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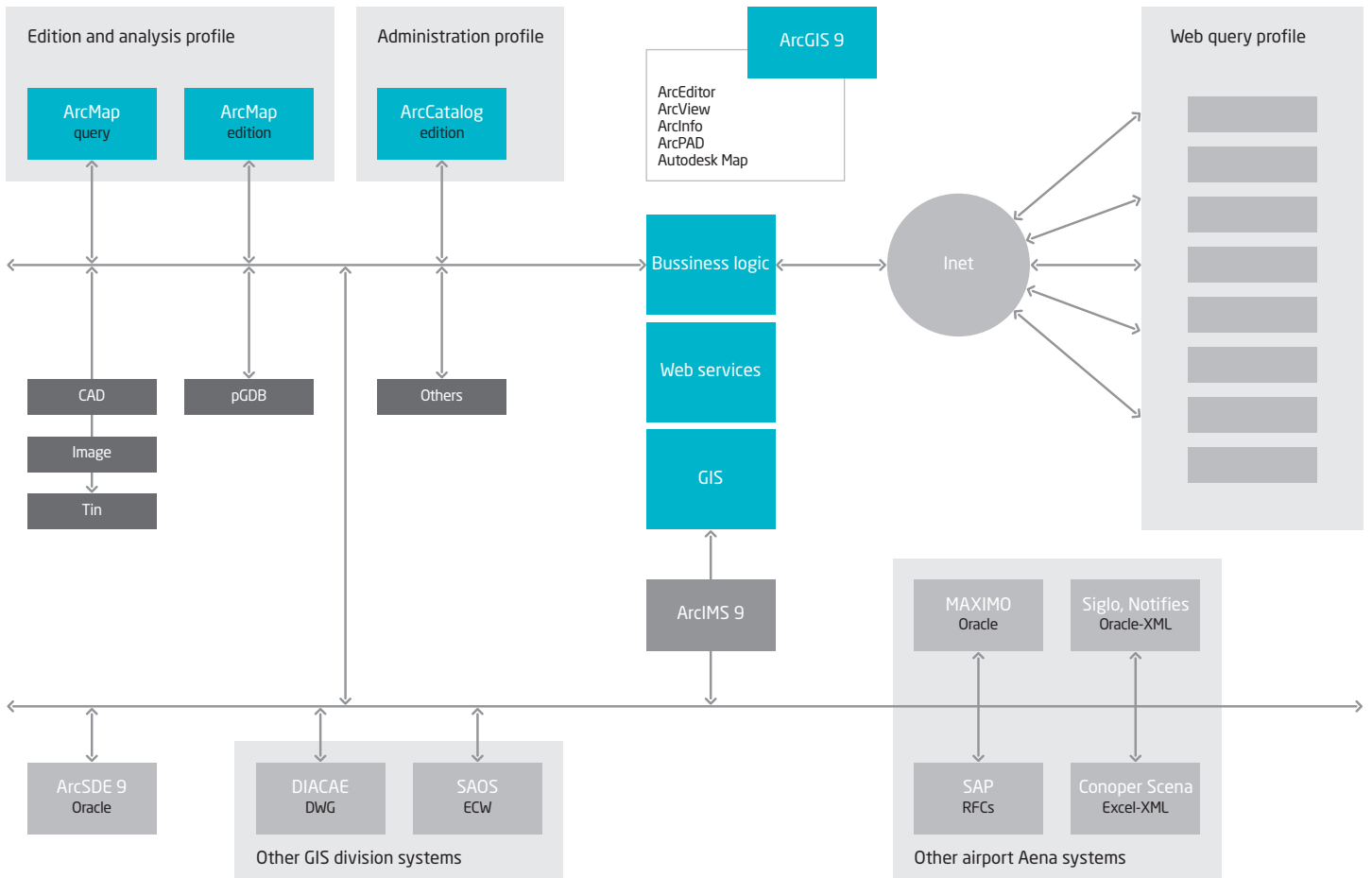
AIR TRAFFIC MANAGEMENT

GEO-REFERENCED INFORMATION SYSTEM FOR AIRPORT MANAGEMENT

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Typical SIGRA environment



Characteristics

Civil Works Management Module

It is in charge of managing and operating the geographical information and its technical data for the civil works existing inside the airport field limits, accessing to the plan and charts of each project and civil work, its technical data, its photographs and other associated documents.

Additionally it can query the affections and actions inventory, managing the civil works historic data and generating alarms to detect delivering out of date.

