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Promoting Research through Improved Online Collaboration Software

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Abstract

The purpose of this project was to create an online platform to facilitate and promote research collaboration among faculty and students at the Financial University in Moscow. We gathered data on this problem through holding interviews and focus groups. Using this data we decided which online research collaboration tool would work best for the university, and we developed a prototype SharePoint website that delivers the features we determined to be most essential for successful online research collaboration.

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Executive Summary

Communication and collaboration software can provide tools for researchers from all across the world to collaborate with one another. However, even though the technology exists to enable successful research, some researchers either improperly utilize these tools or choose to work without them. The Financial University under the Government of the Russian Federation (FU) has had some difficulty incorporating the use of their newest knowledge and research management software, FinLab Wiki, and as a result the university has struggled with promoting and enabling more frequent and more effective research. In this report we provide some solutions to this problem.

The goal of this project was to determine how to improve Financial University's knowledge and research management software so that the researchers at Financial University's many campuses could collaborate on their research more effectively and efficiently. Our research objectives to achieve this goal were:

1. Determine the effectiveness of the current collaboration tool, FinLab Wiki
2. Identify the most desired features for enabling online research collaboration
3. Determine which online research collaboration platform to use as the basis for an effective tool for Financial University researchers.

Financial University is a federal government-funded institution of higher education headquartered in Moscow made up of a wide regional network of branches dispersed throughout different parts of Russia (Moveonnet, 2015). Financial University encourages its students and faculty to perform research and submit work for publication as a means to contribute to the scientific discussions in many fields. Through conducting research and publishing papers, the university's researchers can contribute to increasing the prestige of the university. Online

research collaboration can be used as a tool to increase research productivity and streamline the collaborative process. In order to analyze research at FU we divided online research collaboration into five topics: online research collaboration software, online communication, user interface, reproducible research, and research collaboration culture in Russia. Our sponsor was particularly interested in supporting reproducible research, which is an approach to research where researchers provide all of their algorithms and all of their data to help legitimize their findings and enable other researchers to continue with this research or attempt to replicate it.

To achieve our objectives we used two main methods of data collection: interviews and focus groups. We hosted two interviews with faculty members and carried out six focus groups with students and faculty, which were divided according to the demographic characteristics of the participants.

We found that Financial University's current research collaboration software, FinLab Wiki, was rarely used due to a multitude of problems. According to its users, FinLab Wiki's biggest flaw is its lack of privacy control. Other problems with FinLab Wiki that were mentioned in our focus groups include it being slow and not fully customizable, having an unfriendly user interface, lacking active users, suffering from numerous errors, and the absence of private messaging capabilities.

General problems that have prevented or hindered research include the difficulty of finding other researchers with whom to collaborate, a preference for writing shorter and less in-depth research papers than those published in peer-reviewed journals, and the cost of publishing papers. Researchers also stated that a lack of time, interest, skill, incentives and motivation prevented them from conducting research. Although our sponsor stressed the importance of

implementing reproducible research as a means to make the university's research scalable and more legitimate, very few students were aware of the concept.

Our focus groups and research indicated that the most important features for an online collaboration tool at Financial University are communication functionality, networking features, file sharing, task management, and reproducible research. Additionally, the most important attributes for online research collaboration tools are having privacy features, being user-friendly, flexible, easy to access and open-source.

Based on the importance of these features and attributes, we have concluded that although FinLab Wiki was a good starting point for research collaboration at FU, it still needs a great deal of improvements before it can become a useful platform. SharePoint, Microsoft's online collaboration platform, has better or equal functionality for all of the previously defined features, except for its lack of open-source functionality. SharePoint can easily integrate communication and networking functionality through Yammer, the enterprise social networking platform. SharePoint's discussion board functionality also supports the platform's ability to facilitate communication by allowing researchers to carry out in depth conversations. SharePoint offers file management features, and through its support of Microsoft Word Online, multiple users can edit the same document at the same time. Through SharePoint's file sharing methods, researchers can easily share their data and computations, putting the principles of reproducible research into practice. Task management features are supported as well, allowing users to visualize task due dates and assignments.

We recommend that Financial University's IT department creates a main SharePoint website based on the SharePoint prototype that we developed. SharePoint sub-sites should then be created by the IT department for specific research groups when requested, to ensure that

researchers are able to keep their work private if so desired. These websites should all implement the previously defined features to ensure that researchers have all of the tools they need to carry out successful research collaboration.

Through analyzing the current status of research collaboration at Financial University, we have provided the university with a better understanding of what users want in a knowledge and research management software. Additionally, our recommendations outline how Financial University should use SharePoint to implement our findings.

1. Introduction

It is a natural tendency for individuals to seek a means of collaborating and communicating with each other for the purpose of creating better content. While face-to-face collaboration is relatively easy, maintaining contact with teams over the internet is quite difficult. For example, communicating within Russia, a country with eleven different time zones, is in and of itself a daunting task, especially when researchers in different time zones need to collaborate with one another for their research. Through the rise of many different online collaboration tools and technologies, online research collaboration has become an excellent complement to face-to-face research collaboration.

The Financial University (FU) under the Government of the Russian Federation is a federal state-funded institution of higher education headquartered in Moscow. It has a wide regional network of branches dispersed throughout different parts of Russia (Moveonnet, 2015). The different branches of the university have had difficulties collaborating on research due to the large distance between many of these branches (Baumann, Farrar, and Gray, 2014). One of Financial University's goals is to connect researchers online, creating a social environment that would allow researchers to share and store knowledge for future research. Ideally this solution would also allow researchers to easily manage group-based research, such as multi-regional research teams from different parts of Russia. Providing a means of online collaboration for these researchers would allow future researchers to utilize completed research results in new projects, but so far this has not been possible.

Online research collaboration is not a new concept. Tools such as GitHub, Google Docs, and Canvas are already in use outside of Financial University (Charles Wallace, personal

communication, April 10, 2015; full interview in Appendix P). Task management, online communication, graphical user interface, and reproducible research are among the important research collaboration features that could improve the effectiveness of collaboration. While many options currently exist for Financial University, the International Financial Laboratory (FinLab) operating under the International Finance Faculty (IFF) of Financial University decided to implement their own research collaboration tool. Professor Alexander Didenko, then Director of FinLab, made the decision to invest in FinLab Wiki, a website built in 2014 using MediaWiki as its framework (Baumann, Farrar, and Gray, 2014).

FinLab Wiki is still in the early stages of development and several recommendations for the improvement of the website have been made (Baumann, Farrar, and Gray, 2014). While the website is fairly new and little feedback has been gathered on its effectiveness, the current consensus is that FinLab Wiki has not lived up to expectations, and FU should move forward and consider other methods for improving collaboration.

The purpose of this project was to identify the best ways to promote online research collaboration among FU researchers. We achieved this goal through the use of online database research, focus groups, and interviews. We evaluated the effectiveness of the current online research collaboration tool used by FU, FinLab Wiki. We determined which features were the most essential for an online research collaboration tool, and with this information we decided upon the best collaboration platform for facilitating these features. Lastly, we designed a prototype on this platform of choice. All in all, our project helped determine the future direction of online research collaboration at Financial University by identifying the tool that should be used as the basis for these efforts.

2. Background

Like any institution of higher learning, research projects are an important feature of Financial University (FU) in Moscow, Russia. Through conducting research and publishing papers, the university researchers can contribute to the scientific conversations in many different fields, while also increasing the prestige of FU professors and students. Online research collaboration can be used as a tool to increase research productivity and streamline the collaborative process. In this chapter we will explain the main elements of online research collaboration by dividing the subject into the following five topics:

- Online Research Collaboration Software
- Online Communication
- User Interface
- Reproducible Research
- Research and Publication Culture in Russia

2.1 Online Collaboration Software

Online collaboration is a difficult task that requires certain tools to allow groups to effectively complete their work. Financial University currently uses MediaWiki to handle its collaboration tasks (Baumann, Farrar, and Gray, 2014). MediaWiki is a platform that allows users to create and edit articles, and it is best known for powering Wikipedia, along with 2,000 other wikis (Barrett, 2008).

Although Mediawiki is well suited for larger scale collaboration projects, it has important limitations for smaller scale research collaboration (Barrett, 2008). Being a system meant mostly for public use, it is not the best tool to use when privacy control of a system is necessary. Maintenance gets progressively more difficult as the body of work grows, and the methods of

access are not secure, meaning that it is hard to manage permissions and log-in information. MediaWiki also requires users to learn the correct syntax for formatting articles, which means that there is a fairly steep initial learning curve for using the website.

Another commonly used collaboration tool is SharePoint (Behles, 2013). SharePoint enables users to create collaborative sites that allow users to share documents, assign specific tasks, track the due dates of milestones on a shared calendar, and download shared documents (Sagi, 2013). SharePoint features integration with many other Microsoft programs, as it is a part of the productivity platform Microsoft Office 365. This means that it easily connects with many other programs that are useful for collaboration, such as the email service Outlook, and the social networking platform Yammer. Yammer has similar functionality to Facebook, except it is targeted to be used within specific companies or schools, allowing for professionalism to be maintained while still providing all of the convenience of Facebook communication. Additionally, in SharePoint it is easy to edit privacy permissions, making it better suited for large groups of collaborators. Figure 1 shows icons for many of SharePoint's features, illustrating the breadth of its capabilities. SharePoint's plethora of features and the ease with which it can be tailored to specific needs make it an ideal alternative to MediaWiki.

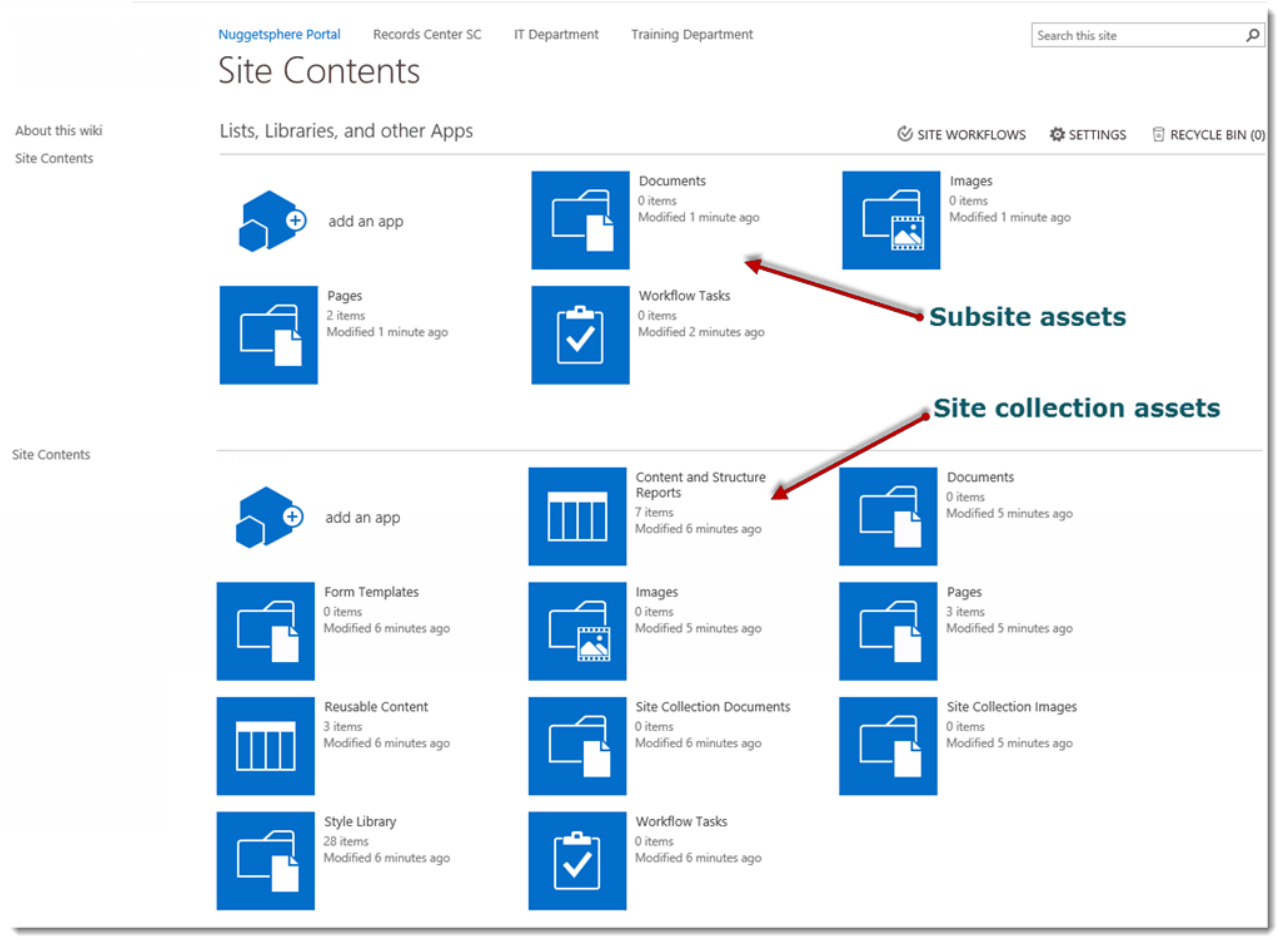

Figure 1: Example of SharePoint features (Warner, 2014, 4Sysops)

2.2 Online Communication

Communication is an essential element of any research collaboration process, but it becomes an even more important factor when researchers are working with each other over the internet (Behles, 2013). For a project to be well-managed and effective, the various researchers working on a project must be able to easily communicate with one another, both so that they can ensure that everyone is working on the correct task, but also so that they can exchange ideas about the research in general.

Online communication is most commonly done through email, instant messaging, and discussion forums (Greener, 2009). Each of these methods has benefits in the context of research

collaboration. The benefit of using email is that it is the standard for professional communication over the internet, and as such it is a widely used option. However, since it is not possible to communicate as quickly as with instant messaging, it has the disadvantage of generally being a slower method of communication. Also, since it exists outside the context of a collaboration platform, it is cannot be directly connected to the software being used for the collaboration. This makes email a good auxiliary communication method, but ideally it would not be the only method of online communication for a research group.

Discussion forums are another method of online communication (Greener, 2009). They are also a somewhat slow method of communication, as people generally don't check forums as much as their email, and they aren't notified of a new message in the same way that instant messaging provides. However, forums are excellent for facilitating long-term discussion centered on specific topics. Forums are built for multiple user discussion, so they would be very useful for online collaboration.

Lastly, there is instant messaging, which is a quick and effective method of communication (Greener, 2009). Instant messaging is such a fast method of communication because when people use instant messaging they have the expectation of a short-term conversation, and as such they tend to keep their messenger open. Instant messaging is another important element of collaboration, because it allows researchers to ask their colleagues questions immediately. Overall it can be said that for research collaboration, emails are a useful auxiliary communication method, forums are useful for long-term discussions, and instant messaging is good for dealing with problems immediately.

2.3 User Interface

When designing software it is essential to implement an effective user interface (UI), which acts as the bridge between users and software (Guntupalli, 2008). UI uses visual and audio cues to interact with users and enables them to perform certain commands. It is essential to explicitly consider the needs of the users at every stage of design, a concept known as user-centric development.

UI design can be evaluated by its usability, which is the extent to which users can successfully complete their goals with effectiveness, efficiency and satisfaction (Stone, Jarrett, Woodroffe, & Minocha, 2005). An effective UI will allow the users to complete their objectives, and this is done by offering the proper features. For instance, if users want a software that will allow them to participate in the stock market, the software should enable the users to purchase stocks, sell stocks, browse a company's history, and look at stock prices.

The efficiency of a UI can be measured by how quickly it allows users to complete their goals (Stone, Jarrett, Woodroffe, & Minocha, 2005). This comes down to the grouping of UI elements. For instance, if there are certain functions that the user will constantly be using, they should be easy to access and not nested inside multiple levels of menus. Menus should also be designed to maximize speed as well, and elements must be ordered logically, contain a fairly minimal number of elements, and have objects evenly distributed among different menus. Figure 2 is a good example of a well-designed pull down menu. The menu only has six items, and does not require users to traverse through various sub-menus to find a desired feature. The menu's items are also grouped logically, with "Open" and "Close", and "Save" and "Save As" next to each other.

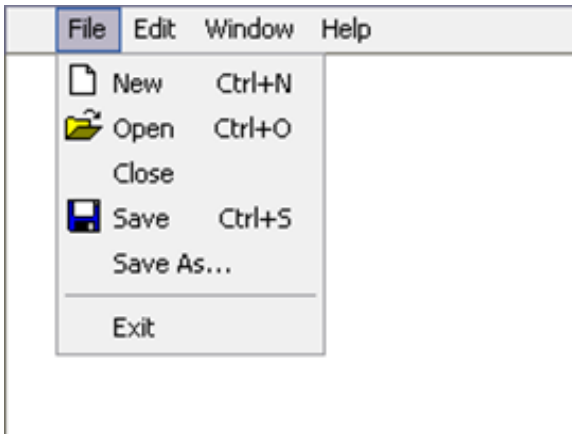

Figure 2: Example of an efficient pull down menu (Jaksmata, 2008, Wikipedia)

User satisfaction is more difficult to define, as this is more dependent on an individual's personal preferences, but there are certain generalizations that can be made. User satisfaction largely comes from including the most commonly desired features and allowing users to use those features quickly (Wilson, 2010). However, user satisfaction also relates to user expectations and aesthetics. It is important to take into account what the user is likely familiar with when designing an interface, as people might become confused if their expectations are not met. For instance, tab manipulation buttons should be placed in the upper right corner of the screen, as it is the common convention to place the close, minimize, or maximize buttons here. The aesthetics of an interface can significantly impact the user's satisfaction, because the visuals affect how the user thinks about the interface. Usability and user centered design should be at the forefront of all decisions made regarding UI, as the only way to properly design an interface is to consider who will be using it.

2.4 Reproducible Research

Another important aspect of research collaboration is ensuring that the results of research are reproducible. Reproducible research can be summarized as an approach to research where researchers provide all of their algorithms, and all of their data that they used when they created

their research paper. For instance, if a researcher writes a paper about how Wall Street trends indicate that oil prices will go up, then they must include all of the numbers and computations that they performed to arrive at this conclusion. This allows for others to easily reproduce their results using the same techniques, while also making it harder to skew results (Yale Roundtable, 2010).

This is particularly useful in the context of university research, as it would allow for researchers to easily carry on a student's or professor's work if they were to graduate or leave the university for any other reason. Reproducible research is also well suited for Financial University, as the principle readily applies to research in economics and finance.

An excellent example of reproducibility in action is the Open Science Framework's Psychology Reproducibility Project, in which 270 collaborators recreated 100 psychological studies from prominent psychology journals (Cahoon & Kidwell, 2015). The project's 270 collaborators used wikis to document the process. Version control systems were used to maintain each report's file history, allowing the researchers to easily find the latest draft of their work.

RStudio, a software that is based on the statistical computing language R, could easily be used in tandem with the principles of reproducible research, allowing researchers to share their algorithms and data with one another. RStudio allows users to easily perform complex computations, and has built in functionality to display data visually. Figure 3 below shows an example of RStudio's graphing functionality.

