



Brainware company



Company description

Defence domain

Company Description


intecs s.p.a. is a private, Small Medium Enterprise company operating in the Information Technology field since 1974.

intecs operates at the forefront of the software market, where innovation, complexity and quality aspects are essential to determine the company success. It provides the major national and international organizations with consultancy services on high-tech systems, as well as prototype, product and "turn-key" software systems developments.

intecs has about 210 employees located in Rome, Naples, Pisa and Toulouse. More than 80% employees have a university degree, either in Computer Science, Engineering or other scientific disciplines.

In December 1994 **intecs** has been **ISO 9001** certified by DNV. This places **intecs** among the first software Companies certified in Italy. In 2003 **intecs** also passed the formal certification audit for **VISIO 2000**. The certification is renewed every year and applies for any software development project in the Civilian, Space, and Defence domains.



In 2005 the **intecs** division in Naples (as part of A.S.S.O.) has been assessed at **level 3** of the **Capability Maturity Model** by the Software  Carnegie Mellon Software Engineering Institute.

Technological Expertise

Given the complexity of nowadays software systems, their development is a true challenge. This complexity is due not only to their functionality but more and more to their dependability and quality requirements. **intecs** can truly claim to have won such challenge through the application of sound **Software Engineering practices** as well as rigorous **Process development models**, coupled to the specific expertise acquired during over 30 years of activity.

In the following a general overview of the major expertise is presented.

Real-Time Embedded Systems

The analysis, design and development of Real-Time software represent a class of systems where **intecs** has gained a remarkable experience, acquired since its first years of activity on several application domains. The complexity of these systems is given by the performance constraints that they have to respect. To this end **intecs** has defined specific methods, and has developed supporting tools, for the design of (Hard-)Real-Time software systems.

A peculiar difficulty of these systems is also the complexity

of their verification process. This is carried out by **intecs** in specialized software laboratories with well established methodologies and techniques, which include the use of simulators and/or specialised software tools.

Command and Control Systems

intecs has participated to the development of several Command and Control (C²) systems, of different nature and for different applications domains.

C² systems are particularly challenging because they have to process, according to complex functional requirements, large amount of data usually coming from multiple sources and deliver them to multiple destinations. C² systems are usually composed by (or coupled with) major sub-systems like Human Computer Interfaces, Data Base management Systems and Graphical Information Systems.

In general the development of C² systems makes use of state-of-the-art technology, on which **intecs** has a consolidated reputation and experience. Such technology includes object-oriented methods and languages as well as standard components, available as COTS or Open Source software.

Human Computer Interfaces

The same trend observed during the years on the increasing complexity of data processing systems applies also to Human Computer Interfaces (HCI), that shall handle larger and larger number of data types and data items within precise time periods. In addition HCIs have usually to provide flexible means in order to easily configure their layout according to comply to ergonomic constraints. However the increasing complexity of HCIs is balanced by the availability of an impressive number of new tools, libraries and framework, often as Open Source software, that allow the developer to concentrate on the actual structure and semantics of the interface elements rather than on the implementation details.

intecs has followed, along the years, the technological progress of HCI means and facilities, always mastering the available tools and providing quality-standard solutions according to the specific needs of the various applications.

Check-out Systems

The term "Check-out systems" refers to a wide class of apparatus that generally provide dedicated facilities for the verification of electronic and electromechanical equipments. **intecs** has developed several Check-out systems targeted to radar electronic components, to inertial navigation modules, or laser instruments.

The software of these systems is centred around, and has been developed through, the LabVIEW toolkit by National Instrument and allows to verify the correct behaviour of the target equipment by setting and acquiring analog and digital signals through specific I/O boards.

Software Verification & Validation

The long and consolidated experience acquired in the development of complex software systems allows *intecs* to offer specialised services for the Verification & Validation of software applications where dependability is of the outmost importance.

