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VERTICALLY INTEGRATED PROJECTS

vip.fiu.edu

Abstract - The Vertically Integrated Projects (VIP) program aims to involve everyone on campus in innovation. VIP unites undergraduate education and faculty research in a team-based context. Undergraduate and Graduate VIP students earn academic credits, while faculty benefit from the design/discovery efforts of their teams. VIP extends the academic design experience beyond a single semester, with students participating for up to three years. It provides the time and context to learn and practice professional skills, to make substantial contributions, and experience different roles on large multidisciplinary design/discovery teams. The long-term nature of VIP creates an environment of mentorship, with faculty and graduate students mentoring teams, experienced students mentoring new members, and students moving into leadership roles as others graduate. VIP attracts students from many disciplines and enables the completion of large-scale design/discovery projects, strengthening and expanding faculty research portfolios.

I. INTRODUCTION

This Paper gives a detail description of website vip.fiu.edu with which both Professors and Students interact together in achieving the collaboration for different projects. Vip.fiu.edu provides a very user intuitive platform which allows users to get to know more about the projects that professors are working on in FIU. With making the design very unique, we are also keeping the design very simple that serves the purpose more efficiently. We categorized the users who potentially use the website into four categories and they are Guest, Faculty, Student and Admin. Guest is one type of user who can visit the vip.fiu.edu website without logging in and can view the entire list of projects and their respective description that professors in FIU are working on. Faculty are categorized into another type of users who proposes a project in the website which he/she is working on or would work on. Student is another type of user, who logs into the website to apply for the projects which he/she is interested to work on with professor. Finally, Admin is one of the categorized user who can view more information about all the users and perform tasks like accepting the registrations of new users and post the important information in website.

II. FACULTY

Faculty/Staff in FIU can propose their project idea using vip.fiu.edu website and can give a detail description of their project along with skills that are required to work on the project so that student can view these details and decide whether to apply or not. Faculty/Staff uses propose a project tab in the website which navigates to a form [1] which they have to fill in order to submit their proposal to the website. With Review Student Application page [2] in website, Faculty/Staff can accept the request of Students who are interested to work for the project.

III. STUDENT

Students at FIU can view the list of Projects that professor in FIU are working on and if interested can login with their FIU Gmail account and can apply for the project. They will be informed with an email if professor accepts their request. Both Undergrad and Graduate Students can also get credits for working on these projects. With Apply to a Project tab, Students will be navigated to an application form [3] where they have to fill in the details like project name on which they are interested in, skills that they have and their general information like panther id, full name and Department. Once they have submitted the application, they have to wait to receive an email to know if their application is accepted or rejected by professor.

IV. ADMIN

Admin for vip.fiu.edu is a user who has more privileges than any user to use the website. For Admin there is a special page called Admin Panel [4] where he can see more information like total users who registered to vip.fiu.edu and all the student information who logged into the website at least once and can do more tasks like posting new information on the website. Admin also will have the privilege in accepting the professor's proposals and post them on projects page. We made Admin Panel very user intuitive with which Admin can lock and unlock projects on semester basis.

V. IMPLEMENTATION

For this project, we used MEAN stack framework. MEAN is a full stack web development framework. We used Agile methodology for the development process. We used Scrum as a tool to incorporate Agile methodologies and used Mingle application to use a board environment where we can upload our user stories and create new tasks for 2 week iterations. We used WinSCP and Putty to do the backend integration for server integration on both dev and live servers.

- **MEAN**

The term MEAN stands for MongoDB, ExpressJS, AngularJs and NodeJS, is a full-stack improvement toolbox. It is an accumulation of JavaScript based advancements used to create web applications, can be used for both server-side and client-side execution environments.

Mongo DB: MongoDB is the leading NoSQL database, empowering businesses to be more agile and scalable, that uses a document- database oriented data model. The document model maps to the objects in your application code, making data easy to work. MongoDB spares information in binary JSON design which makes it less demanding to pass information amongst client and server. MongoDB is a distributed database at its core, so high availability, horizontal scaling, and geographic distribution are built in and easy to use.

ExpressJS: Express is a framework of Node.js that allows you to use several very useful and powerful features without having to reinvent the wheel, helps you organize your application's routing and use any templating solution with minimal effort. It also allows for much better organization of your code. Express is a light-weight web application framework to help organize your web application into an MVC architecture on the server side. Express is a negligible and adaptable node.js web application system, giving a powerful arrangement of components for building single and multi-page, and hybrid web applications.

