

Lab 1 – Blackboard Extractor Product Description

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1 Introduction

Blackboard is an online course management system used by educational institutions around the globe. It is a tool that allows professors to share course resources for students to access online. Professors are also able to organize course materials, such as homework assignments, lectures, and exams. Blackboard is used by more than 17,000 educational institutions, ranging from elementary schools to universities (Corcoran).

Table 1 shows the breakdown of Blackboard's customer base.

Blackboard Customer Footprint

Segment	Number of Customers
Higher Ed	+3,000
K-12	+12,300
Professional Learning	+1,800

Table 1. Blackboard Customer Base (Corcoran)

1.1 Blackboard in Learning Institutions

At Old Dominion University, according to the ODU Faculty Handbook, lecturers must be reviewed every three years and professors every five years (ODU Faculty Handbook.). For the purposes of the review, the mentioned faculty members need to present all material utilized in all courses given since the previous review. Material provided via Blackboard must also be included in the review. Blackboard, at Old Dominion University, only stores content for up to two years. Once a course reaches a two year life span without renewal, the course content must be exported as a Blackboard Course Archive.

1.2 ODU Faculty Review Process

Professors and lecturers have difficulties acquiring content after it has been exported as a Blackboard Course Archive. Currently, extracting a Blackboard archive requires the educator find an unused Blackboard course into which to load the archive. If there is no unused Blackboard course it is not possible to extract the content. Assuming that there is an unused course to load the archive into, the process there after for extracting content is strictly manual. Each course must be manually downloaded page by page, and the folder structure manually formatted.

1.3 Solutions Overview

Blackboard Extractor is the intended solution for the current problem that educators face when it comes to extracting content from Blackboard archives. Blackboard Extractor allows users to load a Blackboard Course Archive and explore the contents of the archive without needing an unused blackboard course. Developed by Old Dominion University's CS411 Team Crystal, under the guidance of Professor Steven Zeil, Blackboard Extractor will automate the currently manual extraction process. Blackboard Extractor will not automatically retrieve Blackboard archives, the archive must be provided. Blackboard Extractor will not extract PLE web content.

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2 Blackboard Extractor Product Description

Blackboard Extractor will allow users to load Blackboard archives via a graphical user interface and explore archive contents. This application will be able to handle downloadable files, assignments, journal entries and forum posts. Blackboard Extractor will create a directory containing all of the extracted and processed contents from the archive. The process for extracting Blackboard archives will be automated by the implementation of an algorithm that will process the data for the given archive automatically, and an algorithm that will link data attributes automatically and format data automatically. Figure 1 demonstrates the current manual process for extracting content from a Blackboard archive. Currently the user needs to manually find an empty course into which to manually load the archive. After the archive has been loaded the user then has to manually visit each page and manually extract all content.

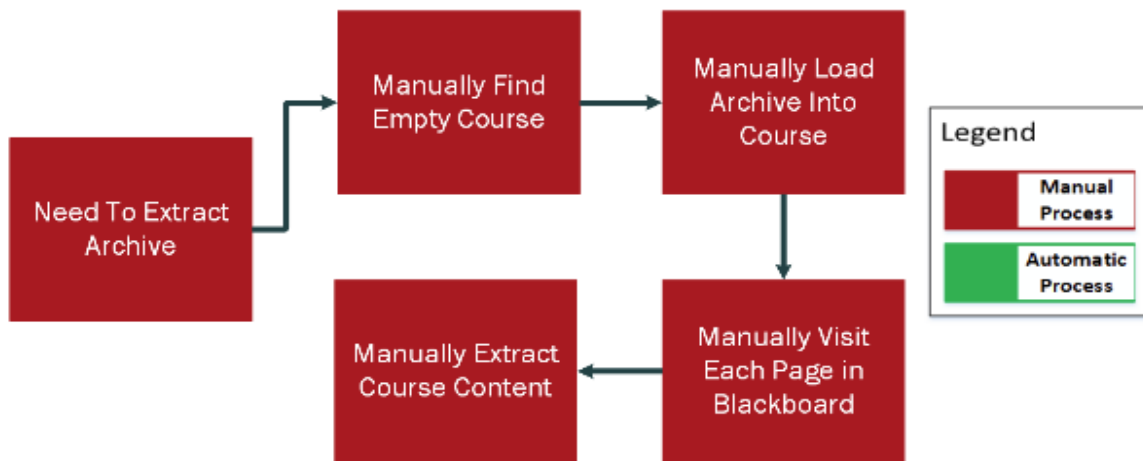


Figure 1. Current Manual Process Flow

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Figure 2 shows the revised automated process that is to be implemented by Blackboard Extractor. In the new process the user has an archive that needs content extracted just as in the manual process. This time the user loads the archive into the application and the rest of the process is automated.

