

1 Publishable summary

1.1 Objectives

The overall objectives of ATOM project are to contribute to improve the security in the airport area and, thus, on board of departing aircrafts by:

- detecting and identifying, without interfering neither with the normal passengers flows, nor with the normal airport operations, the presence of hazardous materials or tools, concealed (under clothes or inside bags) by ill-intentioned people circulating inside airports and that could deliver attacks;
- Tracking the movements of those threatening people concealing those forbidden items, so that they can easily be localized by security operators.

The project intends to study, design and develop a functional prototype of an innovative multi-sensor based system integrating active and passive radar sensors, able to survey wide airport areas without requiring the passengers cooperation by detecting hazardous materials/tools and tracking threatening people or containers; the system will increase the security level not only in the gate area (behind metal detector), but also at preliminary stage, starting from the airport arriving/departures halls. The approach to be followed foresees two separate and integrated controls:

- 1) One at the terminal access (between sliding or revolving doors, etc.) equipped with innovative active devices, not interfering with passengers transit and able to detect and identify dangerous tools (guns, knives, non-metallic weapon, explosives, etc.) concealed under clothes or inside bags, without requiring passengers to remove their clothes or to empty out their bags;
- 2) The other in the airport hall before the gate area equipped with new passive/active RF sensors not interfering with passengers transit and able to track suspicious people/containers.

The integrated controls information will be managed in a secure way within the airport information networks allowing security operators to face threats in the most suitable way, minimizing the risk to the other people inside the terminal area.

1.2 Fields of actions

ATOM project intend to study and design a new innovative security system for detection and tracking of dangerous materials inside the airport area. Even if the ATOM system was born with this main field of actions, however, it is sensible to suppose that, once the system has been designed and developed, it could be easily exploited in other contexts. An example of typical infrastructures could be involved are in the following:

- Railway stations
- Ferries and vessels
- Underground stations
- Access to the Stadium

ATOM project falls into the following fields of action that can be also exploits in the future in the areas mentioned above:

- Industrial activities related to ATC / ATM
- Airport security controls

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- Network and communication issues and data distribution
 - Data management
 - Active and passive radar networks
 - Tracking algorithms for people localization

1.3 As of today work and results

At the current the ATOM project is in the middle of its foreseen flow. Most of work-packages are already started (all except WP9: test-bed study).

The WP2 has been closed at the end of January 2010. The ATOM architecture has been defined and the deliverable D2.1 is available to the consortium member on the web intranet. Starting from this document, all technical WPs are in progress with some early results already available and shown to partners during the periodic meetings. The detection and tracking sensors are under studying and the first simulations for data fusion and data management have been run. Also the WP regarding the ATOM network is ongoing. The deliverable D8.1 about analysis of requirements for data exchange and management will be submitted within the middle of February with some studies on Network requirements and traffic load.

Regarding the non-technical WPs, large attention was given to the ethical issues. The work started with the definition of the guidelines for ATOM consortium and are continuing with the creation of a check list by some ethical experts. This check list will be compiled by all the WP leaders in order to verifying the compliance with the different ethical aspects (health, data management and privacy issues).

Regarding the dissemination and exploitation activity, due to the current situation and attention of media on airport checkpoints issues, ATOM partners decided to disclose only technical information at the moment. However the most relevant activities in this period were the definition of the user group and the upgrading of the web-site with the creation of the user-group workspace and the on-line questionnaire. For the next period it is planned to do the following activities for the project dissemination:

- The production of an article or paper to be published in journals, magazines or international conferences, seminars and trade shows relevant for the sector;
- The upgrading of the “public” interface of the ATOM Web Site to show the first results on the project’s activities to interested parties;
- the organization of a workshop towards possible ATOM users (User Group and Wider Audience), and to the scientific community (End of project)

1.4 Expected impact

ATOM project is expected to provide a new and innovative security system to detect and track dangerous materials inside airports. This is achievable thanks to the different sub-systems that work in different way with different characteristics and performance. An appropriate data fusion and management sub-system allows to better manage all information that become available from the sensors and help the security operators to take an appropriate decision of intervention in case of alarm. A list of the main impacts to which ATOM project is likely to contribute is in the following:

