The Blackboard Improvement Initiative To improve the Website's UI For Easier Navigation Shohag Islam, Gurjeet Mall, Usman Shafi, Dave Camilien. City College of New York

Summary

Cluttered and confusing website design can make it difficult for both students and faculty to efficiently get work done on a school website. The present state of CUNY's Blackboard doesn't properly allow easy navigation for it's users. In our proposal, we introduce a new UI design for Blackboard's user interface based off of a previously established educational website, Google Classroom. Our goal is to improve the efficiency of the website and provide a better experience for CUNY's faculty and students. We provide a timeline and flowchart of our progress as well as an estimated budget for the following year of development. The initial costs for the first year of development will range from \$273,000 to \$515,277.

Authors Note:

This paper was prepared for English 21007 taught by Professor Susan Delamare.

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Introduction

Blackboard is an online program that allows students and staff to communicate with each other in the online world for educational purposes. It can be used by students and staff for online schooling and can be used to do online activities, classwork, and paper works that would traditionally be done face to face teaching. According to Bradford, Porciello, Balkon, & Backus, (2007) Blackboard was founded in 1997 by two educating advisors, Matthew Pittinsky and Michael Chasen (Bradford et. al., 2007). More than 70 percent of U.S. colleges and universities use blackboard for education purposes (Bradford et al., 2007). Blackboard was named to the Forbes.com Most Connected Campuses' List (Bradford et al., 2007). The importance of this research area is that blackboard went public in June 2004 and since then it has merged with many rival online learning companies (Bradford et al., 2007). As a result, Blackboard's interface system has been jammed up with many outside resources and that has made it very hard to navigate it through. In addition, the software system looks like it hasn't been updated in years; it looks like an interface system you would see in the early or mid-2000s.

One of the school systems that utilize Blackboard heavily each semester are the City Universities of New York (CUNY). CUNY consists of multiple schools that span across the five boroughs of New York City including the likes of City College and Hunter College. Although the use of Blackboard varies on the type of teacher and course, those that have experienced Blackboard have many critiques on it's interface. According to Smale et. al.'s (2018) study on the matter, both professors and students commented that the website felt cluttered which made it difficult to do various tasks (Smale et. al. 2018). For the faculty, these tasks were setting up and administering assignments while for the students it was completing them (Smale et. al. 2018). This cluttered feeling can be seen on the main page of Blackboard (*fig. 1*) which contains too much information that may be distracting to people looking to find what they're looking for. We hope to reduce the clutter and make the website easier to navigate for both students and staff by implementing changes to the website's layout.

It is very important that the online learning education industry like Blackboard continues to make their software systems faster, reliable, easy to use, and updated as years pass by. In order for them to continue growing, the website needs to be modernized to make the overall user experience better for both faculty and students. In the Blackboard Improvement Initiative (BII), we hope to improve a service that is integral to countless individuals in the CUNY system.

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Figure 1: Blackboard's home screen as seen from the perspective of a student. Adapted from CUNY Blackboard, 2020.

Objectives

BII is aimed at improving and updating the current CUNY Blackboard website used by The City College of NY and other CUNY schools. We will begin by establishing a team to do a literature review of similar endeavors and projects and then work on creating our plan to improve the website. Then, if successful, we will begin work on implementing a brand UI(user interface) to modernize Blackboard's homescreen to make it easier for users to navigate. We will visually represent our process with a flow chart akin to what programmers use to represent algorithms. Finally, we'll give an estimated budget for our project.

The task schedule will include a detailed account of our progress over the coming months. If all goes as planned, we expect to finish the project in the span of a year.

Preliminary Literature Review

Online education was first introduced in 1998 where full programs such as Blackboard Course Management were available online (Best Schools, 2019). Over the coming years, modern websites have come very far in providing a good user experience through various improvements in website layout, UI and response time.

An educational website needs to have 3 properties that make it more user friendly and successful, according to Tubin and Klien (2007) those three properties are but not limited to an attractive web content, a fast and informed web response to actions (Tubin et. al., 2007). Along with a clear web structure keeping everything organized without making the user confused or have to find programs within other programs (Tubin et. al., 2007). A successful website that can incorporate all these aspects in a non confusing way is what many students and professors desperately need in order to supplement their online learning. The researchers provide information using a table when the site's web contents are visited and included in the table are the visits for teacher emails and principal emails (Tubin et. al., 2007). Compared to other categories on this same website they tested communication from this education website's teacher

and student was very low only scoring a 1.10 out of 3 (Tubin et. al., 2007). The website's class form was also neglected by students and that can hurt many student and institution relations (Tubin et. al., 2007). The class form in the table includes school events and drug prevention topics of discussion. These two topics are very crucial for students to understand what's going on at their school in order to keep current.

