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## JISC Project Plan

| Project Information         |                                |                 |         |
|-----------------------------|--------------------------------|-----------------|---------|
| <b>Project Identifier</b>   | <i>To be completed by JISC</i> |                 |         |
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| <b>Project Hashtag</b>      | #ONCourse                      |                 |         |
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| <b>Partner Institutions</b> |                                |                 |         |
| <b>Project Webpage URL</b>  | coursedata.blogs.lincoln.ac.uk |                 |         |
| <b>Programme Name</b>       | e-Learning Programme           |                 |         |
| <b>Programme Manager</b>    | Robin Englebright              |                 |         |

| Document Information   |   |                 |                                    |
|------------------------|---|-----------------|------------------------------------|
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| <b>Access</b>          | This report is for general dissemination  |                 |                                    |

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| Version          | Date       | Comments                                |
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|                  |            |   |
|                  |            |   |

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Project Overview

## 1.1 Project Summary

*This Implementation Plan describes work that is both already on-going at the University of Lincoln as well as the concurrent and complementary work we propose to do under the JISC Course Data Programme. We refer to the former as the Academic Programme Management System (APMS) project and the latter as the **ON Course** project. In practice, they both share the same project management team, but so as to clearly identify what work will be undertaken under the JISC programme, we identify them here separately. As will be discussed in this Implementation Plan, the ON Course project has a specific number of deliverables that are outside the scope of the internally funded APMS project and which deliver benefits to both the University of Lincoln and the HE/FE sector.*

For several years the University has been considering implementing a computerised system to manage academic programme (curriculum) information that allows automated version control and archiving of definitive programme information. We acknowledge that it is essential to have a single source of information for programmes and modules to enable the same information to be available across the University, for Faculties and Professional Service Departments, and for the production of information such as consistent marketing material, academic transcripts, programme and module specifications, and diploma supplements. An electronic system will also become increasingly needed for requirements such as the HEAR<sup>1</sup> for graduating students, KIS<sup>2</sup> and other public information obligations, including FOI requests.

Consequently, the University has been running a project to implement a new 'Academic Programme Management System' (APMS) and has recently accepted a EU Tender by Worktribe (Nottingham) to deliver this system by August 2012. The requirements for that project are very much focused on the need to "improve course data flows within the institution" and also requires that the provision of an XCRI-CAP 1.2 feed is also supported.

The proposed ON Course Implementation Plan starts from the assumption that the existing internal APMS project is very much focused on improvements to course data flows within the institution and acknowledges the benefits of aligning our existing project within the context of a national 'course data' programme where we can share our experience and furthermore benefit from the experience of other institutions and support from JISC.

Equally, the ON Course project has a specific focus on the provision and use of external, public course data and in this respect is located within the context of our Open Data project, <http://data.lincoln.ac.uk>. As such, we plan to focus on ensuring that the APMS project offers not only benefits to the institution in the form of improved internal course data flows, but also on the exposure and innovative use of public, open course data, combined with existing sources of open data that we publish and the use of third-party APIs.

## 1.2 Objectives

The ON Course project has two primary objectives:

1) To support and disseminate the relevant outcomes of the current acquisition and development of a central, authoritative, Academic Programme Management System (APMS).

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<sup>1</sup> <http://www.hefce.ac.uk/learning/diversity/achieve/>

<sup>2</sup> <http://www.hefce.ac.uk/learning/infohe/kis.htm>

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2) To provide a public XCRI-CAP 1.2 feed for all credit-bearing courses at all levels across the institution and develop appropriate 'course data' web services and applications of tangible benefit to the institution and the sector.

Furthermore, the APMS project aims to:

Implement a central, single source of academic programme information contained within an appropriate management system with automated version control and associated historical records for all programmes and modules. When fully approved, to enable this information to be used by various areas across the University. Other objectives are to:

- Support the production of information for Key Information Sets (KIS) and Higher Education Achievement Reports (HEAR).
- Meet the University's obligations to publish open data as a publicly funded institution.
- Streamline and standardise workflow patterns for curriculum development across diverse university groups, in addition to programme and module modification/revalidation processes.
- Automate production of historical student transcript requests.
- Automate the production of diploma supplements.
- Incorporate the management of marketing information into the system and enable its use through recognised standards in other forms and systems. e.g. programme marketing copy managed within an academic programme management system that can be automatically available to a course information page on a website.

### 1.3 Anticipated Outputs and Outcomes

| Output / Outcome Type<br><i>(e.g. report, publication, software, knowledge built)</i>                       | Brief Description  |
|---|--|
| Case Study  | A thorough Case Study of the acquisition and development of an Academic Programme Management System.   |
| XCRI-CAP feed   | A valid, system-generated, public XCRI-CAP 1.2 feed for all credit-bearing courses   |
| APIs for the use of the XCRI-CAP feed via <a href="http://data.lincoln.ac.uk">http://data.lincoln.ac.uk</a> | RESTful API access to the XCRI-CAP and KIS data.   |
| Mashups and visualisation   | Visualisation tools to better understand our APMS (including XCRI-CAP) and existing open data (e.g. how courses relate to each other, how staff relate to courses, the use of space by course, use of energy by course, etc.). Well documented, with code examples.  |
| Personalised Prospectus Plus  | Based on user group requirements, we will develop a 'Design Your Degree' web application. This will employ data from XCRI-CAP and supplemented by KIS and other institutional data to allow prospective students to gain a very full and integrated picture of their lives as students at Lincoln – not simply the course information. They will be able to 'build' their degree using course data, understand the class time and overall contact time for their desired course. They will also be able to clearly see who their lecturers might be, the kind of workload for their course including assignment deadlines. We would also include book recommendations based on library book access of existing students on each course (from our involvement in the MOSAIC project), information about Societies they might wish to join, the price and location of student Halls, based on their accommodation requirements and local attractions and facilities, such as nightclubs, restaurants, sports centres, etc. |