- 1) Preventing hostile action of any kind to incur injury, loss, damage or disruption to travellers or citizens due to the effects of aircraft misuse.
- 2) Ensuring enhanced security in air transport
- 3) Eliminating hazards of hostile actions in the air transport system in the following ways:

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- By allowing both the detection of hidden hazardous materials/tools and the tracking of suspicious people (i.e. people hiding hazardous materials/tools under their clothes or somewhere else), ATOM system will allow the security officers of the airports to isolate ill-intentioned people, preventing them from accessing aircrafts and committing an illegal acts (e.g. hijack or other kinds of assault) that may procure damage either to the travellers or to the citizens (as it happened on 11 Sept. 2001). This will, of course, enhance security in air transport.
 - Due to enhanced and wide detection and tracking capabilities of ATOM system, ill-intentioned people would be strongly deterred from trying to bring hazardous materials/tools inside the aircrafts with the scope of committing illegal acts.
- 4) Focusing on the security aspects of airport operations. Due to its intrinsic characteristics, ATOM system will be complementary to other security systems already in-use in airports. This will certainly increase the reliability and effectiveness of the current screening processes, which have often revealed failures. Besides, being able to monitor not only the sterile area, but also the almost “public” terminal, ATOM system will contribute to enhance the overall security of the operations performed inside the airports.
- 5) Application of a wide range of concepts, innovative solutions and technologies able to improve security aspects in airports. ATOM project will exploit several solutions and technologies for implementing the airport-oriented security system: imaging sensors based on equipments at W or terahertz frequency and/or in the 15-50GHZ frequency range; passive tracking sensors, multistatic sensors for active tracking.
- 6) Securing and further developing the competitiveness attained by the European industries in the global market. Aviation security expenditures have always been quite high, but they have been further increased after 11 September 2001. According to a study¹ aimed at analysing aviation security expenditure, funding mechanisms and associated competition issues (and which covered 15 Member States plus Norway, Iceland and Switzerland), the total security-related expenditure in 2002 was between 2.5 and 3.6 billion euros (borne for about the 25% by the states, for the 53% by the airports and for the remaining 22% by air carriers).
- ATOM project will offer the Large to Small and Medium EU industries belonging to the consortium the chance for successfully establishing in this wide market, by further developing their expertise (through research and innovation), thus taking one more step in the direction of:
- reducing the current European dependence on USA industry and technology, in the security sector;
 - increasing the competitiveness of EU industry in security-related technologies/applications; in fact, the successful conclusion of the ATOM project can bring to the industrial participants first of all an increased productivity and, consequently, an increased turnover deriving both from national and from international market.
- 7) ATOM project also comply with the need (set out in Document 30 of the ECAC European Civil Aviation Conference) of ensuring civil aviation security by virtue of:
- control of access to sensitive areas of airports and aircraft;
 - control of passengers and their hand luggage;
 - control and monitoring of hold luggage.
- 8) The results of ATOM project also significantly contribute to some general priorities/objectives of the EU policy, such as:
- guarantee the security of European citizens by preventing acts of unlawful interference;
 - enable all Europeans to continue to have confidence in EU skies and airports.

¹ Study No: TREN / F3 / 51-2002 “STUDY ON CIVIL AVIATION SECURITY FINANCING”

1.5 The project web-site

For the ATOM web-site, it is possible to distinguish between a “Public Site” and a reserved site, or “Project Intranet”. However they are build both above the same software platform called “Plone”, so as to be able to share some contents and other resources between them.

What distinguish the “Public Site” and “Project Intranet” is:

- The site addresses
- The access policies we apply (wich users can do what ?); the Plone platform is very effective and reliable in defining and enforcing said policies;
- The communication protocols.