The researchers also analyzed the website's structure and noticed there were three categories the website was organized into, a symbolic category, a technical category, and an indifferent category. Each category had its own focus; the symbolic would have school events within it, the technical pertaining to curriculum for students and indifferent to forums students could use (Tubin et. al., 2007). Tubin et. al. (2007) saw that each category was missing at least 30% of the subcategories of each main category (Tubin et. al., 2007). The last aspect the researchers looked at was the website's responsiveness and the way many schools were using the website. The researchers find that in 2005 many schools were not using websites to their full capability and repeatedly were leaving traces of neglect (Tubin et. al., 2007).

In the case of Blackboard, we argue it's missing the third component of a good website: a clear structure. Through BII, we will work to improve this structure.

Technical Description of Innovation

Our BII proposal is largely based on another similar website also dedicated to education, Google Classroom which boasts minimalist UI in both the home screen and following pages dedicated to each course. We chose to base our new UI on Google's educational website because it matched our design philosophy of being simplistic and easy to navigate. Further details on Google Classroom will be provided in Appendix B.

We propose to simplify the UI of the home screen along with the rest of the website to make it easier to navigate. Instead of having text cluttering the front page, the home screen should primarily focus on the classes along with class announcements. In order to prevent excess information, class announcements will be combined with courses and be displayed in a tile-like fashion akin to google classroom (*Fig. 4*) On these tiles, students will be able to see the course name, syllabus link, announcement link and content link (*Fig 2*).



Figure 2: Proposed UI design for Blackboard. Created by team using Google Drawings, 2020.

Designing it this way will vastly decrease information clutter on the homescreen and allow students to focus on what's important: their courses. The home screen could also include a search bar and a new profile icon on the top right. The search bar will allow students to search up keywords that will then prompt the website to direct you to the area of that key word. This will let users go to the page which includes information they're searching for directly from the home page without having that information directly there. Though this isn't as direct as a link, this makes it possible to navigate the website precisely without having an extra link option on the page. This simplistic design philosophy will be carried on to the rest of the pages of Blackboard and also follow a simplistic design. Our team's efforts are outlined as such:



Figure 3: Flowchart of software development process. Created in Google Drawings, 2020

Budget

Our initial budget assessments cover the year of development needed to complete this project. This estimate can be a subject to change due to changes in position or budget cost reductions. We plan to have a main software development along with a software engineer and intern recruited for the main programming. We also plan to have a graduate computer science

Line Item	Cost	<u>Time</u>	Per year Totals
1. Personnel:			
Software Developer	79,000 - 130,000	Annual	79,000 - 130,000
Software Engineer	63,000 - 134,000	Annual	63,000 - 134,000
Software Engineer Intern	65,000 - 94,000	Annual	65,000 - 94,000
Graduate Student (computer science)	25,000 - 47,000	Annual	25,000 - 47,000
Personnel Totals	232,000 - 405,000	Annual	232,000 - 405,000

student working with us to aid in the completion of the project. Expected equipment costs and place of work are also shown below.

2. Equipment			
Coders	41,000 - 96,000	Annual	41,000 - 96,000
GitHub	0 - 21.00	Monthly	0 - 21.00
Atom	0	N/A	0
Standard Query Language	0 - 14,256 or 0 - 2,005	One time fee/monthly	0 - 14,256 or 0 - 2,005
Equipment Totals	41,000 - 110,277	N/A	41,000 - 110,277

3. Work Space			
From Home/Office	N/A	N/A	N/A

4. Annual Totals		
		273,000 - 515,277

Table 1: Budget

Reference

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Task Name	May 2020	June 2020	Aug. 2020	Sept. 2020	Oct. 2020	Nov. 2020	Dec. 2020	Jan. 2021	Feb. 2021	Mar. 2021	April 2021
Literature Review											
Equipment Purchasing											
Frontend Development											
Backend Development											
Bug and Error Fixes											
Final Test and Experiments											

Appendix A - Task Schedule

Appendix B - Google Classroom

Google classroom is a web based application meant for educational uses that was released in August 2014 (Siu, 2019). Over the years, the website became well known and was used by over 10 million students and teachers across the world (Siu, 2019). In the figure below, we can see the simplistic home screen seen in the view of a student using the application.



Figure 4 : Student view of Google Classroom home screen. Adapted from Google Images, 2020.



Figure 5: Typical classroom view in the students perspective. Adapted from Google Images, 2020.