open course data
developing a flexible model for course data feeds with open-source technologies

JISC

US University of Sussex IT Services

XCRI-CAP FEED

As one of the projects funded under the *JISC Course Data: making the most of course information (Stage 2)* funding stream, our objective was to produce data feeds in a prescribed format. These feeds carry information about the courses offered by Sussex in a way that might enable them to be compared with other institutions. The data format is known as XCRI-CAP (eXchange of Course Related Information – Course Advertising Profile).

61 Postgraduate (research)

189 Undergraduate

219 Postgraduate (taught)

XCRI-CAP Data Course types

Reading the rules

We used JAXB to build Java classes automatically from the XCRI-CAP specification. **JAXB (Java Architecture for XML Binding)** enables us to process XML without having to know the underlying structure. This approach would make it easy to deal with future changes in the XCRI-CAP specification or use the same approach for a completely different service.
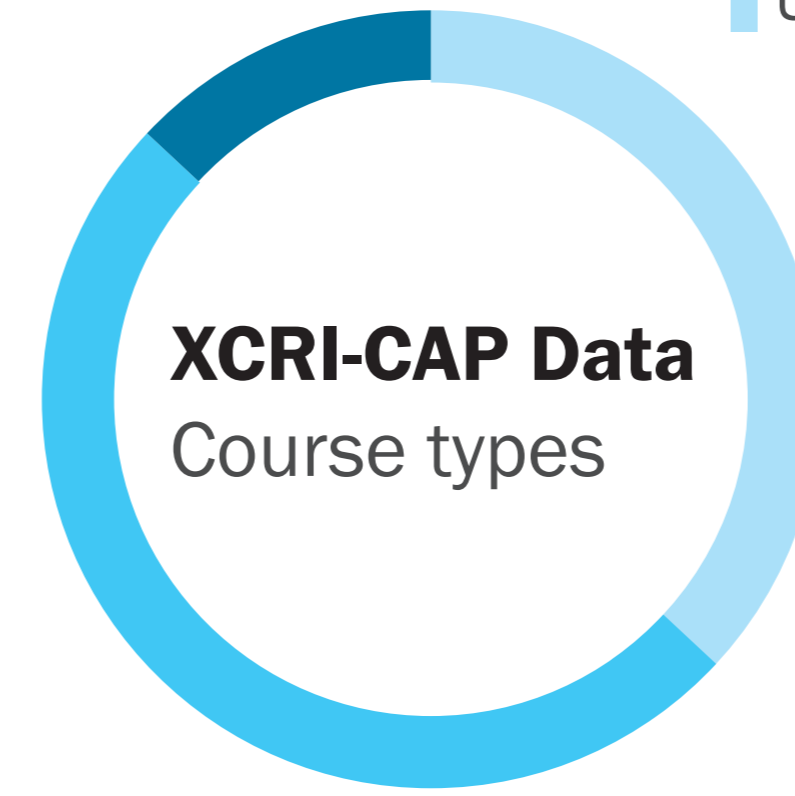
Specification

The XCRI-CAP XSD is one of the inputs to the model but we could handle other specifications in the same way.

XCRI-CAP XSD

Automated testing

The model allows us to perform automated testing at this point using technologies such as **JUnit**.

