

# KING'S COLLEGE LONDON DENTAL INSTITUTE BUILDS AWARD WINNING VIRTUAL CAMPUS EXPERIENCE ON JBOSS ENTERPRISE MIDDLEWARE

## FAST FACTS

Company	King's College London
Industry	Education
Geography	United Kingdom
Red Hat Premier Business Partner	Tier 2 Consulting
Business Challenge	To provide online learning materials and assessment tools virtually to dental students through a flexible, secure and cost-effective technology infrastructure with optimal functionality
Migration path	The application was developed from ground up using JBoss
Solution	The IVIDENT project (International Virtual Dental School, now known as UDENTE - Universal Dental E-Learning <a href="http://www.udente.org">http://www.udente.org</a> ) is a flexible learning platform (FLP), conceived to deliver quality assured content and web-based education tools to dental students. The platform is built on Red Hat's open source middleware portfolio including; JBoss Enterprise Application Platform and JBoss Developer Studio.
Software	JBoss Enterprise Application Platform, JBoss Developer Studio, JBoss Seam, JBoss Hibernate, and jBPM
Hardware	Dell Poweredge 1435 2 x Dual Core AMD
Benefits	To create an award-winning virtual experience for students, to improve the educational experience for both students and tutors, potentially improve ROI while reducing costs, to increase flexibility, interoperability and ease of maintenance.



**KING'S**  
*College*  
**LONDON**

**University of London**

## BACKGROUND

King's College London is the Sunday Times University of the Year 2010-11, one of the top 25 universities in the world (Times Higher Education 2010) and the fourth oldest in England. A research-led university based in the heart of London, King's has nearly 23,000 students (of whom more than 8,600 are graduate students) from nearly 140 countries, and some 5,500 employees.

The College offers an intellectually rigorous environment supported by welcoming and caring traditions. King's has played a major role in many of the advances that have shaped modern life, such as the discovery of the structure of DNA, and it is now the largest centre for the education of doctors, dentists and other healthcare professionals in Europe and home to six Medical Research Council centres.

At the hub of the award winning IVIDENT ethos is customisable, high quality, secure, seamless integration of learning tools, systems and e-content with an accent on sustainability in the project. The virtual faculty, and indeed all stakeholders, strive to achieve economic, environmental and technological sustainability throughout the advanced second generation virtual learning environment and infrastructure.

### **BUSINESS CHALLENGE**

King's College London Dental Institute received the highest quality assurance and research ratings in the latest assessments. This is despite the national 22 percent decline in the number of professors, senior lecturers and lecturers since 2000. The loss of research expertise of clinical academics and the impact on the research agenda is concerning. It is therefore to the Dental Institute's credit that the creative solutions of IVIDENT can support teaching and learning in a blended approach that incorporates the latest research findings and the best clinical practice. With a finite number of senior faculty especially in the smaller specialties, the Dental Institute wanted to provide an innovative solution to better serve its growing, geographically dispersed student body and to more efficiently use its tutoring resources.

"The main challenge for the Dental Institute was to create a premium environment for learning, whilst meeting the project's final objective of sustainability," said Professor Patricia A. Reynolds, Director of Flexible learning, at the Institute. "King's saw technology as a strategic tool for centralising resources and providing increased accessibility to the latest learning content and curriculum for students while scaling the curriculum to serve its growing number of students."

The Dental Institute designed an online, flexible and scalable learning portal to deliver expert curriculum to dental students, called the International Virtual Dental School (IVIDENT) which was jointly funded by the Higher Education Funding Council for England (HEFCE) and the Department of Health. The £2.3 million three-year project aimed to bridge the gap between skills development for dental students and the availability of expert teachers in smaller specialties, by providing an online-based, flexible learning capability with universal IT integration.

A critical part of the successful introduction of IVIDENT was gaining mindshare and momentum from a diverse set of the King's community, including; students, lecturers, faculty members and research specialists. For this to be achieved the Dental Institute had to implement a solution that brought together technology and education for an improved student experience within the context of a sustainable but not-for-profit business.

The IVIDENT project was created with an ultimate objective of proposing a sustainable solution that could be shared by other dental learning institutions around the world, once it had been proven at the Dental Institute and its partner institutions. With this potential reach in mind, the technology infrastructure had to be built on open standards. As with any educational establishment cost reduction and return on investment were key requirements. The Dental Institute was therefore searching for a solution that consolidated its current IT infrastructure, maximising existing technology assets and minimising capital expenditure.