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|                                      |  |
|--------------------------------------|--|
|                                      | Could also use local crime data to reassure parents, as well as careers information about past-graduates on the courses. The aim would be to present to prospective students an accurate overview of their lives at Lincoln, not simply their courses. Using our Common Web Design (HTML5/CSS3) presentation framework, the site would be mobile ready. It would be well documented on our blog with source code examples. |
| JISC documentation                   | Project plan, six-monthly interim reports, a final report and a completion report.   |
| Blog                                 | A regularly-maintained blog which can be consumed as an RSS feed.  |
| Developer knowledge of XRCI standard | Expertise around the production and use of XRCI-CAP and other institutional data.  |

## 1.4 Overall Approach

The acquisition and implementation of our APMS has been undertaken using the university's internal project management processes, overseen by a Project Group led by the University Registrar and including key staff from Marketing, Student Services, Quality Assurance and ICT.<sup>3</sup> Following our Field Testing of the JISC XCRI Self-Assessment Framework (see Appendix D), we developed a Business Plan for the provision of a new APMS<sup>4</sup>. Furthermore, we have since undergone an EU Tender for this work, which has recently been awarded to Worktribe<sup>5</sup>, who are committed to meeting our requirements by 31st July 2012. The Tender process formally sets out the requirements (see Appendix C) for the APMS, including the *full* support for XCRI-CAP 1.2 and the *desired* support for XCRI r 1.0. A full list of 'Information to be recorded' was also provided as part of the Tender process (see Appendix C).

Interoperability is a key section in our requirements documentation and includes integration with our existing systems, web services and the provision of the XCRI-CAP feed. The documented Critical Success Factors for the APMS Implementation are as follows:

- Manual maintenance of the current 'University Portfolio' of curriculum information is reduced to a minimum or rendered unnecessary. The annual Curriculum Confirmation process is no longer required.
- Diploma supplements for all graduating students can be produced using similar methods and in a similar timescale to transcripts and certificates.
- Academic programme information is available electronically in a format appropriate for access and use in other systems and reports.
- The new system supports the development of accurate information to meet public information requirements, including those of the KIS.

As well as supporting the APMS project overall and producing a thorough Case Study of our entire project, the ON Course project will explicitly focus on the last point regarding the production of public data and the development of appropriate 'course data' web services and applications of tangible benefit to our institution and the sector.

<sup>3</sup> Many of these staff were signatories on our Stage One Letter of Commitment.

<sup>4</sup> The Business Case for the APMS will be incorporated into the Case Study deliverable.

<sup>5</sup> <http://www.worktribe.com/>

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As with previous JISC development projects we have worked on, we employ an 'agile' approach to working with data and building software, relying on regular, active input from users, working iteratively on short 1-2 week code sprints.

To support this methodology, we use a tool-set incorporating Codeigniter, a PHP development framework, Github<sup>6</sup>, a distributed source-code repository and Pivotal Tracker<sup>7</sup>, for project and personal task management. For this project, we will also use our institutional Get Satisfaction account for supporting and managing user feedback and requests<sup>8</sup> and Zen Desk for long-term support.<sup>9</sup> Each of these tools is integrated at the API level, allowing us to easily tie user feedback to project tasks and to the development of code in a way that is transparent.

We will use other collaborative software such as our project blog and Google Docs. We will ensure that key documents and decisions are carefully considered and approved by our APMS project group.

We will recruit one full-time developer to work exclusively on the ON Course project alongside the APMS/ON Course Project Manager and the ON Course Principal Investigator. The Project Manager will report to the APMS Project Team about the progress of the ON Course Project and feed back any issues to the ON Course PI.

As such, the APMS Project can be understood as the overall parent project, with the JISC-funded ON Course project providing informed support, evaluation and tangible development, allowing us to benefit from JISC programme and community support and reciprocally producing a Case Study for the benefit of the Sector, in addition to providing documented applications for the use of course data by the sector.

Dissemination for the ON Course project will be both informal and formal. Community engagement will be on-going throughout the project through our project blog<sup>10</sup> and Twitter account<sup>11</sup>. More formal dissemination will take place through the use of Interim and Final reports, Press Releases, a Case Study, conference and journal papers.

