

## Information and Management System application architecture

The application architecture is designed to specify the functions identified previously in terms of solutions that are more akin to "software" solutions (applications).

It can be used to develop alternative organisational and/or technical options for estimating implementation schedules and set-up, operating and maintenance costs, together with any other aspects that must be taken into account in the budget for the AMT project.

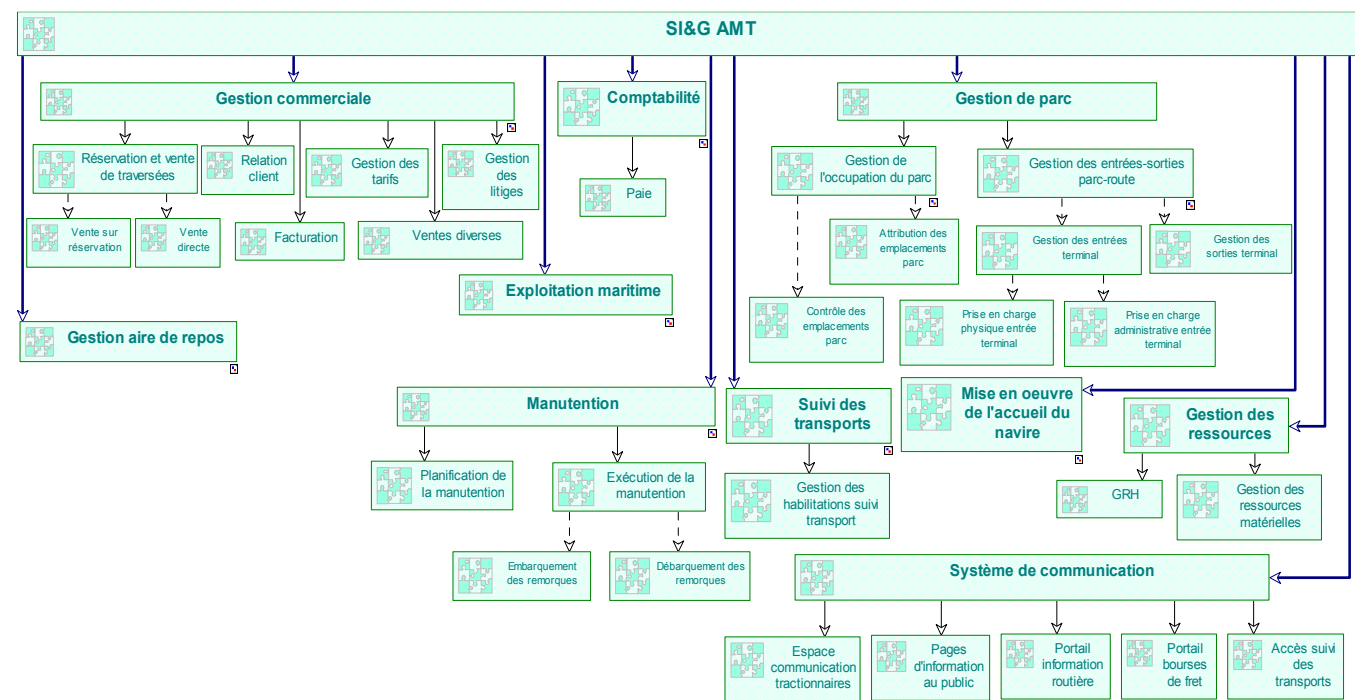


Figure 3: Application architecture for the AMT Information and Management

### Conclusion: recommendations

Using the ACTIF method has enabled us to identify the external associates and internal partners concerned by the project, together with the various functional sub-systems that make up the information and management system required for the AMT.

Although it is incomplete insofar as certain functions specific to the AMT are concerned (rest area management, implementing vessel

reception services, vessel operations, accounts – external players, as understood under ACTIF), the ACTIF model has served as a basis for attributing to each sub-system the essential functions that it must cover and to define the interfaces (data interchanges) needed between sub-systems and external players.

Some of the functions identified will be integrated in the Version 5 of the ACTIF model.

## Comment by Mr Christophe Leclerc, in charge of AMT project – Port of Nantes Saint-Nazaire

"The Autoroute Maritime Transgascogne is an intelligent transport infrastructure project. Using ACTIF to design the information and management system was the obvious choice, even though this was not initially required by the project owner.