As part of V&V activities an important role is played by Hazard Analysis, which aims at the anticipated identification of possible hazard that can lead the system to have an unsafe behaviour. *intecs* has applied various Hazard Analysis techniques on critical components of several systems for different applications domain, including avionics and railway systems. Among the others, techniques that have been widely used are Fault Tree Analysis (FTA) and Failure Mode Effect and Criticality Analysis (FMECA).

Domain Experiences

The business area of *intecs* is centred on the Information Technology applied to the Transport, Space and Defence domains.

Among them, with about 40% of annual turnover, the Defence domain has always had a central role in *intecs* business.

In this domain *intecs* has participated to the development of a large number of applications for different Programmes, generally as sub-contractor of large electronic Industries. A brief summary of relevant experiences is included hereafter.

Naval Systems

intecs has been working on several software components of the Combat Management System (CMS) for various Italian and International Naval Programmes, like "Horizon", "NUM" and "Baynunah".

Central function of a CMS is to process the radar track data, make the track identification and threat evaluation and prepare the engage plans, coordinating the missile firing and flying phases. Among the others, *intecs* has been involved in the development of some of the



most critical components of a CMS, like the "Sensor Data Processor", implementing Multi-Radar Tracking functions, and the "Human Computer Interface", providing user interaction facilities.

Terrestrial Systems

During the years *intecs* has participated to the development of the various terrestrial systems (e.g. CATRIN, SAGAT and others), among which it is worth to mention the most recent ones, like the International Programme CAESAR or the Italian Inter-Forces Programme C2I-Difesa.



Objective of these systems is the territorial surveillance in order to achieve the awareness of the operative scenario. They are generally composed by networks of sensors and ground stations for the determination and forecast of objects' positions and movements.

Missile Systems

Mission of these systems is the definition of the air tactical diagram using the data sent from sensors and external environments, in order to define the best defence plan.



intecs has been especially involved in the design and development of the Human Computer Interface, in the GIS functionalities and in the development of the signals drivers and synchronization clock.

intecs has also experience in the development of the external interface simulator connected to the missiles control.

Avionics Systems

intecs experiences on avionics systems is related to the participation to several Italian and European Programmes, including among the others the EFA and TORNADO aircrafts and the NH-90 helicopter.



intecs involvement in these Programmes has been on various tasks, including the design, development and testing of software components, to Software Hazard Analysis, to Independent Validation & Verification, to Software Quality Assurance tasks.

Air Traffic Control

Air Traffic Control (ATC) systems are dedicated to the supervision and coordination of airplane flights and airport traffic. **intecs** has taken part to the design and development of various parts of ATC systems, in particular the Controller Working Position (CWP), that provides the interface toward the flight control operators, and the Flight Data Processing (FDP) system, which manages, archives and control flight information. Other parts developed by **intecs** include the Flight Statistics and Billing sub-system, dedicated to the acquisition of flight data from the FDP system and to the statistical and billing accounting.



Vessel Traffic Systems

Vessel Traffic Systems (VTS) are aimed at the control of maritime traffic and emergencies on sea.



intecs has participated to the development of several subsystems and components, including the Human Computer Interface, the user configuration and management functions and the real-time monitoring of status of the

various equipment over Local or Geographical Area Networks in order to prevent faults, evaluate the optimal operation conditions and support maintenance activities.

Products

intecs' offer includes the following products:

- ◆ **UML-HRT**, a CASE tool, supporting the HRT-UML method for the modelling of Hard-Real-Time software applications according to the UML notation. It also includes capabilities allowing to embed in a UML model dependability characteristics and properties of the system that can be formally evaluated and checked.
- ◆ **MICROSEK**, a Real-Time Operating System compliant to the automotive OSEK-VDX standard and suitable for the development of embedded real-time applications. MICROSEK is also certifiable against the most severe safety critical software international standards.
- ◆ **SOFT-REC**, a GPS/EGNOS positioning receiver using the Software Define Radio paradigm.

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Products

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