The address of the public site is: <http://atom-project.ue>

The base address of the project intranet is: <https://atom-project.net/intranet>

In particular, the ATOM Project Intranet is compose by, a number of sections/sub-areas reserved to well-identified groups of site members. These sub-areas include:

- 1) Project Repository: reserved to the Management Committee plus the Technical Committee, unless a different choice will be approved.
- 2) Area reserved to the Management Committee
- 3) Area reserved to the Technical Committee
- 4) Area reserved to members of the Users Group
- 5) Areas reserved to members of individual Workgroups, possibly corresponding to people working in the corresponding ATOM Workpackages.

Each reserved area consist in a plain “Plone Folder” that, like a directory in a file-system, can be:

- Used as a repository, to share documents (files)
- Further organized in sub-folders.

Inside each specific reserved area the site manager is able to install, on request, one or more instances of collaboration tools, for example “Discussion boards” supporting a “threaded” discussion among the group members, and other communication.

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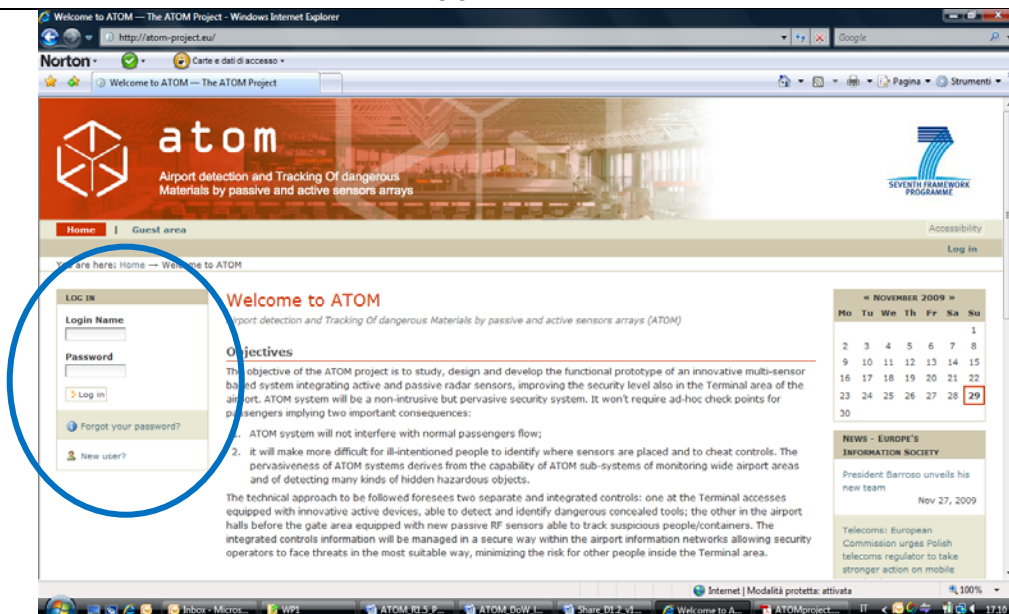


Figure 1 – ATOM project website and access to the Intranet

1.6 Contacts



Project Coordinator: Roberta Cardinali rcardinali@sesm.it
Coordinator Assistant: Enrico Anniballi, eanniballi@sesm.it
Technical support : Francesco Sardaro, fsardaro@sesm.it



INFOCOM	LOMBARDO Pierfrancesco	lombardo@infocom.uniroma1.it
TNL	VAN DER LAAN Ronald Alexander	ronald.vanderlaan@nl.thalesgroup.com
HAI	VANGELATOS Charalampos	vangelatos.charalampos@haicorp.com
FRAUNHOFER	SCHULTE Christoph	christoph.schulte@zv.fraunhofer.de
TUD	LEKBIR Horia	h.lekbir@tudelft.nl
SLOT	GURALY Roland	rolandguraly@slotconsulting.hu
AYCO	MOURE Miguel	mmoure@ayco.net
LINK	TOFFOLI Giovanni	toffoli@uni.net
TMURES	BACEANU Toni	tmcservices@rdslink.ro
SCHIPHOL	JERKOVIC Miro	jerkovic_m@schiphol.nl

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