# SYSTRAN
The leading supplier of translation software

SYSTRAN Solution: Intranet Translation Services

EADS is a global leader in aerospace, defence and related services. The Group includes the aircraft manufacturer Airbus, Eurocopter, the world's largest helicopter supplier, EADS Astrium, the European leader in space programmes from Ariane to Galileo and MBDA, the international leader in missile systems. EADS largely deployed SYSTRAN on its Intranet. MBDA ensures the continuous enrichment of the translation tool.

"The dictionary coding at the heart of machine translation removes ambiguities so at MBDA, we load a number of noun phrases and verb phrases into SYSTRAN to maximize the coverage rate and enhance translation quality. The higher quantity of expressions contained in the user dictionaries leads to improved translations. The various terms and phrases are initially created by MBDA and then transferred to the SYSTRAN Translation Server on the EADS portal, which is accessible by all EADS users. Even basic machine translations are now of a good quality, meaning the number of requests for expensive human translation services have been reduced. Users are increasingly going to the self-service portal."

Michael Hoff and Eliane Grosheny-Langlois,
Translation Department, MBDA
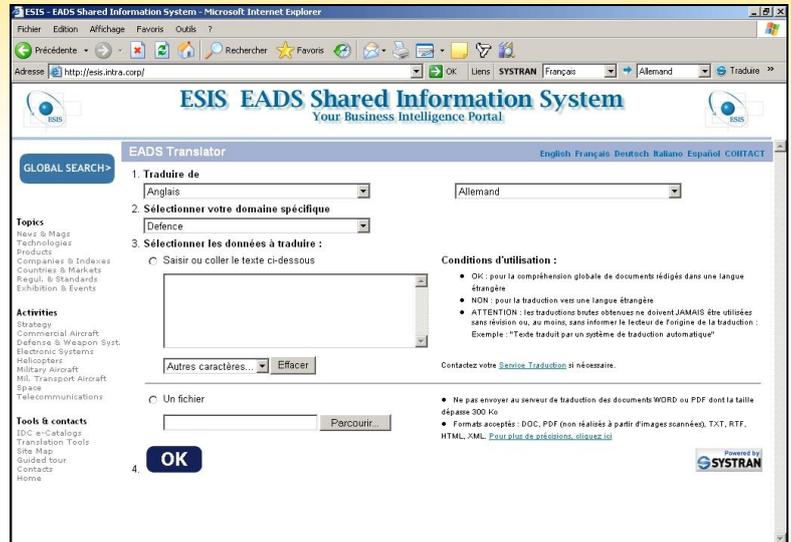
EADS Translator is available on the Intranet and offers 6 EADS-specific domains for enhancing translation quality.

Challenges

- Improve communication and knowledge share between EADS sites located in the UK, France, Spain, Italy and Germany.
- Cover all languages spoken within the organisations, including English, French and German at first, then Italian and Spanish as a second phase.
- Reduce requests for human translation, and associated costs.
- Assist organisational changes and enable employees to work in a multilingual environment.

Solutions

- **SYSTRAN Enterprise Server** installed within the firewall provides a translation service inside the EADS portal.
- **MBDA Translation Department** builds large dictionaries in defence, aerospace, engineering, management and legal from translation samples and by using terminology extraction tools.
- **MBDA Translation Department** offers machine translations combined with a quick post-edition as a free-of-charge service which provides enhanced translations against in-house requests.

Results

- **High level translation quality** with an out-of-the box EADS translator obtained from customised dictionaries.
- **Strong, and increasing, use of translation requests inside the EADS ESIS portal - with more than 30,000 translations per day.**
- **Direct cost savings of 30% of the yearly budget on human translation services at MBDA; combined with advantages of a close-to-real-time service.**

A few minutes with the MBDA Translation Department…

With an integrated framework covering France, the UK, Italy and Germany, MBDA is ideally positioned to offer tailored defence systems that address the requirements of its defence and domestic customers in Europe. Now, with employees working across all these countries, MBDA is facing an increased need to knowledge-share. Tools are required to enhance collaboration between entities and to reduce language barriers between the employee base.

MBDA must handle effectively a high level of translation requests from engineering, management, product development, quality and legal departments so started to look for, and assess, machine translation solutions as an innovative initiative under the sponsorship of the EADS Group.

The project originally started in 1999 with MBDA acting as the project leader and main provider of terminology for customisation. EADS then performed a direct comparison between two language translation technologies. At that time, SYSTRAN - available in version 3 – boasted the higher level of translation quality and was therefore the solution that was chosen.

The basic idea was to create an overall translation service shared by all entities within the EADS Group. Three language pairs were selected: French-English, German-English and German-French.

