

## Statement of Requirements

*The requirements listed here are grouped under 6 major categories. Where appropriate some context statements are also provided. There are some elements that appear under more than one category, but each instance has a different focus identified by the category.*

It is important to think of the LMS as a broader service and not just a single platform. An enhanced service will seek to provide better integration and linkages with other relevant services, and is likely to be derived from multiple platforms. Ideally it should be possible to provide a broad and flexible service and make changes to the platforms behind the service without users being too aware of it beyond enhanced functionality. There are also some issues in supporting the current platforms, creating unhelpful and arbitrary limitations. The enhancement process seeks to remove these limitations, and lead to better support for additional functionality, flexibility and amenity.

Vendors may propose one or more platform(s) or services to deliver the functionality sought, but must identify which elements address which requirements.

## General requirements

Fundamentally, there are a set of basic essential principles that underpin the requirements of the LMS:

- G-1. The service must be extremely robust, i.e. established as an enterprise class system with associated service-level guarantees and high-availability mechanisms, whether hosted externally or self-hosted.
- G-2. The service should be world-class. Students and staff need to know that they are supported by the best possible environment.
- G-3. The service must be easy and pleasant to use, with characteristics of intuitiveness, customisability, ease of navigation, and design that encourage users (in all roles) to engage with and explore the service.
- G-4. The service must separate the content and presentation of materials, allowing for easier management and re-use of materials in other contexts, within the platform (e.g. across courses, across course instances) and with other platforms.

## Flexibility Requirements

Given the strong interests and opportunities in enhanced flexibility of the ANU's educational processes, the ANU LMS needs to be prepared to support them. Programs or courses of study will ultimately be seen as attributes of individuals and not the other way round. A student will be able to have multiple pathway options through ANU content and processes, and accreditation may be separated from teaching and learning. Any LMS environment must be able to support these aspirations, and not constrain the University. The enhanced service should improve flexibility in teaching and learning. This can mean flexibility in location, in time, in content, in method, in schedule and in delivery.

The new service should:

- F-1. Improve the range of methods of interaction and communication amongst users in diverse roles and relationships. These include enhanced support for peer-based learning, small-group interactions, tutorial processes, etc.
- F-2. Provide better support for flexible pathways through courses, perhaps by considering it more as a student-oriented service than a course-oriented service.
- F-3. Have no real limitation in the number of students, courses, programs, etc. that the service supports, allowing for growth in student, course and program numbers
- F-4. Support more flexible assessment methods and 'goal-aware' tools

- F-5. View courses as short-term instantiations inside the LMS. Ideally the core LMS platform becomes stateless in the longer term. It should not be a repository for longer-term storage, but a service to provide discovery and access to instances of courses and their associated materials and tools, allowing additional tools and services to be 'plugged in'. Courses may also have multiple instantiations running in parallel at different stages.
- F-6. Support short-term course-instantiations as well as long-term course and program background sites, i.e. a website that promotes and provides background to a course, likely to be publicly accessible, and a more tightly access-controlled website for materials during the running of a course. Courses may further be aggregated into one or more programs requiring their own websites.
- F-7. Support more flexible access to materials stored in, or generated within, the LMS. It should not lock materials into a single inflexible access framework but support other access methods for upload and download. This will allow other materials-management processes to be linked with the LMS.
- F-8. Have no constraints on the type (formats) and quantity of materials presented through the system.
- F-9. Have no constraints on the client side platform, within reason, i.e. cross-platform and cross-browser support, and ideally support the newer generation of portable devices with lower bandwidth and smaller screens.

## Linkages Requirements

The LMS does not exist in isolation within the university, but sits within a broader context. It needs to link with a range of other university information services to provide fundamental services, to improve the way the LMS is used by all users, and to lead to opportunities for additional functionality. Linkage as a concept implies a communication between platforms rather than in-depth integration. This allows elements to be replaced or upgraded without significant flow-on upgrades being automatically incurred.