## 1.5 Anticipated Impact

| Impact Area          | Anticipated Impact Description   |
|----------------------|--|
| Internal auditing    | Impacts ability to audit the production of course information                                      |
| Integrated services  | Impacts the ability to better integrate others services (e.g. timetabling, student records)        |
| FOI compliance       | Impacts ability to respond to public requests for information                                      |
| Open Data/KIS/HEAR   | Impacts public reputation of university  |
| The innovation cycle | Impacts our ability to innovate as an institution through better information management.           |
| Staff skills         | Impacts the development of staff skills, experience and knowledge transfer within the institution. |

<sup>6</sup> We maintain both private and public repositories on Github <https://github.com/lncd>

<sup>7</sup> e.g. see our public tracker for the Jerome project <https://www.pivotaltracker.com/projects/250373>

<sup>8</sup> <http://wwh.lincoln.ac.uk/universityoflincoln>

<sup>9</sup> <https://support.lincoln.ac.uk/home>

<sup>10</sup> <http://coursedata.blogs.lincoln.ac.uk>

<sup>11</sup> <http://twitter.com/lncd>

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|-------------------------------|---|
| Recruitment                   | Impacts our ability to recruit and retain IT staff  |
| Culture change                | Impacts on the sharing of information across departments and the way departments understand that information                            |
| HE sector R&D                 | Impacts on overall R&D in the HE/FE sector by demonstrating the uses of course data   |
| Public Sector data management | Impacts on the overall exposure of public sector data and how it is integrated and used   |
| Efficient re/use of resources | Impacts on the use of existing IT systems by re-using course data in different ways and for different purposes. e.g. Marketing/KIS/HEAR |
| Strategic Planning            | Impacts on our ability to plan more effectively and simplify our administrative procedures.   |

## 1.6 Stakeholder Analysis

| Stakeholder                                     | Interest / stake  | Importance (H/M/L) |
|---|---|--------------------|
| Registry  | Has overall responsibility for the development and management of course information   | High               |
| Marketing and Communications                    | Responsible for marketing of course information   | High               |
| ICT Services                                    | Responsible for technical implementation and maintenance of course information system   | Medium             |
| Student Services                                | Part of Registry, responsible for supporting students and providing information on courses, timetables, assignments, etc.                             | Medium             |
| Office of Quality, Standards and Partnerships   | Part of Registry, responsible for the quality assurance of all course provision and the management of portfolio documentation                         | High               |
| Centre for Educational Research and Development | Provides support to other academic departments on the development of curriculum. Seeks to innovate in Higher Education through the use of technology. | Medium             |
| JISC  | Provides public funding for the project. Seeks value for money.   | High               |
| HE/FE sector                                    | Benefits from JISC funding programme through support and dissemination of the various projects  | Low                |
| Public  | Benefits from KIS/HEAR information as well as innovation made possible by public provision of course information in agreed                            | Low                |

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|  |                     |  |
|--|---------------------|--|
|  | standard (XCRI-CAP) |  |
|--|---------------------|--|

## 1.7 Related Projects

This ON Course project is part of our current Academic Programme Management system (APM) project, which will deliver a new curriculum management system for the University by August 2012. Whereas the main driver and focus of the APM project is to improve internal course data flows, we will complement it by working closely with the existing project team to produce valid external course data feeds and develop new web services which demonstrate the value of open course data to the institution and to the wider sector.

This project also relates to our on-going work on <http://data.lincoln.ac.uk> where we are exposing both public and authenticated institutional data. The external feeds generated through this project will be made available as XCRI-CAP XML as well as through APIs for our Nucleus datastore, which will provide a robust platform from which we will develop the proposed course data applications.

We are also running the Linking You project,<sup>12</sup> to support ten institutions that have responded to the recent Digital Infrastructure Programme call<sup>13</sup> to contribute to the development and implementation of the Linking You Toolkit. The Toolkit offers a national audit, data model and guidance on the use of institutional web identifiers. The Toolkit is also applicable to the Course Data programme in the production of course related identifiers and will continue to offer 'best practice' to institutions funded under the Programme.

## 1.8 Constraints

The ON Course project is partially constrained by the progress and success of the over-arching APMS project. The APMS project is a formal, tendered project of the University of Lincoln and aims to meet the institution's business requirements (see Appendix C) by August 2012. However, even with any delays, the eventual Lessons Learned from the APMS project will provide a useful experience for the Case Study deliverable of the ON Course project. While part of and dependent on this project, the ON Course project is able to proceed to some extent independently, using our existing XCRI feed as test data for the development of course data applications built off of <http://data.lincoln.ac.uk>

## 1.9 Assumptions

The ON Course project proceeds on the assumption that the APMS project will meet the business requirements (see Appendix C) and deliver a new Academic Programme Management System by August 2012. The ON Course project is 12 months long and involves the recruitment of 1.0FTE Web Developer (grade 5). The Project manager for the APMS project is also Project Manager for the ON Course project and will co-ordinate the work of the two projects. The PI will work with the PM to ensure that the JISC funded deliverables are met and Line Manage the Web Developer. The project aims to document the overall APMS project through the production of a Case Study and develop applications for the use of course data.

