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## **PARTICULARITIES OF ADVANCED DISTRIBUTED LEARNING SYSTEM IN “CAROL I” NATIONAL DEFENCE UNIVERSITY**

*Moto: Live like you die tomorrow. Learn as if you live forever  
(Gandhi)*

### **I. Overview**

The Advanced Distributed Learning, as well as the initial INTERNET, appeared as an initiative of the military system, destined to put to good use the information and simulation advantages in carrying out education and training. At present, for various military or civilian organizations, the advanced distributed learning has various meanings and is implemented in various ways. There is one common fundamental requirement however, that it must accomplish training and support competitiveness anytime and anywhere it is necessary: classrooms, military compounds or even on the battlefield. The idea brought forward by the ADL concept is that education is associated with the creation of a new type of learning, that attracts and motivates the subject to whom this type of learning is destined. At the same time, the students are interested in this type of education because they can learn anytime, anywhere; they can enjoy the benefits of education right where they are and when there is the need. Travelling costs are no longer needed and the students can better manage their time between work and study. They can study whatever they wish to know. They can jump to or select the best part, they can repeat as many times as they need or wish. This self taught way of learning is very efficient. Realistic simulations can be created. Many online students prefer to review or re-do exercises “without anyone keeping the score”. Departing from the pressing need for knowledge and access to information, more and more organizations offer training services using alternatives to traditional methods or combinations with these, thus meeting the requirements of society and facilitating at the same time the access to education. The advanced distributed learning is destined both to the individual use of the students, course members or

soldiers and those who elaborate decisions, and to the collective use of groups of individuals such as teams, crews or staffs. The internet is preferred as a way to disseminate information, due to its reach, easy access, being also the cheapest and most flexible alternative. Due to security issues, it was preferred that all materials be non-classified, as the best solution available.

Taking in consideration all these aspects, seven years ago, National Defence University “Carol I” decided to develop a new dimension of its university education capabilities based on this new concept.

### **II. Stages for Developing the ADL System in Romanian National Defence University**

#### **2.1. The Beginnings**

In the autumn of 2004, the senate of the “Carol I” National Defense University decided to investigate the possibility of adding e-Learning technology to its educational capabilities and services. As a particularity it is necessary to be mentioned that all this system was started as a simple idea belonging to a small group of enthusiastic for applying the latest technologies of communications and informatics inside the military education system. It was a period of searching and testing. There were no models or rules to follow that and sometimes everything built up from scratch. Around this small group was built a team consisting in teachers, IT specialists and researchers. With their contributions was realized an elearning laboratory developed with no money from our Ministry of National Defense. Everything was based on a scientific research project called “e-Learning Pilot Centre”.

A year later, the Advanced Distributed Learning Department was formed. We started out to create an integrated educational system

that develops and manages effective distance learning curricula in accordance with national educational laws and ADL principles.

### 2.2. System components

When we talk about creating a system we must consider at least the next steps: set a goal, where we want to reach, which are key characteristics that need to meet system, which means are necessary to be able to make that system functional. Normally, the first step in development was to acquire information, knowledge and competencies about e-learning and ADL:

- Fundamental theories about e-learning: distance learning, advanced distributed learning, on-line learning, web based training
- Teaching and learning processes based on information technology, including: instructional design, digital content development, pedagogical aspects, adult education learning
- Technical tools and e-Learning systems: learning management systems, learning content management system, authoring tools in content development, contents standardization, especially SCORM
- Best practices and case studies: virtual campuses for universities, advanced distributed learning in NATO and the PfP Consortium, e-Learning in the military and civilian institutions, private sector experience

As normal, the second step is to establish a plan which must set out clear directions on development, so-called project master plan.

final goal has to be very well defined, realistic and proper with the institution's base mission, in fully accordance with the time length of the project and the internal and external support.

The final goal for the "Carol I" NDU Advanced Distributed Learning System project is "to create the distributed network based education — student oriented in order to develop valuable digital standardization content and deliver knowledge what, where, when and to whom it is necessary".

