George Mason University

Content Management System (CMS)

Pilot Proposal

Last Printed: 4/14/2004 2:32 PM

Last Updated: 04/05/2004

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1. Summary

In April 2003 Joy Hughes, Vice President for Information Technology and CIO for George Mason University, reconstituted the Information Technology Council and charged the council with meeting two objectives:

a) Establish a data base driven architecture that will move the institution's web presence away from static pages towards dynamic integrated pages and will enhance productivity by enabling the inter-site flow and reuse of information.

b) Develop multi-level templates that will simplify the web redesign and implementation process for departments lacking sophisticated web resources.

Since that time, various groups and sub-groups have met to outline technical requirements, analyze relevant business processes, and review current market offerings in the field of commercial Content Management Systems (CMS).

In January of this year the Web Architecture sub-group concluded that commercial CMS systems were either too expensive and/or didn't otherwise meet the charter. At that juncture it was decided to attend the mid-Atlantic EDUCAUSE conference, discover what other schools were doing in the CMS space, and attend a presentation by Duke University about their in-house developed CMS system.

The Duke CMS system (Faculty Database System – FDS) seemed promising. Based on further research and additional contacts with representatives from Duke, a trip to Duke was scheduled for April 2, 2004. Attending from Mason were:

- John Creuziger – Manager, Workflow and Data Warehouse Services, ITU
- Mel Nichols – Director of Information Technology, College of Arts & Sciences

- Gerri Nickle – Lead Analyst, Technology Systems Division, ITU

Based on a more detailed review of the system functionality at Duke and through our own access and inspection of system internals subsequent to the trip, the conclusion drawn is that the Duke CMS system can, with modification, meet the original charges given to the Tech Council.

Therefore, it is recommended that George Mason University obtain Duke University's FDS system and conduct a pilot program based on the goals, objectives, scope, and costs outlined below.

2. About Duke's Faculty Database System

Duke University's Faculty Database System (FDS) is a content management system originally developed and initially deployed in 1998. It's an operational system used within the College of Arts & Sciences at Duke to capture and disseminate faculty CV data. Among it's more outstanding features and functions:

a) **Templates** provide full control over the display of data. Multiple levels of templates (individual, group, and global) exist for each page.

b) Visitors to a page may see **different versions** of the page depending on whether their connections are **secure** or insecure, or **internal** to a subnet or external to it.

c) **Version control** feature allows development on multiple versions of a template at once. New templates may be developed while the existing template remains in place and new templates can be published without deleting the existing template.

d) **Template certification** is in place to ensure that templates go through an approval process to prevent publication of insecure code.

e) **"Extra Templates"** allow developers to generate new pages which were not originally built into the system.

f) LDAP and many other system interfaces exist.

g) Encryption of data and advanced security

h) Platform is **LAMP**: **L**inux, **A**pache, **M**ySQL, **P**erl/PHP/Python

In mid-2003 Duke deployed FDS to 34 departments with mixed results. Most of their problems centered on lack of proper planning and support, little training, and software usability issues. Of consequence, and in contrast, technical bugs, database problems, and scalability issues apparently weren't problems.

3. Pilot Goal

Put succinctly, the goal of the pilot should be to validate whether Duke's FDS software can be effectively and sufficiently modified to meet the original charter to the Tech Council by automating the course and program development business processes at George Mason University.

