Challenges of implementing a large-scale elearning and collaboration platform - The Dias Project, Cyprus

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CHALLENGES OF IMPLEMENTING A LARGE-SCALE ELEARNING AND COLLABORATION PLATFORM - THE DIAS PROJECT, CYPRUS

Stefan MORCOV
SIVECO Romania
E-mail: stefan.morcov@siveco.ro

Liliane PINTELON
Catholic University of Leuven
E-mail : *liliane.pintelon@cib.kuleuven.be*

Rob J. KUSTERS
University of Technology Eindhoven
E-mail: r.j.kusters@tm.tue.nl

Abstract: *The Ministry of Education and Culture (MoEC) in Cyprus is focusing on moving towards transferable competencies and computer based learning environments as well as innovative models necessary for the new millennium challenges. The decision makers recognize that significant changes need to occur in several areas, but most of all concerning the use of information technology.*
The main objective of the project is to contribute to the development and modernization of the Cypriot educational system, by introducing and enhancing the use of information technology in the process of teaching/learning in the pre-university education.
The Ministry of Education and Culture aims at encouraging innovative teaching and learning techniques and stimulating creativity among teachers and students, while offering a general framework for development of collaborative projects, allowing the actors enrolled in the educational system to participate in the information society development and the creation of the knowledge economy.
This paper describes the approach that was taken for the implementation of a national eLearning implementation project in Cyprus. The paper describes the logical and physical architectures of the eLearning platforms. The paper analyses the challenges and risks faced by the project and in general by similar national-level projects in education and the main methods for mitigating them. Finally, the paper underlines lessons learnt and the degree of reusability and replicability of the implemented architecture.

Keywords*: eLearning; Education; Complex projects; Project Management*

I. PROJECT DESCRIPTION

The project provided the Ministry of Education and Culture in Cyprus with an integrated learning and collaboration platform, which consists of a Learning Management System (LMS) and a Collaboration Suite, built on, and fully integrated with the Microsoft Learning Gateway technology.

The project had a duration of 2 years. It was implemented between 2006-2008 by a consortium of SIVECO Romania and HSData (Cyprus), with the support of HP and Microsoft.

The centralized eLearning platform for the Middle General and Middle Technical & Vocational Education in Cyprus addresses:

- 700 schools;
- 130,000 students;
- 150,000 parents;

- 20,000 teachers;
- 20 administrators.

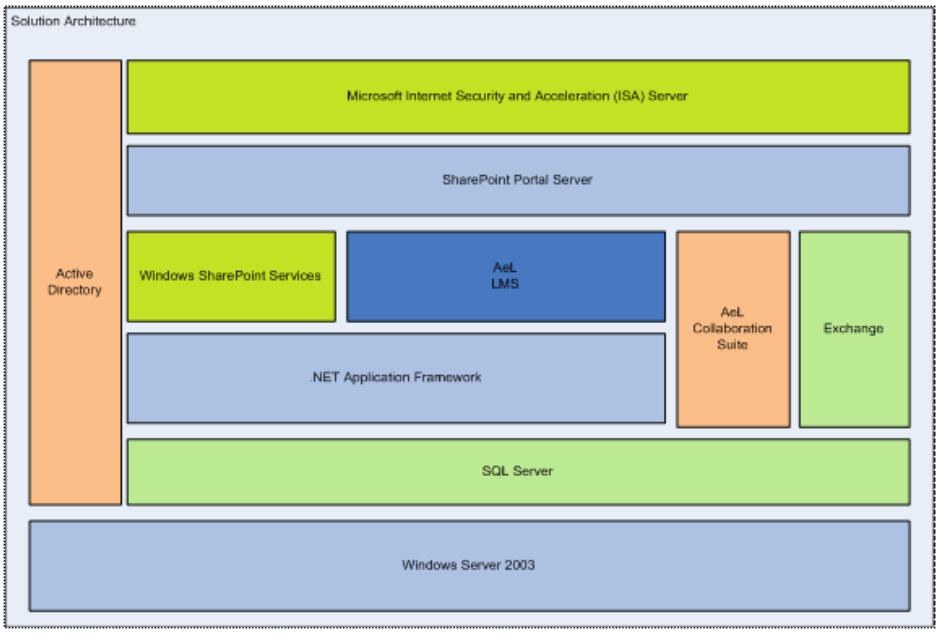
II. THE COMPONENTS OF THE PROJECT

The products delivered consisted of hardware, software and services as follows:

- Hardware Infrastructure - Blade configurations, Enterprise Storage, Backup Solution;
- Software infrastructure - based on a MS Learning Gateway architecture;
- AeL eLearning and AeL Collaboration software;
- Customization of the software systems (including business analysis, gap analysis, design and development, testing);
- Installation and configuration;
- Training, workshops, change management support;
- Support and maintenance;
- Project management and quality assurance.