NodeJs: Node.js is a platform built on Chrome's JavaScript runtime for easily building fast, scalable network applications.Node.js gave JavaScript newfound back-end functionality—allowing developers to build software with JavaScript on the server side for the first time. It allows JavaScript to be used outside the Web Browsers, for creating web and network applications. This means that you can create the server and server-side code for an application like most of the other web languages but using JavaScript.

AngularJs: AngularJS is a structural framework for dynamic web apps. It is a client side JavaScript MVC framework to develop a dynamic web application. It excels at building dynamic, single page web apps (SPAs) and supports the Model View Controller (MVC) programming structure. It powers sites include Google, Virgin America, and HBO’s mobile site for iPad. AngularJS tackles the problem of building dynamic web apps,

allowing the developer to extend the functionality of HTML by giving them the ability to create new constructs with Angular directives. This effectively abstracts away tricky DOM manipulation, reducing it to simple elements that can be embedded directly into an HTML template. The most famous example of this is two-way data binding, a once code heavy task being relegated to simply wrapping around your expression.

- **AGILE**

Agile describes a set of principles for software development under which requirements and solutions evolve through the collaborative effort of self-organizing cross-functional teams. It is an umbrella term for several iterative and incremental software development methodologies. The Agile movement seeks alternatives to traditional project management. Agile approaches help teams respond to unpredictability through incremental, iterative work cadences and empirical feedback. Agilest propose alternatives to waterfall, or traditional sequential development.

- **SCRUM**

Scrum is the most popular way of introducing Agility due to its simplicity and flexibility. Scrum is a subset of Agile. It is a lightweight process framework for agile development, and the most widely-used one.

A “process framework” is a particular set of practices that must be followed in order for a process to be consistent with the framework. (For example, the Scrum process framework requires the use of development cycles called Sprints, the XP framework requires pair programming, and so forth.)
“Lightweight” means that the overhead of the process is kept as small as possible, to maximize the amount of productive time available for getting useful work done.

A Scrum process is distinguished from other agile processes by specific concepts and practices, divided into the three categories of Roles, Artifacts, and Time Boxes. These and other terms used in Scrum are defined below. Scrum is most often used to manage complex software and product development, using iterative and incremental practices. Scrum significantly increases productivity and reduces time to benefits relative to classic “waterfall” processes. Scrum processes enable organizations to adjust smoothly to rapidly-changing requirements, and produce a product that meets evolving business goals.

- **MINGLE**

Mingle is a web-based Agile Project Management and collaboration tool that provides a combined workplace for the entire team, keeping them on top of growing business demands. It is versatile and can be modified according to the team, work and the project. Mingle is a simple and powerful tool that has been developed, based on the experience of

Thought Works in pioneering Agile delivery. It is a user-friendly interface which conveniently holds all project activity in one central place. Mingle-Agile is designed for small businesses to large enterprises.

Features:

1. Project Collaboration - Provides real-time collaboration in one shared workspace. It offers a customizable web-space with the ability to gather and organize requirements, report bugs/defects, share documents and track project status.
2. Project Management - Provides all-in-one complete support of team activities, keeping real-time track of project status.
3. Program Management - Offers at-a-glance cross-project visibility, providing you with critical visibility to properly allocate resources and effectively manage constraints.
4. Test Management - Provides accurate tracking of bugs/defects, enabling consistent visibility, tracking and testing.
5. Release and Iteration Planning - Provides you with the ability to quickly adapt to changing business demands and priorities. It is equipped with best practices, enabling you to track and manage critical product information.
6. Tracking and Reporting - Provides you with relevant real-time metrics. It holds valuable data and allows you to accurately track projects and identify risks with quick and easy reporting.

- **PUTTY**

A free Telnet and SSH terminal software for Windows and Unix platforms that enables users to remotely access computers over the Internet. It is a popular tool for text-based communication and is also a popular utility for connecting Linux servers from Microsoft operating system-based computers [5]. The primary goal of PUTTY is to become a multi-platform application capable of executing in most operating systems. It can be considered like an xterm terminal for most purposes. It even specifies its terminal type as xterm to the server; although this can be reconfigured. Most features like port forwarding and public keys are available through the command line options.

