Integrating Multiple Technologies into a Company Intranet

About PAETEC
PAETEC Communications, Inc., a subsidiary of PAETEC Corp., is a communications solutions provider offering broadband services, including advanced voice and video, enhanced data and communications management services to medium-sized and large businesses, colleges and universities, hospitals, hotels, governmental organizations, financial markets, and affinity groups. Headquartered in Fairport, N.Y., the company boasts one of the highest customer retention rates in the industry.

About The Project
PAETEC Communications currently has a large number of disparate data sources that employees utilize on a daily basis. Employees access various applications to view the data they need. This is confusing and time-consuming for users and reduces employee productivity and quality of work. The goal of this project is to make all the data accessible through a single intranet portal. Deliverables include a Portlet Development Kit (PDK), demonstration portlets for different types of data sources, and associated documentation. The PDK will contain common components to facilitate development of portlets for all of the data sources at PAETEC. WSRP and JSR 168 standards will allow PAETEC to plug the portlets into any compliant portal environment.

Process
The process that we used was a hybrid of the Waterfall and Incremental methodologies. We used this method as PAETEC develops software with a pure Waterfall methodology and we wanted to use what their developers were familiar with for our project as they will be taking it over when we are done. However, due to the short-comings of the Waterfall model, we decided to incorporate the Incremental methodology for our design, development, and testing phases. Each portlet was an individual increment that included design, implementation, unit testing, and integration testing.

Deliverables
- Requirements Specification
- Architecture Specification
- Design Specifications
- Documented Source Code
- Code Review Results
- Test Plan
- Test Cases
- Test Results
- Portlet Development Kit
- Demonstration Portlets
- Software Documentation
- White paper

Portal
An HTTP-based site hosted with software that allows the aggregation of several different back-end systems, processes, or sites brought together through a single page. They may provide additional services such as single sign-on security, customization, personalization, and back-end administrative/declarative application.

After extensive research into several different open source portals, we chose Liferay as our portal to provide a consolidated view of PAETEC’s disparate applications. We based our decision on the ease of installation, ease of use, and ease of development that the application provided. Using Liferay, we were able to quickly take portlets from design to installation. Liferay also has an extensive list of features that made our decision much more valuable in the end. Finally, the set of base portlets that Liferay provided were invaluable as a guide to developing new portlets as well as a place to start looking for reusability.

System Interaction
A typical user interaction would consist of the following steps:
1. User submits a request to one of the portlets.
2. Portal authenticates against PAETEC’s LDAP server.
3. Portal displays the portlets that the user is allowed to use.
4. User submits a request to one of the portlets.
5. Portal container processes the request and gets relevant session data from the portal database.
6. Portal forwards the request and session data to the portlet.
7. Portlet returns an HTML response to the portal.
8. Portlet uses the session data and data from an external source, depending on the portlet type.
9. Portal combines HTML responses from all the portlets and renders it for the user.

Future Work
Upon completion of the project, PAETEC will take the portlets that we developed inside Liferay and will deploy them inside of a commercial portal application. The portlets that we developed are the ground work that is needed to begin moving some of PAETEC’s disparate applications into a single entity, Oracle Portal.

The engineers at PAETEC will utilize the PDK that we deliver to extend the functionality of our base portlets as well as to create new portlets. This project was mainly a research project for PAETEC and it will be up to their engineers to actually implement a business-oriented product from the results of our research.