Security also needed to be taken into account throughout this project. Teaching resources and student data needed to be protected, therefore any solution had to have a stringent security layer. As part of this requirement, the ability to audit any activity within the system was crucial as all interactions could play a part in a student's assessment.

Finally, the Dental Institute had to ensure that students did not experience downtime from any solution that was put in place. Availability, around the clock support, and accessibility were crucial to the college meeting its need to have course content and educational mechanisms available online.

### **SOLUTION**

King's worked with Tier 2, a Red Hat Premier Business Partner that holds a middleware specialization, to design the specification requirements of the IVIDENT project. As IVIDENT took shape, it encompassed online course content, virtual classrooms, social networking tools, a bulletin board, assessment tools, virtual lectures, and demonstrations. Students would be able to access these services via laptops or smartphones, encouraging collaboration, mobility and research.

Tier 2 worked with King's to identify its options, which included a non-technical scoping exercise to decipher the exact applications and requirements of the system. The College was aware that there were many off-the-shelf technology solutions specifically designed for educational needs; however, it wanted a more customizable infrastructure that would meet its exact requirements and integrate with its existing, incumbent technology.

An open source architecture was identified early on as a solution that King's wanted to explore. The ability to reduce capital expenditure as well as benefiting from community collaboration fit well within the project's sustainability programme. With integration, security, customisable features and capital expenditure taken into account, the over-riding factor behind the decision to use JBoss Enterprise Middleware as the basis for IVIDENT was its technology superiority. JBoss Enterprise Application Platform was considered to be the only open source enterprise middleware solution upon which the college could build applications and scalable platforms to the standard that it required. On the completion of IVIDENT in March 2010, King's named the completed project UDEnte (Universal Dental E-Learning <http://www.udente.org>).

## BENEFITS

IVIDENT/UDENTE is changing the way that King's Dental Institute is delivering dental education. It has created a virtual learning environment which not only meets, but enhances, the traditional learning experience in a blended approach.

Flexible graduate dental courses are already delivered online through blended learning programmes at <http://www.kcl.ac.uk/distancedentistry>. These allow greater flexibility of access for students and effective monitoring by faculty. Using flexible learning techniques, staff are freed up from repetitive teaching tasks, and faculty can also focus on the individual needs of students as well as their own research.

In addition, dental institutions and organisations will be able to affiliate with IVIDENT/UDENTE, allowing them to leverage and access extensive quality assured e-content and tools to create their own curricula. As the UDEnte family grows it is hoped that those institutions located in developing countries may access and share world-class training resources according to their local needs.

From a technical perspective IVIDENT/UDENTE has met all of the challenges of integration, open standards and interoperability. JBoss Enterprise Application Platform and frameworks has enabled the legacy systems to be integrated into the current system, and therefore created a full portfolio of functionality on more cost effective hardware.

Another benefit of the IVIDENT/UDENTE application running on JBoss Enterprise Application Platform, was the potential cost savings, and possible revenue generating benefits to support further research and development of the system. An unexpected benefit is the way that IVIDENT/UDENTE acts as a publishing capability for teaching materials from all dental professionals across the world, provided the resources meet the quality assurance requirements.

Additionally, Red Hat's growing ISV ecosystem ensured that third party applications and other affiliate bodies could integrate and interact seamlessly with the system. JBoss Enterprise Middleware also gave King's valuable security reassurance with full administration, audit and log on functionalities to ensure accountability and audit trails for all interactions by students.

"Ultimately IVIDENT as a project has been a resounding success and has met all of its objectives," said Reynolds. "The UDEnte approach has already been appreciated by an international body of senior deans and experts, and together with student involvement will steer us on a course for the future."

King's, as a member of the prestigious Russell Group, is widely recognised as a leader in academia and research. It is anticipated that the IVIDENT/UDENTE model will assist in influencing the changing landscape of higher education. And as such, be transferable to all specialties and faculties in healthcare and beyond.



## ABOUT RED HAT

Red Hat was founded in 1993 and is headquartered in Raleigh, NC. Today, with more than 60 offices around the world, Red Hat is the largest publicly traded technology company fully committed to open source. That commitment has paid off over time, for us and our customers, proving the value of open source software and establishing a viable business model built around the open source way.

Red Hat provides high-quality, affordable technology to the enterprise. Our solutions are delivered via subscription and range from operating systems and platforms like Red Hat Enterprise Linux and JBoss Enterprise Middleware, to application and management tools, as well as consulting, training, and support.

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