The software solution includes:

- SIVECO AeL Learning Management System;
- SIVECO AeL Collaboration Suite;
- Microsoft Sharepoint 2007;
- Microsoft Office SharePoint Portal Server – for Portal Interface, content aggregation, personalisation, MySite, crawling and searching;
- Windows SharePoint Services (WSS):
- School, Parent, Teacher and Student Web Sites;
- Class and Assignment Team Sites;
- Staff Rooms, KLA Content Creation Sites and Content Storage;
- Microsoft Exchange Server - Email, Tasks To Do and Calendaring;
- Microsoft SQL Server - as database.
- Microsoft ISA Server – firewall, security
- Microsoft Active Directory - Authentication, Access Control, Group Management.



2.1. AeL Learning Management System

AeL LMS offers support for training and learning, testing and evaluation, content administration, and for monitoring the training and evaluation process. It can be used to conduct trainer lead training or self-training. AeL provides a single point of training for all course participants.

The LMS platform allows **teachers** to:	For **pupils** the LMS provide services, which are used to:	The LMS allows **parents** to:
Manage their time, Plan lessons, Collaboratively schedule resources, Organise resources, Build teaching material, Research and locate existing material Exchange materials and knowledge Collaborate with other teaching professionals Record their activities Record the pupil's activities, Inform teachers of relevant developments, Assist teachers in their career development.	Deliver lessons, Support research, Deliver homework, Educate, Provide news both educational and recreational, Collaborate, Have their interaction with the LMS tracked, Profile pupils, Play. Manage their time.	View the pupil's academic profile, View homework, View classwork Educate, Provide support to encourage their participation in the education of their child, Collaborate with other parents and teachers, Provide background material on the curriculum.

2.2. AeL Collaboration Suite

AeL Collaboration Suite helps students communicate faster and better. It is a solution designed for virtual meetings and collaboration, providing also a native bandwidth management mechanism. AeL Collaboration suite is closely integrated with AeL LMS and with Microsoft Learning Gateway.

2.3. SharePoint Portal component

The Learning Gateway Solution utilises SharePoint technology to provide the portal framework and team collaboration web sites throughout the solution.

SharePoint Portal Server 2003 is used to provide:

- Search and indexing;
- Personal Web Sites "MySite";
- Content aggregation and site collections; and
- Portal Root document lists.

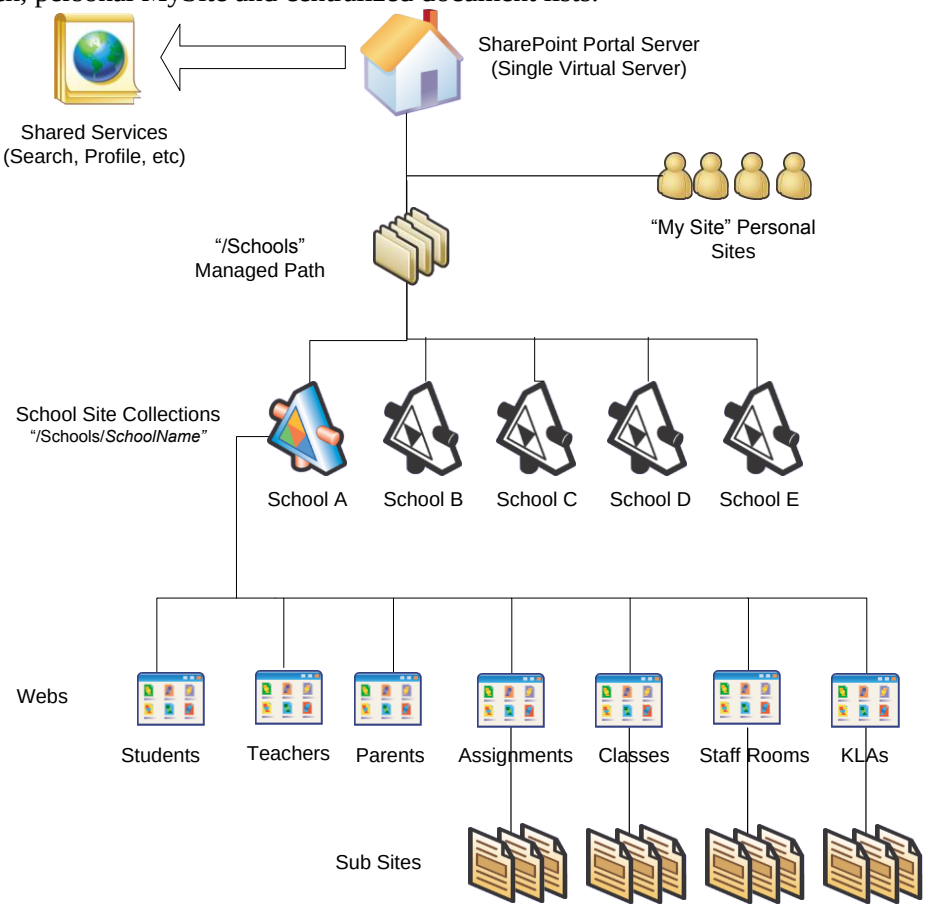
Windows SharePoint Service (WSS) provides:

