Lab 1 - ResearchLink Product Description

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CS411

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Lab 1- ResearchLink Product Description

1 Introduction

Each year, Old Dominion University enrolls around 6000 graduate students (ODU, 2016). Among those students, many can take advantage of research opportunities provided by outside companies to help better their education. These opportunities include skill camps, internships, research grants, and scholarships. By participating, these students receive on the job experience to help them apply their studies to the real word. However, due to outdated delivery methods such as lost emails, miscommunication, a lack of deadline notification, and no public venue for students, many of these opportunities are lost. As a direct consequence, ODU becomes a less attractive option for potential graduates, who choose to attend a school where they have more exposure to employers. This causes companies to miss out on talent, and ODU to lose potential revenue.

To solve this, a system or public venue needs to be put into place that can distribute these opportunities appropriately. Developed by the Orange Team (CS411) at ODU, ResearchLink is the solution to ensure students, faculty, and companies can communicate their needs for research opportunities. ResearchLink is a hub that students can access to see trending opportunities, receive deadline reminders, and share success stories. It removes the middleman between employers and graduates, allowing students to browse opportunities pertaining to their major at ease. It’s intuitive design will ensure that these grants, internships, and co-ops receive the publicity they deserve. Not only will this improve ODU’s ranking and accreditations, but it will entice more undergraduates to pursue a master’s program.
2 Product Description

2.1 Key Product Features and Capabilities

The main feature that will set ResearchLink apart from the old methodologies is its ability to push notifications. This is extremely important in the busy lives of students and faculty who in the past have forgotten to apply or missed a deadline. ResearchLink will send live updates to students via email the moment a relevant opportunity becomes available. It will include a brief description, a link to the posting on ResearchLink, and a deadline. If interested a student can opt to receive continual notifications up until the deadline. Conversely, faculty will also receive live updates. These updates will include a brief description, the link, and how many slots will be available.

In addition to push notifications, there will be three kinds of user profiles, administrative, faculty, and student. All of them will have crucial roles to ensure ResearchLink achieves its optimum effectiveness.

The most widely used profile will be the student user and the first thing they will want to do is set up a username and password. This will be used to securely log them into their user profile. The student will have the ability to update their profile with specific characteristics to make the experience more personalized. Traits like their major of study, current grade point average (GPA), and completed courses all will be required to match students with the right opportunity. Optionally, students can also add in their own personal interests to make their results even more specific. Once complete, a news feed with a search bar will be made available
displaying all opportunities pertaining to the user. From here, the student can select the desired opportunity and see all information pertaining to it.

The ability to make a profile will also be given to the faculty. Their main role will be to help link students to opportunities. Their profile will serve as a communication portal viewable by the public that will include their contact information. It is then their job to wait for new opportunities to be created. Once created, a faculty user will receive an email so they can immediately start to peruse through potential candidates. Using an intuitive search interface, the faculty user will then be able to filter out unqualified or irrelevant candidates. Once they find a group who match the qualifications, a faculty member can send a batch notification to all of the student’s emails.

Finally, ResearchLink will have an administrative user profile. It will be strictly this user’s job to assist in profile creation when necessary, aid with password resets, ensure old opportunities become archived, and most importantly create new opportunities. They will serve as a point of contact for company spokespersons when they would like to list their open position. The admin user will also have access to both student and faculty profiles and be given the ability to edit profiles if they need to.

2.2 Major Components(Hardware/Software)

The main piece of software that makes up ResearchLink is it’s website. This will be developed using Apache for the server, MySQL for the database, and PHP for the web programming. It’s hardware will be made up of three different servers. The first being a web server to host the site which will be integrated straight ODU’s Banner. Then a database server to store user credentials, past opportunities, profiles, and more. Finally to aid in the push notification
feature an email server will be used to keep students up to date. All three of these servers will be provided by ODU.

Any devices used to communicate with ResearchLink will be provided by the users themselves. Students and faculty can either a computer or mobile device to connect to the web server. From there, the web server can connect to the database server to pass back information to the user.