Although not needed in this case, the ability will be a key advantage if we decide to re-use the approach for other projects.
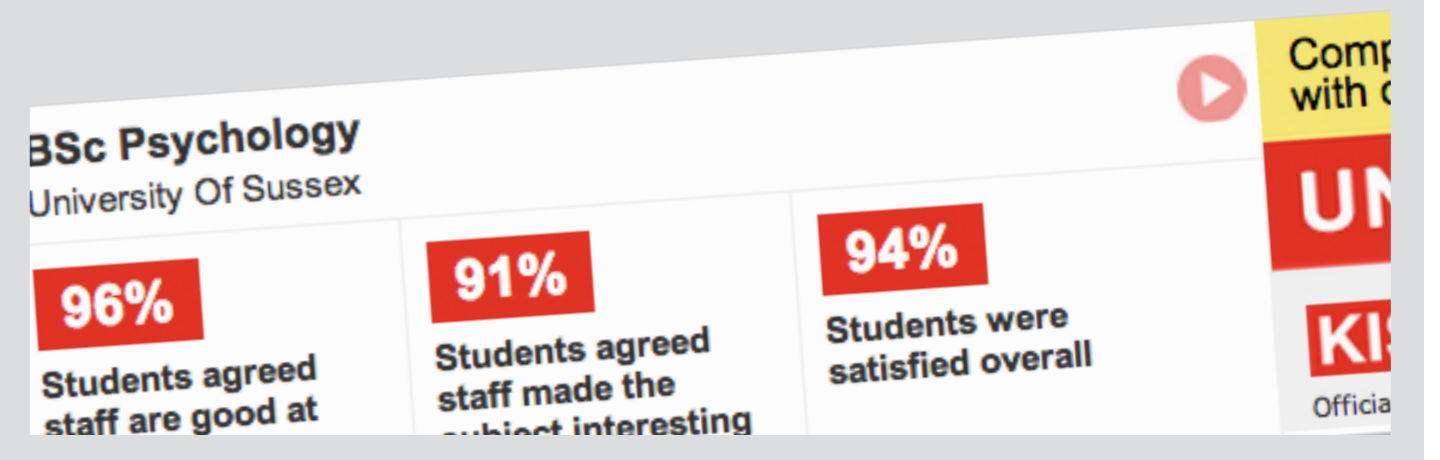
Processing

The Java classes from the specification use the data stored in the ORM (see **Data handling**) to rearrange the data across all Sussex courses according to the XCRI-CAP specifications.

The application uses open-source technology, running in **Java EE6** on a **Glassfish** server.

KEY INFORMATION SET

In parallel with the XCRI-CAP feed, we developed a process to extract data on courses and National Student Survey results to compile the University's Key Information Set.

292,098

page views of KIS-enabled data (to 7 January 2013)

BSc Psychology
University Of Sussex

96% Students agreed staff are good at

91% Students agreed staff made the subject interesting

94% Students were satisfied overall

Data handling

Course data is read from the central database and stored in an **ORM (Object Relational Model)** persistence layer.
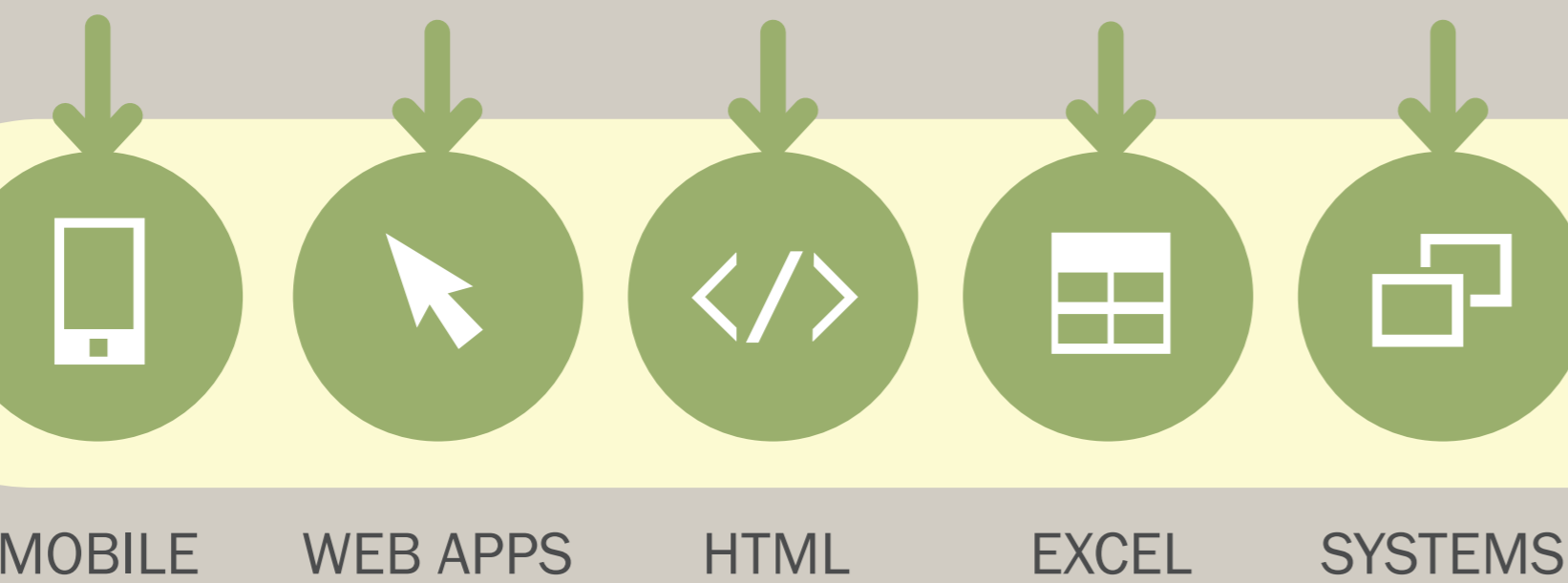
COURSE DATA XML