## 1.10 Risk Analysis

Risks below are identified as risks to the ON Course project and therefore the risks associated with the funding of the project by JISC. It does not identify the risks associated with the APMS project,

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<sup>12</sup> <http://lincn.eu/toolkit>

<sup>13</sup> [http://www.jisc.ac.uk/fundingopportunities/funding\\_calls/2011/10/grantcall1611.aspx](http://www.jisc.ac.uk/fundingopportunities/funding_calls/2011/10/grantcall1611.aspx)

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which are borne by the University of Lincoln and documented in our Business Case. These will be documented in the proposed Case Study deliverable.

| <b>Risk Description</b> | <b>Probability (P)<br/>1 – 5<br/>(1 = low<br/>5 = high)</b> | <b>Severity (S)<br/>1 – 5<br/>(1 = low<br/>5 = high)</b> | <b>Risk Score (PxS)</b> | <b>Detail of action to be taken<br/>(mitigation / reduction / transfer / acceptance)</b>   |
|-------------------------|---|--|-------------------------|--|
| Staffing                | 1   | 4  | 4                       | A current Intern working on data.lincoln.ac.uk is interested in applying for the 1.0FTE Web Developer position. The post offers an attractive position for a developer interested in open data and new web technologies. We are confident of being able to recruit in a timely manner. The PM is already working on the APMS project and is a Business Analyst in central ICT Services. In his absence, there are other Business Analysts able to step in. The PI manages a number of projects relating to our work on data.lincoln.ac.uk and should be unable to work due to unforeseen circumstances, the PM would help oversee his work, together with the Online Services Manager. |
| Institutional           | 1   | 5  | 5                       | The institution has already committed to the APMS project and signed contracts with a supplier to deliver the appended requirements, which includes the production of an XCRI-CAP feed.  |
| Legal                   | 1   | 3  | 3                       | We see few legal risks associated with the ON Course project. We are already publishing an XCRI feed on our website and are under a legal obligation to provide the KIS/HEAR information. The development of the course data applications may require the use of personal/private data, which is covered by our data protection obligations and secured through authentication (OAuth) and secure transport (SSL) protocols.   |
| Technical               | 2   | 2  | 4                       | Much of the technical environment for the development of the course  |

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|                    |   |   |   |   |
|--------------------|---|---|---|---|
|                    |   |   |   | data applications is in place (as evidenced on data.lincoln.ac.uk). There are no additional equipment costs and we are familiar with the XCRI standard. There will be technical challenges like on any project but these should not present risks to the project. We are used to working on such projects and use a widely recognised agile methodology for the development of software.  |
| External Suppliers | 3 | 3 | 9 | There are no external suppliers directly involved with the ON Course project. However, the larger APMS project is reliant on external suppliers for the development and delivery of the APMS. This risk is borne by the APMS project and should not impact on the delivery of the Case Study or the applied use of the XCRI course data, which the ON Course project is concerned with. The APMS project has already undertaken a risk assessment and steps to reduce this risk are in place. |

## 1.11 Technical Development

The Tender for our APMS system has been awarded to WorkTribe, who have provided a full response to our requirements. Their system employs a Service-Oriented Architecture. Third party systems can interface with the SOA services via XML or REST/JSON. Furthermore their product supports the XCRI-CAP version 1.2 and can import and export data in this standard.

JISC funds are *not* being sought for development of the APMS, but rather for the development of demonstrator and showcase visualisations/mashups and applications using the data provided by our XCRI-CAP feed and other data held by the APMS. Our approach to using this data will be similar to other JISC projects we have undertaken, whereby we ingest the source data (e.g. XCRI-CAP) into our MongoDB datastore and develop a set of RESTful APIs which are used by the applications developed. This data will be made easily accessible through a public web interface and through APIs documented at <http://data.lincoln.ac.uk/documentation.html> The raw XCRI-CAP feed will also be made available as an XML file at <http://www.lincoln.ac.uk/courses.xml>

MongoDB is a database used by companies such as Craig's List, FourSquare, the New York Times, the Guardian and LexisNexis. A document-oriented 'NoSQL' database such as MongoDB, offers us flexibility in that it will accept any data object (e.g. tabular data, survey results, images) without the need to develop a schema beforehand. In our experience, MongoDB, combined with the Sphinx search engine and Memcache, is also extremely fast<sup>14</sup> and allows us to develop simple, attractive APIs which we can expose to the Course Data applications.

<sup>14</sup> <http://jerome.blogs.lincoln.ac.uk/2010/07/23/engage-ludicrous-speed/>

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Any personal access to the data (e.g. by current students) will be token-based using the open source OAuth 2.0 Single-Sign-On framework that we developed for the Total Recal project.<sup>15</sup> This approach is extensible and allows us to easily integrate with SAML and Shibboleth-based applications.

We will also use our Common Web Design (CWD) HTML5/CSS3 presentation framework, which offers fast, consistent user interfaces for our web services across conventional and mobile devices.<sup>16</sup>

We also expect to use <http://lincn.eu>, our URL shortener and link proxy, which enables us to gather real-time analytics on the use of our applications.

## 1.12 Standards

| Name of standard or specification | Version | Notes |
|-----------------------------------|---------|-------|
| XCRI (XML)                        | 1.2     |       |
| HTML                              | 5       |       |
| CSS                               | 3       |       |
| PHP                               | 5       |       |
| Javascript                        |         |       |
| OAuth                             | 2       |       |
| JSON                              |         |       |

## 1.13 Intellectual Property Rights

All documentation produced by the project will be licensed under a Creative Commons UK BY license. Code developed for visualisations will be licensed under an open source license. Open source licensed code examples will be made available on the project blog to ensure that the work and findings of the project are fully disseminated. We are currently assessing our choice of open source licenses as part of a wider project and are committed to developing open source software, as can be seen from previous JISC-funded projects we have run. We will seek guidance from OSSWatch on whether and what open source license is appropriate.