Architecture

It is based on distributed work environment for functionality and data management purposes. It uses a services oriented architecture (SOA) and it is composed of several server nodes (Web Map services, Web Image services, GIS - CAD application servers and others). Standard products are used, such as ESRI tools, Oracle DBMS, BEA Weblogic, IIS Microsoft, Crystal Reports and MS Office tools). There are different client types (Heavy, Light, Mobile), all of them in an open and scalable architecture. The user goes into the system through client server technologies (administration, edition and dynamic analysis) or intranet Web technologies (queries and analysis) according to a defined users' policy.

Main Benefits of SIGRA

It enables the integration of other airport information systems in a common spatial GIS interface, simplifying and making more friendly the IT-user interaction, taking advantage of Web and high speed communication services.

A unique and corporate airport maps-plans database is maintained at the airport, common for all the airport users. This fact improves the information maintenance and optimizes airport operations associated to databases.

It simplifies and saves time in maintenance duties associated to airport equipments. It also helps locating commercial and patrimonial assets yielding a more effective business monitoring and control.

GEO-REFERENCED INFORMATION SYSTEM FOR AIRPORT MANAGEMENT



A global airport management also includes the environment and non-flying activities

Introduction

SIGRA is a geographically referenced information system, developed by Indra for Aena, and focused on airport environment management.

Though under general purpose criteria, SIGRA makes up a powerful tool structured as a basic core, in one hand and in the other, as a set of several functional modules.

These modules have been developed attending to the necessity of a management tool that such airport activities, as those related with the commercial and patrimony management, handling services, engineering activities and equipments maintenance, airports operations, environment and civil works management, AIP-AIS queries, and security support systems, more and more became essential.

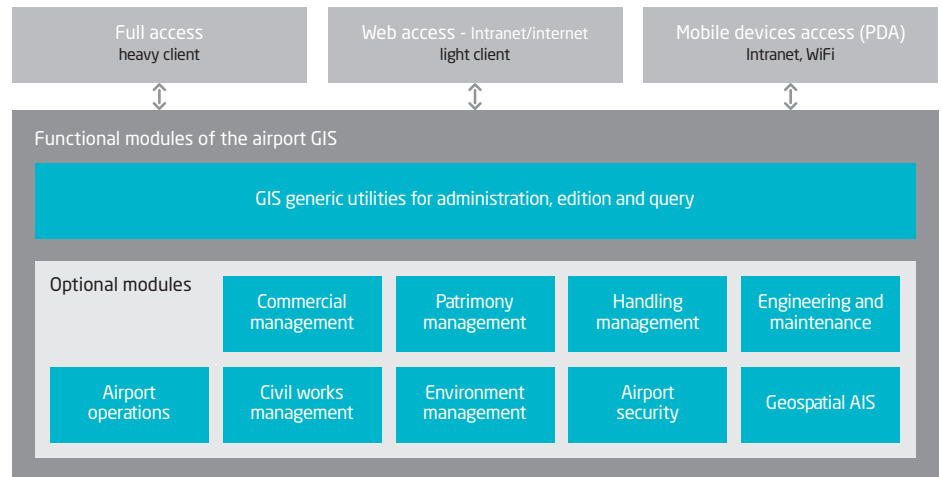
The system is designed to work cooperatively with other airport information systems helping them to present their data and results associated to their corresponding physical location.

In its full configuration, SIGRA system is composed of nine operative and running modules, which are: Administration, Commercial Management, Patrimony, Handling, Engineering and Maintenance, Airport Operations, Civil Works Management, Environment Management, Airport Security and Geospatial AIS.

The system could be the substratum for all the relevant corporate management systems, such as:

- SAP (ERP)
- SCENA, cooperative airport management system (AODB)
- SAOS, Satellite Airport Orthoimage System
- MAXIMO, infrastructure servicing and maintenance management system
- DIACAE, computer-aided engineering design tool for Spanish airports

SIGRA modules



System management and common utilities - core modules

Developed for database administration, users administration and their accesses and privileges control. It consists of all the common basic utilities that are available for any functional module of the system.

It also includes a license package composed of a database manager server, applications server, contents web and web map server. Additionally it contains an authorizations manager, heavy client sites for administration and CAD graphic edition and web light clients.