Providing access

The course XML is then marshalled using various open-source tools to give access by a range of different protocols. Different output formats could easily be added at this stage.

SOAP

JSON

REST

Course list

The processed course data is held in an XML file, which is recompiled automatically every day to reflect any changes in course data.

Oracle

Student Records

ORM Persistence layer

XCRI-CAP Repository

Glassfish 3.1

XCRI-CAP application

SchemaLoaderBean

Populate XCRI Database (scheduled process)

read update

read

update

read

XCRI-CAP.xsd

Generate JAXB classes

CatalogueLoaderBean

JAXB classes

call

write

XCRI-CAP file.xml

populate

XCRI-CAPSessionBean

Search XML

XCRI-CAP REST Service

Marshall XML

call

XCRI-CAP SOAP Service

Marshall XML

call

SOAP Call

JSON Call

REST Call

Third-party system

Secure

The whole model is based on a loosely-coupled connection to the main database with all third-party access restricted to feeds built from the daily XML file.

The limited access to the underlying data also means the process is not dependent on a particular database.

MOBILE   WEB APPS   HTML   EXCEL   SYSTEMS

Flexible

Since the core classes are generated automatically, changes to the inputs (the course data and the XCRI-CAP specification) can be handled easily without having to modify the entire system.

The use of standard protocols makes it easy to provide access for a range of different systems and services.

Realising the benefits

Data validation

The project required some initial validation, which gave us the opportunity to check the course data held in our core systems.

Course promotion

The resulting data feeds will help us to promote the University's courses by providing consistent data for potential students.

Expertise

We developed valuable expertise in some key areas, which will help us to deliver similar projects more effectively in the future.

In particular, the creation of a REST interface provided an opportunity to develop skills in data feeds that will be useful in other projects.

Reusability

The system developed during the project could be deployed at other institutions.

You can get direct access to our feed using the links shown here, or you can see a sample query of the REST interface and the entire project is available in our **github** repository.

Handwritten notes:

How much would it cost to use this approach?
NOTHING! (built with open-source tech)

Will this system work with our database?
YES – it can work with any database

What's the address of the main feed?
http://xcri.sussex.ac.uk/courses/

How do I query your service?
TRY THIS SAMPLE QUERY:
http://xcri.sussex.ac.uk/courses/CourseCatalog/rest/title/French

Could it be used to display course data in a mobile app?
JUST USE THE JSON FEED:
http://xcri.sussex.ac.uk/courses/CourseCatalog/json

Read our project blog: http://blogs.sussex.ac.uk/coursedata

https://github.com/sussexcoursedata/course_data_project