- **WinSCP**

WinSCP (Windows Secure Copy) [6] is a free and open-source SFTP, FTP, WebDAV and SCP client for Microsoft Windows. Its main function is secure file transfer between a local and a remote computer. Beyond this, WinSCP offers basic file manager and file synchronization functionality. For secure transfers, it uses Secure Shell (SSH) and supports the SCP protocol in addition to SFTP.

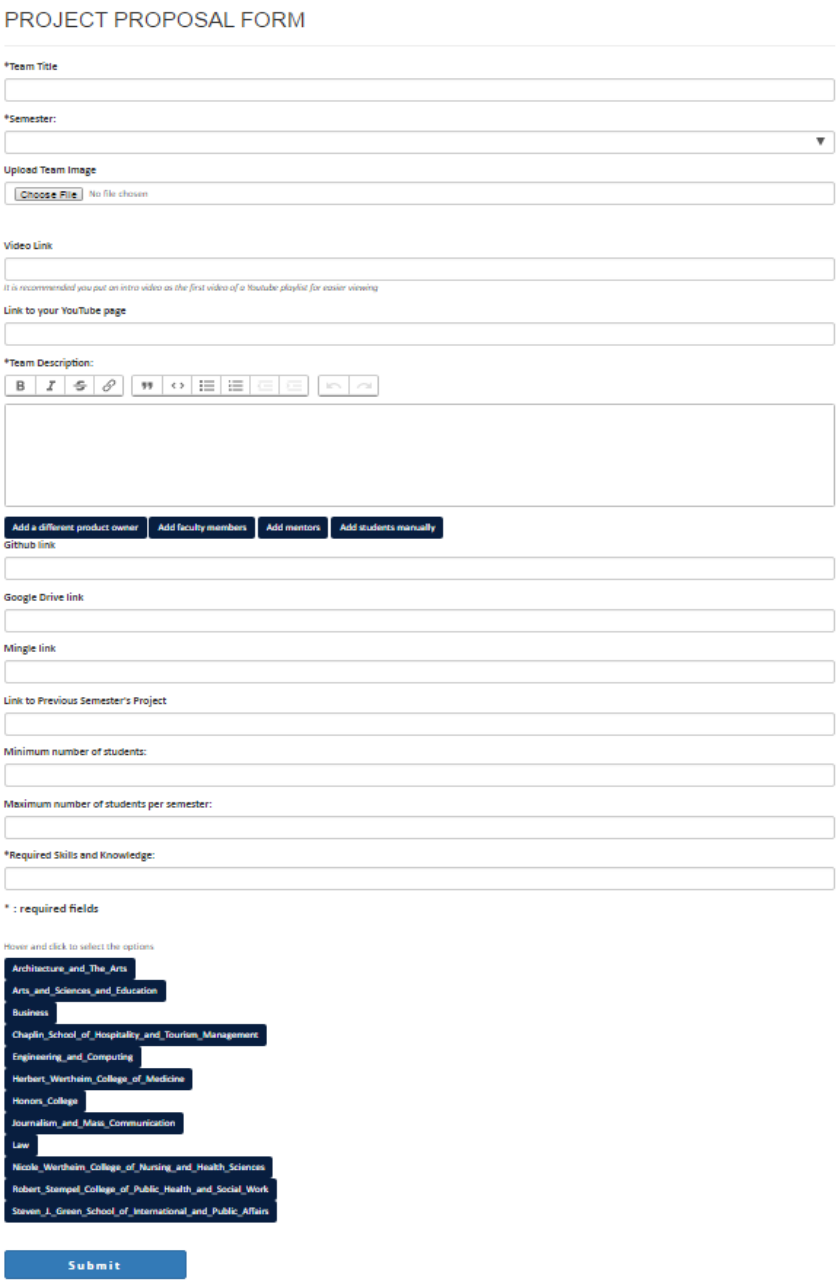
VI. CONCLUSION

Vip.fiu.edu bridges the gap between Professor and Student with a website that is specifically designed for the purpose. With this project we have developed our skills more rapidly than with any other project. The industry standard experience that we incorporated into the development process really helped us in evolving into a professional software developer. With Agile development process in Scrum as a 2 week iteration process, we as a team worked collectively in achieving the goals. Vip has really gave us a good chance in developing a website with industry standard frameworks. These kind of project should be implemented in every university so that a collaborative work environment among professors and students would create great results in academic progress.