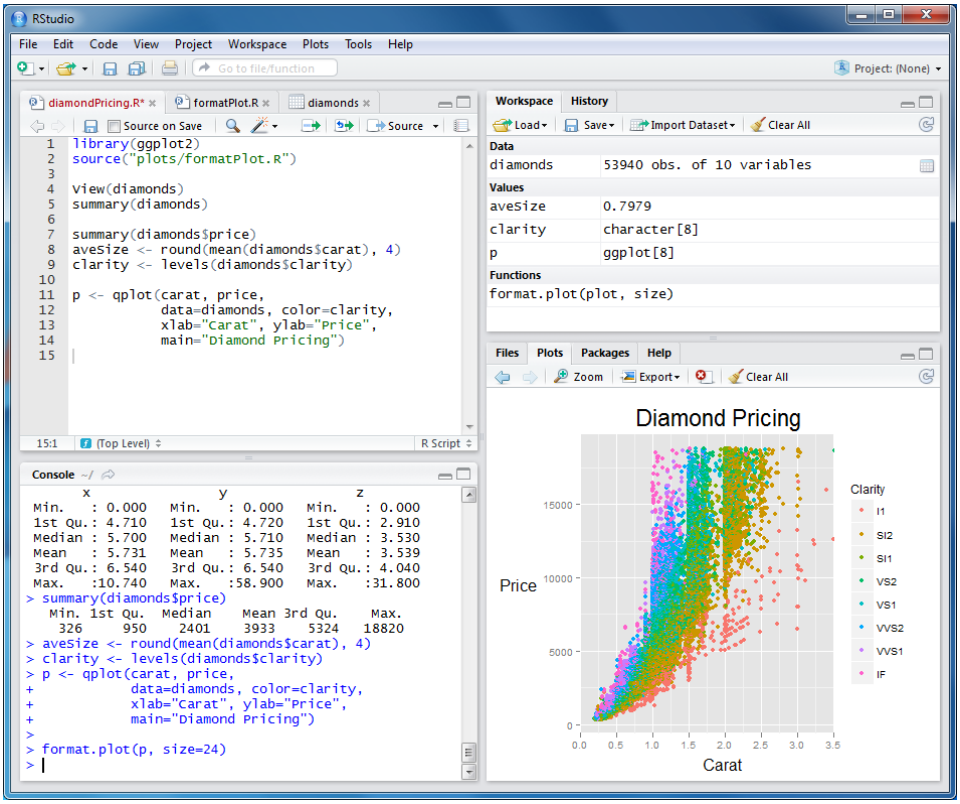

Figure 3: Example of RStudio interface (RStudio, 2011, RStudio Blog)

2.5 Research and Publication Culture in Russia

One challenge associated with research collaboration in Russia is identifying how standards differ between Western and Russian research publications. In the US, it is expected that a research paper will have extensive peer review, and that there will be multiple iterations of editing before a paper is published (Hewlett, 2002). Generally researchers will get their work peer reviewed by two or three colleagues, whom they know, before it is submitted to a journal or publisher. After this, researchers will submit their papers or larger works to official publishers and journals, and the majority of the time their first submission will not be accepted, as only 5-10% of papers are accepted on their first attempt. If the paper is marked as “Accept and revise” or as “Revise and re-submit”, then the next step will be to make revisions and resubmit, or submit to an entirely new journal all together.

In Russia, the process for submitting papers is not always this multi-layered. In many cases, getting a paper published is as simple as paying a journal to do so (Anderson, 2012). In Russia, peer-review and multiple stages of editing are less common and largely unnecessary for getting published in Russian publications. This, combined with the Russian Ministry of Education and Science's initiative to reward research productivity with salary increases, promotions, and extended contracts, have created an environment in which publishing reports quickly is not only possible, but it is rewarded. Because peer-review is far less common in Russia, and because generating a larger number of reports is rewarded more than creating thorough papers, Russian researchers find it exceedingly difficult to get published in foreign journals, which are looking for longer, more carefully revised papers.

Our sponsor, Professor Alexander Didenko, further confirmed this trend by describing Russian research as generally being more of a "report-oriented" culture, as opposed to a "publication-oriented" culture (Alexander Didenko, personal communication, September 21, 2015; full interview can be viewed in Appendix K). The distinction means that in Russia, shorter, less iterated upon papers are released as Russian publications. These papers are frequently a report on a particular researcher's opinions on a matter, as opposed to an extensively researched paper.

2.6 Project Background Summary

Any endeavor in online collaboration must consider the issues of online communication, software selection, and user interface design to be successful, and this is no different for Financial University. Financial University is a higher education institution, with branches throughout Russia's eleven time zones, and as such its researchers have a daunting task to coordinate research efforts among students and professors across these multiple campuses. The

university has begun to utilize online collaboration tools for the purpose of bolstering online research collaboration, their current software is far from being fully functional.

Financial University's current collaboration tool, known as FinLab Wiki, is meant to offer a centralized location for Financial University's researchers to work towards common goals, but it is not regularly being used by Financial University researchers. Financial University's online collaboration tool must be designed with Russian research culture in mind, and it should contain communication tools, an effective user interface, and reproducible research features. Difficulties in communication can easily arise when collaborating over the internet, so more extensive methods for messaging should be explored. The user interface should be designed to ensure that it is intuitive and satisfactory to its users. By stressing the importance of reproducible research, researchers' work will be easy to understand, and their results will be easy to recreate and build upon. In the next chapter we will explain how we carried out our research to find solutions to these challenges.

3. Methodology

The goal of our project was to determine how to improve research collaboration among researchers at Financial University through improving their online collaboration tools. We established the following objectives to achieve the goal of this project:

1. Determine the effectiveness of the current collaboration tool, FinLab Wiki
2. Identify the most desired features for online research collaboration
3. Determine which online research collaboration platform to use as a basis for a prototype tool for FU

We designed three different methods of data collection to achieve these objectives: interviews, focus groups, and a survey.

3.1 Determine the effectiveness of FinLab Wiki

Our first objective was to measure the effectiveness of FinLab Wiki by analyzing the website through creating flowcharts, and by asking FinLab Wiki users their opinions of the website.

We performed an in-depth analysis of FinLab Wiki to measure its usability and functionality by creating a flowchart of the website's structure. This flowchart shows the various paths a user can take to reach different areas of the site. Flowcharts are a useful tool for measuring a site's usability as they show how many links it takes to reach commonly accessed areas of a site. This makes it fairly easy to determine a site's efficiency, as if it takes many clicks to reach the most desired pages on a site, or if it is unclear how to reach a desired area of the page, then the site is inefficient.

We hosted six focus groups, each divided based on demographic, during our time at Financial University. We hosted three separate groups of undergraduate students consisting of

five sociology students, three international economic relations students and six international finance faculty students. Additionally, we hosted one group of six graduate students, one group of two professors, and one group of six active researcher.

In our focus groups we talked with researchers who had previous experience with FinLab Wiki, and we asked them several questions about their experiences with FinLab Wiki. We inquired about how often they used it, what they liked and disliked about it, and what they recommended for changes (Focus group protocol can be found in Appendix C).

We also interviewed our sponsor, Professor Alexander Didenko, to gain insight into how people have been using FinLab Wiki, how often it has been used, what his opinion of it was, and how he thought it could be improved. This interview was conducted in a semi-structured fashion, which allowed us to expand upon our original interview protocol when presented with the opportunity for gaining more information. Lastly, we interviewed the university's IT director, Vladimir Soloviev, and during this interview we asked his opinion of FinLab Wiki, as well as possible alternative software programs that the university has access to that could serve the same purpose.

3.2 Identify the most desired features

Before we could develop a new collaboration tool, it was essential to fully identify which features were needed to entice FU researchers to use it. In our focus groups we asked the participants what features researchers believed were necessary for a research collaboration tool (See Appendix D-I).

We asked the participants in the focus group to explain why they believed these features were important, and we recorded their responses. We combined these responses with the results of our preliminary research on features that are essential for online research collaboration.

Additionally, we determined how to incorporate the principles of reproducible research into a collaboration tool through our interviews and by searching through online databases. We also asked our focus group participants about their level of knowledge of reproducible research to help us establish how to include reproducible research into the collaboration platform.

Although we had designed a survey to be distributed as a means to obtain quantitative data regarding which features were most favored by Financial University researchers, due to problems with distributing the survey, the results we received were deemed were unusable (Survey can be found in Appendix N) .

3.3 Determine the most ideal online research collaboration platform

To determine which online research collaboration platform to use for creating a prototype research collaboration tool, we compared the features of FinLab Wiki and SharePoint, the most logical alternative to FinLab Wiki. Using the list of important features that we had previously identified from users, we created a chart that compared the amount of functionality each of the platforms had with respect to each of the features. The platform deemed to have more functionality for each feature earned a point, and in the case of a tie, both platforms received a point. A total tally of points was taken for each platform.

We also took into account our analysis of the effectiveness of FinLab Wiki, explained in section 3.1, and by analyzing the results of this data we came closer to concluding which platform should be used at FU. Finally, we took into consideration the Financial University IT director's opinion on SharePoint compared to FinLab Wiki, as he understood how both platforms would integrate with Financial University systems.

To demonstrate the features and platform that would best suit a research collaboration tool for Financial University, we created a prototype version of the platform. This prototype was

not meant to be a complete implementation of the collaboration, but simply an example of what a possible implementation could be, and could serve as a summary of our recommendations. To create this prototype we merely used the platform's add-ons. The results of our research are presented in the next chapter.

4. Results and Analysis

In this chapter, we present and analyze the relevant information gathered during our research at Financial University in order to achieve our goal of determining how to improve the effectiveness and efficiency of Financial University's knowledge and research management software. We have organized our findings and analysis into five categories: the effectiveness of FinLab Wiki, the current research practices of Financial University, the features needed for research collaboration, the platform that should be used to facilitate collaboration, and implementation of the platform.

4.1 Effectiveness of FinLab Wiki

FinLab Wiki's website design is relatively straightforward. Figure 4 shows a simple flowchart of the website's design; there are four main categories (hereby referred to as tabs) that dictate the structure of the website. Users start at the "Main Page" tab and from this tab they can traverse to the "Create a Ticket" tab, the "Guide" tab, and the "My Userpage" tab. All tabs eventually lead to either the "Ticket Summary" section or the "Existing Category" section.

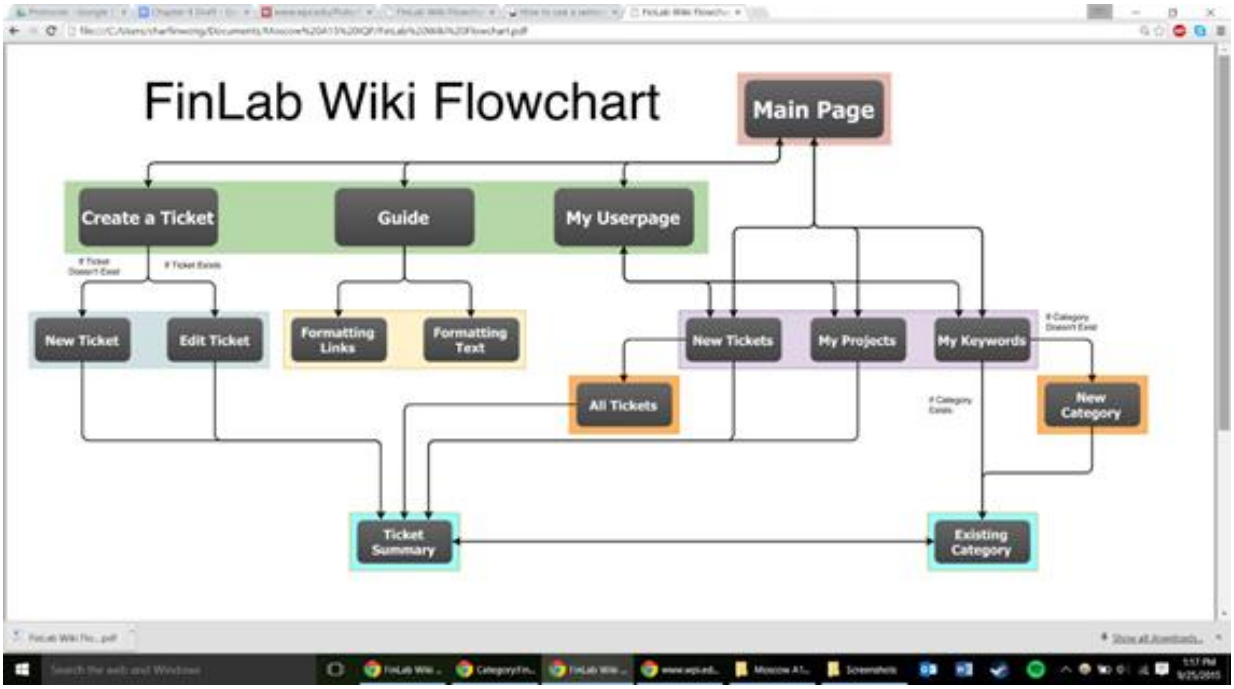

Figure 4: Flowchart showing FinLab Wiki's website structure.

The website's functionality revolves around two terms: tickets and keywords. On the website, tickets are the fundamental statement of a problem (Baumann, Farrar, Gray, 2015). Every ticket contains a description of the research problem and links to related tickets and relevant research. A keyword is a word or phrase that describes a topic of research. Users can find related tickets and other users with similar interests by searching the wiki with a keyword search.

In 2014 our sponsor, Professor Alexander Didenko, supervised the WPI IQP team that created Financial University's first research collaboration tool, FinLab Wiki (Baumann, Farrar, Gray, 2015). His original intentions with FinLab Wiki were to increase cooperation among researchers at FU and to provide a platform where researchers could share their research results and build upon each other's findings (Alexander Didenko, personal communication, September 21, 2015; full interview can be viewed in Appendix K). Our sponsor said he believes that FinLab

Wiki met the goal he set for the creators of FinLab Wiki, but further improvement could be made to the website. However, director of the Information Technology Department at FU, Vladimir Soloviev (personal communication, September 24, 2015; full interview can be viewed in Appendix M), had a somewhat different opinion on FinLab WIki, saying that its potential is limited due to being slow and not fully customizable.

Most undergraduate and graduate students said they had no idea what FinLab Wiki was, while some graduate students said they had stopped using FinLab Wiki for various reasons (see Appendices E & I). These include problems with inserting citations and links, errors during file uploads, a lack of privacy and messaging capabilities on the website, and a difficulty navigating the site due to its user interface.

Table 1 shows a list of problems associated with FinLab Wiki (see Appendix B: FinLab Wiki Analysis, for more information on how this table was created).

Table 1: List of problems associated with FinLab Wiki

Problems	Problems (Continued)
Lack of privacy within the website – anyone can edit, alter, or remove all contributions made to FinLab Wiki.	Errors while uploading files and inserting citations/links – Unable to load some files and hyperlinks
Unwillingness to share work/upload publications – Since all users can anonymously edit, alter, or remove contributions made to the website, users prefer to work alone and prefer not to publish their work on the website.	Lack of private messaging feature – Cannot privately message or send files to individual users on the website.
Slow - Website is not optimized, so users experience delays while traversing the website	User interface is too complicated – Most users are not programmers, but FinLab Wiki requires users to have basic knowledge of PHP programming language or a lightweight wiki markup language to be able to contribute.
Not fully customizable – limited by MediaWiki framework, and requires programmers proficient in PHP programming language to customize it.	Few active users - MediaWiki sites require regular participation from users to make full use of collaboration.

The biggest flaw with FinLab Wiki is the lack of privacy within the website. When first accessing the website, users are taken to a security page and prompted to log-in. Users cannot access other pages without logging in, providing the website with some privacy. However, once users get past this security feature, they are given full access to all pages on the website. This proves to be problematic as all users are able to edit, alter, or remove any contributions made to the website (Figure 5 shows the warning displayed to users attempting to edit a page). With the fear of having their work altered, stolen, or deleted on a whim, most FinLab Wiki users have stopped using the website.

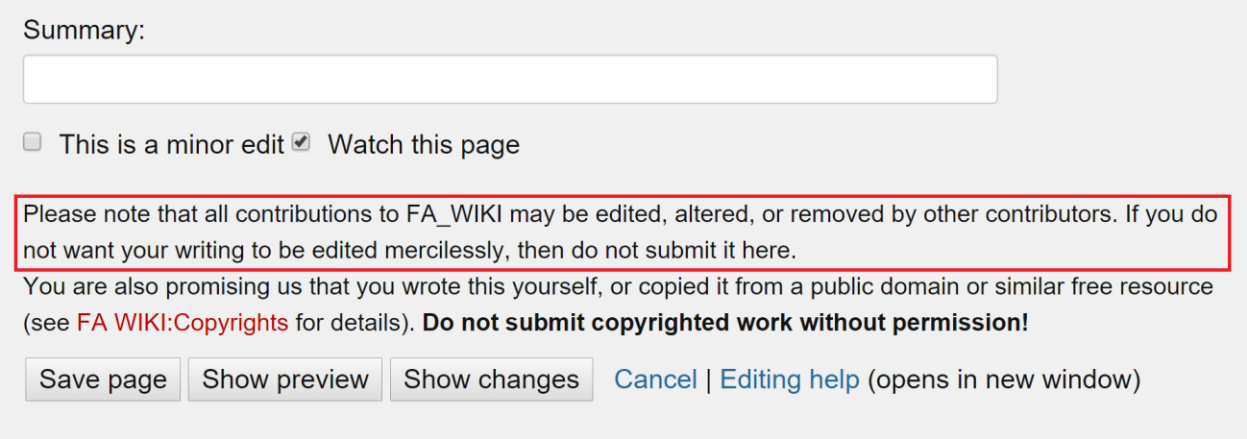

Figure 5: Warning shown to users when editing a page, highlighted in red.

4.2 Current status of research collaboration at Financial University

To better understand what was necessary for FU's research collaboration tool we first studied how collaboration at Financial University had previously been handled. We gathered data on the institution's research collaboration techniques through various focus groups and interviews.

4.2.1 Finding Research Partners

It goes without saying that for research collaboration to be successful within an organization, there needs to be an effective process for researchers to find team members. As of right now, Financial University lacks a standardized process for assisting researchers in finding other researchers (see Appendices D, E, G, H, and I). Due to this, students and professors will almost always work with their friends and acquaintances, or by themselves. While this can still lead to successful research, it would be far better if researchers at Financial University took advantage of the institution's large body of students and professors.

In regards to research projects that are given to students through the school, teachers will either delegate students to work with one another or professors will send out offers for projects and students will volunteer if interested. Although networking tools such as Facebook or VK (the

Russian equivalent of Facebook), email, and forums can be used to find research partners, these tools are not specifically designed to network people for research purposes, and as such, it is likely that researchers will only use them to communicate with people they already know. It is clear that researchers at Financial University need some means to meet new people with the desired skills for a particular research project.

4.2.2 Software and methods used for collaboration

Before we began to design a tool for research collaboration, we had to identify tools and techniques that were being used at Financial University. Table 2 summarizes our findings.

Table 2: Tools currently being used at FU

	Professors and Major researchers	Master Students	Undergraduate Students
Google Drive	✓	✓	
Dropbox	✓	✓	✓
Email	✓	✓	✓
Face-to-face	✓	✓	✓
Facebook		✓	✓
Phone	✓	✓	✓
Skype	✓	✓	
Google Translate			✓
Github		✓	

Overall, researchers at Financial University favor easy to use tools that allow them to immediately begin their work. Google Drive is commonly used, and the frequency of its use can be attributed to its simplicity and effectiveness (see Appendices E & F). Researchers appreciated the convenience that Google Docs provides by allowing multiple people to edit the same document at the same time. Alternatively, Dropbox has been used by many researchers as a means for storing files.

Not surprisingly, email was used very frequently as well, both for communication and for sending files, but there were complaints about the inconvenience of sending the same document back and forth, and it could easily become confusing as to which version of the document was the most recent.

Despite the frequent use of these tools, most researchers preferred face-to-face communication as their primary means of collaborating (see Appendices D, G, and H). This was partially due the difficulty of balancing many different software programs, but also because there is a perception that face-to-face meetings are the best method for quickly communicating and delegating work. Delegation was a major component of collaboration for the FU researchers, because most students and faculty said it was rare for all of the researchers on a project to be available at the same time. It is important to consider that although our collaboration tool will help facilitate research collaboration, it will most likely be used as a complement to face-to-face communication.