In developing the proposed applications, we will be using existing open source software and third-party APIs, which will affect the licensing of our own work. We will ensure that an appropriate license is chosen for our own work with the intention of delivering widely usable (i.e. public facing) and sustainable applications.

## 2 Project Resources

### 2.1 Project Partners

There are no project partners. However, Dr. Tony Hirst from the Open University will act as a Consultant on the ON Course project. He is a Senior Visiting Fellow at the University of Lincoln and in

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<sup>15</sup> <https://github.com/alexbilbie/Codelgniter-OAuth-2.0-Server>

<sup>16</sup> <http://alexbilbie.blogs.lincoln.ac.uk/2011/03/23/introducing-common-web-design-v3-0/>

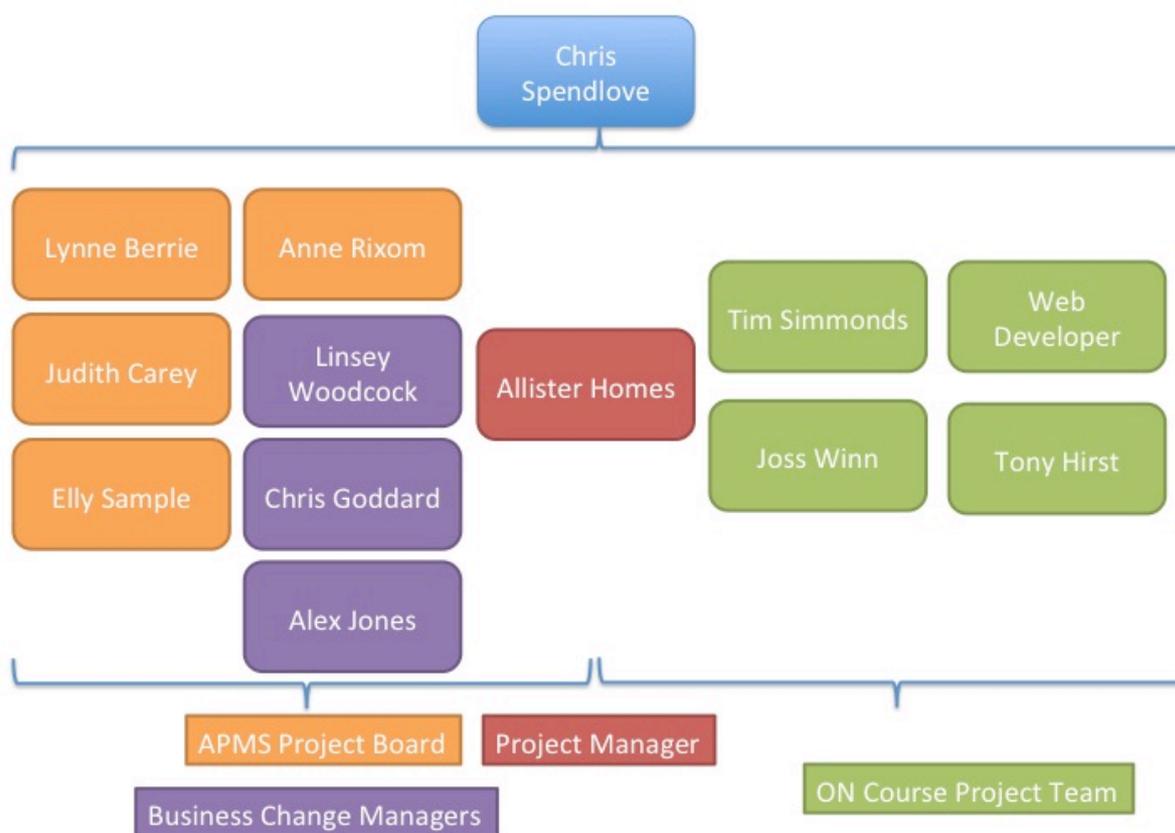
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this project, is valued for his work on the 'Course Detective' search engine<sup>17</sup> and the TSO funded 'Opening up UCAS data' project.<sup>18</sup>

## 2.2 Project Management

An APMS project board is already in place, chaired by Chris Spendlove (University Registrar) who is also the Project Sponsor and deputy chaired by Lynne Berrie (Co-Acting Director of ICT). Other board members are Anne Rixom (Head of Office for Quality, Standards and Partnerships), Judith Carey (Director of Student Affairs), and Elly Sample (Director of Communications Development & Marketing). Business Change Managers are Linsey Woodcock (OQSP), Alex Jones (Planning and Business Intelligence) and Chris Goddard (Marketing and Communications). An evaluation panel was convened which, in addition to the Business Change Managers and Project Manager, included representation from Finance and an academic from the School of Computing. The project manager is Allister Homes, from ICT's Project Services.