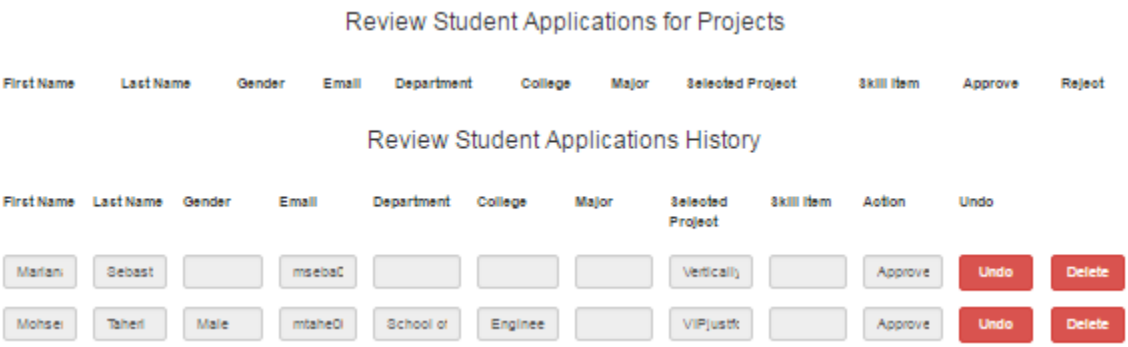
REFERENCES

1. http://vip.fiu.edu/#/about
2. http://www.infoworld.com/article/2937159/application-development/mean-vs-lamp-your-next-programming-project.html
3. http://searchdatamanagement.techtarget.com/definition/MongoDB
4. https://winscp.net/eng/docs/protocols
5. https://www.cprime.com/resources/what-is-agile-what-is-scrum/