4.2.3 Factors that prevent or hinder research

One of the most notable factors that we observed regarding research collaboration at Financial University was the large number of problems that researchers encountered, and the consistency of these problems. Undergraduate students mostly cited a lack of time, interest, and skill as reasons for why they did not conduct research. Since writing research papers is not required for undergraduate students until their final year, and because professors do not always teach research methods, many students wait until later in their academic careers to begin doing research (see Appendix D). Another commonly mentioned hindrance was the cost of publishing, which was particularly detrimental for students, who lack the same financial resources as the professors and dedicated researchers. Although the graduate students were far more involved in

research than their undergraduate counterparts, they still cited a lack of incentives as a reason for not conducting research. One complaint was that research does not generally help with getting a job after graduation, and that only those who plan on working at the university or for the government truly benefited from writing papers and getting published. Professors at the university also admitted that supervisors, who are professors that oversee student research projects, need to do a better job at motivating students.

One of the most consistently mentioned barriers for conducting research is the difficulty researchers have in finding other researchers with whom to collaborate. Many researchers said that although working with others could be beneficial, they rarely would work with people outside of their friend groups because there is no established method for how to connect with other members of the university (see Appendices D, G, and H). Researchers also frequently choose to work by themselves because they believe that it is more efficient, and because coordinating among multiple researchers is a waste of their time.

Our focus group with professors, dedicated researchers, and Masters students also reinforced information about a larger societal problem regarding research and publishing in Russia, that being a preference for shorter and less in-depth research papers (see Appendices E, F, and I). We were informed that for dedicated researchers at Financial University, they are expected to publish more than four papers every year (see Appendix I). While this expectation may not seem detrimental by itself, many journals in Russia will publish any research paper regardless of content and quality if they are paid to do so. This means that instead of being encouraged to create longer and more detailed papers, researchers are instead incentivized to write many short papers. Instead of the quality of their work being the primary concern, quantity is the primary concern. This becomes a problem when researchers try to publish in foreign

journals, as Western standards for publishing generally require longer papers that have been extensively peer-reviewed.

4.2.4 Current status of reproducible research

The concept of reproducible research is still not a widely accepted standard for all research, and as such it was important to gauge the university researchers' awareness of this approach to research. Although none of the undergraduate students were familiar with reproducible research, the Masters students were somewhat aware of it, and professors were rather familiar with it (see Appendices D, E, F, G, H, I). Many of the Masters students had used reproducible research in some form already, and the university's professors saw it as an opportunity for students to easily continue research that had been started by a student who had graduated. One of the greatest difficulties surrounding reproducible research is that the university has lacked a system or platform to help researchers carry out and store reproducible research, making it difficult to share algorithms and data. Some researchers also felt that the idea of reproducible research could only work effectively in the context of math-based research papers, such as in the fields of economics, statistics, or perhaps even in the context of natural science.

4.3 Potential features of the collaboration platform

Through our focus groups and interviews we established some of the basic functionality that would be most important for online collaboration at Financial University. These features are as follows: communication functionality, networking functionality, file sharing, and task management. Additionally, it was a key request from our sponsor to enable reproducible research as a feature for the collaboration tool.

4.3.1 Communication functionality

Although there are many pre-existing methods of communicating over the internet, a key complaint that students had about using Facebook or VK to communicate was that it was too informal for communicating with professors (see Appendix E). Similarly, older researchers tended to prefer email as a communication method instead of instant messaging. If the new platform had instant messaging functionality, then it is likely that students would find this to be more formal than other instant messaging software, as this instant messaging functionality would be tailored specifically for research. Another method of communication to consider adding to the platform is forums. Forums were mentioned by students as a favored method of communication, as they allow for lengthier conversations among larger groups of people. This is ideal for research collaboration, as it gives a central location for discussing research topics.

4.3.2 Networking functionality

One of the largest hurdles for research collaboration at Financial University has been the lack of an established method for finding partners on projects. Most researchers said that the only time they would seek partners outside of their friends and acquaintances was when they were in need of a researcher who belonged to a different academic field (see Appendices D,E,G,H,I). The difficulty of finding partners would frequently lead to researchers working alone on projects. One method of solving this problem through an online collaboration tool would be to have an easy method to search through the profiles of Financial University's researchers. Members of the university would fill out their information, including their major, their year, their research interests and works they have published. It would be possible to search for these traits in other's profiles, making it easy to find appropriate researchers to work with. These profiles could overcome some of the trust concerns associated with working with strangers by allowing

researchers to rate people they had collaborated with. This would add an element of accountability to the researching process, and it would also allow researchers to screen others before partnering with them.

4.3.3 File sharing

We found that researchers use many different methods to share their documents with one another. Although Google Drive was a commonly used tool, Dropbox and email were widely used as well. All three of these were commonly used because of their simplicity; however, a desire for version control was also mentioned among some students. While Google Docs can work for research collaboration, it lacks version control methods that would allow researchers to easily access the previous versions of files. A new platform could offer the ability for multiple people to edit the same document at the same time, like Google Docs, while also offering a way to easily view the previous versions of files. This is a far more effective method of file sharing than sharing files through email.

4.3.4 Task Management

One of the largest complaints that researchers had about online research collaboration was that without face-to-face communication it could quickly become difficult to manage who was in charge of different tasks (see Appendices D, H). One way to compensate for this problem through an online tool is to allow for an easy visual representation of which tasks need to be accomplished, and which group member is performing them. To do this, having a calendar built into the tool would be advantageous. Ideally there would also be the ability to describe the tasks that need to be accomplished, as well as assign a priority level to them.

4.3.5 Reproducible research

Reproducible research is an underutilized research technique, but by offering an easy method to share algorithms and data, this beneficial practice would be encouraged. The collaboration tool could offer researchers the ability to attach their algorithms and data along with their papers. For instance, if researchers were using the statistical computing software RStudio to perform their calculations, they could attach their R file with all of their calculations when they publish their paper. Reproducible research partially addresses the Russian problem of publications having less depth in their research, as it ensures that researchers will support their claims with data, increasing the credibility of their results. Also, due to the fact that the purpose of reproducible research is to ensure that results can be reproduced, researchers would be encouraged to continue the work of other researchers, leading to more in-depth papers.

4.4 Determine the best platform for research collaboration at Financial University

To establish which platform is the best for research collaboration at the Financial University we compared the features that FinLab Wiki offers against what SharePoint offers. Table 3 shows a comparison of FinLab Wiki's features and SharePoint's features, with a check mark assigned to either FinLab Wiki or SharePoint depending on which platform provides a better implementation of the mentioned feature. In cases where the functionality is equivalent, both platforms received a check mark.

Table 3: Comparison of FinLab Wiki with SharePoint

Features and Attributes	FinLab Wiki	SharePoint
Instant Messaging		✓
Forums		✓
Networking		✓
File Sharing	✓	✓
Shared Document Editing		✓
Task Management		✓
Implementing Reproducible Research	✓	✓
Privacy Control		✓
User-Friendly		✓
Flexibility		✓
Access to Software	✓	✓
Open-Source	✓	
Total	4	11

SharePoint provides eight of the specified features better than FinLab Wiki and ties with FinLab Wiki on three features, with the only positive attribute of FinLab Wiki being that it is open-source.

SharePoint is better suited for instant messaging because it can easily incorporate chat functionality through the integration with Yammer. Figure 6 shows Yammer's instant messaging functionality, which has a similar design to other social media platforms, making it familiar and easy to use. Although FinLab Wiki can potentially integrate a chat functionality through add-ons, this feature is a third-party add on, and as such is not as polished.

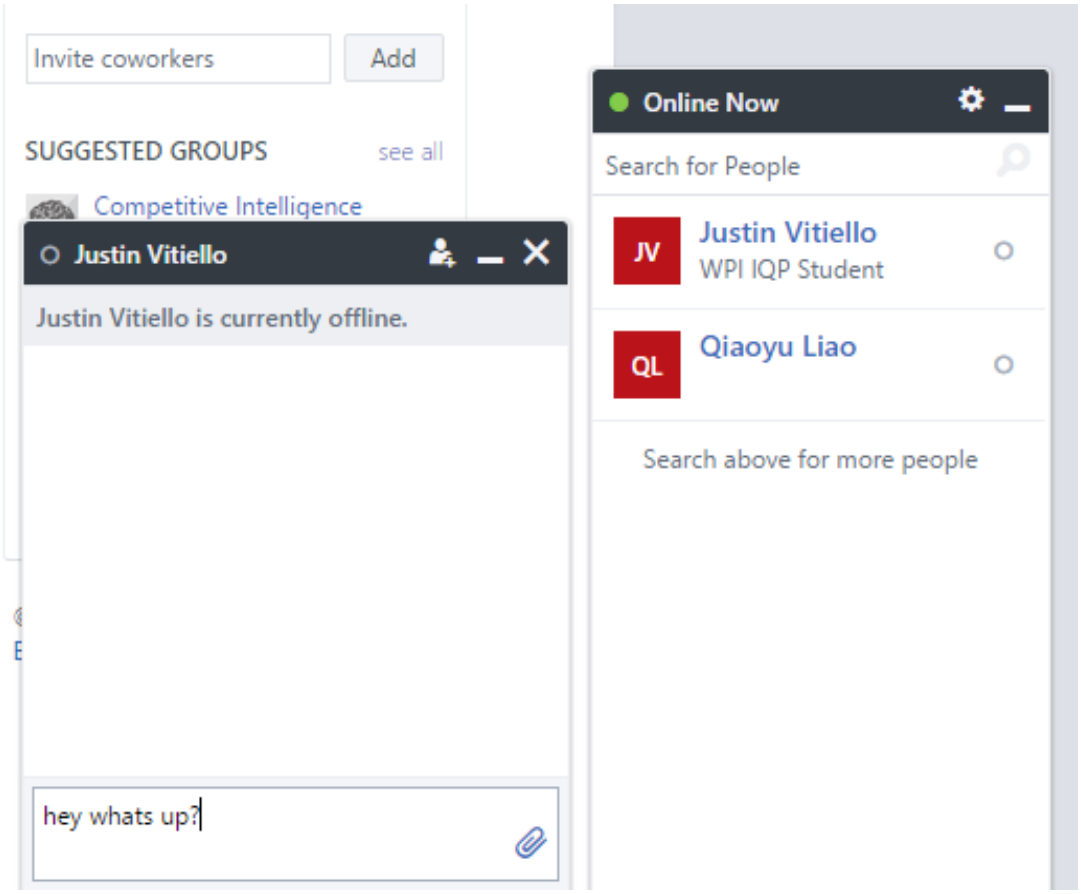

Figure 6: Yammer's instant messaging

Although FinLab Wiki has some networking functionality through keyword categorizing and personal pages, SharePoint has the superior form of this feature due to its easy integration with Yammer. Yammer allows for students and professors to search through the members of the university based on faculty, making it easy to find research partners to work with. Yammer is a closed social media platform that allows for members of an organization to network and communicate with other members of the organization. Financial University already has a Yammer site for the university based on Office 365 login credentials, allowing the entirety of the students and faculty to easily interact with each other. Figure 7 shows Yammer's feature to create and join groups based on field of study.

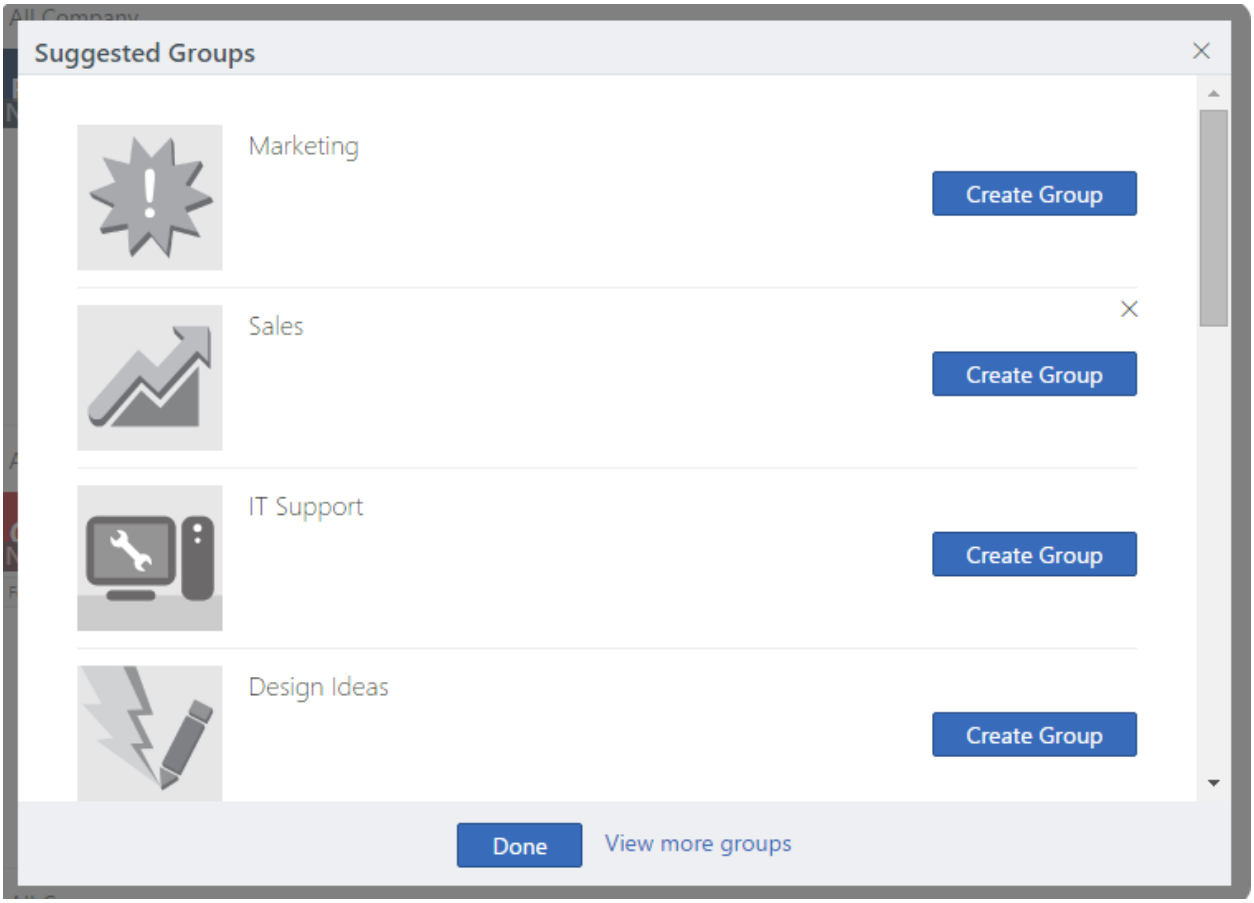

Figure 7: Yammer's group creation feature

SharePoint also has forum functionality in the form of its built-in discussion board feature. This allows for users to open discussion topics and engage in long-term conversations. Figure 8 shows these discussion boards. FinLab Wiki is limited to the WikiForum extension, which suffers from the same problem as other third party FinLab Wiki add-ons, in that it is not part of MediaWiki's core functionality.

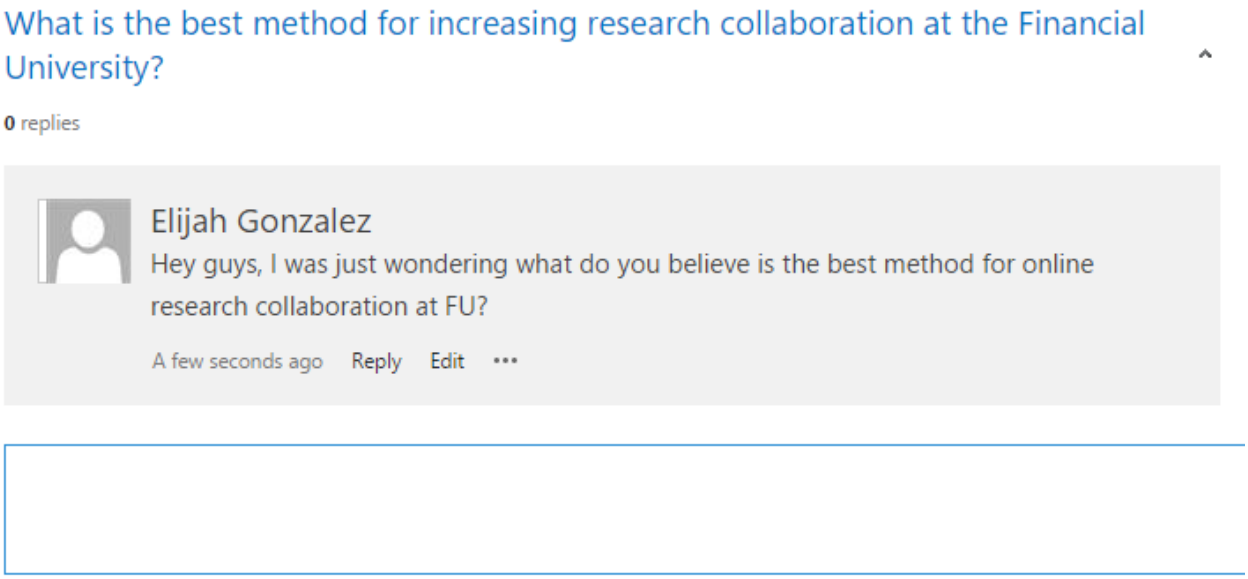

Figure 8: SharePoint's discussion board feature

Shared document editing is a core functionality of SharePoint as well, allowing multiple users to edit the same document at the same time through Microsoft Word Online, functioning similarly to Google Docs. Figure 9 shows that Microsoft Word Online has the exact same layout as Microsoft word, so it would be familiar to the vast majority of users. The Word Online documents are also shared with everyone who has access to a SharePoint site, so users do not need to specifically share their documents with their team members every time a new document is made. FinLab Wiki lacks any sort of shared document editing features.

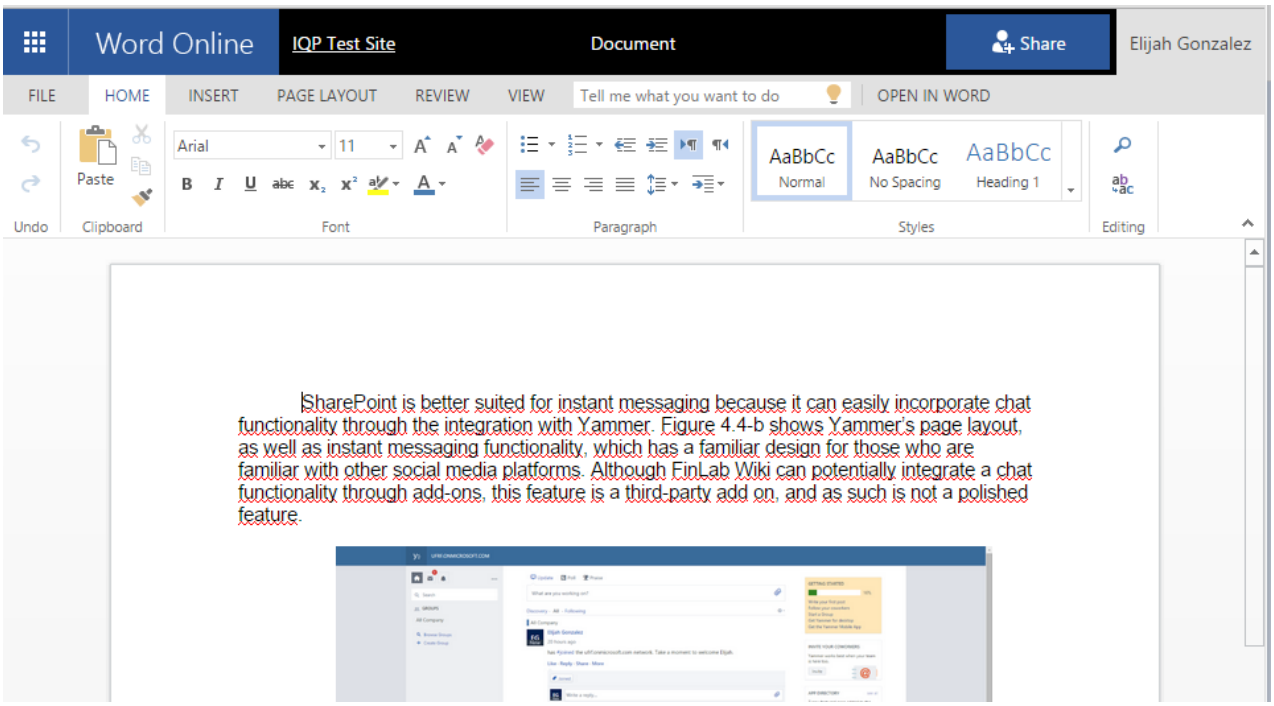

Figure 9: Microsoft Word Online

FinLab Wiki and SharePoint both share similar file sharing capabilities in that both tools allow users to upload and download files onto the tool, therefore, neither platform has an advantage over the other in this regard.