- L-1. Linkage with our Student21 (PeopleSoft) system for course-instance information including enrolments and responsibilities, and with teaching-activity databases for up-to-date teaching/tutoring role information.
- L-2. Linkage with or support for user portfolio services, both for assessment portfolios (formative portfolios), and for medium-to-long-term storage of user materials (summative portfolios). This would apply mainly to students, but could also be relevant for teaching staff.
- L-3. A need to cleanly support external course materials and websites for information not stored in the university's business systems, including the library, institutional repository systems, multimedia archives, and 3<sup>rd</sup> party websites, which may include additional functionality through Web2.0/AJAX methods and/or require additional authentication steps.
- L-4. Linkage, under appropriate access controls, with course evaluation system(s), such as CEDAM's Student Evaluation of Teaching and any lecturer or College driven processes.
- L-5. Linkage with various identity-provisioning and management services, including LDAP, Kerberos and Shibboleth.
- L-6. Ability to augment the core platform with a broad range of other external functions. Examples include email, document management, specialised teaching software such as language laboratories, wireless handheld devices for in-class interaction, and collaboration tools (real-time and asynchronous) for a range of media types apart from text and slides, e.g. audio, video and whiteboard tools.
- L-7. Linkage with a broader service user portal, using portal standards such as JSR-168.
- L-8. Linkage with Academic Honesty processes, for example supporting the use of external tools and educational materials; the ANU has used MyDropBox in the past as an analysis tool.
- L-9. Linkage with other, potentially external, LMS frameworks to support delivery of content to e.g. partner institutions around the world and private/public-sector organisations.
- L-10. Linkage with other resource management tools, such as booking systems.
- L-11. The ability to link with, or migrate to, other LMS platforms in the future, through up-to-date support for IMS/SCORM import and export.

## Enhancement Requirements

There are many opportunities to do more with the LMS than currently utilised. Some features may significantly enhance the educational experience, others the processes to support them.

The enhanced service should, amongst others, aim for:

- E-1. A broader base of supported content types, and delivery mechanisms, e.g. for audio, video and other materials, including live and on-demand delivery, for one-to-one up to many-to-many users, and support for richer presentational markup languages such as MathML to be used in webpages
- E-2. Wider access, for remote users and/or from home. For example, a significant fraction of ANU's students come from the region which is predominantly rural/non-urban in nature, or from home/office environments, and issues such as bandwidth, latency and client-side processing (e.g. through AJAX/Web2.0 approaches) play a key role.
- E-3. Where a level of trust is required for access to materials through the LMS it should not consider the users location (IP address, on-campus or not) but only their identity.
- E-4. Enhanced accessibility, to support learners and teachers with various disabilities. There are externally mandated levels of accessibility that must be met, and higher levels to provide maximum support for users.
- E-5. Support for course-instance archiving and recovery through some processes, including selected elements of courses, on-demand and/or automated. Students may have a reasonable need to see older materials, which may or may not be kept in their own portfolios, and teaching staff may wish to return to older instances of courses, possibly for later (re)evaluation of staff/student performance. Conversely, old course materials should not be inappropriately accessible to new students.
- E-6. Full support for electronic submission, where appropriate, and for a wider range of materials than just text and imagery. This includes postings to discussion forums, survey feedback, and wikis.
- E-7. Better support for electronic assessment, reducing the paper load and improving communications between student and assessors, but still providing a comfortable assessment environment for assessors. This includes annotation and assessment of contributions such as discussion items, as well as formal assignments, etc.
- E-8. Inclusion of inbuilt assessment mechanisms such as quizzes, polling tools, and self-tests.
- E-9. Better support for bulk-movement of materials from the student submissions to assessors, within the marking process, and in the return to the system. Some courses have several hundred students. Processes should also for example include mechanisms to 'tag' materials with user information, e.g. where students have forgotten cover sheets.
- E-10. Better support for teacher's materials management by better integration with their desktop environments which are predominantly Windows, MacOS and Linux.
- E-11. Support for internationalisation, i.e. multi-lingual materials and user-interface support, which is crucial to ANU language teaching amongst others. This should include non-roman languages (e.g. Chinese, Japanese, Indic) and right-to-left languages (e.g. Arabic, Persian, Urdu).
- E-12. Improved support for more complex roles within the system to support various delegations of responsibility at much greater granularity.
- E-13. Improved support for more complex granularity and timing of access to materials throughout the system, i.e. selective and sequenced release, based e.g. on date, performance or group membership
- E-14. Support for both private and anonymous contributions to tools in the system where appropriate.
- E-15. Improved granularity of assessable contributions beyond formal assignments, such as forum postings and wiki contributions, at individual and group level.
- E-16. Support for time-management and resource-management, e.g. booking systems for tutorials and other events, involving students and staff.
- E-17. Support to monitor usage of the system, to identify how users (staff and students) engage with the system and the content, and where improvements could be made.

