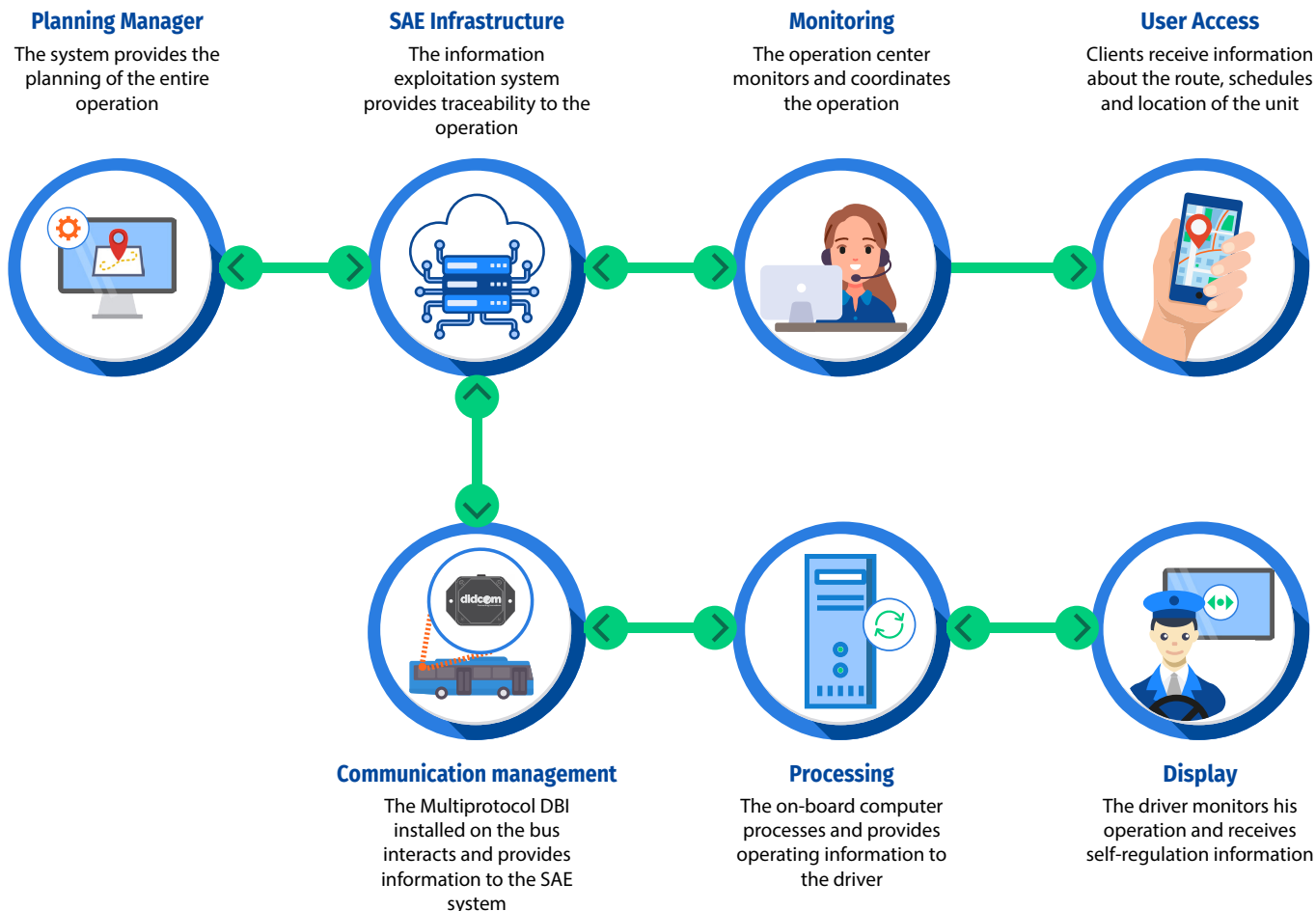
Measurement of main indicators:

- + Frequency on route
- + Efficiency by route, vehicle and driver
- + Self-regulation of units en route
- + Punctuality in departures, arrivals by route and by service
- + Alerts and messages

These points should be displayed graphically and at the report level in a simple way, to minimize the response time at the operational level in the event of any eventuality.

Carrying out this entire project involved researching and developing a series of physical and logical technologies, ranging from design and manufacture of new products, to analysis and design of algorithms with processing capacity of hundreds of thousands of data per minute to be displayed at the platform level, without any doubts a great challenge that had to be overcome in a period of 6 months.

The solution



A unique solution was developed, which is functional for various areas:

- + Operating Center
- + Drivers
- + Business Management

Through the SAE-ADO system, the centralization of information for decision making is displayed quickly and easily, this allows the opportunities in the operation to be visually identified.

Some of the information obtained from SAE-ADO

- + Visualization of units and route in synoptic map with detail from origin to destination
- + Self-regulation: unit status (punctual / regular / punctual)
- + Information of stops: units that went through stops and next to pass
- + Frequency and punctuality
- + Travel and stay times
- + Messages to drivers to report on regulation lag, individual or massive notification of an incident. And many others.

After several weeks of research and development, the project architecture of each area was defined, having as its main objective that at a certain point they had to be integrated naturally and simultaneously.

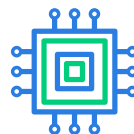
What did each of these areas do?



Hardware

A product called “DBI Garmin” was designed and developed, which manages and controls the data flow between the GPS device and the Integrated Information System on board.

This device has unique features, since it has high capacity electronic components for mass information processing.



Firmware

A communication protocol was designed and implemented to integrate the transfer of information in an organized and intelligent way between the aforementioned hardware, this because it had to adapt to the design of frames used by the Integral Information System on Board, and provide two-way communication to said system remotely, using as a means the cellular communication implemented within the GPS device, having an average processing of 600 messages per day per device.



Software

It was designed based on the requirement provided by Mobility ADO, following the guidelines indicated, technologies were used for its implementation at the WEB level, dynamic databases were also created with Big Data technology to quickly process the large volume and flow of information.

Likewise, a mobile application was developed in IOS / Android, whose main function is to visualize the location and determine the arrival time of the bus at its next stop, its use is for the users of the service.





Results that transcend

With the implementation of SAE-ADO, it was possible to self-regulate the frequency of the route and reduce the gaps or saturation between units at the same point, situations that represented problems in the operation and especially in the economic income of the route.

In the same way, reliable information about the operation is obtained, which serves to guarantee the client the punctuality of the arrival of the units, a situation that manages to retain the client by offering certainty of compliance.

It was possible to give additional functionality to the investments in technology previously made by Mobility ADO, taking advantage of its infrastructure and integrating new solutions that together offer a unique solution for the operation and business.

As a valuable addition, SAE-ADO has an APP for passengers, downloadable on their cell phones, which allows them to see the nearest buses, allowing you to better schedule your daily activities.

Undoubtedly, credibility is obtained from Mobility ADO towards didcom, which allows replicating this development and, above all, the results in new routes.

didcom

About didcom

Didcom is a hub of engineering and technological development, offering to the international market complete solutions of Hardware, Software and Firmware, for the transportation industry, backed with personalized support and more than 10 years of experience.

Learn more at
www.didcom.com.mx