The method chosen by SETEC ITS allowed us to use the best parts of ACTIF and also reveal new areas for development, taking account of intermodal transport and physical interfaces (port areas in the project). Applying the method, dividing the project into clearly-defined phases and, above all, constant dialogue, enabled us to find the

answers to our 6 initial questions within the deadlines set.

Placing all the AMT sub-systems and functions into perspective confirmed just how complex managing this new form of transport infrastructure will be. Here, as elsewhere, the limitations inherent in interfacing information systems (roads, motorways, etc.) became apparent and the issue, a central issue insofar as an intelligent transport is concerned, of coordinating and controlling flow in a market economy, has been highlighted."

**Projet:** to develop an information and management system for a project to create a sea motorway crossing the Bay of Biscay between the ports of Nantes Saint-Nazaire in France and Bilbao in Spain, to be known as the Autoroute Maritime Transgascogne (AMT).

**Challenge:** To design an effective technical and commercial management tool for the AMT.

**The advantages of ACTIF:** Defines needs clearly and translates into an operative and applicative project architecture to ensure simple, fast and competitive performance.

## General background

The economic boom in the Iberian peninsula has given rise to massive growth in the volume of road freight crossing the Pyrenees. This traffic is concentrated on the two coastal motorways. In 2006, there were 2.9 million trucks on the A63 motorway on the Atlantic side and 3.2 million trucks on the A9 on the Mediterranean side. Added to this increasing truck traffic is an increase in the number of private vehicles on the roads. This trans-Pyrenean road traffic is 66% heavier than trans-Alpine traffic which, for its part, has many more crossing points.

In the 1990s, an Atlantic road corridor developed, with road traffic from the Iberian peninsula concentrated on just a few main trunk roads (A 10 – RN 10), resulting in a serious increase in local pollution. The trans-Pyrenean passes have become major bottlenecks within the trans-European transport (TEN-T) network.

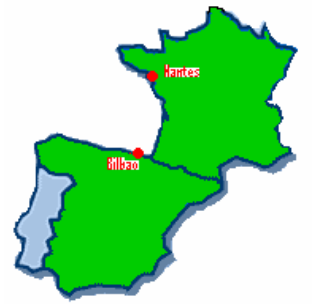
To deal with this situation, the European Union has decided to provide 4 "sea motorways" for the TEN-T network by the year 2010, one of which will run close to the coastline. In line with this decision, the French government decided on 18 December 2003 to create its own sea motorway to ease traffic congestion on trans-Pyrenean roads and joined forces with Spain to launch, at the beginning of 2007, a call for proposals to develop this infrastructure.

### Port of Nantes Saint-Nazaire

The feasibility studies for the project are managed by the Autonomous Port of Nantes Saint-Nazaire. The aim is to set up a road trailer shipping service that will run between the ports of Nantes and Bilbao three times a day in each direction. This service will be designed to afford distinct advantages in terms of time and/or money compared with the road-only route. This will thus entail adding a sea crossing for a trailer alone as part of the entire journey. Initial capacity offered

by this service will be 350,000 trailers a year.

Resources include a fleet of 6 new-build Ro-Ro vessels each with capacity for 230 trailers, two dedicated port terminals linked directly to the road and rail networks by an efficient information and management infrastructure.



The feasibility of this information and management system was the main subject of the key questions defined by the Project Manager.

### The 6 questions addressed by the Project Manager

The specifications drawn up for the feasibility study by the Port of Nantes Saint-Nazaire were based on 6 key questions:

- ▶ What is the overall design of the information and management system to be developed for the Autoroute Maritime Transgascogne (AMT) project?
- ▶ How can the neutrality of the system insofar as concerns business relations with AMT users be ensured?
- ▶ How will the safety and security levels required for the AMT be integrated?
- ▶ How will information on conditions on the road infrastructure network be taken into account and thus provide AMT customers with useful information?
- ▶ How much will set-up, operating and maintenance of the information and management system cost in all?
- ▶ What tests will be carried out on the information and management system before the AMT is opened?

The design office chosen for the project is SETEC ITS, using ACTIF.

