Assessment Engine for an E-learning Solutions Provider

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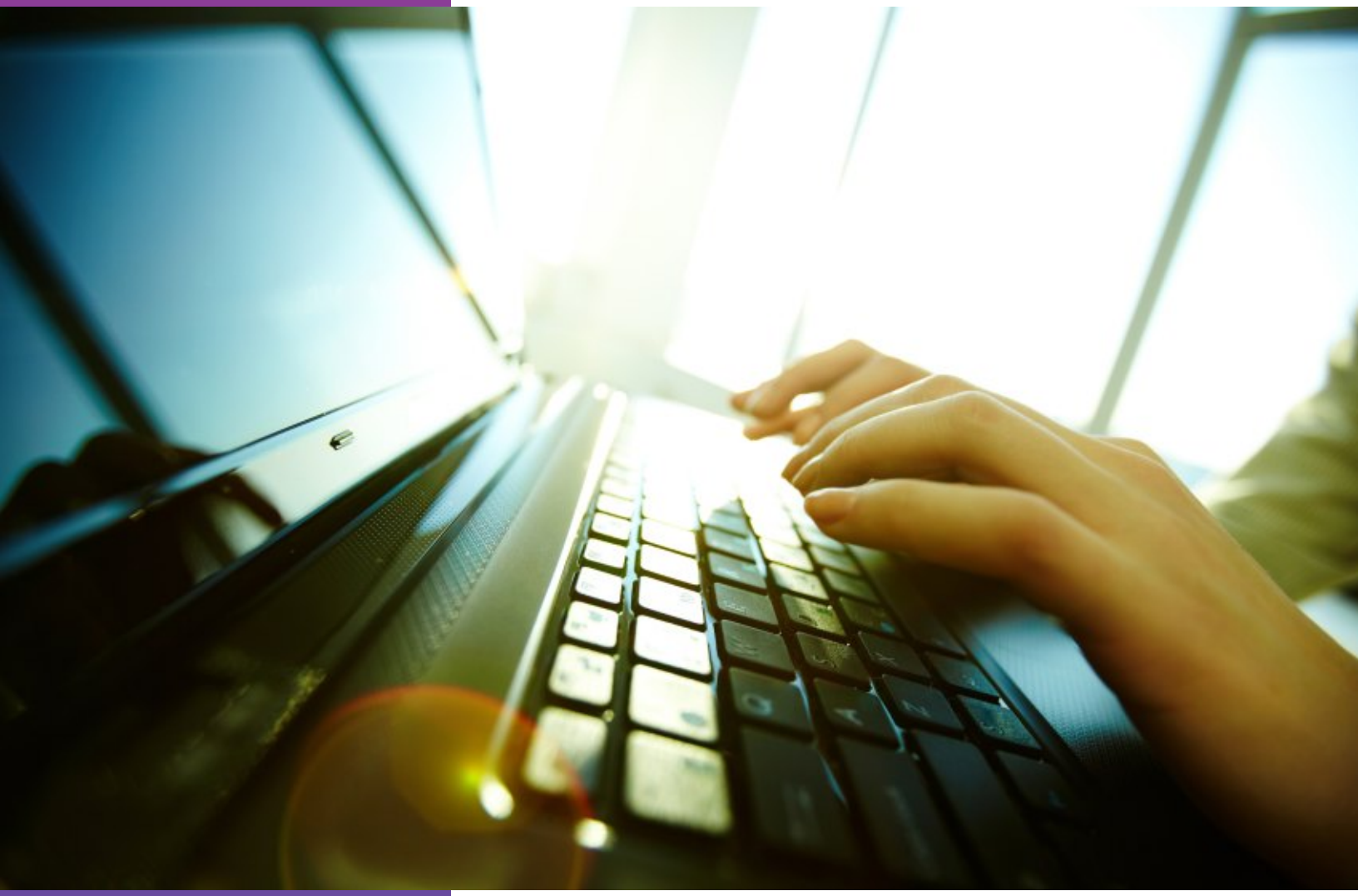
THE CUSTOMER

An eLearning solutions provider that delivers Course Management software, Custom Course Development, Course Libraries, Assessment and Testing toolkits. They have about 4,500 off-the-shelf courses and have delivered more than 2.5 million courses to more than 850,000 users. They offer multiple ways of learning such as self-paced, live and blended environments.



THE CHALLENGE

The customer offered its users an array of courses through various models. They recognized that assessments and self-assessments were needed as a part of these courses and hence wanted an Assessment Engine to be developed and integrated with the courses.

THE SOLUTION

> "Aspire Systems developed the Assessment Engine that included Assessment Authoring, Assessment Tracking, Grading, Reports and Alerts."