- School Web Sites;
- Student, Teacher and Parent Web Sites;
- Class and assignment Team Sites;
- Staff Room sites;
- General Discussion and document lists.

The home page for users within the portal is the role based WSS site for the particular school that the user belongs to. For example, a Teacher's home site will be the Teacher WSS site for the school that they belong to.

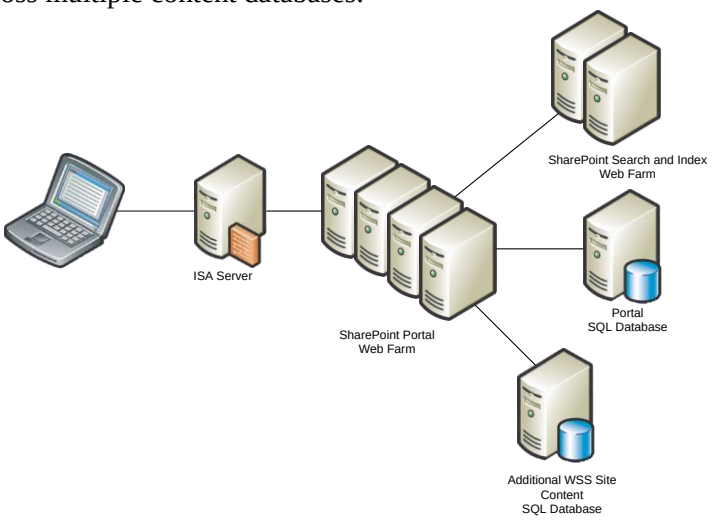
By using WSS as the primary home page for users, the portal is able to produce a unique experience across potentially thousands of schools. This architecture also enables thousands of school portals to be hosted on a single server.

In the solution, SharePoint Portal Server provides shared services to school WSS sites in the form of search, personal MySite and centralized document lists.



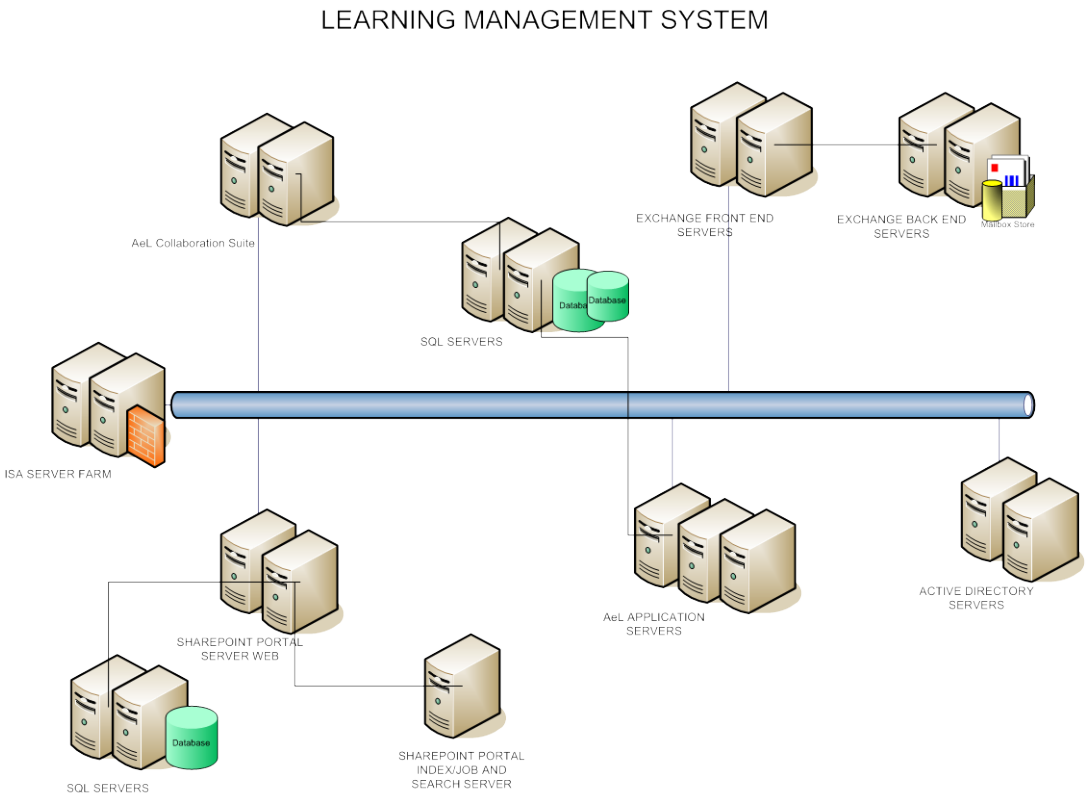
SharePoint Portal Server can be configured as a Web Farm to improve scalability, performance and availability. As the number of concurrent users is increased, additional Web Servers can be added to the SharePoint Web Farm. The scale out of SharePoint Portal Server does not impact the site hierarchy.

