



## Maintaining a sustainable Future for IT in Higher Education

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### A Student Registration System in the Azure Cloud

#### 1. INTRODUCTION

Student registration is a process executed every year, usually in the first two weeks of September, in which every student has to register for the current year courses'. In the same process, the student has also to fill a general survey, regarding his current social situation. This process is executed by the student on an on-line web application. Because most students will try to register in the first two days of the registration period, the web application and the supporting system are used only once a year in a very intense way and for a very short period of time. In the last year there was a need to upgrade the system, so, considering all the announced cloud computing advantages, we decided to redesign the system to be implemented in Microsoft Cloud Azure. The main reasons behind this decision where to verify: the feasibility of using Azure to support future projects; the Azure feature of buying only the computing and database space needed at any given moment. This paper describes the registration system as it was developed and used to register UTAD's 8.000 students, last September. It reports on the advantages of using the Azure cloud platform and establishes fairly good reasons for using Azure has The platform for developing and hosting future applications.

#### 2. CURRENT PROBLEM

The Students Management System (SMS) is used, by students and faculty personnel, as the main tool to manage the daily activities related to teaching and learning. Among this activities are: a core of administrative daily tasks; and a set of periodic tasks, executed only a couple of times a year. Student registration is a good example of such type of task.

The SMS was sized for a regular workload, without workload distribution mechanisms. So, to provide resources to execute periodic tasks, such as student registration, a full architectural redesign was need. This upgrade would inevitably include the upgrade of the hardware supporting system. From the observed workload it was estimated that half the resources would be used by the regular daily task; and the other half by the periodic tasks.

At this point there were two options: go for a new hardware system; explore the possibilities of a cloud solution.

### 3. THE AZURE CLOUD OPTION

The cloud option was clearly the winner, mainly for three reasons:

- the price;
- The Microsoft developers community;
- the underlying services.

The price means that instead of buying new, expensive, hardware for a load-balancing architecture, we could pay per usage instead. In this case, it is a huge difference, considering that half the resources would only be used a couple of times a year.

Choosing Microsoft was a matter of continuity, considering our expertise in windows server, database and .NET/C# development.

The underlying cloud services guarantee a full SLA, regarding uptime and system administration, together with a solid development architecture. Programming for the cloud, means that programmers have to comply with a scalable software solution.

### 4. THE SOLUTION

The system was developed to provide, on a first phase, student registration. It is integrated with other build blocks, such as identity management, for student authentication, and webservice integration for approval of foreigner student credentials in the homeland security agency systems.

As for the supporting Azure system, it was issued two webfront server roles, providing web access and load-balancing, together with a azure database service to provide database storage and operations.

The web applications was devolved with Silverlight, in a very common way, connecting with the authentication provider, running locally in our datacenter, and connecting with the homeland security agency servers, on their own datacenters.

The project was a total success, and on a second phase, we're working to implement and deploy more functionality to the azure cloud.