Aspire Systems developed the Assessment Engine that included Assessment Authoring, Assessment Tracking, Grading, Reports and Alerts. This Assessment engine supports multiple question types and navigation based on defined parameters, which was an essential requirement of the product. The Assessment engine built was completely web-based and is now a part of all the courses offered by the customer.

Assessment Engine Features

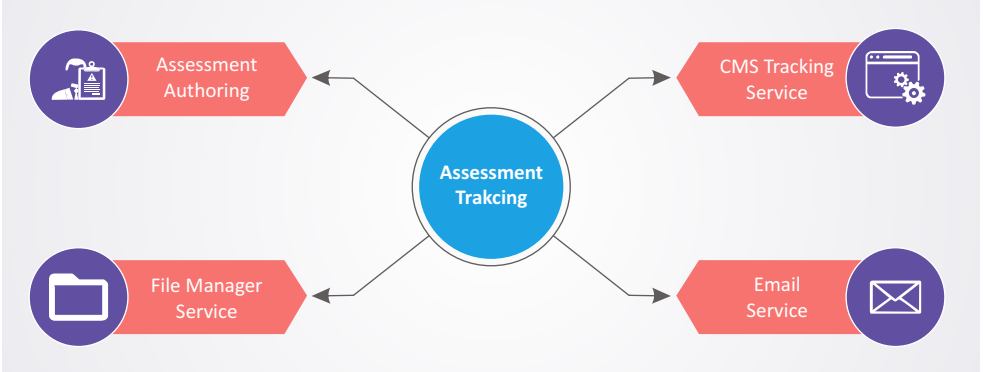
The assessment engine built by Aspire completes the e-commerce offering of the customer and has the following features:

1. Assessments are delivered in multiple formats with support for multiple question types.
2. Each assessment can be customized as per one's requirements like timed assessments, multiple sections, randomization of questions with various levels of difficulty.
3. Questions can be selected at run time based on the rules defined by the author.
4. Assessments can be divided into sections to track the student's performance better.
5. Each assessment can have weight-age classification, based on question types.
6. Different forms of assessments like self-assessments, grading, reporting and certifications are possible.

The Assessment engine has profile synchronization and single sign-on integrated so that assessments as well as courses could be accessed through a single sign-on. User authentication and management is also centralized and can be customized.

The Assessment engine integrates well with the customer's rights management and license management modules.

Assessment Engine Workflow



Assessment Tracking

- Communicates with Assessment Authoring to track the various values that are obtained while attending a test.
- Communicates with Course Management Software (CMS) Tracking Service and pushes the values obtained from Assessment Authoring to the Grade Book.
- Communicates with file manager service to file the assessments.
- Communicates with email sender service to send email alerts.

Performance Tuning

Initially, Aspire used OODBMS on the customer's suggestion but the framework was not quite effective in terms of performance. In spite of the powerful features of the Objectivity Database, Aspire figured out that it was not the right choice for the customer's transaction volumes.

Hence Aspire decided to migrate from the Objectivity database to MySQL. This porting reduced the response time from 60 Seconds to a few milli-seconds.

Hibernate was used along with MySQL as it allowed for Object-Relational Mapping.

Also, when the issue of database portability was considered, Hibernate seemed like the best solution. Only few changes were needed in the configuration file of Hibernate and the database was migrated in record time.

Clustering for high availability

To ensure high availability of the customer's web-based service even during system outages and maintenance periods, Aspire clustered several web-servers together. The database was also clustered with two servers using master-to-master replication.

Caching for better performance

Reusable data was cached to maintain high performance. The Objectivity (OODBMS) and MySQL databases were used in combination to manage large and small transactions effectively.

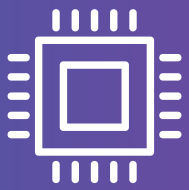
SOA for Scalability

Service Oriented architecture was implemented in order to scale horizontally rather than vertically. In case of non-service oriented architecture, the server capacity has to be grown vertically.

Permission based Security

The whole system functions based on permissions that ensure each user accesses only the data that is permitted for their use.

TECHNOLOGY SNAPSHOT



- JDK1.4
- Jetty Web Server
- Jini Based Distributed Architecture (SOA)
- Objectivity (OODBMS)
- MySql
- Eclipse 3.1
- HTML
- DHTML
- Javascript
- XML
- MVC based service oriented framework.

THE RESULT

Aspire has been the customer's development partner for more than 3 years and has consistently met the customer's quality expectations and timeframes. This has resulted in Aspire developing more products and tools for the customer and integrating them successfully with the customer's existing software.

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ABOUT ASPIRE

Aspire Systems is a global technology services firm serving as a trusted technology partner for our customers. We work with some of the world's most innovative enterprises and independent software vendors, helping them leverage technology and outsourcing in our specific areas of expertise. Our core philosophy of "Attention. Always." communicates our belief in lavishing care and attention on our customer and employees.

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