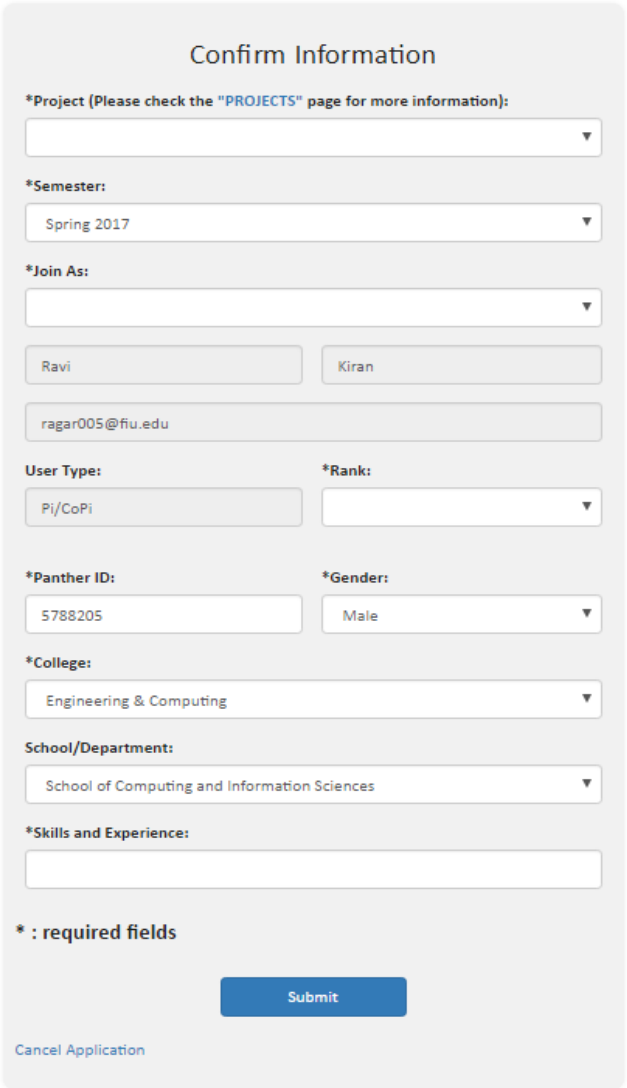
VII. SCREENSHOTS



1. Project Proposal Form



2. Review Student Applications



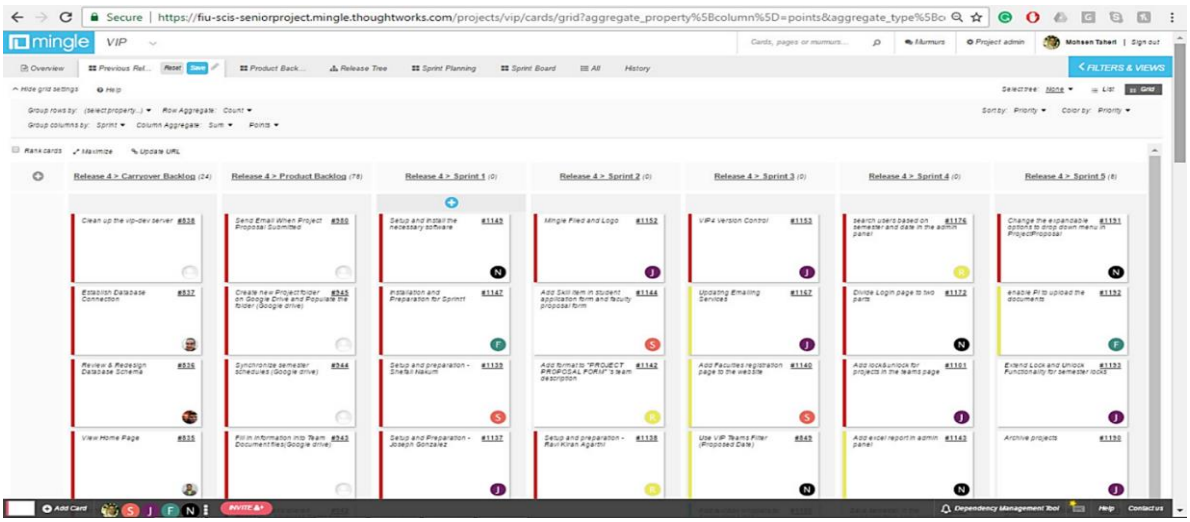
3. Apply to a Project

Admin Panel

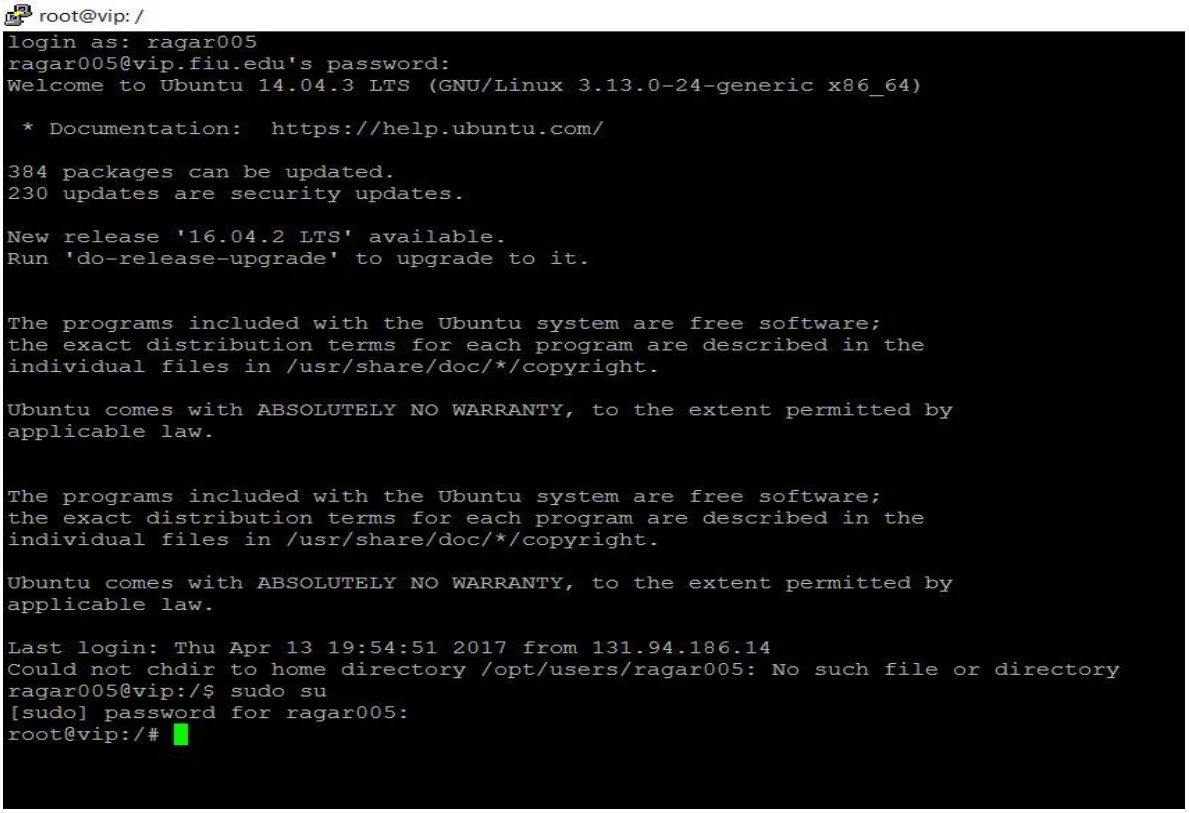
Refresh Filters | Filters | Excel

First Name	Last Name	Email	Panther ID	User Type	College	Project	Gender	Joined Project	Rank	Mentor	PiApproval
Vladan	Lalovic	vlalo001@fiu.edu	30225612	Pi/CoPi	Engineering & Computing	Neat 1.0	Male	true			true
Mohsen	Taheri	mtahe006@fiu.edu	5495915	Pi/CoPi	Engineering & Computing	57b5fedc0033071834262d97	Male	false			true