- E-18. Support for local (University, College, Area), and ideally individual (lecturer, student), customisation of look-and-feel, language, terminology, etc., without incurring a significant administrative overhead.
- E-19. Support for the development and integration of additional tools and features that may be ANU-specific.
- E-20. Improved management of student roles within classes, such as the ability to easily create subgroups with associated materials and tools, but still provide whole-of-class aggregate and individual-student communication channels. It also must include scalable support for students to self-create and/or self-enrol into groups, such as tutorial/study groups.
- E-21. Improved management of courses themselves as elements of broader programs, including access to materials and tools, and aggregated program websites, within a broader framework.
- E-22. Support for greater client-side processing to reduce the load centrally and enhance the user experience on the client side, e.g. through Web2.0/AJAX methods.
- E-23. Improved integration of tools within tools, e.g. quizzes and discussions within teaching content, rather than separate content, quiz and discussion areas.
- E-24. Support for easy creation of rich web-pages for course content and navigation (CourseGenie is currently used standalone for some applications, as well as manual html editing), as well as shared content creation through the web, such as a user-friendly wiki and blogging environment.
- E-25. Support for a richer student environment encompassing all of their activities, including user-friendly personal-workspace pages, scheduling/calendaring, communication and materials management.

## Support Requirements

The greatest costs of migration to a new platform are the change in support needed, and the physical migration itself.

- S-1. To minimise day-to-day support costs the platform(s) must have an intuitive and user-friendly user-interface that guides users through common tasks.
- S-2. The platform(s) must include extensive support materials, including training materials and online self-help materials, editable to suit ANU conditions
- S-3. The vendor must provide courses for train-the-trainers and potentially direct to users. In the first instance there must be training provided to ANU support staff centrally and in Colleges.
- S-4. The platform must include support for easy and fast migration of materials from our current platform to the new platform, and the proposal must identify any limitations in such a migration.
- S-5. To manage the ANU support resources effectively the vendor should provide information on any short-term to long-term hosting environment, including infrastructure and helpdesk services, and how to transition back to a self-hosted environment. This may include support for a self-hosted but externally-supported system.

## Implementation Requirements

The ANU requires detailed information about the capabilities, usability and requirements of proposed platforms, the vendors and any associated service providers, in a real-world situation as similar as possible to the ANU, and what the directions of the platforms are likely to be over time.

- I-1. The proposal must provide multiple reference sites and contacts which the ANU can contact and/or visit to seek information about their experiences. In particular, these sites must be able to address
  - a. the usability and functionality of the platform(s) in real-world educational processes,
  - b. the quality of support from the platform and the vendor, and
  - c. the integration of the platform(s) with the organisation's business systems.
 The reference sites must demonstrate similarities with aspects of the ANU, e.g. in terms of a university environment, similar or larger populations, the same back-end business systems, etc.

- I-2. The proposal must include mechanisms to potentially support analysis of the usability of the platform by the ANU through multimedia materials, presentations and/or hands-on demonstrations, if required during the evaluation.
- I-3. The proposal must include detailed implementation information to be able to run the platform(s) on the ANU, including hardware, software and networking requirements, and information about the scalability of that environment to meet the university's evolving population.
- I-4. The proposal must provide a 5 year roadmap of the proposed platform(s), including planned functionality and usability features, and likely infrastructure requirements.