3 Identification of Case Study

ResearchLink will be targeted specifically at two different markets, the students of ODU, and the school itself. A study was done in 2012 that said 69% of companies with 100 or more employees offered their interns full time jobs post graduation (Forbes, 2013). That means almost three fourths of the market is hiring graduates who have taken advantage of these opportunities straight out of school. In the current state, these connections are often missed or overlooked. ResearchLink’s team sees this as unacceptable. Students want an easier time finding jobs and career experience. Once this happens, it is only natural that Old Dominion University will be a more attractive place to study. This makes ResearchLink’s goal clear, increase post graduate employment and help increase the number of graduate students enrolled at ODU.

4 ResearchLink Product Prototype Description

The prototype of ResearchLink will be used as a proof of concept to demonstrate to faculty and students the feasibility of combining all this information into an intuitive web portal. It will use real world students and faculty and deal with simulated research opportunity data.

4.1 Prototype Architecture
The prototype being demoed will be very similar to the real world product. Figure 1 shows an example of how data will be transferred amongst the different components. All hardware will be simulated on a virtual machine in ODU’s computer science department. A personal computer on site or remotely will be used to access the web server and simulate all faculty and student features including account creation and customization. Research opportunity data will be simulated in the database server hosted by ODU using MySQL. This data will include opportunity descriptions, deadlines, and contact information. All servers used will run Apache2 to connect the user and the simulated information. The website itself will be compiled using PHP 7.0 and the Laravel 5.2 framework. PHP composer will be used to manage all of the websites dependencies.
4.2 Prototype Features and Capabilities

Many of the great features listed will be available for demo using the prototype. Users will be able to simulate account creation as a faculty member, student, or administrative role. Customizable alerts will be available to directly email someone regarding a new opportunity or one that is scheduled to end soon. This will demonstrate ResearchLink's key feature in delivering information to users on time. Both student and faculty user alike will be able to view news feed tailored their interests. In this news feed, current, upcoming, and past opportunities will be available for viewing based on the user's requests. Success stories will also be available for viewing and editing purposes. All types of users will also be able to witness the archival of opportunities after they have expired. This exists to go along with adding and viewing of success stories from faculty or students upon the completion of one of these connections. Faculty users will also enjoy the ability to receive notifications about annually occurring opportunities via email.

Table 1 provides a brief summary of the differences between the real world product and ResearchLink Prototype.

<table>
<thead>
<tr>
<th>Features</th>
<th>Real World Product</th>
<th>Prototype</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banner Integration</td>
<td>The developed product will be integrated straight into ODU’s banner website.</td>
<td>The prototype will be hosted on a private ODU server</td>
</tr>
<tr>
<td>Opportunity Data</td>
<td>Faculty and administrative members will add actual opportunities with full contact information to the companies</td>
<td>All information added by faculty and administrative members will be fake for demo purposes.</td>
</tr>
</tbody>
</table>
Midas Login Functionality | The user will be able to login into Research link using their normal ODU credentials | Users will be required to create their own username and password.

### 4.3 Prototype Development Challenges

Their will be several challenges faced by the team during development. Unfortunately, it will not be possible to integrate the product into Banner so one of the biggest conveniences of the product will be missed. This will be overcome by using a private ODU server to host the product on a separate website.

A general deficiency in coding knowledge amongst team members can also be an issue due to the many different technologies in use. It is not realistic to train the entire team in the use of MySQL, Apache, PHP, and the Laravel Framework. We will mitigate this risk by making sure everyone has a basic understanding of the full product’s mechanics and splitting members into a web development and database team.

Our last challenge will be ensuring that the prototype is fully functional by the appropriate time. The team takes deadlines very seriously and we want to ensure the promised functionality. To do this, there will have weekly meeting to discuss progress as well as assigning a project manager to make sure a strict schedule is adhered to.
Glossary

**Banner:** Old Dominion University’s Administration System that provides controlled access to financial, student, and personnel data. This system is only available to Faculty and Staff.

**Laravel Framework:** A powerful MVC PHP framework, designed for developers who need simple and elegant toolkit to create full-featured web applications.

**PHP:** Server scripting language for making dynamic and interactive web pages.

**HTML:** HyperText Markup Language is the standard language for creating web pages and applications.

**CSS:** Cascading Style Sheets is a style sheet language used for describing the presentation of a document written in a markup language.

**MySQL:** Open-source relational database management system.

**Apache2 Server:** Web server software

**NSF:** National Science Foundation (NSF); Offers funded research opportunities through Research Experiences for Undergraduates (REU)

**Nasa:** National Aeronautics and Space Administration; Offers undergraduate research fellowships and internships
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