Dictionary.com defines “wrapper” as a material, such as paper, in which something is wrapped. When “wrapper” is used to refer to the various complex components which comprise the majority of the New Degree Audit System (NDAS) it gives the false impression that these components do little more than act as glue connecting DARS to UCLA’s technological infrastructure. It is critical to understand that the NDAS is not an off-the-shelf purchase intended to be woven into UCLA processes but rather a hybrid development combining the DARS core analysis engine with an entirely custom-developed support system. To emphasize this distinction the term “wrapper” has been replaced by the term “component” in the following text.

1. Component Questions:

   a. How are the components dependent or not dependent on vendor software changes as the vendor introduces new versions of the software?

One of the components is completely independent (the Print Server) from the DARS analysis engine while the other components have very limited dependence.

The job of most components is to collect or display data in a manner consistent with the needs of the users or providers of that data. In addition to the implementation of an efficient and intuitive interface the components are also responsible for storing data in, or reading data from tables designed consistent with the specifications of the core analysis engine. This is the extent of the relationship between component and analysis engine. Hence, upgrades to the core analysis engine are independent of the components unless the upgrade includes a change to the data structure upon which the analysis engine is dependent.

Moreover, it is important to note that Miami University’s stated policy is to minimize any changes to the underlying data structure. Our experience has been consistent with this policy: of the several minor upgrades and one major upgrade we have implemented only one included any changes to the analysis engine data model (and that change was very minor—introducing a single new column in one table). Nonetheless the code will be written and documented in a way that accommodates such changes with minimal effort.
b. **What is the data model of the vendor software?**

The data model is quite complex requiring over one hundred pages of documentation. It is included as Appendix A.

c. **What specific additional data types is the component software going to introduce, if any?**

The answer to this question depends on whether the “data types” mentioned above refer to data elements in the NDAS or to data elements in the Student Record System.

In the first case (data elements in the NDAS), it is too early to know with any certainty. However, we anticipate that the components developed for the NDAS will require only a few new data elements beyond those fundamental to the operation of DARS. The majority of these will likely be *metadata*, for example: date fields indicating when a table was last updated, when transfer course work was taken or when a stored audit was created.

In the latter case the answer is easier to predict: any data elements created to facilitate the interaction of NDAS components and the degree audit engine would, in all probability, be specific to NDAS processes. As the Degree Audit table of record, the NDAS database server would be the logical place for new data elements to be added, not the Student Record System.

d. **What is the functionality needed?**

The components created for the NDAS will be designed to capitalize on DARWin’s strength, its powerful backend audit engine, while compensating for its weaknesses: an intentionally one-dimensional interface for students and counselors and the absence of integrative options for associated processes.

Our strategy is not unique—in fact, the majority of Miami University’s clients have chosen to follow a similar route. This is no accident. Believing that the client institution would be in the best position to evaluate the integration and interface needs of its users, Miami University has concentrated on developing tools for encoders and technical administrators not audit end-users. Schools that lacked the resources to adopt this strategy were obliged to use DARWin’s generic audit reports. Not surprisingly, their audit end-users have had difficulty navigating the standard interface largely because it can only approximate the specificity of their institution’s particular rules and requirements.
The components developed for the NDAS will be designed to provide the following functionality:

- Leverage existing skills and experience in place at UCLA
- Dovetail with existing methodologies and processes in use at UCLA
- Leverage existing and emerging service technologies (MyUCLA, URSA, Campus CMS infrastructure)
- Develop a source course work editor specifically designed to leverage the skills and experience of UARS staff in the application of transfer credit.
- Develop a substitution and exemption web interface designed to efficiently capture those few exceptions each department deals with on a regular basis. The goal of the interface is to entirely encapsulate the application of the exception without requiring any other system knowledge. Such system knowledge severely handicaps efficient use of the current system.
- Deliver audits using existing systems and applications (integrated tools)

Is there potential for collaboration with other campuses?

Yes, there is potential for collaboration with other campuses in certain key areas of this endeavor, not the least of which is the development of a standard XML schema for audit delivery. However, the potential for collaboration in the design of system components for the NDAS is necessarily very limited.

Arguably this is largely due to the development strategy adopted by Miami University—a strategy which is based on the assumption that a certain degree of difference (whether it be in rules and regulations or in administrative organization) among institutions of higher education is the norm and not the exception. Given this philosophy, it made little sense to make a high-level, necessarily user-specific interface (not to mention the integrative processes needed to sustain it), an essential part of the DARWin “package.” Frankly, this is one of the main reasons why the committee charged with exploring commercial degree audit systems found Miami University’s products so attractive.

