Degree Audit Document Viewer

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MIS 430: Systems Analysis
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# Table of Contents

Organic Proposal ......................................................................................................................................................... 1

Project Deliverables .................................................................................................................................................. 2
  Deliverable 1: Problem Identification and Alternatives ...................................................................................... 2
  Deliverable 2: Research on Document Viewers .................................................................................................. 3
  Deliverable 3: Data Model ...................................................................................................................................... 4
  Deliverable 4: User Interface Design ................................................................................................................... 5

Peer Reviewer Comments ......................................................................................................................................... 6

Lessons Learned ...................................................................................................................................................... 7

Project Scope Spreadsheet ..................................................................................................................................... 8
Hello Mr. Scott,

My name is Mackenzie Thompson and I am a student at Penn State Behrend majoring in MIS. I am aware that you are currently working on the LionPath project and would like to suggest that the Degree Audit be considered for renovation as a part of the ISIS upgrade. I have been working on an idea for an upgraded Degree Audit report that I think would greatly benefit both students and faculty advisers, and I have attached a document to this email laying out the details. The current Degree Audit tends to be confusing and difficult to decipher, and an upgrade to the current layout and viewing options could ease the stress of scheduling for many students. I would greatly appreciate any attention you could give this issue.

Thank you in advance for your time,

Mackenzie Thompson
Penn State Behrend

Response from Target Organization (Penn State)

No response received as of 04/04/2016.
Project Deliverables

1. Problem Identification and Alternatives

Problem Description

Penn State’s current degree audit system consists of a time-consuming report generator that allows for no interaction with the student and a report that is often confusing to read. This inarticulate report often causes students to take unnecessary courses, fail to take required courses and/or fail to graduate on time or with the accreditation they had hoped for.

Summary of Alternatives

1. Continue to use the existing degree audit report system.
   While many students and advisors find the problems with the current solution to be bothersome, no plans are currently in place to upgrade.

2. Upgrade the system using the proposed changes.
   Upgrading with the proposed changes would provide the benefits of a better solution with the least possible cost.

3. Create an entirely new system that is more interactive.
   Creating or purchasing a new system would be the most costly alternative but would bring with it maximum benefits.

Feasibility Analysis for the Second Alternative (Project Topic)

Technical

Necessary technology already exists (document viewers, database(s), Penn State online infrastructure). Penn State also has several large teams and dozens of faculty members with the necessary technical skills to re-program a report generator.

Economic

While it is difficult to quantify the man hours needed for a project like this, Penn State employees are usually paid by salary rather than wage. Assuming this project could be incorporated into the Lion Path project, additional labor costs could be minimal. Software upgrade would depend on whether Penn State used a free/ already owned software or entered into a new purchase. Licensing fees for a new product could cost thousands.

Legal

Penn State already owns software and has the rights to all of the information that would be used in this proposed solution. If the University wanted to purchase new software, licensing restrictions may have to be applied.
Operational

A report with more clearly-defined sections laying out graduation requirements would ease the frustration of deciphering the current degree audit. Allowing for rollover options with links to helpful web content would allow students to be better prepared on their own for scheduling courses they need. The links to web content would also decrease the amount of time advisors would need to spend with each of their advisees going over scheduling questions every semester.

Schedule

The schedule for a project like this would be very flexible, because it is not currently being promised to anyone, nor is it in the plans for the current LionPath project. Feature upgrades are not flexible, because the current system already exists and compromising too much on feature would yield an ineffectively different product. Cost, staff, and resources will be necessities with which the project could not afford to be flexible. Given the triangle of constraints, the project could be geared toward the “good” and “cheap” corner and could stand to not be as pressed for time.

2. Research on Document Viewers

The usual winner in these types of cases, Adobe, would be the top choice for the University because:

1. It has a fast start time (generally less than 3 seconds, even for larger documents)
2. It is available for Windows, Mac, and Linux operating systems (important because of the variance in student web-capable devices).
3. It has accessibility options, such as tag reading.
4. It allows users to copy text.
5. It provides an interface for annotations (could be used for rollover options).

The second choice for the University could be Google PDF Viewer because:

1. The software is free.
2. It is available both online and offline.
3. It is mobile compatible (when downloaded on the device).
4. Text can be searched, highlighted, and copied.

This option is the second choice because of a lack of partnerships with businesses thus far and no current options for rollovers.
3. Data Model: The relationships among entities involved in the Degree Audit.
Peer Reviewer (Taryn Testa) Primary Comments

Suggestion: Providing information on when courses are offered within the report

Students will be able to navigate away from the document viewer to informational pages regarding when courses are offered through links in the rollover boxes. Courses offered in the upcoming semester (that are also in the Requirements Not Completed section) could be flagged with an icon. Penn State currently maintains web pages with this and other degree-relevant information that would need to be pulled from an online source.