SharePoint incorporates a calendar and reminder feature that aids in distributing and managing tasks among users. It also has a task management timeline, which shows when certain tasks are due. Figure 10 shows the task management timeline feature. FinLab Wiki's only task management features are the ability to add users onto projects and the ability to receive updates when a page is edited.

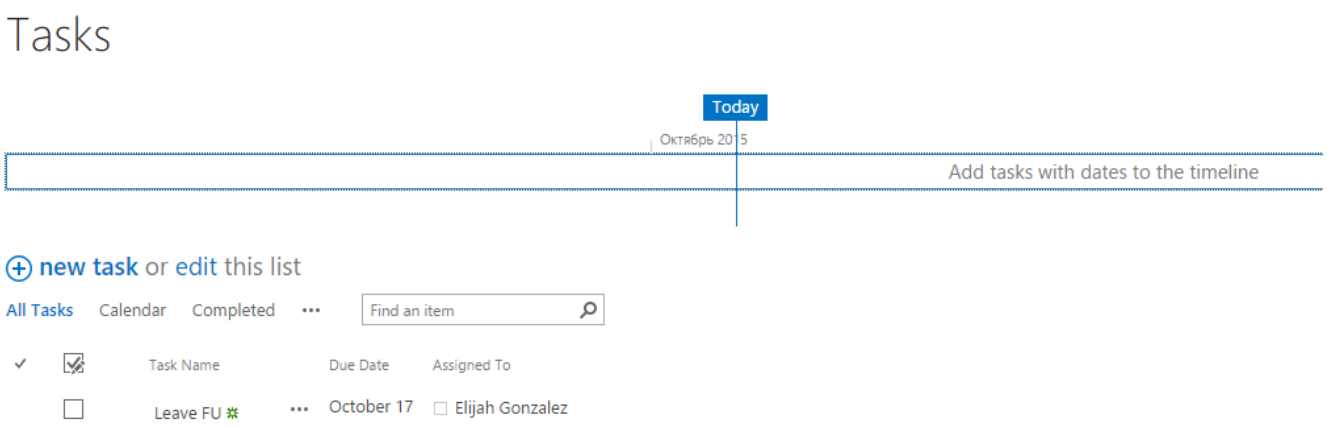

Figure 10: SharePoint's task timeline feature

FinLab Wiki comes with minimal privacy control in that everyone who attempts to access FinLab Wiki requires a login to view the website. In addition, FinLab Wiki pages are editable by everyone who has access to the platform, defeating the purpose of privacy control. On the other hand, administrators for SharePoint have the ability to delegate access to the site. Sub-sites can be created within SharePoint to create privacy within project groups.

As far as being user-friendly, FinLab Wiki is far harder to use than SharePoint. Users must become familiar with the PHP programming language and markdown syntax to be able to edit FinLab Wiki, meaning that only users that have some technical knowledge will be able to use it. SharePoint requires no programming knowledge to use. Although FinLab Wiki can be expanded through the use of PHP programming, this requires a great deal of knowledge and skill to implement. SharePoint is much more flexible as there are numerous downloadable apps that integrate with SharePoint without the need for any programming experience. Users merely need to search through the SharePoint apps store, and download the desired app to add it to their SharePoint site.

Both FinLab Wiki and SharePoint have similar functionality with regard to implementing reproducible research. Users of both tools are able to upload and download RStudio files from

the tool. Outside of this, to fully incorporate RStudio into either FinLab Wiki or SharePoint would require extensive programming knowledge in PHP and C#, respectively, and thus, neither tool is better than the other for implementing this concept.

In terms of the university's level of access to the tools, Financial University has access to both FinLab Wiki and SharePoint, as the former was created specifically for FU, and the IT department at FU has SharePoint access through Microsoft Office 365. As such, both tools require no additional effort to obtain.

FinLab Wiki has only one distinct advantage when compared to SharePoint in terms of features, that being it is an open-source platform. The term open-source refers to whether or not the code base of a program is open to the public. In the context of FinLab Wiki, this means that if a team of experienced programmers were working on the platform, they could extensively customize FinLab Wiki to the university's needs. SharePoint is a Microsoft-owned product, and FU must comply with Microsoft's terms of service, meaning it is not open-source.

By analyzing the effectiveness of FinLab Wiki, researching the current status of research collaboration at Financial University, determining the most important features of research collaboration, and comparing the possible research collaboration platforms, we came to the conclusion that SharePoint is an effective tool for online collaboration at Financial University. It supports better communication tools than FinLab Wiki, better document sharing features, a means to visualize tasks, and is much more usable overall.

4.5 Implementation of the platform

Based on our findings we have established an optimal method for implementation of the research collaboration platform at Financial University. One important element of SharePoint sites is that they enable administrators to create sub-sites within a larger SharePoint site. This

means it would be ideal for Financial University to run a main SharePoint site that would act as a hub for the university, with research groups within the university being given sub-sites for specific projects. Since SharePoint sites can easily be created in a few minutes, we would recommend that Financial University's IT department should create SharePoint sub-sites for students and professors who request them. These sub-sites that the IT department creates should have all of the basic functionality that is important for online collaboration, which we will explain in the next section of this report. Alternatively, since it takes very little technical skill to create a SharePoint sub-site, researchers should be given the ability to create their own sub-sites. In either case, editing permissions for the sub-site should be given to researchers to allow them to further customize their sub-site using the rest of SharePoint's add-on features. These sub-sites allow for a great deal of privacy control as well, because only researchers working within a research project group will have access to the content of their sub-site. We would recommend that each of these sub-sites implements the features we have previously mentioned, those being Yammer support, discussion boards, document editing, task timelines, and calendars. Figure 11 displays our prototype site, which incorporates all of these features.

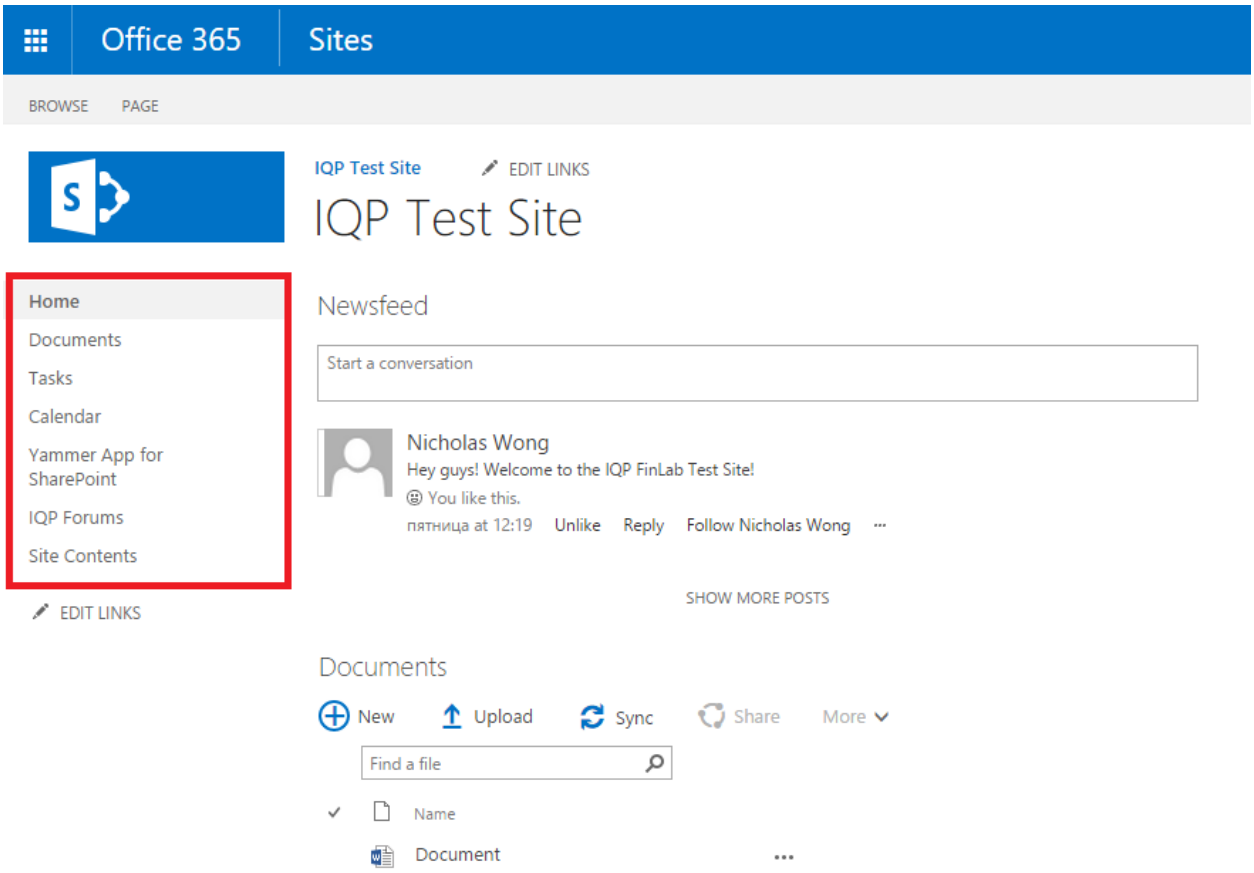

Figure 11: The homepage for our SharePoint site

Since Financial University has access to Microsoft Office 365, the family of Microsoft products that hosts SharePoint, this means that the university can supply its students and professors with Office 365 accounts. All students at Financial University should be emailed their Office 365 account credentials, and they should all be informed about its usefulness. To ensure that SharePoint is adopted as the university's collaboration platform it is important for professors to recommend its use when assigning research projects. Additionally, when a research project is assigned through the university, the IT department should send all of the researchers working on a project a link to their project's sub-site. Even though it does not take a great deal of time to create these sub-sites, if the IT department is unable to handle this, then researchers should be given the opportunity to create their own sub-site themselves.

5. Conclusions and Recommendations

The purpose of this project was to determine how to improve online research collaboration at the Financial University under the Government of the Russian Federation in Moscow, Russia. In this chapter we will discuss our conclusions and recommendations based on our research results. Our conclusions section is structured according to our research objectives, and our recommendations are separated up into online platform recommendations, and features recommendations.

5.1 Conclusions

Our first objective was to determine the effectiveness of FinLab Wiki, Financial University's previous research tool. We concluded that although FinLab Wiki was a good starting point for research collaboration at FU, it still needs a great deal of improvements before it could become a useful platform. One crippling issue FinLab Wiki suffers from is the depth of technical knowledge it requires from users, as to edit the wiki users must be familiar with PHP or markdown languages. FinLab Wiki's lack of privacy control is detrimental as well, due to the fact that any member of the wiki can edit any other member of the wiki's articles dissuades researchers from using it at all. Lastly, FinLab Wiki lacks many of the features that researchers believe would be useful in such a tool.

Our next objective was to establish which features are most important for an online collaboration tool. The features we identified can be summarized as follows: instant messaging, forums, networking, file sharing, shared document editing, task management, and reproducible research. Communication methods such as instant messaging and forums are an important element of online research collaboration software, as researchers must be able to easily stay in contact with one another. Instant messaging partially solves this problem by offering a quick

means to contact others. Forums allow users to have more in depth conversations, which are important in creating a thorough research paper. Networking features are essential because Financial University lacks an effective system for allowing researchers to find partners, leading to most researchers either working alone or only with friends. File sharing and shared document editing are integral to creating papers online because they allow for a group to have a centralized location to edit their work. Task management allows for researchers to clearly outline the tasks that must be completed, state the due date for these tasks, and delegate work. Finally, reproducible research is a concept that bolsters research by encouraging users to share their algorithms and data, legitimizing their results, and allowing for others to expand upon their research.

Our final objective was to decide which research collaboration platform should be used as the basis for Financial University's online research collaboration efforts. FinLab Wiki and SharePoint were the two options we considered. When compared to FinLab Wiki, SharePoint had better or equivalent functionality than FinLab Wiki for every feature or attribute except that it is not open-source. Overall, it was clear that SharePoint has a much better suite of features for online research collaboration and thus is a much better option for a research collaboration platform.

5.2 Recommendations

Our recommendations for Financial University can be broken into two categories: platform recommendation, and collaboration tool features recommendations. The platform recommendation section covers the platform that we think would best fit with Financial University's needs. In the features and implementation section, we discuss the features that we

believe are most important for online research collaboration, as well as how they can be integrated into the chosen platform.

5.2.1 Platform recommendation

Based on our analysis presented in Chapter 4 of this report we recommend that SharePoint is implemented as the online platform for research collaboration at Financial University. Although SharePoint is the best option for a collaboration platform at Financial University, it should be mentioned that if Financial University is unable to use SharePoint, there are additional recommendations for improving FinLab Wiki located in Appendix B.

In terms of implementing the platform, we recommend that the university creates a main SharePoint site that all members of the university have access to, and then creates sub-sites that only specific research groups have access to. The university's main SharePoint site should be used to share general information that would be applicable to all researchers at the Financial University, and to facilitate discussion between all of the research community. The SharePoint sub-sites should be created by the university's IT department after research groups request them, but researchers at the university should also have the ability to create their own sub-sites as well.

Additionally, it is essential for the university to endorse the SharePoint platform as the primary means for research collaboration at the university. All members of Financial University should be sent Office 365 accounts so that they can access SharePoint. Additionally, we recommend that the Financial University professors should teach students how to effectively use SharePoint, as well as encourage the usage of SharePoint during the undergraduate student's mandatory research projects.

Lastly, although our focus groups and interviews gave us a great deal of information about the state of research collaboration at the Financial University, we were unable to receive

valid results from our survey. We recommend that the university send out this survey to gain additional information about how the SharePoint platform should be implemented (see Appendix N for the survey).

5.2.2 Collaboration tool features and implementation

Financial University should incorporate the following features into their SharePoint platform: instant messaging, forums, networking, file sharing, shared document editing, task management, and reproducible research. If Financial University decides to utilize SharePoint, all of these features should be incorporated into their main SharePoint site, and all of their SharePoint sub-sites.

Instant messaging and communication information should be integrated into the platform. Instant messaging should be implemented into the platform through SharePoint's integration with Yammer, and message board support should be integrated through SharePoint's discussion board feature.

Yammer integration with SharePoint should also be utilized for networking purposes. Professors should encourage their students to fill out their Yammer profiles, and they should explain that Yammer should be used for collaboration at the Financial University instead of other social networking platforms because it is better at connecting researchers to their colleagues.

File management functionality should be implemented through the document library feature, allowing users to upload documents, and use Microsoft Word Online to edit the same documents at the same time. Although users can work separately and upload their files onto SharePoint, we would recommend that Microsoft Word Online is used instead so that all users can have access to the most current versions of files.

Task management functionality should be integrated using SharePoint's task management timeline feature, which allows users to set deadlines and assign members for each tasks. The calendar feature should be included as well, as it is possible that researchers may prefer to visualize their tasks using calendars.

Reproducible research should be incorporated into SharePoint through the file sharing feature, as researchers can include their data and algorithms on the main page of the university's SharePoint site if they are interested in showing that their research is reproducible. Although SharePoint has functionality for reproducible research, the most important factor for increasing reproducible research at Financial University is education about its principles. Requiring students in economics and math related fields to perform at least one research project using reproducible research would also be an effective method to introduce the concept to the university's students and future researchers.

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Appendix A: About Financial University

The goal of the Financial University under the Government of the Russian Federation is to serve as a leading institution of higher learning. The institution's primary goal is to teach students how to become economists, financiers, bankers, and financial lawyers; however, it also has a department for applied mathematics and computer science. The university also has a focus on research, and it aims to generate scientific knowledge in finance, economics, and several related fields, with a special emphasis on quantitative and empirical studies (International Finance Faculty of Financial University (IFFFU), 2015).

The university is a public institution, and it is non-profit (Moveonnet, 2015). Additionally, it is federally funded, and receives income from the enrollment fees of its students (The Financial University under the Government of the Russian Federation [FU], 2015a). As of December 31, 2012, the university became one of the first Russian universities to open a registered endowment foundation worth 215 million Russian Roubles, or about 372,423 US dollars.

Financial University is a massive institution with 19 faculties, 192 chairs, 13 institutes, 2 higher schools, 6 research institutes and centers, 3 educational research laboratories, and 37 university branches throughout Russia. Financial University's organizational structure is shown below in Figure 12. Some of the faculties are accounting and audit, credit and economics, finance and economics, international economic relations, international finance, law, management, tax and taxation, applied mathematics and computer science, public administration and municipal management, risk analysis and economic security, distance education, distance masters training, and open education (FU, 2015b). The academic staff are made up of 2,966 individuals, and there are more than 84,000 students (FU, 2015a). Financial University's

structure is composed of a wide regional network of branches, representative offices, and finance and economics colleges.

Figure 12: Financial University organizational structure

Another asset is the various technologies and software that the Financial University possesses, including the International Financial Laboratory's software. The International Financial Laboratory, headed by Professor Alexander Didenko, hosts research projects led by faculty in collaboration with external researchers and students. The projects range from developing and maintaining research agendas to hosting scientific events, and even includes projects on improving the quality of education and research of the Faculty.

Financial University (2015c) partners itself with 116 other institutions and organizations, some of which include Research Centers, Universities and other Higher Education Information Systems, Insurance Expert and Banker Training Centers, Business Schools, Education Institution and Program Certification and Accreditation Centers, International Examination Centers that issue internationally recognized certificates, banks, insurance companies, audit companies, product manufacturers, and overseas research foundations. By partnering with so many institutions and organizations, Financial University hopes to become involved in financial opportunities all across the world.

Appendix B: FinLab Wiki In-Depth Analysis

Table 4: List of problems and recommendations associated with FinLab Wiki

Problem	Recommendation
Lack of privacy within the website – anyone can edit, alter, or remove all contributions made to FinLab Wiki.	Implement privacy settings so that users can choose who can alter, edit, or delete their work, all while retaining wiki functionality
Unwillingness to share work/upload publications – Since all users can anonymously edit, alter, or remove contributions made to the website, users prefer to work alone and prefer not to publish their work onto the website.	Give privacy settings to users so they can choose who can edit which pages
Slow - Website is not optimized, so users experience delays while traversing the website	Optimize the website's code
Not fully customizable – limited by MediaWiki framework, and requires programmers proficient in PHP programming language to customize.	Gather proficient PHP programmers or utilize extensions provided by MediaWiki.
Bugs while uploading files and inserting citations/links – Unable to load some files and hyperlinks	Optimize the website's code
Lack of messaging feature – cannot privately message or send files to individual users on the website.	Implement messaging feature
User interface is too complicated – Most users are not programmers, but FinLab Wiki requires users to have basic knowledge of PHP programming language or a lightweight wiki markup language to contribute.	Update guide so that non-programmers can quickly learn how to use the website.
Few active users - MediaWiki sites require regular participation from users to make full use of collaboration.	Obtain more users through gamification techniques or more advertisement.
"Main Page" and "My Userpage" are essentially identical except for a few subtle differences	Merge "Main Page" tab with "My Userpage" tab.