Francisco	Ortega	fortega@fiu.edu	1631670	Pi/CoPi	Engineering & Computing		Male		Assitant Professor		true
Masoud	Sadjadi	sadjadi@cs.fiu.edu	1661375	Pi/CoPi	Engineering & Computing		Male		PI		true
Joseph	Gonzalez	jgonz770@fiu.edu	1234567	Pi/CoPi	Engineering & Computing		Male	false			true
Ravi	Kiran	ragar005@fiu.edu	5788205	Pi/CoPi	Engineering & Computing		Male		Assitant Professor		true
Nandini	Dandu	ndand002@fiu.edu	5793467	Pi/CoPi	Engineering & Computing	Nandini Join This	Female	false	Administrator		true
Shefali	Nakum	snaku001@fiu.edu	5788210	Pi/CoPi	Engineering & Computing		Female		Director		true

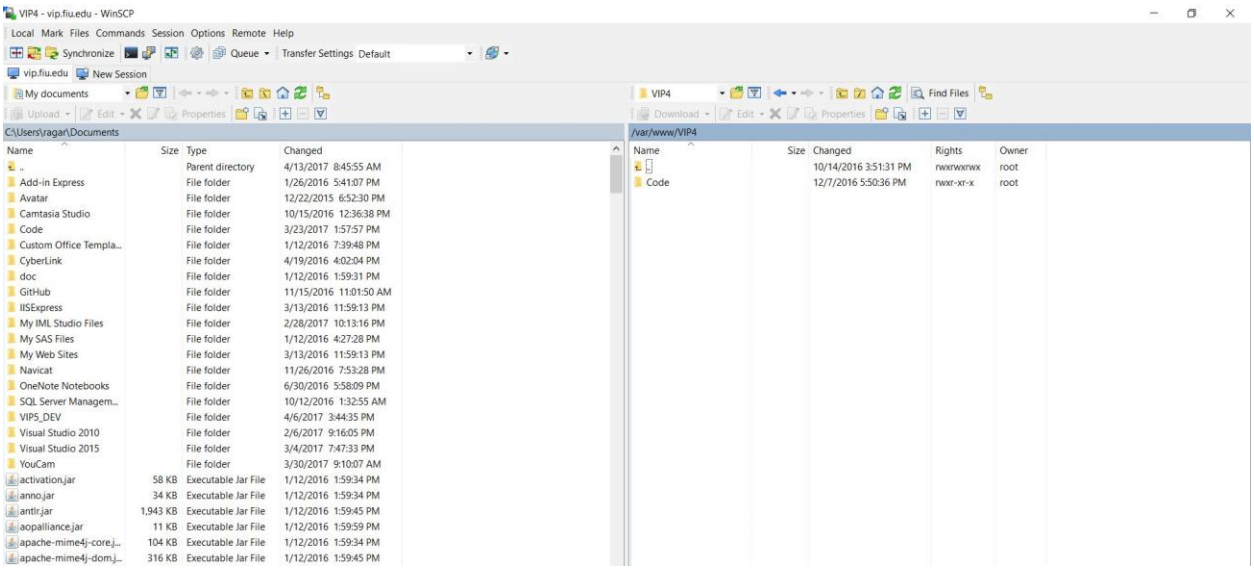
4. Admin Panel



5. Mingle



6. Putty



7. Winscp