We started to draw the framework of the ADL system based on our needs and constraints but tracked the general principles and rules of the ADL. Step by step we build-up the technical and educational capabilities and delivered the first on-line course in the spring of 2006.

### 2.3. Technical Capabilities

In parallel with the elearning laboratory realization was created a portal that contain all necessary information to access all our educational services and a virtual library. The portal is designed as a basic component of the system, access of the allowed users to this component being securely. The virtual library was realized as a collection of available resources which are accessed using a single interface.

The next step was to choose an instrument that allows the distribution of educational content and the connection at distance between students and teacher and this instrument is a Learning Management System (LMS). The primary objective of each LMS is to manage learners, keeping track of their progress and performance across all types of training activities.

Thus initially we used in the same time two different Learning Management Systems. First was an open source system called ILIAS, provided for us by International Relation and Security Network and the second one was bought from a Romanian software company. Both systems had been tested and used for a period. Open source solution had prevailed because of the obvious financial advantage but after testing several other LMS. After a period of time, when we gain enough experience in maintenance, management and organization workspace on ILIAS LMS, in order to improve the activity and to have full administration rights we had implement our own platform.

Speaking about technical issue into Advance Distributed Learning System project has to be mentioned: hardware and communications infrastructure, learning (content) management system, in-house developed software and content development authoring tools, content storage and so on.

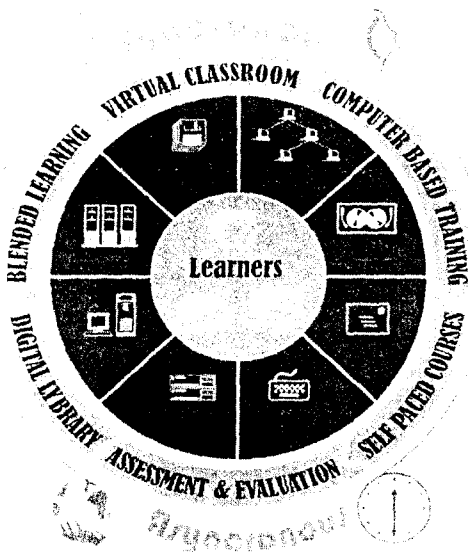


Figure 1. ADL master plan

The final goal of any Advanced Distributed Learning system represents the technical and educational (training) capabilities in order to be able to support the learning processes. The

### 2.4. Educational capabilities

According with the role and mission of Romania NDU in the military and national educa-

tion systems, the area of interest was divided in two different directions called by us e-training and e-education.

E-training follows the military requirements and it is focused on development and provided the short professional and small team tailored courses inside the widely concept Adult Life Long Learning. As a future direction of development, our intention is to create specific domains on our ILIAS platform for schools of applications of military weapons and other military educational institutions where they will develop their own ADL system or will post their own online courses.

E-education is represented by capabilities to organize, deliver and manage the university curricula under the national distance learning specifications and it comprises of educational service support for the distance learning and on-line distance learning university's studies level, master degree and doctoral studies and integrated post graduated courses.

We cannot talk about educational capabilities in reference with an ADL system without remind about the digital content. It is well known that in the digital content development enterprise, there are three pillars: subject matter experts, instructional designers and content developers. Transforming a classical course into digital content can be performed using a variety of knowledge, depending on the degree of complexity and purposes. List of technical knowledge may suggest a large collection

and a huge payroll, but on the contrary, the best solution for committing the purpose of converting the online content can be accomplished with a small team, assisted by specialists.

### 2.5. Human Resources

About ADL system might say that the most important part is the technology but in reality the human component is at least as important. Regarding the human resources management the solution adopted and which we say that is viable is creation and training of two different teams, one specialized in didactical and administration issue and one with computer specialists. In this manner we try to cover all aspects: learning effectiveness, custom content development, research and technical implementation.

Speaking about the people directly involved into this project, have to be stressed two aspects: desire and motivation. Going from those characteristics we succeeded in generating competence through hard work, learning, trials and very important by "stealing" experience from different groups which we joined.