FinLab Wiki's website design is very straightforward. Figure 13 shows a simple flowchart of the website's design; there are four main categories (hereby referred to as tabs) that dictate the structure of the website. Users start at the "Main Page" tab and switch between this, the "Create a Ticket" tab, the "Guide" tab, and the "My Userpage" tab. All tabs eventually lead to either the "Ticket Summary" section or the "Existing Category" section.

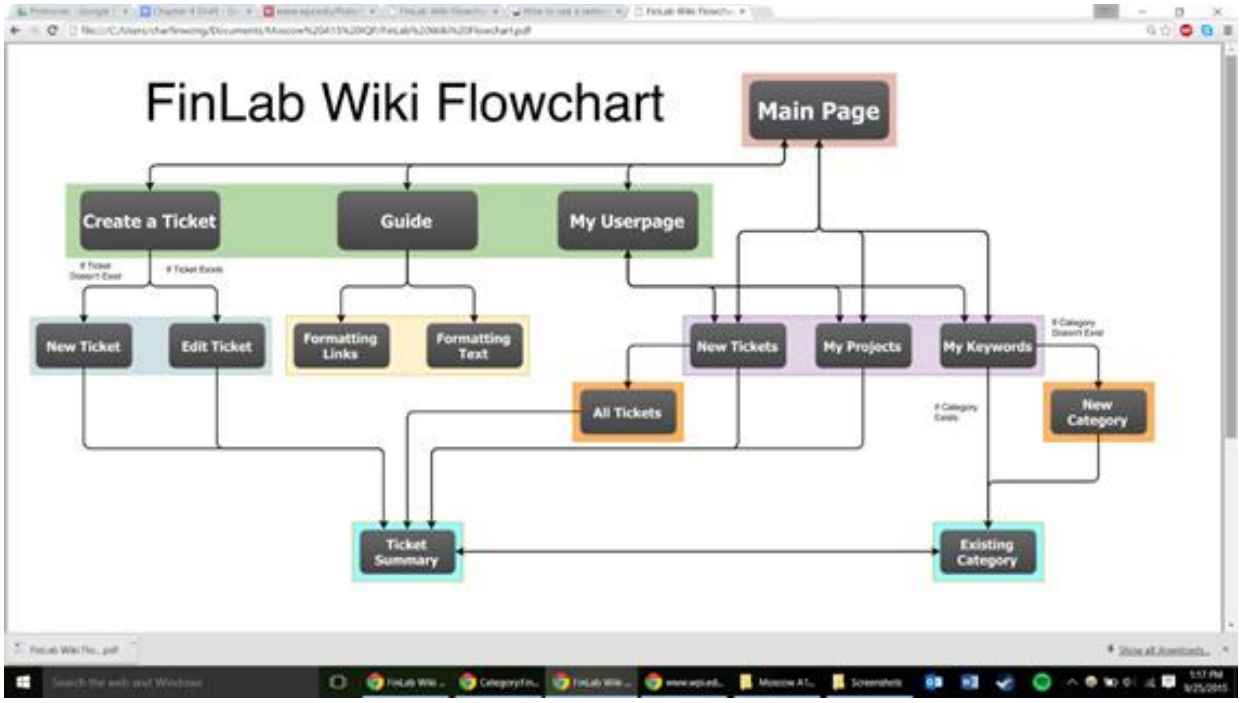

Figure 13: Flowchart showing FinLab Wiki's website structure.

The website's functionality revolves around two terms: tickets and keywords. On the website, tickets are the fundamental statement of a problem (Baumann, Farrar, Gray, 2015). Every ticket contains a description of the problem and links to related tickets and relevant research. A keyword is a word or phrase that describes a topic of research. Users can find related tickets and other users with similar interests by searching the wiki with a keyword search

The “Main Page” tab includes a “My Projects” section, a “My Keywords” section, and a “New Tickets” section. The “My Userpage” tab shares this same information, which prompts the question, why are these two tabs separate?

There are subtle differences between the “Main Page” tab and the “My Userpage” tab. The first difference is the introductory paragraph found on the “Main Page” tab that welcomes users and explains the purpose of the website. The second difference is how the “My Keywords” section is formatted; the “Main Page” tab shows the keywords (also called page categories, or “tags”) as part of a moving image while the “My Userpage” tab shows the keywords in a list in addition to the moving image. Another difference is that the “Main Page” tab has an additional link that takes users to a record of all the projects. The last difference is that users can update their keywords on the “My Userpage” tab via the user page dropdown menu found on the top of this tab, but not on the “Main Page” tab. Figures 14 through 18 show the differences between the two tabs.

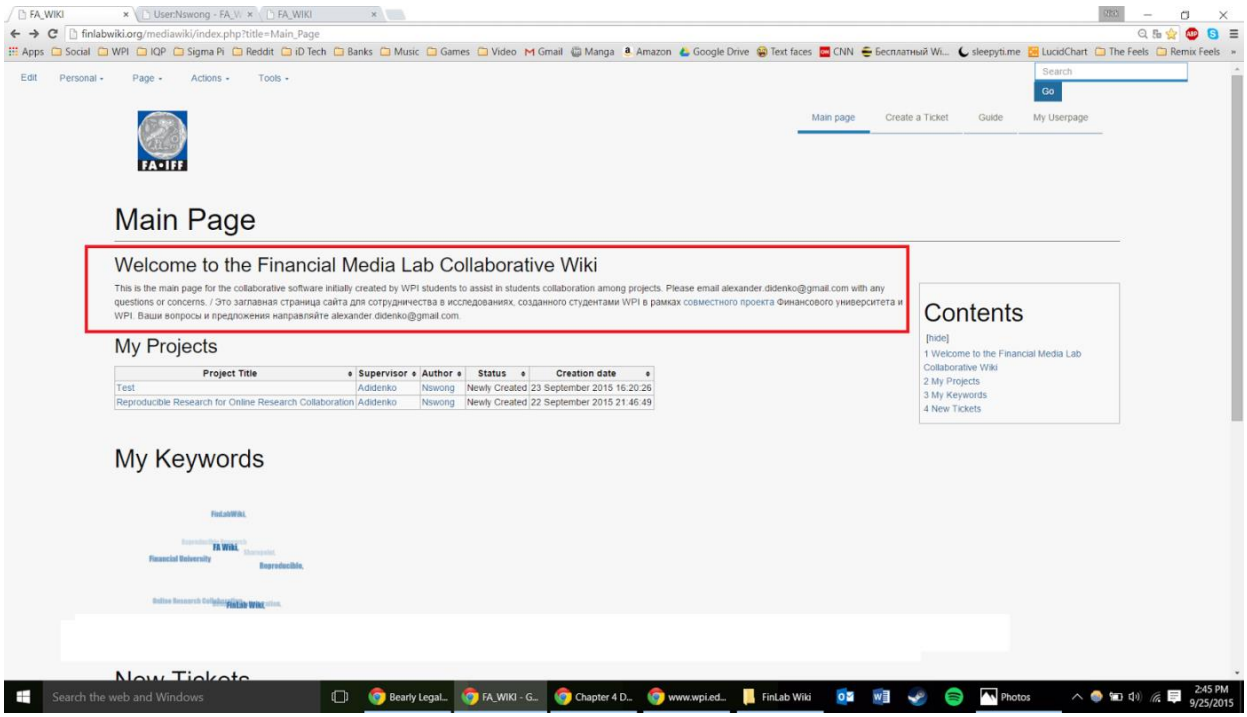

Figure 14: "Main Page" tab (introductory paragraph highlighted in red & shown in Figure 15)

Main Page

Welcome to the Financial Media Lab Collaborative Wiki

This is the main page for the collaborative software initially created by WPI students to assist in students collaboration among projects. Ple
questions or concerns. / Это заглавная страница сайта для сотрудничества в исследованиях, созданного студентами WPI в рамка
WPI. Ваши вопросы и предложения направляйте alexander.didenko@gmail.com.

My Projects

Project Title	Supervisor	Author	Status	Creation date
Test	Adidenko	Nswong	Newly Created	23 September 2015 16:20:26
Reproducible Research for Online Research Collaboration	Adidenko	Nswong	Newly Created	22 September 2015 21:46:49

Figure 15: Introductory Paragraph

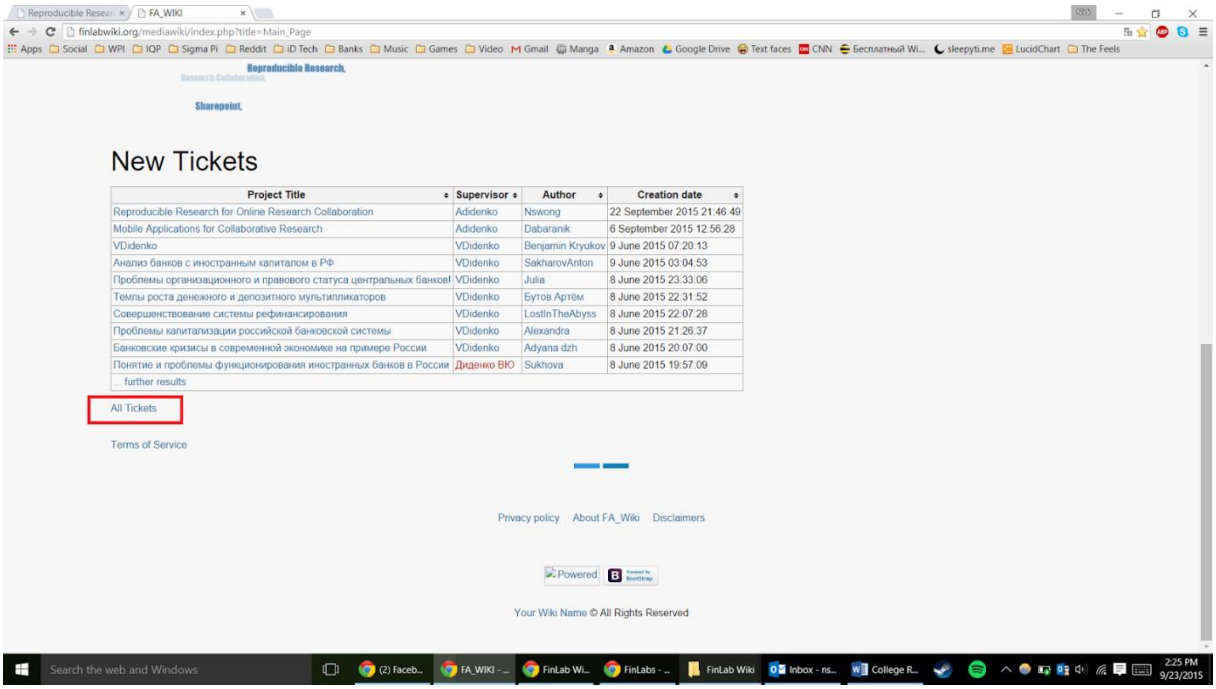

Figure 16: "Main Page" tab - Tickets (hyperlink leading to all tickets page is highlighted in red)

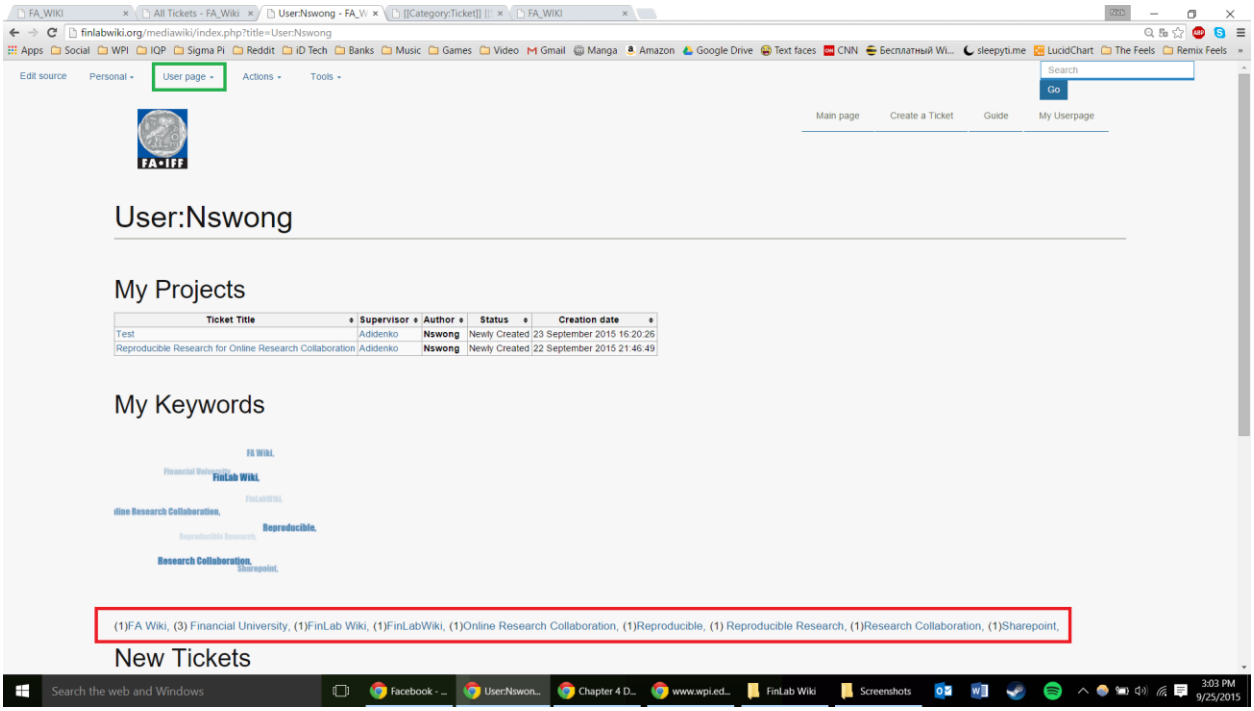

Figure 17: "My Userpage" tab, (list of keywords is highlighted in red on the bottom and shown in Figure 18. Also, User Page dropdown menu is highlighted in green on top).

Figure 18: List of keywords highlighted in red

Clicking on a project will bring the user to a summary page of that project, while clicking on a keyword will redirect the user to a summary of an existing category for that keyword (Figure 19 and Figure 20). If there is no existing category for the keyword, then the user will be redirected to a page for creating new categories (Figure 21 and Figure 22). While the keywords feature is a great way to promote online research collaboration by grouping projects and users together, the execution of this feature is underwhelming because it relies on users to regularly update these pages. Very few categories have been created or updated due to the lack of active users, so most keywords redirect to the creating a new category page.

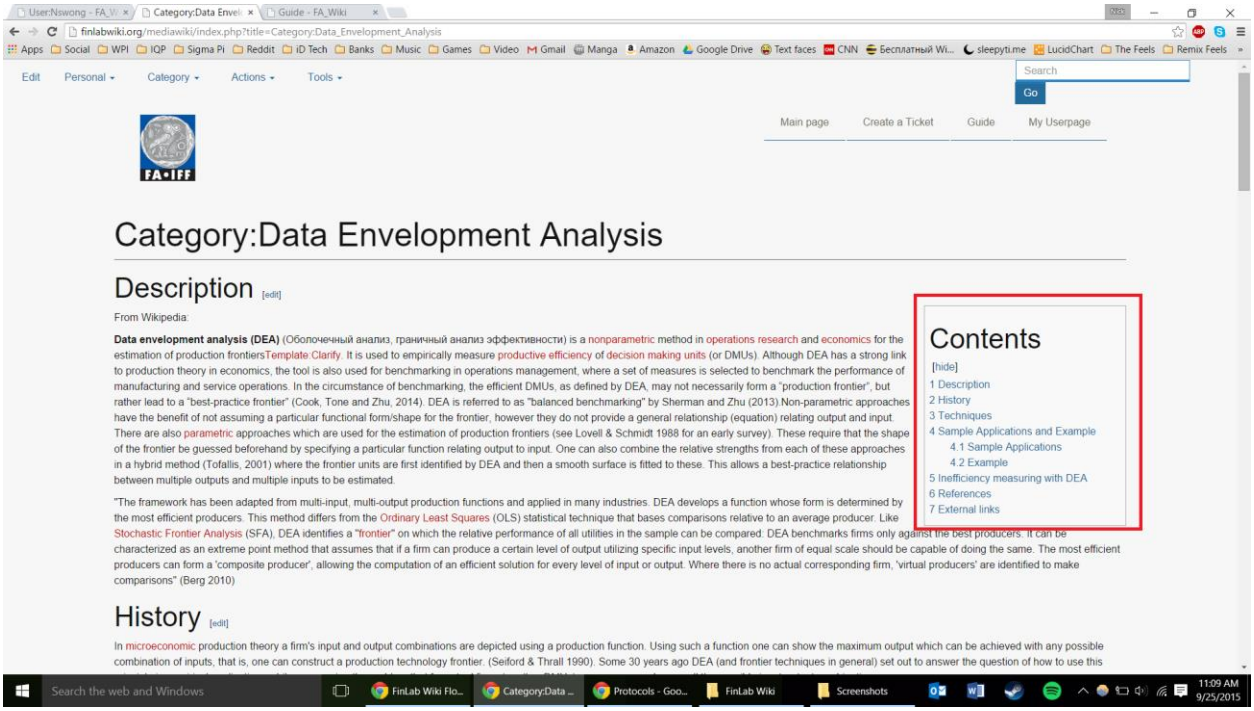

Figure 19: Existing category summary for the Data Envelopment Analysis keyword. (Content summary for this page is highlighted in red and shown in Figure 20.)