## ACTIF

SETEC ITS used ACTIF methods, models and tools to:

- ▶ map key players, their roles and the relations that exist between them;
- ▶ identify the needs, requirements and constraints of each player;
- ▶ describe the different operational channels required;
- ▶ describe an organisational and applicative architecture for the information and management system, factoring in the existing system.

This stage was implemented during the second and third quarters of 2006 .

## Do you have a project ?

The ACTIF team can help you with your projects and preliminary plans:

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## The players interfacing with l'AMT

The Autoroute de la Mer Transgascogne involves players from two different sectors:

Road freight sector	
Description	Role
Transport companies	The AMT's major customers (likely to use sea routes rather than roads)
Owner-operators	Truck drivers that move goods trailers in and out of the terminal
Road traffic information sources (French CRICR regional traffic information and coordination centres, road and motorway management services, etc.)	Provide information about traffic conditions on the various access roads into and out of the ports (predicted journey times, information for drivers, etc.)
Port and maritime sector	
Description	Role
AMT terminal operators	In charge of overall management of the service (at sea, in the port area and on land)
The port authorities	Responsible for managing harbour works, safety and commercial operations related to use of port infrastructures
Harbour master's offices	Services provided by public servants working for the French Ministry of Transport, Infrastructure, Tourism and the Sea but under the authority of the port authority, in charge of policing, quay berth management, managing piloting and boatage services and shipping safety at the port.
Linesmen and pilots	Responsible for mooring and unmooring operations and for guiding vessels in and out of port
Administrative control services (customs, health and safety services)	These services check merchandise and passengers passing through port
Other vessel-related services	Other services, such as ship suppliers and refuellers, etc

## Identifying the needs, requirements and constraints of the players

### Defining needs

The AMT operator needs an information and management system that will enable it to sell a freight transport service as uncomplicated as road freight, that affords tangible savings, and, in technical terms, combines shipping with land-based transportation, mainly road freight .

This involves designing a system that can manage all five major physical traffic flows that will use the AMT: drivers, truck tractors, trailers, merchandise and vessels .

The information and management system must meet the following needs: technical and commercial management of the services offered, making optimal use of the resources required (space on land and on board vessels, human resources and handling facilities, etc., provide information on operational progress to users and players and ensure smooth traffic flow along the sea motorway

### Service requirements

These requirements are mainly defined specifically with the target clientele in mind. How attractive the transport companies find the service depends mainly on the following factors :

- ▶ the price: fixed rates per crossing (including trailer handling, sea crossing and delivery of the trailer at the destination terminal);
- ▶ traceability of the trailer and goods and security throughout the service;

- ▶ security and confidentiality: a neutral system in terms of users' business relations;
- ▶ safety: in particular, relative to transporting and storing dangerous materials;
- ▶ services for drivers: a rest area at the terminal for the drivers, a cabin and 2 meals for drivers accompanying vehicles (max. 12 per crossing);
- ▶ crossings sold subject to advance booking, and also direct sales;
- ▶ useful information on land-based networks: conditions on road infrastructure networks (particularly in the Northwest quarter of France);
- ▶ management of loading, parking and unloading of unaccompanied trailers: liaison between transport companies and owner-operators must be dealt with;
- ▶ facilitating relations between transport companies and owner-operators to ensure continuity in the transportation of trailers and keep empty tractor journeys to a minimum

The service must also take account of the regulations and requirements specific to the Kingdom of Spain

### Identifying constraints

These are primarily related to the aspects below:

- ▶ the integration of two sectors within the transport industry, maritime and road transport
- ▶ physical passage through port terminals (dedicated to the AMT),
- ▶ and to existing regulations (i.e. applicable to transport, security, etc.).

## Modelling operational channels

### Operational architecture

Modelling has been undertaken to study the various options for organising the information and management system, in view of the lack of any specialised applications or software related to Sea Motorways.