During 2000 and 2001, the project team spent most of its time collecting various terms from many different entities. MBDA played a central role in gathering all vocabularies, restructuring them and loading them into the machine translation system.

EADS and MBDA then undertook a major campaign to adapt the terminologies to suit the other translation software which was then in use. "It was painful because using the other translation software meant we had to manually code all inflections of each term."

At that time, the machine translation service was then made available to end users through a single page on the EADS Intranet. The service became popular very quickly, so in 2001, costs of terminology integration started to become more and more important.

At that time, Michael Hoff produced an average of 120 entries per day, integrating them into the dictionaries of the translation software then in use. To increase the integration flow, EADS/MBDA started to subcontract additional professional services but the model was not scalable and became expensive as the requirement was to integrate more terms and expressions into the system.

During 2003, pushed by EADS growth and the integration of entities, the company wanted to extend the system and add Italian. At the same time, SYSTRAN released its new version product which featured Italian language pairs with both English and French.

Following a re-assessment of SYSTRAN, the company then decided to implement SYSTRAN as the preferred EADS Translation Server solution.

According to Michael Hoff "The IntuitiveCoding technology enabled a large increase in productivity. At the end of 2003, we had a backlog of around 100,000 terms to be coded. With the old translation software, this task was impossible to complete. With SYSTRAN and its Dictionary Manager functionality, we loaded the data within a few weeks."

Compelling business reasons to use machine translations are low costs and quick results. Often, users have time constraints and need to translate a large volume of text quickly: such as operational documents, design specifications, engineering documents, quality plans, meeting minutes, good manufacturing practices, management documents, etc.

In early 2004, the MBDA Translation Department (at that time part of the Quality Directorate) decided to begin work on French-English machine translation on a wide scale through bulk integration of the terminology along with the corresponding validation work in corpus documents. At this time, the EADS level of activity was at approximately 30,000 translations per day.

On the EADS translation server, English to French is the most popular language pair (31%), followed by English to German (22%) then French to English (19%) and German to English (14%).

Along with the EADS translation service portal page, an email-based user comment service was also developed. This service saw a further increase in quality using a dialogue method across the users - taking their remarks into account and thus providing the human element of the process. The MBDA Translation Department also then noticed that comments subsequently started to decrease, whilst the number of users and translation requests increased.

In addition to this successful translation service portal initiative, MBDA was also working to reduce the costs of human translations.

The MBDA Translation Department completed more than 10,000 translation requests in 10 years with its classic human-based professional translation service. To address these translation demands, MBDA had defined an intermediate state which was called "enhanced machine translation". It offered to quickly post-edit the output of SYSTRAN translation and produce a translation quality that was close to professional translation.

The mission of the MBDA Translation Department now is to provide all kind of translations - offering three classes: classic-professional translations done by humans, machine translations performed using computer technologies, and enhanced machine translations performed by machine translation software with minimal human post-editing.

"The three types of translations fit perfectly with all the translation needs that we are faced with inside our organisation," Hoff added. "Around 1,000 human translation requests were addressed to the department last year, 20% of which were processed using the new enhanced workflow which reduces the overall demand for expensive human interactions. Between 2004 and 2007, we saved around 30% of our yearly budget, thanks to the new service.

The SYSTRAN system was customised with large EADS and MBDA dictionaries to offer the capability of producing a translation that was up to 90% complete. Revisions then only took a few minutes per page.

Quality output is mainly dependant on the effectiveness of the user dictionaries," Hoff concluded.

An ideal machine translation solution would feature complete disambiguation of all ambiguous categories (semantic and context) in the source document.

To obtain the quality approach, the translation solution creates dictionaries that contain as many noun collocations, multi-purpose expressions and verb phrases as possible.

"The dictionary coding at the heart of the translation machine removes ambiguities so at MBDA, we load a number of noun phrases and verb phrases into SYSTRAN to enhance translation quality. The higher quantity of expressions contained in the user dictionaries leads to improved translations."

SYSTRAN offered a key advantage against the previous translation software - IntuitiveCoding technology. SYSTRAN automatically codes all inflections for a given term and, in addition, offers a very powerful coding technique that enables context-specific translations of the terms used.

MBDA is now using specific tools to automatically extract the expression candidates from the texts. Then decides whether to code them or not within the dictionaries.

Thanks to the SYSTRAN dictionary prioritisation sequence - which is formed by subsequent layers of dictionaries - the most recent term additions are used before older terms. Effectively, the system evolves to produce increased quality translations.

The architecture is also error tolerant as errors can be corrected in the uppermost dictionary without requiring corrections in the lower layers. It also reduces the workload for ensuring the system remains operational.