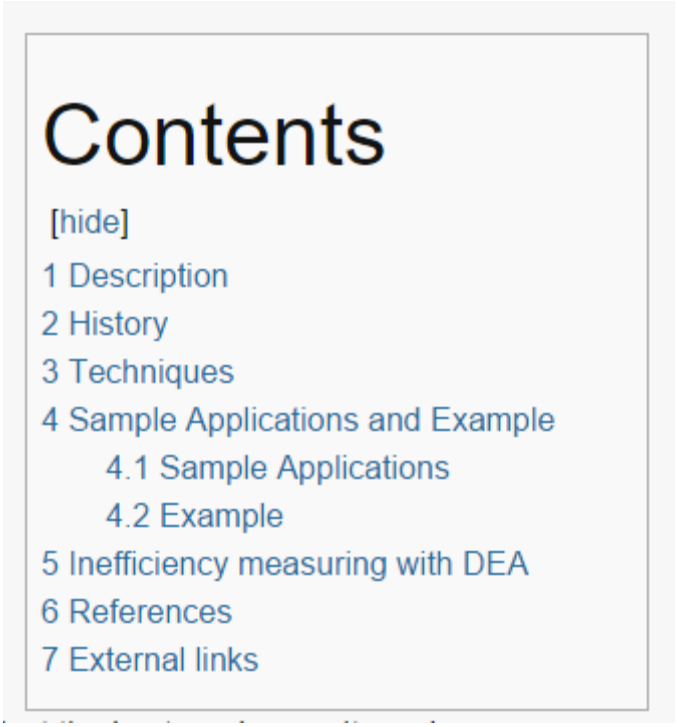

Figure 20: Contents summary for Data Envelopment Analysis category

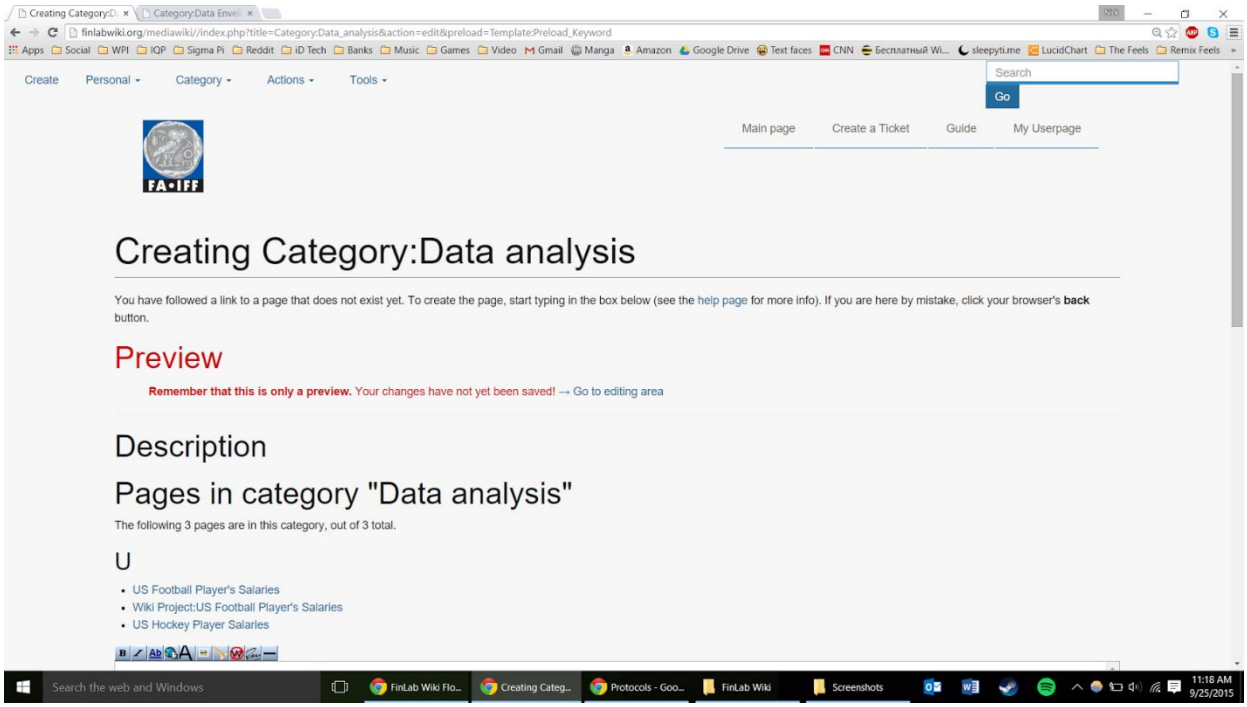

Figure 21: Creating a new category for the Data analysis keyword. (Note that most keywords redirect to this page, as very few categories have been created or updated)

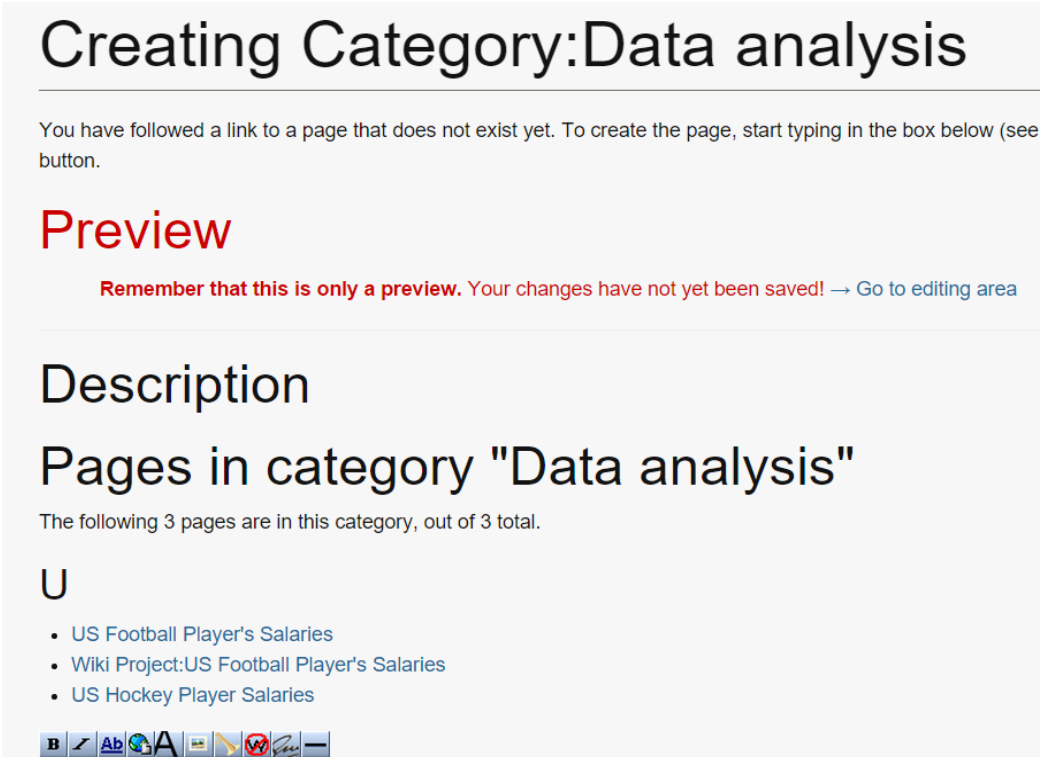

Figure 22: Creating a new category for the Data analysis keyword – closer view

The “Guide” tab is the third main tab of FinLab Wiki. This tab contains instructions on how to create a ticket, a guide on what users can do on the “My Userpage” tab, a table describing how to format links on the website, and two links which direct the user to the MediaWiki help sections on formatting links and text, respectively.

An unfortunate consequence of using FinLab Wiki is that users who wish to utilize formatting features, such as bolding or hyperlinking, must become familiar with basic programming in PHP or a lightweight wiki markup language. For example, some FinLab Wiki users who participated in our focus groups have expressed their dismay at how they must type “<b>” and “<b/>” around the words they wish to bold, and would much rather bold words by pressing a bold button (see Appendix E: Master Students Focus Group Notes for full details of the focus group). The “Guide” tab does a poor job of teaching non-programmers these basics, a flaw that is further complicated by the fact that most students attending the Financial University under the Government of the Russian Federation (2015a) are non-programmers who are studying finance and economics. Figure 23 through Figure 25 show what little information FinLab Wiki has related to formatting.

Formatting Links

				Basic Wikilink Syntax
Code	→	*Result*	*Target*	*Description*
[[a]]	→	a	a	The simplest wikilink
[[a b]]	→	a b	a b	Multiple words
[[a b|c d]]	→	c d	a b	Link targets 'a b' but displays 'c d' *
[[a b]]c	→	a bc	a b	The link label is the link target, with its last language)
<nowiki>[[a]]</nowiki>	→	[[a]]	Ø	Text is displayed as typed without the prop
entered: [[a (b)|]], converted to: [[a (b)|a]]	→	a	a (b)	A pipe '|' immediately before the closing bra displayed *,***
entered: [[a, b|]], converted to: [[a, b|a]]	→	a	a, b	A pipe '|' immediately before the closing bra it is displayed *,***
entered: [[w:a|]], converted to: [[w:a|a]]	→	a	w:a	A pipe '|' immediately before the closing bra displayed *,**,***
entered: [[w:a (b)|]], converted to: [[w:a (b)|a]]	→	a	w:a (b)	A pipe '|' immediately before the closing bra part in parentheses when it is displayed *,***
entered: [[mediawiki:1movedto2|]]	→	mediawiki:1movedto2	Mediawiki:1movedto2	
entered: [[mediawiki:1movedto3|]]	→	mediawiki:1movedto3	Mediawiki:1movedto3	

Table courtesy of Wikimedia Foundation

More information about formatting links can be found here

More about formatting text on the wiki can be found Here

Figure 23: "Guide" tab, (Formatting Links table with hyperlinks leading to MediaWiki's help pages highlighted in red on the bottom)

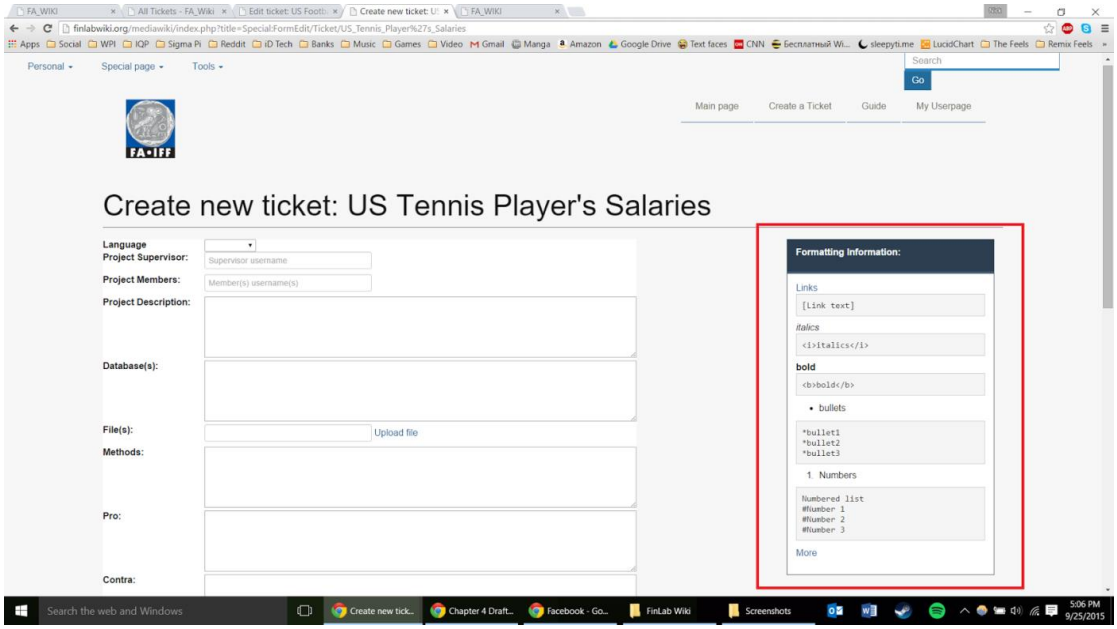

Figure 24: "Create New Ticket" tab. (Highlighted in red on the right-side is a cheat sheet with information on how to format in PHP/markup language.)

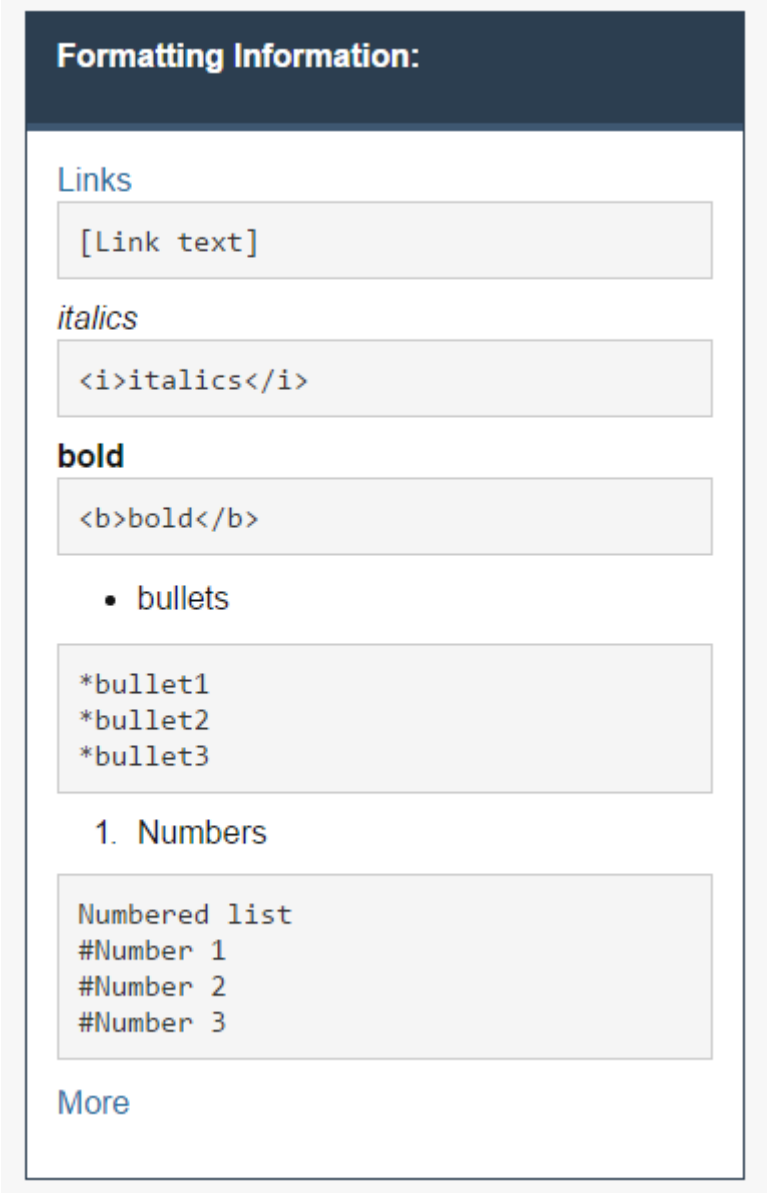

Figure 25: Cheat sheet on formatting information

The “Create a Ticket” tab is the last main tab, which prompts users to enter a title for a ticket. If the ticket exists, users are redirected to a page where they can edit the ticket; otherwise, if the ticket does not exist, users are redirected to a page where they can create a new ticket (Figure 24). After editing an existing ticket or creating a new ticket, the user is taken to a ticket summary page for that project (Figure 26). On the website, the title for a ticket also functions as

a hyperlink which redirects the user to the ticket summary page of that project. Therefore, users can access the ticket summary page for any project from the “Main Page” tab, the “My Userpage” tab, the “All Tickets” page, or by using the search bar found on the top-right corner of every page.

Figure 26: US Football Player’s Salaries ticket summary page.

When first accessing the website, new users are taken to a security page and prompted to log-in. Users cannot access other pages without logging in, providing the website with some privacy. However, once users get past this security feature, they are given full access to all pages on the website. This proves to be problematic as all users are able to edit, alter, or remove any contributions made to the website (Figure 27 shows the warning displayed to users attempting to edit a page). With the fear of having their work altered, stolen, or deleted on a whim, most FinLab Wiki users have stopped using the website.

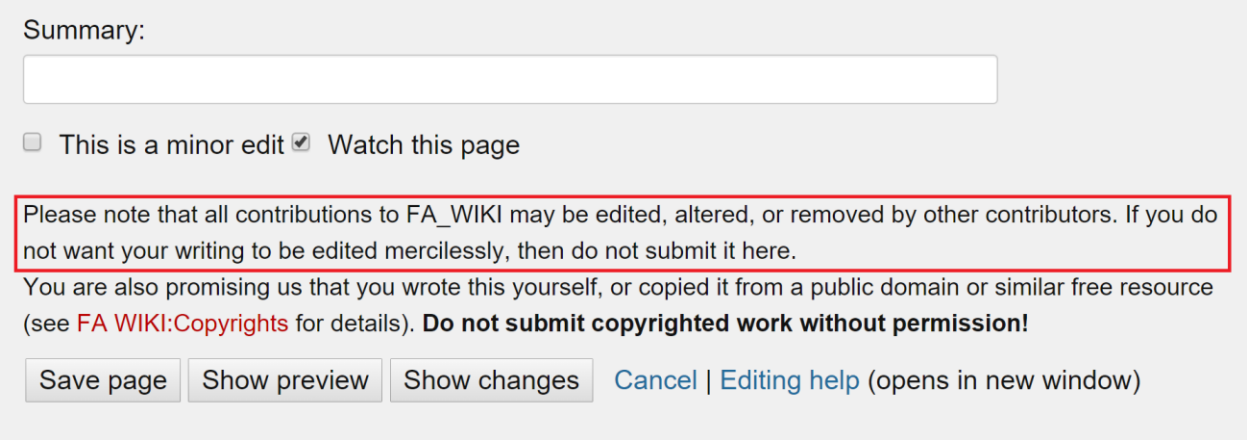

Figure 27: Warning shown to users when editing a page, (highlighted in red)

Appendix C: Focus Group Protocol

Introduction:

We are students from Worcester Polytechnic Institute (WPI) located in Worcester, Massachusetts, USA. Our group is studying in Moscow in order to complete an important academic requirement for graduation. Our project involves determining potential ways to increase research collaboration within the Financial University (FU) through the use of an online collaboration platform.

Mission Statement:

The goal of our project is to determine how to improve Financial University's knowledge and research management software so that the researchers at the Financial University's many campuses can collaborate on their research more effectively and efficiently.

Conductors of Focus Group:

Time, Date, and Location:

Participants:

Relationship with FU:

Focus Group Questions

General Research

1. What sort of research do you do? How often do you write research papers? How often do you publish these papers?
2. How do you find your research partners?
3. What current tools do you use for research collaboration? (Google Docs, Email, etc). What do you like about these tools? What do you dislike?
4. What are the factors that block you from creating and publishing papers? Are there other, larger obstacles for collaboration?

Gamification

5. What are the incentives for you to conduct research? If a collaboration platform had rewards based on use (grants for researchers, prizes for students, etc), would more people use it?

Mobile Applications

6. We want to design a mobile application to connect researchers with each other. What features would be useful in this? What about a function that helps you find researchers with similar interests? (the network will be internal for now but expandable)

Reproducible Research

7. Are you familiar with the principles of reproducible research? (If no, explain) Would you be willing to incorporate these principles into your research?

End

8. Is there anything else anyone wants to add that we didn't touch upon?

Appendix D: Focus Group Notes with Sociology undergraduate students

Introduction:

We are students from Worcester Polytechnic Institute (WPI) located in Worcester, Massachusetts, USA. Our group is studying in Moscow in order to complete an important academic requirement for graduation. Our project involves determining potential ways to increase research collaboration within the Financial University (FU) through the use of an online collaboration platform.

Mission Statement:

The goal of our project is to determine how to improve Financial University's knowledge and research management software so that the researchers at the Financial University's many campuses can collaborate on their research more effectively and efficiently.

Conductors of Focus Group:
Ying Lu
Christopher Navarro
Nicholas Wong

Time, Date, and Location:
15:40-16:30 September 14, 2015, Bloomberg Lab, Financial University

Participants:

Relationship with FU:
2nd year undergraduate w/ sociologist background
2nd year undergraduate w/ sociologist background
2nd year undergraduate w/ sociologist background
2nd year undergraduate w/ sociologist background
3rd year undergraduate w/ sociologist background

Focus Group Questions

General Research

1. What sort of research do you do? How often do you write research papers? How often do you publish these papers?
    - *Most of their research is done for academic purposes by using the Internet and the university's library.*
    - *Why do you research?*
        - *For marks/grades*
        - *For master's project*
    - *Do you write research papers?*
        - *Rarely, most of the students' involvement with research papers are during their 4th year*
            - *Instead a few keep portfolios*
            - *Do you publish these?*
                - *Rarely, however the group had a desire to publish their work if it was of good quality.*

2. How do you find your research partners?
    - *Normally, through their own personal network of friends*
    - *They also sometimes use social media tools to connect with others*
        - *Example given: Facebook*

3. What current tools do you use for research collaboration? (Google Docs, Email, etc). What do you like about these tools? What do you dislike?
    - *Google translate, docs, email, and social media tools were listed.*
        - *However, the group preferred to meet in person for collaboration or work individually.*
        - *How do you work individually?*
            - *Divide and conquer with tasks*

4. What are the factors that block you from creating and publishing papers? Are there other, larger obstacles for collaboration?
    - *Time*
    - *Lack of interest or motivation*
    - *Not enough skill*
    - *3rd or 4th year student bias for research publication*
    - *Problems with professors*
        - *There is no support or instruction to help them publish their research.*

        - *Are there accessible resources that could help guide you through the publication process?*
            - *None that they are aware of.*
                - *There is a lack of general support for the process.*

Gamification

5. What are the incentives for you to conduct research? If a collaboration platform had rewards based on use (grants for researchers, prizes for students, etc), would more people use it?
    - *Incentives:*
        - *Personal interest*
        - *Recognition*
        - *Their work could be shown to potential employers*
        - *To share personal opinions*
    - *What rewards would you like to see?*
        - *Scholarships*
        - *Monetary rewards*
        - *Recognition*
        - *Connect with companies (career driven)*

Mobile Applications

6. We want to design a mobile application to connect researchers with each other. What features would be useful in this? What about a function that helps you find researchers with similar interests? (the network will be internal for now but expandable)
    - *Do you all have a smartphone?*
        - *All answered yes.*
    - *Features mentioned:*
        - *Avoid chat feature:*
            - *The group believed this feature would be too informal.*
        - *Online functionality:*
            - *The group wanted to be able to access their files offline.*
        - *Contact information:*
            - *The group wanted to be able to find a person's contact information through the app.*

Reproducible Research

7. Are you familiar with the principles of reproducible research? (If no, explain) Would you be willing to incorporate these principles into your research?
    - *Are you aware of what reproducible research is?*

        - *All answered no.*
    - *A brief explanation of the subject was given to the group.*
    - *Would you be willing to incorporate this idea into your research?*
        - *Only if it is a large project, otherwise no.*

End

8. Is there anything else anyone wants to add that we didn't touch upon?
    - *Exchanged contact information*

Gave the participant a survey that they would fill out and return to our Russian associates.