As described above, the ON Course project exists as an adjunct to the existing institutional APMS project. Both projects share the same Project Sponsor and Project Manager, who will ensure that the work of both projects is well co-ordinated and communicated. The APMS project consists of a Project Board, a team of Business Change Managers and the Project Manager. The ON Course project consists of the PM, PI, dedicated Web Developer, Online Services Team Manager and Consultant.



<sup>17</sup> <http://lincn.eu/c378>

<sup>18</sup> <http://lincn.eu/fhv2>

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## 2.3 Project Roles

| Team Member Name | Role                    | Contact Details         | Days per week to be spent on the project |
|------------------|-------------------------|-------------------------|--|
| Joss Winn        | Principal Investigator  | jwinn@lincoln.ac.uk     | 1  |
| Allister Homes   | Project Manager         | ahomes@lincoln.ac.uk    | 0.5                                      |
| To be recruited  | Web Developer           |                         | 5  |
| Tim Simmonds     | Online Services Manager | tsimmonds@lincoln.ac.uk | 0.25                                     |
| Tony Hirst       | Consultant              | a.j.hirst@open.ac.uk    | 5 days over the project                  |

## 2.4 Programme Support

Likely technical discussions around XCRI standard.

# 3 Detailed Project Planning

## 3.1 Evaluation Plan

| Timing   | Factor to Evaluate   | Questions to Address   | Method(s)  | Measure of Success  |
|----------|----------------------|--|--|---|
| Month 1  | Project Initiation   | Is the project well-established? Has recruitment been successful? Has the website been set up? Do team members understand the purpose of the project and their role? Have we satisfied our funder's initial requirements? Is there a roadmap for the project that people are aware of?   | Feedback from Project Team.<br>Feedback from Project Board.<br>Feedback from JISC.   | The project is on schedule and the team is actively engaged. Recruitment has been successful. The website is fully established and being used. The Project Board is satisfied with progress. JISC is satisfied with progress. |
| On-going | Community Engagement | Are we clear about who our community is composed of? Are we reaching them effectively? How are they engaging with our work? Are we employing effective and appropriate methods of engagement (e.g. conferences, journals, workshops, seminars, website, social media, discussion groups, | Conference participation, journal paper submissions, workshops, seminars, an active website, use of social media, active participation in discussion groups and other forums | Web analytics, social media engagement, conference attendance, discussion list contributions, journal paper submissions, and knowledge exchanges/transfers.   |

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|------------|--------------------------------------|--|--|--|
|            |                                      | forums). Are we able to measure the impact of our engagement?<br>What is the project learning from this engagement?  |  |  |
| On-going   | Gather user requirements             | Are we engaging our users effectively? What stake do they have in the project? Are we engaging with them regularly/iteratively? Have we identified 'proxy users'? How are we gathering our 'user stories'? How does our development cycle reflect our engagement with our users? Are we flexible/agile? Are we open to changing requirements? Are we employing a variety of methods to gather user requirements (interviews, questionnaires, observation, workshops, etc.)? What is the project learning from this work? | Interviews, questionnaires, surveys, workshops, informal meetings. | Active contribution from users. Useful contributions from users. Comprehensive number of user stories to base development on. A well-formed requirements analysis with lots of user input. |
| By Month 3 | Create initial requirements analysis | Do we have a clear basis from which to start development? Are the user stories effectively represented in our analysis? Does the analysis identify the types/category of user? Does the analysis identify methods of acceptance testing? Does the analysis identify our constraints? Does the analysis estimate the work involved (i.e. 'story points')? What is the project learning from this work?  | Synthesise user stories and literature review.                     | The creation of a useful and thorough requirements analysis that can serve as a reference for our development of the 'Personalised Prospectus Plus'.                                       |
| By Month 3 | Assess data sources                  | What are the common attributes of the data sources? What are the common methods by which we access the data sources? What  | Study the XCRI-CAP 1.2 specification and APMS APIs.                | The creation of a useful and thorough assessment that can serve as a reference for our development.  |

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|            |                       | issues/challenges have been found? How can they be resolved? What is the project learning from this work?   |   |  |
| By Month 6 | XCRI-CAP feed         | Does the feed validate? Does it include all credit-bearing courses?   | Use XCRI-CAP validator. Check with APMS project/WorkTribe   | The feed is comprehensive and valid.   |
| On-going   | Technical development | Is development going according to the Project Plan? Do we have the right tools to be productive? Are the development cycles on track? Are users being regularly engaged? Are we responding to user requirements in an agile way? Is the workspace suited to the development work? Are development staff feeling energised? Are development staff clear about their responsibilities? Is code being well documented? Is code being licensed and published for public review? Is code being thoroughly tested? Are we deploying regularly and incrementally? Are we integrating our work with existing services where appropriate? Are we planning for future development? What is the project learning from this work? | Employ an agile method to software development. Regular face-to-face communication within team to check on progress. Regular deployment of working code for user feedback. Publish open source code for review by other developers. Publish blog posts which discusses the development and solicit comment. | Working code. Positive user feedback. Achieving roadmap set out in Project Plan. |
| Month 12   | Case Study            | Is the Study clearly written, using jargon-free language? Does it cover all aspects of the APMS project, from planning to procurement to implementation to use? Has it been published in formats that are accessible?   | Solicit feedback from colleagues.   | Feedback from peers. Feedback from JISC.   |
| Month 12   | Project Close         | Have the project objectives been met?   | Measure against Project Plan and  | Feedback from JISC. The project leads to   |