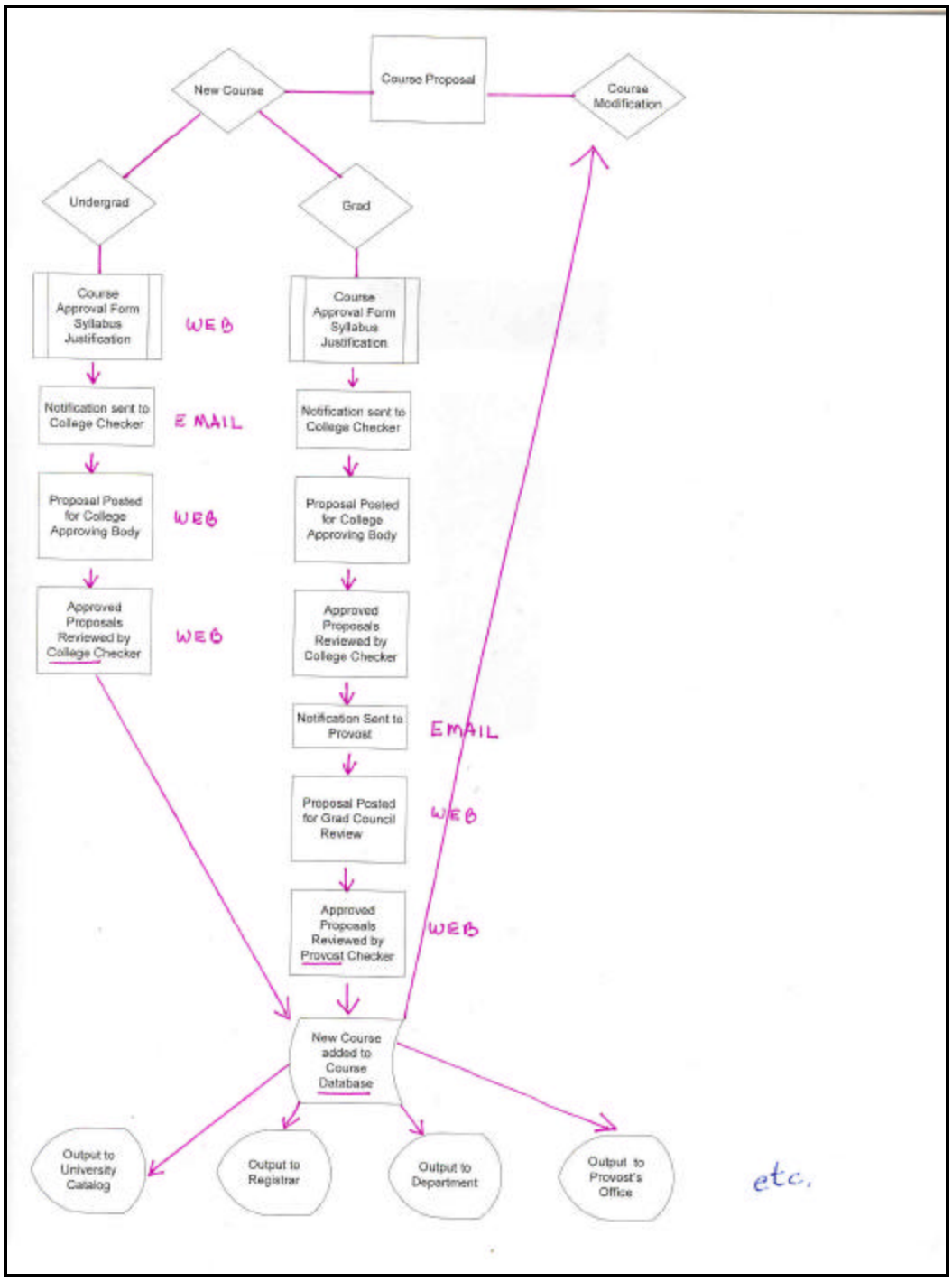

Fig 1. Course and program business process at GMU

4. Pilot Objectives

In order to meet the goal of the pilot, the following objectives (among many others) must be met.

4.1 Obtain FDS software from Duke University

In any collaboration with GMU, Duke doesn't want to bear additional support burdens. At the same time, Duke wants to benefit in some way if it provides licensing to use the software. At the 4/2/04 trip we proposed several alternative ways in which the two universities might collaborate. If the decision is to proceed with the planning and execution of a pilot based on Duke's FDS software, then a proposal would be written to Duke based on the following terms:

a) GMU would develop and provide Duke with commercial quality documentation of FDS

b) GMU would return modified FDS code and database designs to Duke

c) GMU would participate in a conference at Duke with other schools interested in FDS

4.2 Integrate existing efforts from College of Arts & Science

The College of Arts & Sciences has already done a lot of planning, prototyping, and system development in the area of course and program development. It's essential to build on those previous efforts and integrate any existing business process automation they may have with the features and functions of FDS.

4.3 Integrate with SCT Banner and other central systems

In order to effectively demonstrate the inter-site flow and reuse of information across organizational boundaries and business entities, interfaces and functions need to be created that connect enterprise databases and central applications and systems.

5. Scope of Work

Based on the limited research and analysis of FDS internals to date, the following activities would be part of the pilot. There could be other activities identified as more research is conducted and the software is better understood. Additional planning would also need to be done to determine the exact work involved in each topic and the resources necessary to complete the work within the time frame of the pilot. **Note**: the topics below aren't in any particular order of rank.

5.1 Port database to Oracle

The existing system is hosted in a MySQL database and uses old ISAM structures. The database should be ported to Oracle and relationships established between the entities to improve quality through referential integrity and other mechanisms.

5.2 Augment database design for course/program information

Beyond application support entities, FDS as designed today primarily tracks and maintains faculty CV data. New tables would have to be designed to accommodate workflow functionality and potentially hold course and program data.

5.3 Implement workflow functionality

The source code would have to be modified to enable some kind of approval/submission workflow process at various levels (individual, roles, group, etc) for course and program information.

5.4 Revise security architecture

FDS presently uses webAuth software as a proxy to implement single sign-on. GMU will likely use the Central Authentication Server (CAS) in the future for the same functionality so we should plan on using CAS in place of webAuth.

5.5 Develop documentation

In order to document the system properly, commercial quality documentation needs to be developed using technical writing resources. Probable manuals might include an installation guide and various manuals targeted to different users of the application (developers, end users, administrators, etc). Since GMU doesn't have professional technical writing resources it's recommended that a consultant be hired for this work.

5.6 Develop interfaces

Duke's back-office system is PeopleSoft. In addition to removing interfaces we're not interested in, we'll have to develop interfaces to systems and products Duke doesn't have. SCT Banner and our own LDAP directory are candidates.

5.7 Populate database with GMU data

The current FDS system uses a single database. Operationally, it expects to have the necessary data resident in the one production database. We'll either have to change the software to use distributed databases, such as SCT Banner, or develop extraction/importation routines that get the necessary data into the FDS database. The former would be preferred.

5.8 Improve templating usability

As it stands today, designers and programmers are still necessary to effectively use the templating features in FDS. Duke is presently trying to make usability improvements but they simply don't have the resources necessary to implement large-scale, wholesale improvements. This could possibly be the most important piece of work to accomplish.

6. Costs

Again, costs could vary as more is known and understood about FDS and planning for the pilot addresses more detail. However, at this point, some high-level costs can be identified and *estimated* for the pilot:

Item	Cost
Contract for documentation	$ 10,000
Server	$ 3,000
Professional services consulting for Dr. Yu	$ 5,000
Conference participation (3 people for 1 week)	$ 4,000
Other programming and systems engineering support	Unknown
Total	24,000