Appendix E: Focus Group Notes with Master students

Introduction:

We are students from Worcester Polytechnic Institute (WPI) located in Worcester, Massachusetts, USA. Our group is studying in Moscow in order to complete an important academic requirement for graduation. Our project involves determining potential ways to increase research collaboration within the Financial University (FU) through the use of an online collaboration platform.

Mission Statement:

The goal of our project is to determine how to improve Financial University's knowledge and research management software so that the researchers at the Financial University's many campuses can collaborate on their research more effectively and efficiently.

Conductors of Focus Group:
Ying Lu
Christopher Navarro
Nicholas Wong

Time, Date, and Location:
17:00-17:50 September 14, 2015, Bloomberg Lab, Financial University

Participants:

Relationship with FU:
1st year master student
1st year master student
1st year master student
1st year master student
1st year master student
1st year master student

Focus Group Questions

General Research

1. What sort of research do you do? How often do you write research papers? How often do you publish these papers?
    - *What sort of research do you do?*
        - *Corporate findings*
        - *Managing business data*
        - *Master dissertations*
        - *Writing and presenting financial findings*
        - *The study of theory versus practice*
            - *Through the use of Bloomberg*
    - *How often do you write research papers?*
        - *Approximately 2 times per semester*
    - *How often do you publish these?*
        - *Sometimes, more so when there is a competition.*
            - *Some members had published up to 30 articles*
        - *There is a large gap between the quality and quantity of published papers.*

2. How do you find your research partners?
    - *Scientific advisors*
    - *Addressing a professor who is an expert in your research topic.*
    - *Through student societies*
        - *Every faculty has a local society that can help find you partners.*
    - *The students mentioned a lot of individual work is required to find research partners.*

3. What current tools do you use for research collaboration? (Google Docs, Email, etc). What do you like about these tools? What do you dislike?
    - *What current tools do you use for collaboration?*
        - *Social networks*
        - *Skype*
        - *Email*
        - *Dropbox*
        - *Google Drive*
        - *FinLab Wiki*
    - *What do you like about them?*
        - *Ability to send documents*
        - *Version control*

        - *Easy to use*
        - *Privacy control*
        - *Chat system capability*
    - *What do you dislike?*
        - *A lot of the dislikes focused around FinLab Wiki*
            - *FinLab Wiki:*
                - *Not user friendly*
                - *Sometimes broke with file upload*
                - *No privacy*
                - *No file or message sending*

4. What are the factors that block you from creating and publishing papers? Are there other, larger obstacles for collaboration?
    - *Other priorities*
    - *Finding the right people to work with*

Gamification

5. What are the incentives for you to conduct research? If a collaboration platform had rewards based on use (grants for researchers, prizes for students, etc), would more people use it?
    - *Incentives:*
        - *Monetary*
        - *Fills degree/grade requirements*
        - *Scholarships*
            - *Want more opportunities for them as well*
        - *Recognition*
        - *A lasting impression*
        - *Looks good to employers, and other selective processes*
    - *More people would be willing to use a tool which used these incentives.*

Mobile Applications

6. We want to design a mobile application to connect researchers with each other. What features would be useful in this? What about a function that helps you find researchers with similar interests? (the network will be internal for now but expandable)
    - *Features:*
        - *File sharing*
        - *Chat*
        - *Newsfeed/timeline of current work*
        - *Ability to follow other researchers*

Reproducible Research

7. Are you familiar with the principles of reproducible research?(If no, explain) Would you be willing to incorporate these principles into your research?
    - *Are you familiar with reproducible research?*
        - *Yes, somewhat.*
    - *Would you be willing to use it?*
        - *Most said yes, and some were even using in their research already.*
        - *Those who weren't using it would strongly consider using it.*

End

8. Is there anything else anyone wants to add that we didn't touch upon?
    - Exchanged emails

Handed out paper survey to participants

Appendix F: Focus Group Notes with Professors

Introduction:

We are students from Worcester Polytechnic Institute (WPI) located in Worcester, Massachusetts, USA. Our group is studying in Moscow in order to complete an important academic requirement for graduation. Our project involves determining potential ways to increase research collaboration within the Financial University (FU) through the use of an online collaboration platform.

Mission Statement:

The goal of our project is to determine how to improve Financial University's knowledge and research management software so that the researchers at the Financial University's many campuses can collaborate on their research more effectively and efficiently.

Conductors of Focus Group:
Josh Hebert
Qiaoyu Liao
Justin Vitiello

Time, Date, and Location:
13:40-14:23, September 15, 2015, Bloomberg Lab, Financial University

Participants:

Relationship with FU:
Professor
Professor

Focus Group Questions

General Research

1. What sort of research do you do? How often do you write research papers? How often do you publish these papers?
    - *What sort of research do you do?*
        - *Articles in foreign and Russian journals*
        - *Conference and roundtable meetings*
            - *for degrees, PhD, etc.*
        - *Supervise students articles*
        - *Professional work related to expertise*
    - *There is difference between Russian and international journals*
        - *Quality for international journals is higher*

2. How do you find your research partners?
    - *Through Dean's office resources*
        - *Masters:*
            - *need to submit their working area to dean's office and professors will assign them to projects*
        - *Bachelors:*
            - *Professors create offers involving different research topics, and students apply for them*
        - *Professors will supervise 5-7 students, and then build a team*
    - *Need to keep in touch with Prof. and Dean's office to get information for available research opportunities*

3. What current tools do you use for research collaboration? (Google Docs, Email, etc). What do you like about these tools? What do you dislike?
    - *Google drive/Email:*
        - *There is no time to study other platforms; Drive is simple and open source*
    - *Alternatives:*
        - *Dropbox for students*

4. What are the factors that block you from creating and publishing papers? Are there other, larger obstacles for collaboration?
    - *Supervisors need to be motivated so that students will publish consistently; however, it is easier to work with an individual student.*
        - *More efficient to work alone*

- *Journals may not accept a paper*
- *Time constraints*
- *Lack of interest/motivation from students*

Gamification

5. What are the incentives for you to conduct research? If a collaboration platform had rewards based on use (grants for researchers, prizes for students, etc), would more people use it?
    - *Incentives:*
        - *Scholarships*
        - *Education programs/grants, save money*
        - *Provide career opportunities*

Mobile Applications

6. We want to design a mobile application to connect researchers with each other. What features would be useful in this? What about a function that helps you find researchers with similar interests? (the network will be internal for now but expandable)
    - *Have a progress bar for each researcher*
        - *Researchers will usually not share their data and progress*
        - *This will create competition*
        - *Easy to measure*
    - *Why avoid sharing?*
        - *Plagiarism*
        - *Afraid to have similar work to present at the same time*
        - *Want to be unique and individual*

Reproducible Research

7. Are you familiar with the principles of reproducible research?(If no, explain) Would you be willing to incorporate these principles into your research?
    - *Yes:*
        - *However, there is no widely available system platform to do it*
    - *Would be willing to incorporate; however, this is hard to continue among students, especially after they graduate*

End

8. Is there anything else anyone wants to add that we didn't touch upon?
    - *System that allows students to continue research from previous students*
        - *No research focus with 1st and 2nd year students*
            - *Teach students about researching earlier (publication and writing)*

    - *FU is an educational university, so there shouldn't be too much focus on research*
- *Contact Info:*
    - *Can be found at Room 343*

Appendix G: Focus Group Notes with International Economics Relation undergraduate students

Introduction:

We are students from Worcester Polytechnic Institute (WPI) located in Worcester, Massachusetts, USA. Our group is studying in Moscow in order to complete an important academic requirement for graduation. Our project involves determining potential ways to increase research collaboration within the Financial University (FU) through the use of an online collaboration platform.

Mission Statement:

The goal of our project is to determine how to improve Financial University's knowledge and research management software so that the researchers at the Financial University's many campuses can collaborate on their research more effectively and efficiently.

Conductors of Focus Group:
Josh Hebert
Qiaoyu Liao
Justin Vitiello

Time, Date, and Location:
15:40-16:10, September 15, 2015, Bloomberg, Financial University

Participants:

Relationship with FU:
International Economic Relations (IER) Undergraduate
International Economic Relations (IER) Undergraduate
International Economic Relations (IER) Undergraduate

Focus Group Questions

General Research

1. What sort of research do you do? How often do you write research papers? How often do you publish these papers?
    - *Most research pertains to academic requirements*
    - *Published a couple papers within the University; however, this is a low level/college level of publication*
    - *There isn't a lot of collaboration*

2. How do you find your research partners?
    - *Through Professors*
    - *Through own personal networks or friends and associates*

3. What current tools do you use for research collaboration? (Google Docs, Email, etc). What do you like about these tools? What do you dislike?
    - *A majority of research is done individually*
    - *Face-to-face meetings/communication*
    - *Dropbox*
    - *Email*

4. What are the factors that block you from creating and publishing papers? Are there other, larger obstacles for collaboration?
    - *Difficult to find useful material*
        - *Hard to use search engines to find specific information*
        - *Library at FU is complicated to use*
        - *A lot of potential resources cost money*

Gamification

5. What are the incentives for you to conduct research? If a collaboration platform had rewards based on use (grants for researchers, prizes for students, etc), would more people use it?
    - *Incentives:*
        - *Career and job opportunities*

Mobile Applications

6. We want to design a mobile application to connect researchers with each other. What features would be useful in this? What about a function that helps you find researchers with similar interests? (the network will be internal for now but expandable)

- *Keep files private to avoid plagiarism*
- *Implement notification system with file sharing*

Reproducible Research

7. Are you familiar with the principles of reproducible research?(If no, explain) Would you be willing to incorporate these principles into your research?
    - *No*
    - *The topic should be presented in a user-friendly way that is:*
        - *structured well*
        - *easy to understand*

End

8. Is there anything else anyone wants to add that we didn't touch upon?
    - *Potential solutions to get people to collaborate*
        - *Insure competitions are fair, otherwise motivation will diminish*
    - *Scholarship*
        - *The current system is not clear enough*
        - *The requirements for scholarships are too high*
        - *Not enough recognition*
    - *Referencing Research:*
        - *There is no Russian standard to do it*

Appendix H: Focus Group Notes with International Economics Relation undergraduate students

Introduction:

We are students from Worcester Polytechnic Institute (WPI) located in Worcester, Massachusetts, USA. Our group is studying in Moscow in order to complete an important academic requirement for graduation. Our project involves determining potential ways to increase research collaboration within the Financial University (FU) through the use of an online collaboration platform.

Mission Statement:

The goal of our project is to determine how to improve Financial University's knowledge and research management software so that the researchers at the Financial University's many campuses can collaborate on their research more effectively and efficiently.

Conductors of Focus Group:
Dylan Baranik
Eli Gonzalez
Han Junxiu

Time, Date, and Location:
13:20-14:00, September 16, 2015, Bloomberg Lab, Financial University

Participants: (Skipped)

Name:	***Relationship with FU:***
Six participants	*All IIF Undergraduates

Focus Group Questions

General Research

1. What sort of research do you do? How often do you write research papers? How often do you publish these papers?
    - What sort of research do you do?
        - Trading research, company relations, investor strategies, accounting, analyzing key performances and futures of companies
    - How often do you publish papers?
        - Three of the members had published before
            - Approximately once a year
            - Some have this as a requirement for their degree

2. How do you find your research partners?
    - No standardized process to do this
    - Most people just end up working with familiar acquaintances
    - Sometimes teachers will delegate people to work together
    - Team member makes you more productive, more efficient
        - Perception is that working with more people would lead to a better quality of work

3. What current tools do you use for research collaboration? (Google Docs, Email, etc). What do you like about these tools? What do you dislike?
    - Not a lot of tools are used, instead there is a lot of face-to-face communication
        - Meeting in person is better than email; phone communication is not preferred
    - Email is common and the preferred method for communication and sharing ideas

4. What are the factors that block you from creating and publishing papers? Are there other, larger obstacles for collaboration?
    - Different standards and requirements for different journals are boring to learn and difficult to deal with
    - Waste time making work appropriate for different magazines with different standards
    - You have to pay to get your work published
    - Collaboration obstacles:
        - Haven’t found an ideal partner
            - Would prefer a partner, but it's difficult to find one
            - process of finding a partner is difficult and can be inconsistent

- Very difficult to find time to work with group members: can delegate to get around this problem, however this commonly leads to people becoming more separated from the rest of the group
- General strategy is talk about tasks to be accomplished face-to-face and then separate to do delegated tasks

Gamification

5. What are the incentives for you to conduct research? If a collaboration platform had rewards based on use (grants for researchers, prizes for students, etc), would more people use it?
    - Be able to market previous research to companies to provide career opportunities
    - Improve grades, get extra credit
    - Doing research projects helps you learn
    - Scholarships
        - Many aren't compensated, so there is no incentive for these students
        - There are only 9 scholarship students in International Finance Faculty at any given time

Mobile Applications

6. We want to design a mobile application to connect researchers with each other. What features would be useful in this? What about a function that helps you find researchers with similar interests? (the network will be internal for now but expandable)
    - Profile should have all of these things:
        - Photo, resume, spheres of interest, previous works, age, gender, competitions or conferences they are in, magazines published in, future career plans, language, location, notes about themselves, what personality traits are they looking for, skills (programming, etc.) they have and skills they are looking for
        - Everyone has a smartphone ~95% percent

Reproducible Research

7. Are you familiar with the principles of reproducible research?(If no, explain) Would you be willing to incorporate these principles into your research?
    - Somewhat familiar (only one student knew about it)
    - Definitely, useful for teachers as well
    - Teachers can control working process, have to show your results
    - Useful for future publications

End

8. Is there anything else anyone wants to add that we didn't touch upon? - Skipped

Appendix I: Focus Group Notes with International Finance Faculty undergraduate students

Introduction:

We are students from Worcester Polytechnic Institute (WPI) located in Worcester, Massachusetts, USA. Our group is studying in Moscow in order to complete an important academic requirement for graduation. Our project involves determining potential ways to increase research collaboration within the Financial University (FU) through the use of an online collaboration platform.

Mission Statement:

The goal of our project is to determine how to improve Financial University's knowledge and research management software so that the researchers at the Financial University's many campuses can collaborate on their research more effectively and efficiently.

Conductors of Focus Group:
Josh Hebert
Eli Gonzalez
Justin Vitiello

Time, Date, and Location:
16:00-17:15, September 25, 2015, Bloomberg Lab, Financial University

Participants: (Skipped)

Name:	***Relationship with FU:***
Six Participants	*All Young Scientist Representatives

Focus Group Questions

General Research

1. What sort of research do you do? How often do you write research papers? How often do you publish these papers?
    - *Opportunities for publishing several times per year*
    - *dependent on workload, however, it is required to publish a number per year*
        - *Sometimes 1 or 2 per year (below average), 5 or 6 average, up to 10*
        - *If they take part in a round table, they will publish proceedings*
    - *Collaborative research is often easier to publish, as co-authors may have connections*
        - *More authors, more connections*
        - *If you do not have particularly strong network, it is better to collaborate*

2. How do you find your research partners?
    - *Through own personal networks*

3. What current tools do you use for research collaboration? (Google Docs, Email, etc). What do you like about these tools? What do you dislike?
    - *Russia is very conservative in this respective*
        - *WhatsApp, Skype, text messaging very popular*
        - *Typical to meet once per month to divide work*
            - *However, there are teams that meet far more often*

4. What are the factors that block you from creating and publishing papers? Are there other, larger obstacles for collaboration?
    - *No real obstacles to publishing in Russia*
        - *The main issue with Russian journals is the quality. They tend to not have high quality articles*
    - *International articles*
        - *Charge money just to look at article. Does not guarantee publication*
        - *In Russia, publication is guaranteed if the fee is paid*

Gamification

5. What are the incentives for you to conduct research? If a collaboration platform had rewards based on use (grants for researchers, prizes for students, etc), would more people use it?

- *As of right now, for this group, if there is a requirement to publish a number of articles per year, they will do it*

    - *However, they will publish to lower quality journals*
    - *People will write papers for the reputation*
    - *These lead to improved career paths*
    - *If they have the time, they will publish*
- *The best incentives should be the desire to be researchers*
    - *It should not be a quantity requirement for a degree*
    - *People will either copy-paste other articles, write low-quality ones, etc.*
    - *Leads to bad researchers receiving degrees*

Mobile Applications

6. We want to design a mobile application to connect researchers with each other. What features would be useful in this? What about a function that helps you find researchers with similar interests? (the network will be internal for now but expandable)
    - *The idea is good. Should not be just a tool to view papers; plenty of tools that do that.*
        - *Should force public profiles and focus on providing contact information*
    - *Will likely only be popular in major cities with colleges/universities*
    - *Should establish a precedent that if you have an account, you are expected to reply*
    - *Replying should prevent ambiguity. Responses should be yes or no*

Reproducible Research

7. Are you familiar with the principles of reproducible research?(If no, explain) Would you be willing to incorporate these principles into your research?
    - *May discourage people from checking the credibility*
        - *Looking at these algorithms may lead to the false assumption that there is nothing more? to explore*
        - *May stunt creativity and innovation*
    - *Can cause issues when working with confidential data from a company.*
    - *FinLab Wiki was an attempt at this, but it shows too much information before a paper is ready to publish*
        - *Researchers prefer privacy while working on papers*

End

8. Is there anything else anyone wants to add that we didn't touch upon?
    - *(Skipped)*

Appendix J: Sponsor Interview Protocol

Introduction:

We are students from Worcester Polytechnic Institute (WPI) located in Worcester, Massachusetts, USA. Our group is studying in Moscow in order to complete an important degree requirement by completing this research project. Our project involves looking at potential ways to increase research collaboration among researchers within the Financial University, particularly among users of FinLab Wiki. Your responses will help us understand the actual usage of FinLab Wiki and investigate potential ways to improve it.

Mission Statement:

The goal of the project is to determine how to improve Financial University's knowledge and research management software so that the researchers at the Financial University's many campuses can collaborate on their research more effectively and efficiently.

Confidentiality:

Before we start this interview we want to make sure that you give us your permission to use any information you provide in our final report. We will keep your identity anonymous (if desired), and we can stop the interview at any time if you feel uncomfortable. You also do not have to answer any questions that would make you uncomfortable.

Conductors of Interview:

Time, Date, and Location:

Interviewee:

Name:	***Relationship with FU:***

Interview Questions

1. As the new Dean of IER Faculty (International Economic Relations), what do your duties include?

2. Can you tell us about the structure of researchers of the Financial University?

3. Can you tell us about the details of the research situation at this university?

4. What were your original intentions with the WPI project last year? Do you think the project was successful?

5. What do you see as a major roadblock to research productivity: within FU and worldwide?

6. For the gamification team, we are looking to provide tangible incentives, such as small research grants, a free trip to a conference in their field, or anything similar. Is this a possibility within the University?