At present, SYSTRAN handles more than 300,000 terms within the user dictionaries which are organised in six user domains: Aerospace, Defence, Information Technology, Legal & Business and Optronics. These customised resources are then periodically transferred to EADS to also enhance the translation services on the Intranet portal.

With a highly customised translation system, EADS portal users can now easily select from a list the right user domain, and then enter the text or upload a document for translation. Supported formats are DOC, PDF, TXT, RTF and HTML.

Usage rate is also growing, demonstrating that it is a useful business tool that can empower companies to reduce language barriers throughout their organisations.

Typical impact density of EADS / MBDA user dictionary terms in a machine translation (without any manual post-editing)

Communiqué de Presse MBDA (mai 2007)
ASTER

De l'autoprotection à la défense anti-missiles balistiques

Le programme Aster est le fruit des analyses opérationnelles et techniques menées par la France et confortées par les études de l'OTAN, puis de la coopération étroite et volontariste de la France, l'Italie et le Royaume-Uni, pour se doter d'une famille de systèmes anti-aérien et anti-missile terrestre et naval. Ainsi, six armées de trois pays européens financent le développement de variantes navales (Aster 15 et Aster 30) et terrestre (Aster 30) de moyenne portée. Au plan industriel, Aster est aussi un programme structurant de l'industrie européenne de défense avec plus de 1700 missiles déjà commandés.

Les systèmes à base d'Aster bénéficient de la technologie la plus aboutie pour traiter les différentes menaces et notamment la menace balistique de courte portée. Anti-missile de conception, les choix technologiques lui confèrent une très grande manœuvrabilité et une très grande agilité ce qui lui permet d'intercepter dans la majorité des cas par impact direct des cibles avec des vitesses de rapprochement de l'ordre de 4000 km/heure.

La manœuvrabilité d'un vecteur étant inversement proportionnelle à son poids, Aster est donc aussi petit et léger que possible. La conséquence directe a été d'aboutir à une dichotomie entre le volume d'interception, dépendant de la propulsion principale et l'efficacité à l'intérieur de ce volume. L'Aster est donc placé dans son domaine d'interception par un accélérateur largable, dimensionné en fonction des besoins opérationnels. Pour satisfaire à l'exigence de couverture sur 360° dans une fenêtre de tir réduite et avec des portées d'interception courtes, le lancement de l'Aster est vertical et les tuyères de son accélérateur sont flexibles. Elles sont dérivées des technologies spatiales (Ariane).

Le choix d'un pilotage aérodynamique fort conjugué à un pilotage pyrotechnique additionnel appliqué au centre de gravité du missile intercepteur compensant le temps de réponse du pilotage aérodynamique a permis de concevoir un vecteur à l'agilité et à la manœuvrabilité inégalées dans tout son domaine d'action et ce principalement à haute altitude, ce qui le distingue nettement de ses concurrents.

MBDA press release (may 2007)
ASTER

From self-protection to anti-ballistic missile defence

The Aster programme is the fruit of the operational and technical analyses carried out by France and consolidated by the NATO studies, then of the close and voluntarist co-operation of France, Italy and the United Kingdom, to procure of a family of ground-based and naval anti-aircraft and anti-missile systems. Thus, six armies of three European countries finance the development of naval variants (Aster 15 and Aster 30) and land (Aster 30) medium-range. At industry level, Aster is also a structuring programme of the European defence industry with more than 1700 missiles already ordered.

The Aster-based systems profit from the cutting-edge technology to treat the various threats and in particular the short-range ballistic threat. Anti-missile by design, the technological choices confer a very great manoeuvrability and very an high agility to him what enables him to intercept in most cases by direct hit of the targets with closing velocities of about 4000 km/h.

The manoeuvrability of a vector being inversely proportionate with its weight, Aster is thus as small and light as possible. The direct consequence was to lead to a dichotomy between the interception envelope, depend on the main propulsion and the effectiveness inside this volume. The Aster is thus placed in its interception envelope by a jettisonable booster, dimensioned according to the operational requirements. To meet the requirement of 360° coverage in a reduced firing window and with short interception ranges, the launch of the Aster is vertical and the nozzles of its booster are flexible. They are derived from space technologies (ARIANE).

The choice of a strong aerodynamic flight control combined to an additional pyrotechnical flight control applied to the centre-of-gravity of the intercepting missile compensating for the response time of the aerodynamic flight control made it possible to design a vector with the agility and the manoeuvrability unequalled in all its operation area and this mainly at high altitude, which clearly distinguishes it from its competitors.

MBDA and EADS dictionaries offer extensive coverage on any corporate text or document. As a consequence, SYSTRAN out-of-the-box translations are always of a high quality and require minimal, or no, revisions.