This modelling is based on a breakdown of activities into 10 operational sub-systems:

- ▶ Commercial management: covers applications relative to bookings, sales, billing and, more generally, everything related to customer relations. This includes general information relative to the transport service to be provided, such as the type of merchandise transported, stowage and delivery times, etc.;
- ▶ Hub management: deals with transit and storage of goods and containers through the hub and all the activities this entails, i.e., taking delivery of trailers, allocating space according to the type of merchandise, etc. This is closely linked to the sub-systems relative to handling and to sales management, but it is also related to customs and health & safety services to make trailers available for inspection;
- ▶ Management of rest areas: with the possibility of detecting the presence of drivers in the rest area, providing services for their comfort and informing sales management of their presence;
- ▶ Handling: covering all loading and unloading operations at the terminals;
- ▶ Vessel arrival services: manages connections, supplies and refuelling to berthed vessels;
- ▶ Sea operations: manages information and activities related to sea crossings and is interfaced with land-based services to plan port operations in advance;

- ▶ Transport tracking: designed to keep records to track every trailer transported by the AMT;
- ▶ Communication system: gathers information from sales management and transportation tracking, as well as from road network operators on road conditions into and out of the terminal;
- ▶ Management of handling equipment and human resources;
- ▶ Accounts: used in the AMT accounting applications.

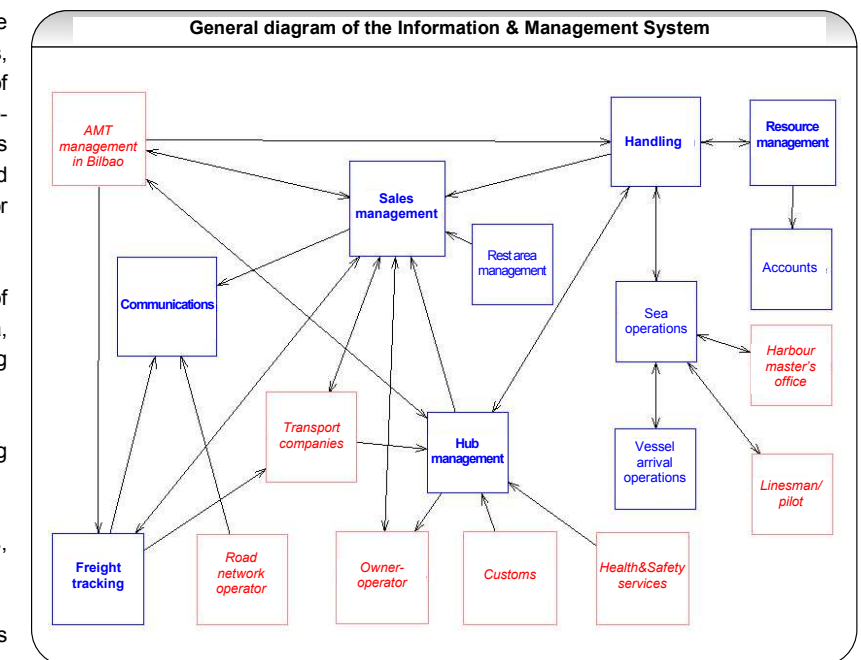


Figure 1: General diagram showing inter-relationships between sub-systems and external

### Functional description

As far as possible, each sub-system has been described in terms of the functions that it will cover, based on the functions contained in the ACTIF model. Thus, for the "hub" sub-system, the different functions identified in the ACTIF model serve to highlight the interfaces required with the other sub-systems and external players .

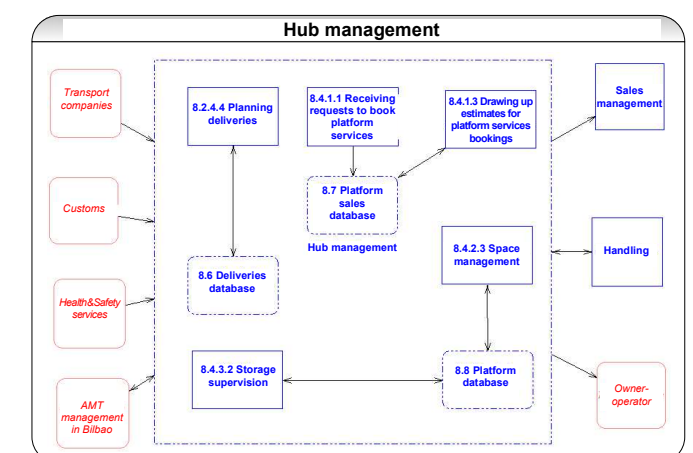


Figure 2: Functional description of "Hub management" taken from "OSCAR"