Appendix K: Sponsor Interview Notes

Introduction:

We are students from Worcester Polytechnic Institute (WPI) located in Worcester, Massachusetts, USA. Our group is studying in Moscow in order to complete an important degree requirement by completing this research project. Our project involves looking at potential ways to increase research collaboration among researchers within the Financial University, particularly among users of FinLab Wiki. Your responses will help us understand the actual usage of FinLab Wiki and investigate potential ways to improve it.

Mission Statement:

The goal of the project is to determine how to improve Financial University's knowledge and research management software so that the researchers at the Financial University's many campuses can collaborate on their research more effectively and efficiently.

Confidentiality:

Before we start this interview we want to make sure that you give us your permission to use any information you provide in our final report. We will keep your identity anonymous (if desired), and we can stop the interview at any time if you feel uncomfortable. You also do not have to answer any questions that would make you uncomfortable.

Conductors of Interview:

Han Junxiu
Ying Lu

Time, Date, and Location:

14:00-15:15, September 21, 2015, Room 315, Financial University

Interviewee:

Name:	***Relationship with FU:***
Prof. Alexander Didenko	Dean of IER Faculty (International Economic Relations)

Interview Questions

1. As the new Dean of IER Faculty (International Economic Relations), what do your duties include?
    - *Everything:*
        - *More specifically, everything that will make students happy.*
        - *Prepare students to write their dissertations*
        - *Instruct students in activities, such as:*
            - *competitions*
            - *conferences*
            - *etc.*
    - *Key Performance Indicators (KPI):*
        - *Short Term:*
            - *Make students desirable to employers*
        - *Long Term:*
            - *Make students influential in the industry/world*

2. Can you tell us about the structure of researchers of the Financial University?
    - *There are two types of researcher at FU: major researchers and student researchers.*
        - *Major Researchers (such as PhDs)*
            - *They teach and do research at FU*
            - *They are paid for researching*
                - *Topics of their research are normally chosen from proposed government plan so that they are funded, as opposed to self-created topics.*
            - *Incentives:*
                - *Personal interest/curiosity*
                - *In order to be re-elected (re-hired) they must produce a certain number of publications*
        - *Student Researchers (Bachelors and Masters):*
            - *Research and take courses at FU*
                - *They must apply for certain research topics which are advertised by the different departments at FU*
            - *Incentives:*
                - *Degree requirements:*
                    - *Grades*
                    - *Dissertations*
                - *Published papers reflect well on student portfolios*

            - *Government is more likely to provide money to student who participates in research*
        - *Do Students work for major researchers?*
            - *Theoretically, yes; however, departments do not trust the students to arrange these relationships and lack time for arranging them themselves.*

3. Can you tell us about the details of the research situation at this university?
    - *Not happy about the current situation:*
        - *Sometimes departments won't change the topic of the research topic year-to-year.*
            - *This is easy for departments and poses less risks to serve as a student's dissertation topic.*
            - *Faculties tend to focus on teaching, not researching due to their tendency to do the minimum amount of work.*
        - *Students will give up when encountering problems in research, causing departments to lose students or have low-quality students.*
            - *Students lack the experience to gauge the difficulty of performing a task, and often take on more than they can handle.*
                - *The Pros and Cons section of FinLab Wiki was intended to help inform students of the risks of certain tasks.*
            - *Didenko blames the reporting culture of research publications in Russia for this problem.*

4. What were your original intentions with the WPI project last year? Do you think the project was successful?
    - *Original intentions:*
        - *To increase the cooperation among FU and match students and professors based on research interests.*
        - *Provide a platform where researchers can share results, and build on each other's findings, thus promoting a higher quality of research output.*
    - *Was it successful?*
        - *Yes*
            - *FinLab Wiki satisfied the original goals; however, it can be more successful.*
            - *FinLab Wiki's major obstacle was lack of usage and not enough people realize its value.*

5. What do you see as a major roadblock to research productivity: within FU and worldwide?
    - *Within FU:*
        - *Lack of motivation*
        - *Language barriers*
        - *Hard To Find trustworthy cooperators*
        - *Students don't have enough experience:*
            - *They don't put in enough effort to produce high quality research*
            - *They often give up*
            - *Don't know how much they can handle*
    - *Worldwide:*
        - *The Western world of research is ideal compared to the current situation in FU and Russia*

6. For the gamification team, we are looking to provide tangible incentives, such as small research grants, a free trip to a conference in their field, or anything similar. Is this a possibility within the University?
    - *Incentives for major researchers:*
        - *Hard to provide money*
            - *It isn't a good way to encourage researchers; it will spoil them.*
        - *Inviting a professor to a conference might be a bad idea.*
            - *They would have fun instead of working.*
    - *Incentives for students:*
        - *Recognition:*
            - *Certificates*
            - *Diplomas*
        - *Educational grants, such as a reduction in tuition*

Appendix L: IT Director Interview Protocol

Introduction:

We are students from Worcester Polytechnic Institute (WPI) located in Worcester, Massachusetts, USA. Our group is studying in Moscow in order to complete an important degree requirement by completing this research project. Our project involves looking at potential ways to increase research collaboration among researchers within the Financial University, particularly among users of FinLab Wiki. Your responses will help us understand the actual usage of FinLab Wiki and investigate potential ways to improve it.

Mission Statement:

The goal of the project is to determine how to improve Financial University's knowledge and research management software so that the researchers at the Financial University's many campuses can collaborate on their research more effectively and efficiently.

Confidentiality:

Before we start this interview we want to make sure that you give us your permission to use any information you provide in our final report. We will keep your identity anonymous (if desired), and we can stop the interview at any time if you feel uncomfortable. You also do not have to answer any questions that would make you uncomfortable.

Conductors of Interview:

Time, Date, and Location:

Interviewee:

Name:	***Relationship with FU:***

Interview Questions

1. As the head of Information Technology at Financial University, what do your duties include?

2. What software tools are provided by the University?

3. How is your user-base using the tools currently available to them?

4. What are your opinions on using FinLab Wiki as the premiere collaboration tool for Financial University?

5. Which tools do you think Financial University should use for online research collaboration?

6. Do you know what incentives/rewards could be offered as part of this collaboration tool?

7. Would it be possible to get your contact information as well as the contact information of other IT faculty members that could potentially answer our questions if we decide to follow-up?

Appendix M: IT Director Interview Notes

Introduction:

We are students from Worcester Polytechnic Institute (WPI) located in Worcester, Massachusetts, USA. Our group is studying in Moscow in order to complete an important degree requirement by completing this research project. Our project involves looking at potential ways to increase research collaboration among researchers within the Financial University, particularly among users of FinLab Wiki. Your responses will help us understand the actual usage of FinLab Wiki and investigate potential ways to improve it.

Mission Statement:

The goal of the project is to determine how to improve Financial University's knowledge and research management software so that the researchers at the Financial University's many campuses can collaborate on their research more effectively and efficiently.

Confidentiality:

Before we start this interview we want to make sure that you give us your permission to use any information you provide in our final report. We will keep your identity anonymous (if desired), and we can stop the interview at any time if you feel uncomfortable. You also do not have to answer any questions that would make you uncomfortable.

Conductors of Interview:

Dylan Baranik
Justin Vitiello

Time, Date, and Location:

15:00-15:30, September 24, 2015, Bloomberg Lab, Financial University

Interviewee:

Name:	***Relationship with FU:***
Vladimir Soloviev	Director of IT

Interview Questions

1. As the head of Information Technology at Financial University, what do your duties include?
    - *Strategic development of information technology:*
        - *Change infrastructure to meet expectations for current and future use*
        - *Develop network/services for user convenience*
        - *Allow home access to FU software*
        - *Constant learning environment for users*
        - *Currently, the system in place is cheaper*
    - *Bringing new technology to education and scientific process at FU:*
        - *Large focus on financial simulator creation*
    - *Transforming research processes:*
        - *Make things more automated*
    - *Inform society:*
        - *Development of new portals to inform society about research and education within FU*

2. What software tools are provided by the University?
    - *Office 365*
    - *Android/iPhone integration*
        - *Access to remote apps to use financial software*

3. How is your user-base using the tools currently available to them?
    - *(Skipped)*

4. What are your opinions on using FinLab Wiki as the premiere collaboration tool for Financial University?
    - *It was a large stepping stone but has limitations.*
    - *Limitations:*
        - *Slow*
        - *Not fully customizable*
    - *FU needs to move forward to another tool.*

5. Which tools do you think Financial University should use for online research collaboration?
    - *SharePoint*
        - *Would be better than FinLab Wiki*
        - *Already have Office 365 at FU*

        - *Easier integration with existing systems; however, there is a lack of SharePoint Developers*
    - *Alfresco*
        - *Content management system that uses Java programming*

6. Do you know what incentives/rewards could be offered as part of this collaboration tool?
    - *Grade students within the system:*
        - *Provide the top 20% with rewards*
            - *Rewards should be dependent on faculty*
    - *For Professors:*
        - *Ratings on system might affect earnings*

7. Would it be possible to get your contact information as well as the contact information of other IT faculty members that could potentially answer our questions if we decide to follow-up?
    - *Email given:*
        - *vsoloviev@fa.ru*

Appendix N: Survey Protocol

Financial University under the Government of the Russian Federation

Questionnaire

Dear respondent,

We ask you to participate in a sociological survey about the integration of the students of the Financial University under the government of the Russian Federation in the international scientific life. We guarantee you the full confidentiality of your answers, which will subsequently be used only in conjunction with the answers of all other respondents.

How to fill out the questionnaire: carefully read the questions and circle the answer that best matches your point of view. If none of the options fit your point of view, please give your opinion on the following line.

Your answers will be used only for research purposes. If you are interested we will provide you with the results of the survey.

We appreciate your participation!

Moscow, 2015.

Demographic Information

1. **YOUR SEX**
   - **a.** Male
   - **b.** Female

2. **WHAT IS YOUR ROLE AT FINANCIAL UNIVERSITY?**

Student – bachelor	1st year	2nd year	3rd year	4th year
Student – master	1st year		2nd year	
Postgraduate student	1st year	2nd year		3rd year
Professor				
Scientist				

General questions

3. WHY IS IT IMPORTANT FOR YOU TO ENGAGE IN SCIENTIFIC ACTIVITY? (CIRCLE ALL THAT APPLY)

A. It is necessary to have an understanding of science in this day and age
B. These skills are necessary in the work environment
C. To meet the requirements and demands of university, department, professors, etc.
D. Personal desire
E. I do not know
F. Other (please, answer on the line provided)_____
_____

4. HOW ACTIVELY DO YOU PARTICIPATE IN ACADEMIC RESEARCH (From 1 till 10, where 1 – min, 10 – max)

1	2	3	4	5	6	7	8	9	10

5. HOW OFTEN DO YOU USE SCIENTIFIC LITERATURE FROM THE INTERNET?

A. Everyday
B. Every 3 days
C. Every Week
D. Other (Please Specify):_____

7. IN WHICH FORMS ARE YOU READY TO PARTICIPATE IN SCIENTIFIC ACTIVITY? (CIRCLE ALL THAT APPLY)

A. Publications in written texts/journals
B. Publication in web-journals
C. Research activity
D. Presentations at conferences, discussions
E. Activity to acquire grants
F. Other (please, answer on the line provided)_____
G. Nowhere

8. LIST THE REASONS FOR YOUR INTEREST IN SCIENTIFIC ACTIVITY. (CIRCLE ALL THAT APPLY)

A. Self help
B. Interest in learning/science
C. A desire to improve the world
D. An opportunity for work
E. Other (please, answer on the line provided)_____
F. I am still not ready to engage in scientific activity

9. HOW OFTEN DO YOU PUBLISH SCIENTIFIC WORK?

A. Never
B. Once a year
C. Once a month
D. Multiple times per month

E. Other:_____

10. WOULD YOU LIKE TO PUBLISH YOUR SCIENTIFIC WORK MORE OFTEN?

A. YES
B. NO, I am not interested in publishing my work
C. NO, currently I have enough publications

11. ARE YOU PLANNING TO CONTINUE YOUR SCIENTIFIC ACTIVITIES?

A. YES
B. NO
C. I am undecided

12. Do you prefer to work with partners or alone? Why?

A. Partners because
_____
_____
B. Alone because
_____
_____
C. No Preference

13. How do you find partners to work with?

A. **Assigned by professor**
B. Work with friends
C. Using social media
D. Recommended by friend or professor
E. Other_____

14. IN WHICH WEB-PLATFORM(S) DO YOU PUBLISH YOUR SCIENTIFIC WORK? (CIRCLE ALL THAT APPLY)

A. E-library
B. Lambert publisher
C. Scopus
D. Web of Science
E. Social Science Research Network (SSRN)
F. Gutenberg
G. Other (please, answer on the line provided):
_____
H. I do not publish my scientific work in any platform

I. I did not know about the existence of these platforms

15. IF YOU DO NOT PUBLISH YOUR WORK ON WEB-PLATFORMS, IS THERE A PARTICULAR REASON WHY? (CIRCLE ALL THAT APPLY)

A. I publish my work on web-platforms
B. The need to translate academic work into a foreign language (for foreign web-platforms)
C. Concerns about copyright infringement
D. It takes too much time to publish
E. The uncertainty in the quality of the scientific work performed
F. It costs money to publish
G. I do not know how to publish
H. I do not have scientific work to publish
I. Other (please, answer on the line provided)_____

Financial University under the government of the Russian Federation with Worcester Polytechnic Institute are creating a platform for the dissemination of scientific knowledge. A place where students and researchers can share their scientific work (articles, monographs, books), find colleagues with similar interests, be able to communicate with one another, and create joint projects. This platform should give an opportunity for students and researchers to collaborate with both domestic and foreign colleagues, to follow the news in their disciplines, to communicate directly with leading scientists, and to find resident and scientific leaders for collaboration.

16. DO YOU USE ANY OF THESE PLATFORMS? (CIRCLE ALL THAT APPLY)

A. Academia.edu
B. Finlabwiki.org
C. Mendeley.com
D. Researchgate.net
E. Linkedin.com
F. Facebook
G. VKontakte
H. Skype
I. SSRN
J. Gutenberg
K. Microsoft SharePoint
L. Google Docs
M. Open Science Framework
N. I know none of them

17. IN YOUR OPINION, WHAT CHARACTERISTICS AND POSSIBILITIES OF THE WEB-SITE REQUIRED FOR THIS PLATFORM? (FROM 1 TILL 5, WHERE 1- MIN, 5-MAX)

(PLEASE GIVE AN ANSWER TO EACH LINE)

Opportunity to communicate (chats)	5	4	3	2	1
Opportunity to freely publish scientific work	5	4	3	2	1
Opportunity to edit your work	5	4	3	2	1
Opportunity to review the works of other participants	5	4	3	2	1
Opportunity to create tags for publications	5	4	3	2	1
Opportunity to "subscribe" to the publications and disciplines you are interested	5	4	3	2	1
Opportunity to look for a co-author for joint research activity	5	4	3	2	1
Opportunity to find co-authors for joint projects	5	4	3	2	1
Opportunity to find a list of conferences and scientific events	5	4	3	2	1
Opportunity to share files with co-workers	5	4	3	2	1
Opportunity to have a personal profile	5	4	3	2	1
A timeline or progress bar of your work	5	4	3	2	1
Other (please, answer on the line provided) _____ _____ _____	5	4	3	2	1

Thank you for participating in our survey!

Appendix O: Professor Charles Wallace Interview Protocol

Interviewee(s) Name:

Interviewer(s) Name(s):

Date:

- *Introduce ourselves*
- *Say what is our project about*
- *Confidentiality:*
    - *Before we start this interview we will make sure that we have the permission to use any information you provided in our final proposal. We will keep the identity anonymous (if desired) and we can stop at any time during the interview if you feel uncomfortable during the interview or do not have an answer to the question. Also, if we already contacted you about recording this interview, we will confirm that again on the interview day.*
- *Mission Statement:*
    - *The goal of the project is to determine how to improve Financial University's knowledge and research management software, FinLab Wiki, so that the researchers at the Financial University's many campuses can collaborate on their research more effectively and efficiently.*

1. *What kind of collaboration work do you usually have among colleagues? What kind of people do you usually work with (i.e. researchers, programmers, etc.)?*
2. *How do you usually collaborate with these colleagues on your projects?*
    a. *For Researchers, how do you usually collaborate with them on your research projects/papers/problems?*
3. *Are you currently using any kind of tools to collaborate with colleagues? If so, how are you using it?*
4. *What do you think is good about the current tools you are using?*
5. *What do you think could be improved about the current tools you are using?*
6. *What kind of features do you want to add to the tools you are using?*
7. *What kind of features do you want to avoid in a tools used for collaboration?*

Appendix P: Professor Charles Wallace Interview Notes

Interviewee(s) Name: Prof. Charles Wallace

Interviewer(s) Name(s): Qiaoyu Liao, Nicholas Wong

Date: April 10, 2015

- *Introduce ourselves*
- *Say what is our project about*
- *Confidentiality:*
    - *Before we start this interview we will make sure that we have obtained your permission to use any information you provide in our final proposal. We will keep your identity anonymous (if desired) and we can stop at any time during the interview if you feel uncomfortable during the interview. You do not have to answer any questions that would make you uncomfortable. Also, if we have already contacted you about recording this interview, we will confirm this again on the interview day.*

We can use the information we gathered in this interview in our final proposal and Prof. Wallace is willing to be identified.

- *Mission Statement:*
    - *The goal of the project is to determine how to improve Financial University's knowledge and research management software, FinLab Wiki, so that the researchers at the Financial University's many campuses can collaborate on their research more effectively and efficiently.*

1. *What kind of collaboration work do you usually have among colleagues? What kind of people do you usually work with (i.e. researchers, programmers, etc.)?*
    a. *Projects that Prof. Wallace usually works in*
        i. *Projects in Michigan Tech*
        ii. *Projects with people from other countries*
        iii. *Administrative projects*
    b. *People Prof. Wallace usually works with*
        i. *Students*
        ii. *Graduate students*
        iii. *Faculty members*
        iv. *Administrators*

2. *How do you usually collaborate with these colleagues on your projects?*
    a. *For Researchers, how do you usually collaborate with them on your research projects/papers/problems?*
        i. *Using Google Docs:*
            1. *For the start of an idea, Google drive is usually used to share documents with ideas recorded on it*
            2. *Later on, those documents will be organized into folders*
        ii. *Directly accepting a project from an administrator:*
            1. *Immediately start working on the project using Canvas and Google Docs*
        iii. *Using Canvas:*
            1. *Using repository features in Canvas, create a project that multiple people can work on*
            2. *Administrators can create assessments on the course using the repository*
    b. *For Programmers, how do you usually collaborate with them on your programming projects?*
        i. *Not many programmers are involved in his projects*

3. *Are you currently using any kind of tools to collaborate with colleagues? If so, how are you using it?*
    a. *Google Docs*
    b. *Canvas*
    c. *Github (when coding is involved)*

4. *What do you think is good about the current tools you are using?*
    a. *Google Docs:*
        i. *Easy enough to share documents*
        ii. *Able to store local copies*

b. *Github:*
    i. *Local copy storage*
    ii. *Overall great functionality, especially version management*
c. *Canvas:*
    i. *Nothing really good about it; only useful feature is the repository feature*

5. *What do you think could be improved about the current tools you are using?*
    a. *Google Drive:*
        i. *Implement functionality that can tie the documents together*
    b. *Canvas:*
        i. *Improve the service response time*
        ii. *User Interface is too complicated*
        iii. *Some features are not useful*
        iv. *Does not support local storage; when the website crashes down, no service will be available*

6. *What kind of features do you want to add to the tools you are using?*
    a. *A nice and easy way to organize information*
        i. *Keyword search function*
        ii. *Gather function that can automatically gather documents with same keyword together*
        iii. *Comments outside of the documents, similar to a tag for the documents*

7. *What kind of features do you want to avoid in a tools used for collaboration?*
    a. *Anything unnecessary, such as Canvas' hw, tests, and teaching-related features.*