Finally, if we are to achieve our goal of providing seamless integration and efficient support of UCLA-specific student system implementations, we need to focus our collaborative efforts in those areas where they will bear the most fruit.
Could a standard for web services be developed that could be adopted by Miami University and other users of DARWin?

We have a working agreement with Miami University to coauthor the resulting XML schema which is the core deliverable of this service.

e. What is the impact on URSA? (i.e. what is the magnitude of work and can it be covered under existing maintenance or will additional funding be required?)

Until the vast majority of students with admit terms prior to Fall 2006 have graduated (estimated to be no earlier than 2012), URSA will have to accommodate the degree audit needs of students using the new system (Fall 2006 and later) as well as those students who will continue to use the current system (prior to Fall 2006). Despite the apparent work entailed in maintaining two systems, the actual impact of the NDAS on URSA will depend on the extent to which URSA takes advantage of the increased range of functionality provided by the new system. For example:

- One solution would be to provide a link on URSA that would direct students in the target population (Fall 2006 admits and later) to the degree audit feature on MyUCLA. Once URSA adopts ISIS authentication this transfer would be “transparent” as these students would not be required to provide their security credentials when changing systems.

Those students admitted before Fall 2006 would continue to access their degree audit reports on URSA using the same procedure they had used before the implementation of the NDAS.

This strategy would involve virtually no commitment of resources or funding from the URSA team.

- If the priority (at least in the short term) is to enable URSA to provide students using the new system with a degree audit report similar to the one currently available (a no-frills, text-based audit), that too, could be provided with relatively little effort.

- If, on the other hand, URSA is to take full advantage of the functionality available through the NDAS in order to build a multi-faceted, web-enhanced interactive audit, the commitment of additional resources will be necessary. However, since the development of a more refined audit tool could proceed in tandem with the use of either of the two audit features described above, the URSA team would be in the position to proceed with development/implementation at its convenience.
If under maintenance, is there a possibility that delays could be introduced into the DAUD project if URSA resources are not available when needed?

The availability (or lack thereof) of URSA resources will have no impact on the development/implementation of the NDARS since these resources will be required only if the URSA steering committee chooses to provide enhancements to the degree audit tool described above.

f. What will the web service data stream look like (so that URSA team can evaluate what it will take to produce the DPR)?

The audit result XML schema will necessarily be highly complex as it will contain as much data as possible relevant to the audit. Although it is expected that the vast majority of system uses will require only a portion of the data contained in this schema, it is necessary that the schema be comprehensive in order to incorporate the union of all possible needs for all potential uses/users. For example, when the system is used to validate graduation requirements, information about those classes not used to satisfy requirements would be of little interest to the user who originated the audit request. However, that same information would be necessary to satisfy the goals of an audit request to identify demand details for classes satisfying any/all requirements. Consequently, the XML schema must reflect the totality of the information available for any given audit.

g. How would an application be authorized to call the web service?

In accordance with the current security strategy employed by AIS, service authorization would depend both on application authorization as well as the authorization of the user making the request via the application. More specifically, authorization would require the verification of the following information:

- the IP address for the server running the application
- the authorized application ID
- the status of the ISIS ticket (current, expired etc.)
- the authorization of the user to request an audit for the particular student.

Is there a built-in function for the former in DARS?

No. DARS does not include components related to specific campus implementations (see 1d above).
Would the College maintain a table of approved applications in the web service component?

Only an approved application (used by a validated ISIS ticket bearing user) could request information from the web service. However, this authorization table would be stored as part of the underlying database structure not within the service component.

2. How will the cost of converting the old DAUD system to use the new DB2 SRS files be covered? Is it expected to be covered with existing maintenance staff or is it funded in the DAUD or SR DbR projects?

The SR DbR project will fund the cost of changing all systems - including the old and the new DAUD systems - to use the new DB2 SR0 files and a team of people will work closely with each interface group. The SR DbR project team will make the required changes and will rely on the system owners and the maintenance staff for testing.

3. What is the urgency of implementing by winter 2005? Is there an anticipated major shift in functional requirements (e.g. expansion of GE requirements, double-majors, etc.) that would render the current system so useless that most DPRs would have to be done by hand? How would that affect the timing?