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|  |  | Have the deliverables been achieved? What have staff learned that can be transferred to other staff and future work? Is the project been completed within budget? | Budget. Feedback from project team. Consider any new work that is an outcome of this project. | continued work in this area. The project has delivered tangible, useful products for the university and HE sector. |
|--|--|---|---|--|

### 3.2 Quality Assurance

|  |  |   |  |
|--|--|---|--|
| <b>Output / Outcome Name</b>             | <b>Case Study of the APMS project at the University of Lincoln</b>   |   |  |
| <b>When will QA be carried out?</b>      | <b>Who will carry out the QA work?</b>   | <b>What QA methods / measures will be used?</b>   |  |
| Month 6, Month 9, Month 11, Month 12.    | Project Board, Principal Investigator  | Peer-review, collaborative review, drafting, rewriting, discussion at Project Board meetings. Share with JISC Programme Managers by Month 11 for final review and re-drafting.  |  |
| <b>Output / Outcome Name</b>             | <b>The production of a valid XCRI-CAP 1.2 feed</b>   |   |  |
| <b>When will QA be carried out?</b>      | <b>Who will carry out the QA work?</b>   | <b>What QA methods / measures will be used?</b>   |  |
| Monthly (to be completed by August 2012) | Project Manager, Web Developer, Online Services Team Manager, Tony Hirst   | Regular engagement with WorkTribe to ensure this requirement is met. Use of external validation tools. Use of the feed as a source of development for other deliverables. Consultation with Tony Hirst around the use of the feed in his TSO project. <sup>19</sup>       |  |
| <b>Output / Outcome Name</b>             | <b>APIs for the use of the XCRI-CAP feed via <a href="http://data.lincoln.ac.uk">http://data.lincoln.ac.uk</a></b> |   |  |
| <b>When will QA be carried out?</b>      | <b>Who will carry out the QA work?</b>   | <b>What QA methods / measures will be used?</b>   |  |
| August 2012                              | Principal Investigator, Web Developer, Online Services Team Manager, Tony Hirst                                    | Consultation with Tony Hirst around the use of the APIs in his TSO project. Internal use of APIs to develop proposed software deliverables. Public exposure of APIs for use by sector. Feedback form on <a href="http://data.lincoln.ac.uk">http://data.lincoln.ac.uk</a> |  |
| <b>Output / Outcome Name</b>             | <b>Mashups and visualisation</b>   |   |  |
| <b>When will QA be carried out?</b>      | <b>Who will carry out the QA work?</b>   | <b>What QA methods / measures will be used?</b>   |  |
| On-going                                 | Principal Investigator, Web Developer, Online Services Team Manager, Tony Hirst                                    | Consultation with Tony Hirst, who is widely regarded for his work on mashups and visualisations. Peer-review from sector. Formal and information feedback from Lincoln staff about the utility and further development of the visualisations.                             |  |
| <b>Output / Outcome</b>                  | <b>Personalised Prospectus Plus</b>  |   |  |

<sup>19</sup> See <http://lincn.eu/fhv2> for details on Tony Hirst's TSO project.

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| <b>Name</b>                         |  |  |
|-------------------------------------|--|--|
| <b>When will QA be carried out?</b> | <b>Who will carry out the QA work?</b>   | <b>What QA methods / measures will be used?</b>  |
| On-going                            | Project Manager, Principal Investigator, Web Developer, Online Services Team Manager, Tony Hirst | On-going, iterative development with user group. Apply well understood agile project management methods (see 1.4 Overall Approach). Apply the principles behind Agile software development ( <a href="http://agilemanifesto.org/principles.html">http://agilemanifesto.org/principles.html</a> ), including regular unit testing. Peer-review of source code, issue tracker and mailing list. Report to Project Board on progress. |
| <b>Output / Outcome Name</b>        | <b>JISC documentation</b>  |  |
| <b>When will QA be carried out?</b> | <b>Who will carry out the QA work?</b>   | <b>What QA methods / measures will be used?</b>  |
| Month 6, Month 12                   | Project Manager, Principal Investigator  | Peer-review of reports prior to delivery. Discussion at Project Board meetings. Feedback from JISC Programme Managers.   |

### 3.3 Dissemination Plan

| <b>Timing</b> | <b>Dissemination Activity</b> | <b>Audience</b>  | <b>Purpose</b>   | <b>Key Message</b>  |
|---------------|-------------------------------|--|--|---|
| On-going      | Blog                          | Public/External and Internal Stakeholders/Project Team/Users | Provide regular updates and reflections on the ON Course project.  | To offer general information about the progress of the project.   |
| On-going      | Public Project Management     | Public/External and Internal Stakeholders/Project Team/Users | Offer a transparent view of the running of the project and its outputs at all stages of production. (i.e. source code examples via Github, task management via Pivotal Tracker, user feedback via Get Satisfaction). | We welcome peer-review and engagement at any time and recognise that we have much to learn from others. |
| On-going      | User engagement               | ON Course user group   | To ensure that our users remain at the core of the project and committed stakeholders. So as to receive useful and representative requirements for the project.  | Users are at the heart of the project.  |
| 01/2012 &     | Press Releases                | Media  | To promote the   | The University of   |