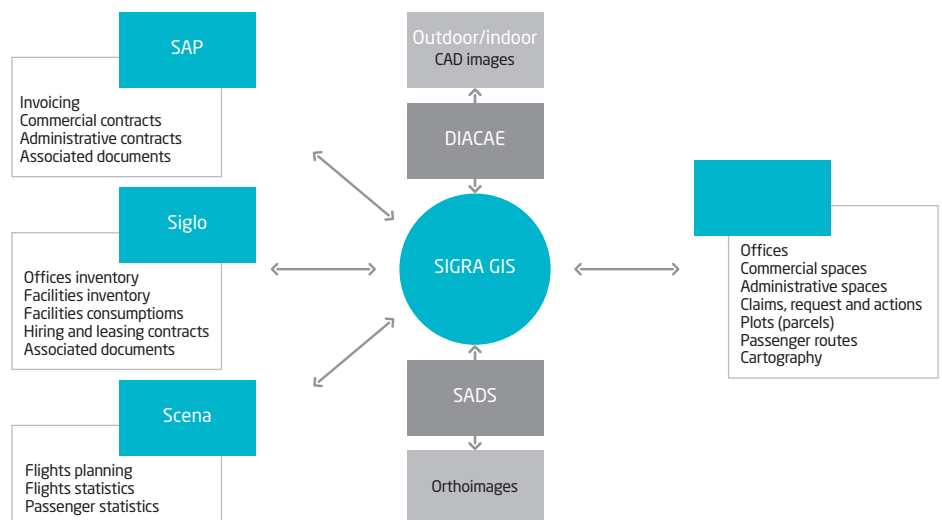
Commercial and advertising management module

The first one is concerned with the business premises management and operation as well as with the different administrative and commercial spaces of the airport, carrying out the management of commercial and administrative concessions placed in each area and premises. It queries the billing data and other data associated with the concessions stored in other systems such as SAP. Passenger routes can be created and commercial spaces can be associated to different routes.

The second one shows the airport hard support devices with their associated advertising contracts. There are conventional and non conventional hard devices, advertising circuits and advertising groups, accessing to their contracts.

This module, as well as all the following ones, includes the support for heavy client applications, web light clients and PDA applications to achieve queries, editions and administration of assets graphic data and their associated alphanumeric attributes.

Typical administrative environment



More SIGRA modules

Patrimony and fixed assets module

It supports the premises and the permanent assets management and operation corresponding to the ownership inventory. It comprises indoor assets and outdoor assets as well, querying the patrimony data and other data associated with the firm assets inventory stored in other systems such as SAP.

Handling management module

It is in charge of managing and operating the equipments and services of passenger attendance, baggage flow and control, and aircraft ground support (passenger routes and the monitoring of possible obstacles disturbing the passenger routes, equipments and routes of reduced mobility, information points, information panels and information screens, fire extinguishers...).

Engineering and maintenance module

This module is in charge of managing and operating the technical equipments of engineering and their maintenance. It carries out the graphical management and location monitoring of engineering equipments and utilities networks. Additionally it connects with maintenance information systems such as MAXIMO and CRM system. Therefore it helps to site and locate incidences, breakdowns and faults, maintenance inspections and work orders.

It includes the definition of the airport zones performing maintenance of infrastructures and civil works, being queried the current and historic news and events of any work.

Airport operations module

It is in charge of managing and operating the follow-me vehicles which guide the aircrafts in landing, take off and parking operations.

A second task of this module is the management of exploitable areas in the airport airside and their interrelation with the companies on duties in air operations and aircraft service assistances.

The third and last task is to map the fire extinguishes services as well as the graphic management of personnel and passengers evacuation planning and evacuation routes along with the alarm utilities to handle these events.

Environment management module

It is in charge of managing and operating the environmental information related with the acoustic impact and noise pollution, the quality air and air pollution, the wastewater pollution and its monitoring, the control of dangerous and hazardous materials and the monitoring and protection of fauna and vegetation inside and around the airport.

This module will create, modify and erase the position and technical data of measuring and monitoring devices which conform the airport environmental systems.

Airport Security Module

It supports the managing and operating of the GIS objects corresponding to equipments of the security support devices as well as the vigilance video cameras, locating on maps and floor buildings events and incidences happening in the airport in coordination with the events and incidences airport management system.

It can associate incidents spatially and, if needed, to establish and launch alarms, reviewing which are active, querying and notifying them to the emergency and maintenance services.

Geospatial AIS module

This module manages and operates the geographic information existing in the AIS (Aeronautical Information System) for each airport, being capable to spatially access to any AIS equipments sited at the airside spaces of the airport, querying their technical data.

It can also query the AIP airport technical data, select, view and query airport supplements and the aeronautical airport charts in PDF format.





ISO 9001:2000



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V.1-02-2009