Suggestion: Combining multiple major/minor audits into one report

Given that this information is all available within the existing degree audit database, this option should be available to students in the proposed upgrade. While this may make the report longer, it would not change its layout. To optimize this feature, the developers would need to disallow the report to repeat courses within one report. The Degree Audit Home page mockup was updated to reflect a student’s ability to add more majors/minors to the report before creating it (notice the additional button below the menu). Currently selected majors/minors would be listed for the reference before processing the report.

Question: How would the new audit viewer handle exceptions to designated courses, i.e., one course fulfilling the requirement of another?

The new audit viewer is not meant to solve every scheduling problem, and this seems to be beyond the scope of this project. What the current degree audit recognizes as a completed requirement will remain the same in this proposed upgrade.
Additional Comments from Dr. Millet

Suggestion (For ERD): Remove relationships not relevant to the audit report, address relationship issues

Relationships that may not have been relevant to the audit report, such as faculty to course, were removed. Issues with relationships between tables were addressed, resulting in a few more many-to-many relationships, and thus, more tables. Changes have been highlighted in green.

Suggestion (For Mockup): Use ‘flags’ to indicate courses offered in the upcoming semester. See first suggestion, above.

Suggestion (For Mockup): Allow filtering options to expand and collapse form sections.

Because this report is likely to be in PDF format, changing the structure of the report once it has been generated does not seem likely. In future versions, if the degree audit report could be even more interactive and ‘changeable’ by a student, this feature would prove useful to students not interested in printing out a full report (especially those with multiple majors/minors included). The format of this viewer would probably have to be a web-based application with clickable elements instead of a document viewer.

Lessons Learned

- Modeling existing databases, especially those for large organizations, is (even more than) four times as complex as it seems.
- Large organizations are often slow to respond to feedback, which is a problem that should be addressed internally.
- Staying within a project’s scope is most difficult at the beginning of the project, but becomes easier as the project becomes more focused.
- Systems can always be improved upon.
## Project Scope Spreadsheet

<table>
<thead>
<tr>
<th>Category</th>
<th>Project Elements</th>
<th>Engagement</th>
<th>Value</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ideas</strong></td>
<td><strong>Problem/Opportunity Identification, Definition &amp; Reframing, Analyze Alternatives</strong></td>
<td></td>
<td></td>
<td>Problem Identification &amp; Alternatives</td>
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<tr>
<td></td>
<td>Root cause Analysis, Fishbone Diagram (formal section), WHY, Brainstorming, SWIPED</td>
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<td><strong>Requirements Ellicitation from users &amp; stakeholders</strong></td>
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<td>Observations, Data Collections, Surveys, Study current Procedures &amp; Workflow</td>
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<td><strong>Research Software Packages, Feature Mapping (formal section)</strong></td>
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<td>Functional/Non-Functional/Supplemental (FURPS+) Requirements (formal section)</td>
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<td>Research on document viewers</td>
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<td>User Goals, User Stories, Use Cases (formal section)</td>
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<td>StoryBoards (formal section)</td>
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<tr>
<td><strong>Requirements</strong> [23]</td>
<td>Process Models (As-is, To-Be), Activity Diagrams (Signavio), Simulation (BIMP) (formal section)</td>
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<td></td>
<td>Data Model (ERD) (formal section), STOP&amp;C</td>
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<td>Data model of student/registrar information</td>
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<td></td>
<td>User Interface Design, UX, Mockups (Balsamiq) (formal section)</td>
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<td>User Interface design for the application</td>
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<td>Output Design: Reports, Emails, Visualizations, Dashboards (formal section)</td>
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<td>Business Rules (Decision Table/Tree), Pseudocode, State Transition Diagram (formal section)</td>
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<td>Cost/Benefit Analysis (Economic Feasibility) using Excel (NPV, PBP, IRR) (formal section)</td>
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<td>Feasibility Analysis (Technical, Operational, Schedule) (formal section)</td>
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<td><strong>Manage &amp; Communicate</strong></td>
<td>Communicate with Stakeholders (meetings, interviews, feedback, building consensus)</td>
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<td>Bridging the User &lt;-&gt; IT communication gap</td>
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<td>Communicate Ideas, Present, Facilitate/Manage Meetings</td>
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<td>Will be presented in final report</td>
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<td>Project &amp; Scope Management, 80/20, KISS</td>
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<tr>
<td><strong>Implement &amp; Deploy</strong></td>
<td>BI: spreadsheet models, reports, queries, dashboards, visualizations, data mining</td>
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<td>Application Prototype (LightSwitch or any other RAD or App Development tool)</td>
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<td>Testing, Procedures, Demonstrations, Training, Conversion, Deployment, Change Mgmt</td>
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</tbody>
</table>

| Total                  |                                                                  |            | 37    |                                        |