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| 01/2013           |  | organisations/public   | innovative work of the university and the skills and experience of the staff.   | Lincoln is a progressive university that aims to offer students and staff better ways of understanding the institution through the use of open data. |
| 02/2012 & 02/2013 | Articles in Staff Magazine   | University of Lincoln staff  | To inform all staff at the university of Lincoln about the project and seek their feedback.   | We are committed to open data and the innovative use of technology for the benefit of staff and students at the university.                          |
| On-going          | Course Data networking   | Course Data community  | To seek reciprocal peer-review and collaboration. The proposed use of some of the technologies we have chosen (MongoDB, Sphinx, OAuth, HTML5), are quite new to the HE sector and should provide some valuable case studies for other institutions. | We are doing innovative work that could be of value to you.  |
| 06/2012 & 12/2012 | Project reports  | University Registrars and ICT professionals.                           | To inform the community about the work we are doing and seek peer-review and opportunities for collaboration.   | A summary of the project to-date.  |
| On-going          | Conference/journal paper(s)  | Developers in the HE sector. Web Managers and Marketing professionals. | To seek reciprocal peer-review and collaboration.   | Our Research and Development is of scholarly interest and undertaken with rigour.  |
| 10/2012           | Workshop discussing our work (production and consumption of open data through APIs, 'design by data', agile methods of working). | Developers, ICT staff and Marketing staff in the HE sector             | To share Lessons Learned with others in the sector.   | We value your interest and participation in the project.   |
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### 3.4 Exit and Embedding Plans

| Project Outputs/Outcomes     | Action for Take-up & Embedding  | Action for Exit  |
|------------------------------|---|--|
| Case Study                   | Dissemination through project website, social networks and JISC Course Data mailing list.   | CC-BY licensed, available from our Institutional Repository, linked to via our project website.  |
| XCRI-CAP feed                | Will be published at <a href="http://www.lincoln.ac.uk/courses.xml">www.lincoln.ac.uk/courses.xml</a> and made auto-discoverable in HTML header tags. We server as source data for public APIs.   | CC-BY licensed, available and auto-discoverable from our institutional website.  |
| APIs                         | Will be publicly documented on <a href="http://data.lincoln.ac.uk">data.lincoln.ac.uk</a> and used for internal development. The APIs will form part of the overall <a href="http://data.lincoln.ac.uk">data.lincoln.ac.uk</a> platform and contribute to the envisaged <a href="http://data.ac.uk">data.ac.uk</a> project. | We are the primary consumers of our own open data and therefore have a stake in maintaining the APIs.  |
| Mashups and Visualisations   | Dissemination through project website, social networks and JISC Course Data mailing list.   | Mashups/visualisations are widely circulated with tutorial-like documentation (in a style similar to Tony Hirst's OUseful blog) <sup>20</sup>        |
| Personalised Prospectus Plus | Showcase institutional web application publicly available to all prospective students. Fully documented with code examples via the project blog and GitHub code repository. Dissemination through project website and JISC Course Data mailing list. Referenced in university Marketing and Press.                          | The application is embedded on <a href="http://www.lincoln.ac.uk">www.lincoln.ac.uk</a> and showcased by the institution during recruitment periods. |
| JISC documentation           | Dissemination through project website, social networks and JISC Course Data mailing list.   | CC-BY licensed, available from our Institutional Repository, linked to via our project website.  |
| Blog                         | Dissemination through social networks and JISC Course Data mailing list. <a href="http://blogs.lincoln.ac.uk">http://blogs.lincoln.ac.uk</a> scores well on SEO.  | The project website is part of our WordPress network and will be maintained indefinitely.  |

### 3.5 Sustainability Plans

| Project Outputs              | Why Sustainable   | Scenarios for Taking Forward  | Issues to Address   |
|------------------------------|---|---|---|
| Personalised Prospectus Plus | Offers significant utility to the institution in recruiting students. A 'selling point' to the University of Lincoln. | Sustained by the institution as the primary method of producing prospectuses for 2013 intake. | Ensure staff remain in place to maintain and develop the application by developing Business Case. |

<sup>20</sup> <http://ouseful.info>

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|                    | A 'showcase' application for developing a sense of 'life at Lincoln'. Significant interest and support from Registry and Marketing departments.   |  |   |
| XCRI-CAP feed/APIs | XCRI-CAP is automatically generated from the APMS. Forms source data for our own applications. APIs provide a convenient method of using XCRI-CAP data and allows easy integration into other web applications we develop, such as the 'Prospectus Plus'. | Forms part of data.lincoln.ac.uk which is becoming the technology platform for institutional innovation. | Formalise the use of data.lincoln.ac.uk through alignment with existing policy and third-party audit. |

## Appendices

### ***Appendix A. Project Budget***

### ***Appendix B. Workpackages***

### ***Appendix C. Functional Requirements of APMS and Information to be recorded.***

### ***Appendix D. XCRI Self-Assessment Report***