Each of these issues, technical capabilities, educational capabilities and human resources can not be considered separately but in a whole. All parts make up a whole and function of the each component determines the proper functioning of the assembly. From our point of view a simple scheme for developing an Advanced Distributed Learning System is as follows (fig. 2):

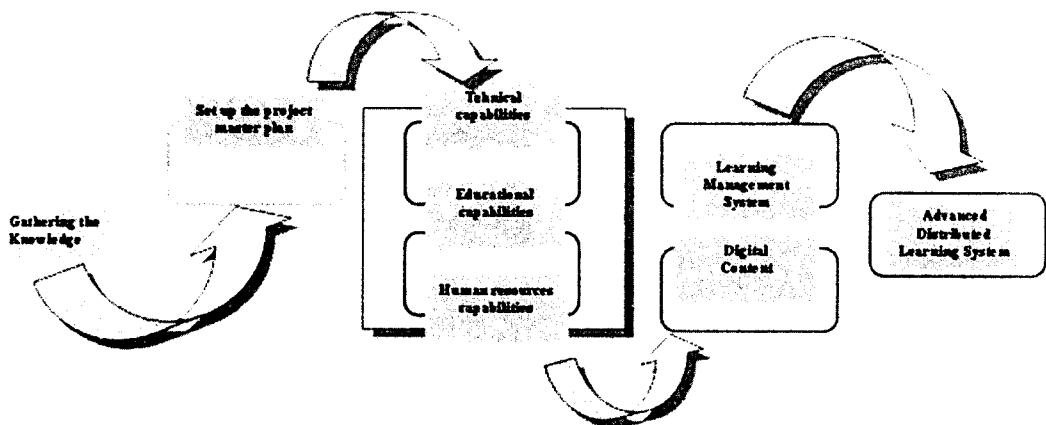


Figure 2. Architecture framework

## III. Capabilities – the Results of This Effort in a Few Data

### 3.1. Present Course Offer

#### Full Online Courses

When conducting full courses, all steps from subscription to final evaluation are carried out online. Currently, the NDU offers five certified online courses and fourteen others that are freely accessible. The course content complies with SCORM standards and can be reused

by the ADL community and in-house developers. Furthermore, all content is shared among the ADL stakeholders of the NATO Training Group. In this way, experience in SCORM development, and subject matter expertise is shared with an effort to expand knowledge and drive down costs.

#### Blended Learning

Three blended courses are offered at NDU. For these courses, about one third of educa-

tional activities are conducted on site and at least two thirds, on-line.

Consequently, the ADL environment has to be able to combine SCORM content courses and other content formats within one single curriculum. Content types include: html, word, excel, power point, PDF, pictures, and video. Due to the complexity of the educational objectives and restrictive content sequencing, this kind of course is harder to manage exclusively online.

**Educational Services Supporting Higher Level Education**

The ADL system should provide a virtual collaborative space between teachers and students. In addition of collaborative tools, it is necessary to offer real-time access to knowledge and content repositories.

In accordance with our development capabilities we can produce a few SCORM courses yearly but it depends on the subjects matter experts.

**3.2. Implication in the Scientific Research Field**

We realized that research activity can give as a lot of opportunity in development and often a source of funds that could otherwise not receive. By the research activity we try to increase the quality of education by newest

The experience gained has enabled us to get involved in the European Security and Defense College project called Internet-based Distance Learning by providing for it a dedicated platform with that entire mean, from implementing, technical support, update, training and also conversion from classical format of content into a SCORM format.