As the number of sites created within the solution increases, customers can add additional databases and SQL Servers to host WSS content. SharePoint Portal Server will automatically host new content randomly across multiple content databases.



When deploying SharePoint Portal Server in a Web Farm environment, a separate Index/Search server is required to provide search services to the Portal (as it offered in this proposition).

The turnkey solution is a secure, highly available framework that integrates several Microsoft and third party server products to deliver a scalable, web-based Portal Solution that supports eLearning. The solution is a central hosting scenario for all schools of the country and it utilizes the latest technology for clustering and load balancing in order to increase scalability (through Web Farms) and provide redundancy in the event of a failure, through Microsoft Clustering.



III. CONCLUSIONS

The main objective of introducing eLearning in the Cypriot national education system is to support education professionals, the pupils, parents and community in the achievement of their short, medium and long term objectives within an educational context. The AeL eLearning solution offers for the Cypriot educational system, by its functions and uses, direct benefits (in immediate relation with the user) and indirect benefits (contributing to the production of other educational instruments) during the learning activity. In all cases, the educational process, as a subject of learning and ideal of education, represents the central reference element in the concept, design and creation of an IT based educational system.

The main benefits of the project are:

- All teachers are empowered to use specifically designed software tools as an additional resource in the classroom. The most innovative teachers can customise or create new educational resources.
- A wider range of resources will be available for both teachers and pupils, including digital materials as well as subscriptions to on-line libraries of curriculum content.
- Collaboration through e-mail, discussion forums and chat, audio and video conferencing, sharing of applications and presentations, shared web browsing and whiteboard. Educators will be able to share best practices and monitor the students' progress more easily, while students will be able to work on joint projects across schools and education authorities.

- Easier access for children to learning resources inside and outside the school environment. The solution also enables parents to support and become more involved in their children's learning experience.
- The support of an educational technology provider will free teachers to spend time on actual teaching rather than IT work.

The main challenges and risks faced by the project were:

- Communication issues linked to the geographic spread of the project team.
  - The project team was distributed between Cyprus (training, local technical services such as installation and support), Switzerland and France (education consultants, change management experts), Romania (software development, testing, remote consultancy services such as configuration, installation and support).
  - The main methods for tackling communication-related risks were: increased communication, regular call-conferences, regular reporting, physical meetings in Cyprus, the setup of virtual communication and collaboration tools (web-based collaboration platform, Jira for incident management and technical support, custom tools for validation of requirements, HP video-conferencing system).
- Planning issues related to communication, as explained above;
- Issues related to the validation of requirements, mainly due to communication.
  - A stricter approach was applied in what regards the formalization and validation of requirements.
  - The initial assumptions of one-size-fits-all was invalidated. Even if standard IT solutions - COTS tools (commercial-off-the-shelf) fit the requirements expressed initially, these requirements were not detailed enough and did not express correctly the customer expectations. During the initial phase of validation and clarification of requirements, a significant amount of differences between the initially stated requirements and the customer expectations was uncovered. This lesson learnt was applied in further projects, which included important phases of detailed analysis and software customization in order to meet expectations.

The implemented platform proved to be a viable, robust architecture that could be replicated in similar situations. Similar projects that benefited from the architectural design and from the lessons learnt were further implemented in Azerbaijan, Dubai and Morocco.

The project also proved that the proactive project management strategies linked to planning, communication, increased reporting and risk management were viable in the implementation of a complex project.