The current system is failing and has been for several years. For example, one of the three schools that the current system was designed to support has had to discontinue using the system entirely because of its inherent limitations and loss of flexibility. The other two have had to resort to manual processing of several new requirements which the current system cannot evaluate. A striking example is the current system’s inability to analyze the new General Education Requirements implemented by the College in fall 2002. These requirements affect over 90% of current undergraduates and are planned for campus-wide implementation in the near future. The projected “devastating impact” is underway with each student service provider suffering more each day.

Out of our desire to replace this mission-critical service as quickly as possible we identified winter 2005 as the earliest feasible implementation quarter. Our estimate was based on a projected two year development process. What we had not anticipated was the time required for the newly established, broadly-based vetting process for projects with campus-wide impact. While we expect that this extended planning process will result in a better end product, we remain eager to begin the actual development.
4. Considering that we are very interested in the results and the successes of Ohio State using the Windows/SQL platform, would delaying implementation until winter 2006 cause irreparable problems for the project and students using the degree audit system?

After Ohio State postponed their production rollout to winter 2004 and UCLA curtailed the admission of students in winter quarter, CIS and its project partners agreed that a winter 2005 rollout was no longer feasible. Consequently, a new rollout date of fall 2006 has been proposed and is pending stakeholder approval.

While any delay in the implementation of the NDARS will invariably result in the increased deterioration of current service, we believe that fall 2006 is the earliest date the NDARS can be completed given the respective scheduling restraints of CIS and its project partners.

5. If the decision is made to move to the Windows/SQL platform what happens to existing investment in UNIX hardware and Oracle license?

If the decision is made to move to the Windows/SQL platform, we would be able to recoup much of the original cost of the Oracle license by reselling the database software. The only restriction imposed by the vendor is that a buyer be found within another UCLA department. Having purchased this software at a considerable discount and for terms which are no longer available, we are confident that we will be able to pass on this value to our colleagues from another department.

Our investment in UNIX hardware was limited to the purchase of a small development server—an investment which we believe can be easily recovered by repurposing the server for local use.

6. How will hardware capacity be planned (i.e. how will you determine how much hardware to purchase to accommodate the capacity required)?

Hardware will be selected based on performance results from our own benchmarking and after discussion with several other schools using the same platform. Clustering of application and web servers will provide efficient and inexpensive scalability.

7. How is AIS work accounted for (this is not in the Gant Chart)? i.e. what work would AIS have to do if there is a platform change? Note: Stakeholders have not previously seen this; they need to examine it more closely to ensure all tasks are accounted for.

AIS work that would be involved in a platform change to MS/SQL has been analyzed by Bonnie and her team of programmers (see chart included in PCD). This task was NOT included in the project plan because the Stakeholders agreed that it would be
sufficient for the purposes of the PCD to “task-out” only the AIX/Oracle option. The stakeholders will decide how to reflect the platform-specific project changes in the PCD—whether it be by adding an addendum or by modification to the original PCD text.

8. In the answers to the questions prepared for the Degree Audit Replacement System Periodic Comprehensive Review, there were some statements included in those answers about the resources needed for the ongoing entry of transfer credit and maintenance of the transfer articulation agreements. UARS thinks those statements and sections should be revised as the project and processes have not been developed to the point to be able to make those resource assumptions.

Estimates for the entry of transfer credit and maintenance of articulation agreements were based on the experience of other institutions and the first hand experience of our current encoder. These were, however, only estimates. The actual resources required to maintain UCLA’s unique set of agreements and the actual entry of transfer credit may vary. Accordingly, we will plan for a periodic reassessment of necessary resources to make sure that available resources match actual demand.

9. How can the encoding of UCLA’s unique degree requirements be documented so that newly hired encoders can get quickly ‘up to speed’ on encoding in our environment? (I.E. how can we reduce dependence on unique knowledge of UCLA in our existing encoders?)

The popularity of DARS has fostered a pool of experienced encoders who also possess detailed knowledge of the internal operation of a DARS based audit. Hiring from this pool greatly reduces the time it takes for a new encoder to come up to speed. While UCLA’s requirements are often complex compared to many schools it is not this complexity which poses the greatest challenge to a new encoder. Rather it is the lack of availability of a university-wide formal repository of record from which major requirements from all schools can be learned. Consequently the most effective way to reduce the time for new (and veteran) encoders to encode a major would be to develop a single authoritative source for requirements and to assign the regular maintenance of the requirements in this source to an experienced and dependable administrative staff member. A thoughtfully designed strategy to document changes to these requirements and communicate those changes to encoders would bring additional value.