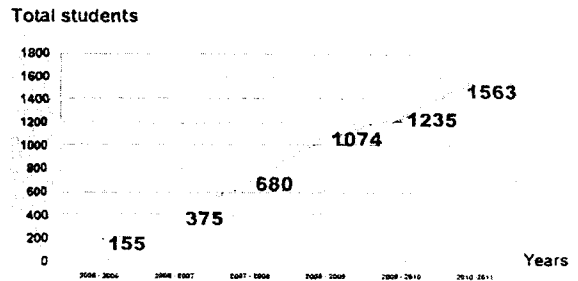


Figure 3. Number of students on ILIAS

e-learning instruments, intuitive and interested content, performance of learning management system and proficiency of didactical tutoring. The involvement in the scientific research is materialized in a few national and international projects in which we have coordinator or partner quality:

National level				International level		
Coordinator		Partner		Partner		
CPEL e-learning Pilot center for development and distribution digital content	MEDSCEN Creating a pilot system for an educational network which uses eLearning technologies and knowledge portal meant to build security awareness for the citizen and community	MOBNET Research on creating an experimental model of a mobile virtual network type learning with real-time access to knowledge and learning, communication technologies and devices using wireless terminal	NANOSTRUCT Complex multifunctional materials with nanometric structure and controlled features for special purpose	MULTITOUCH Optimized educational process in view of the knowledge society skills	MVLE Multinational Virtual Learning Environment	GALA Games and Learning Alliance

Figure 4. Participation in scientific research projects

**IV. Lessons Learned**

Along this development path, the ADL project in Romania benefited from knowledge and support of other institutions. The project would have not been implemented as quickly without support from the ADL community, especially the NATO Training Group IT&ED, ADL Initiative, PfP Consortium ADL WG, NATO ACT and USJFCOM.

From our experience is not an easy job to develop an Advanced Distributed Learning System. But is it challenging. Some of our lessons learned during these years are mention below:

1. It would be useful for implementing such a system to find a model and to apply only the part that is viable for what is intended to be achieved. In this way will be eliminated unnecessary experiments, searches and saves time.
2. Sometimes it is necessary first to demonstrate the utility, benefits of this new education system and in this manner will be created a pressure from the learners to the decision level.
3. Could be easier for the beginning to use a specific domain on a LMS already used based on cooperation with the institutions of NATO or PfP Consortium and only after

- accumulating enough experience to use own LMS.
4. Choosing an LMS have to take into account at least:
    - operating systems;
    - installation and maintenance;
    - realization of connection between students and teachers;
    - students monitoring and tracking learning progress;
    - how to generate tests, exercise and feedback;
    - security solutions;
    - database management.
  5. The content has to be prepared in according with the target group of learners based on the educational objectives.
  6. Deliver the tutoring support. In the online environment the tutors are the interface between the institution and the student. Tutor feedback is an important issue. It is necessary to collect feedback from the participants in order to adapt the training program to the needs of the participants.
  7. Create a motivation for the students — give them recognition of course finalization.
  8. For the beginning, the short useful courses bring the good results.
  9. Through scientific research beyond the specific activities that lead to the

development of the system could be achieved capabilities that usually are more difficult to be realized.

## V. Conclusion

Technology evolves rapidly and in order to keep up it is necessary for the education and training system to adapt rapidly.

The ADL system is far from being perfect and does not intend to replace the traditional systems, but it brings along benefits related to costs, the opportunity to disseminate the content in real time and, wherever it is necessary, the increase of the number of course members without affecting the current assignments of the structures where they come from and ensures interoperability in relation to NATO criteria and requirements.

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У статті розглянутий досвід Національного університету оборони Румунії ім. Кароля I щодо створення, застосування та розвитку системи дистанційного навчання військових фахівців. Наведено послідовність та зміст етапів щодо створення системи дистанційного навчання. Проаналізований накопичений досвід використання дистанційного навчання у практиці підготовки військових фахівців.

*Ключові слова:* дистанційне навчання військових фахівців, система дистанційного навчання, можливості дистанційного навчання, досвід впровадження та використання дистанційного навчання

В статье рассмотрен опыт Национального университета обороны Румынии им. Кароля I по созданию, использованию и развитию системы дистанционного обучения военных специалистов. Преведены последовательность и содержание этапов создания системы дистанционного обучения. Проанализирован накопленный опыт использования дистанционного обучения в практике подготовки военных специалистов

*Ключевые слова:* дистанционное обучение военных специалистов, система дистанционного обучения, возможности дистанционного обучения, опыт внедрения и применения дистанционного обучения.