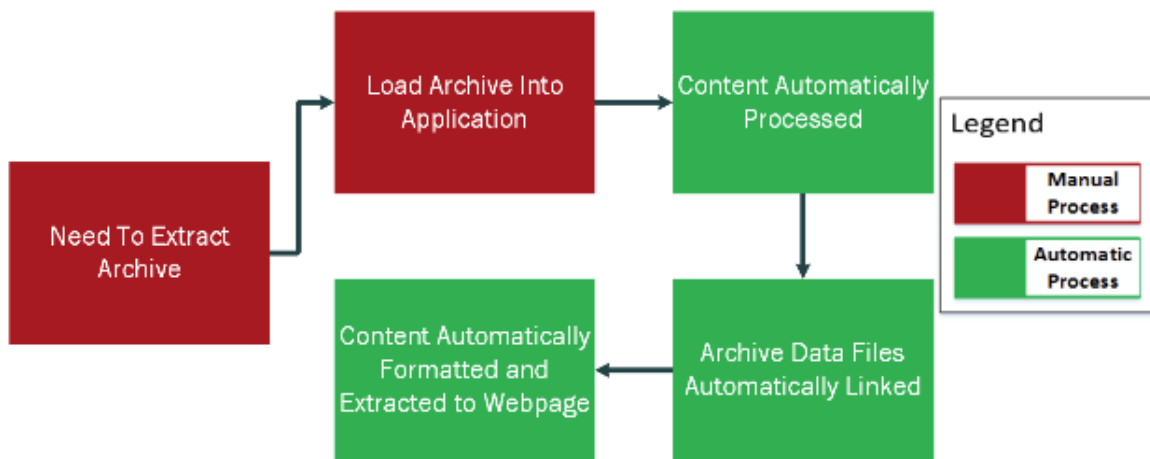


Figure 2. Revised Automated Process Flow

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The user will be able to interface with the application either via command line or via GUI. There will be input and output options, the user will be able to drag and drop the archive into the interface and choose where they want to save the output. They will also be able to automatically display the webpage. Figure 3 shows an example of the GUI.

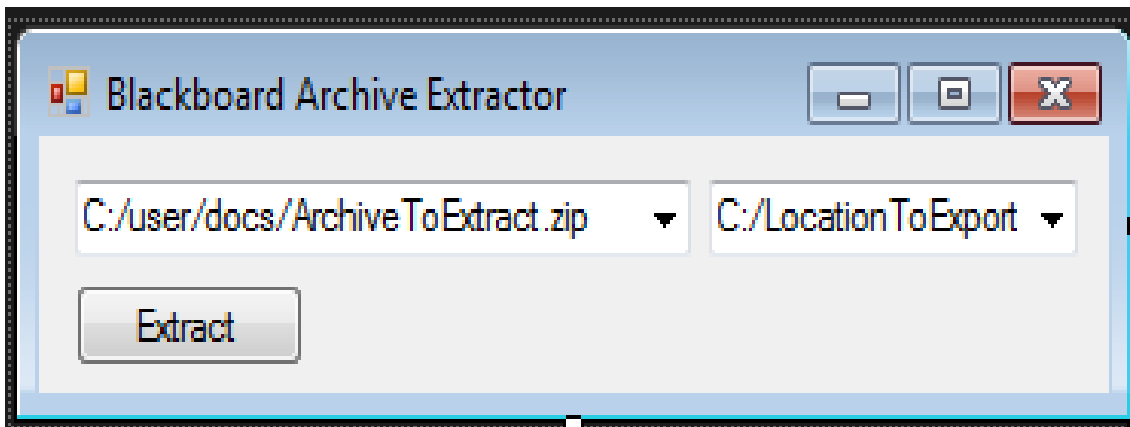


Figure 3. Graphical User Interface

2.2 Major Components

The main functional components for the Blackboard Extractor are broken down into four major parts as shown in Figure 4. First there is the Blackboard Extractor Interface which will be implemented via two different methods. The user can choose to execute the application from command line or interact with the application via GUI. In both interfaces, a Blackboard archive must be provided to Blackboard Extractor. Once an archive has been provided to the application, the archive goes through the parsing process. At the parsing phase an algorithm will go through all the XML files in the archive and format the data in preparation for the linking and reformatting phases. In the linking and reformatting phase the data is put into a folder structure

that is indexed by HTML files. These HTML files will be available to the user and will show all the contents that were inside the archived file. The user will also be able to choose where the output is saved.

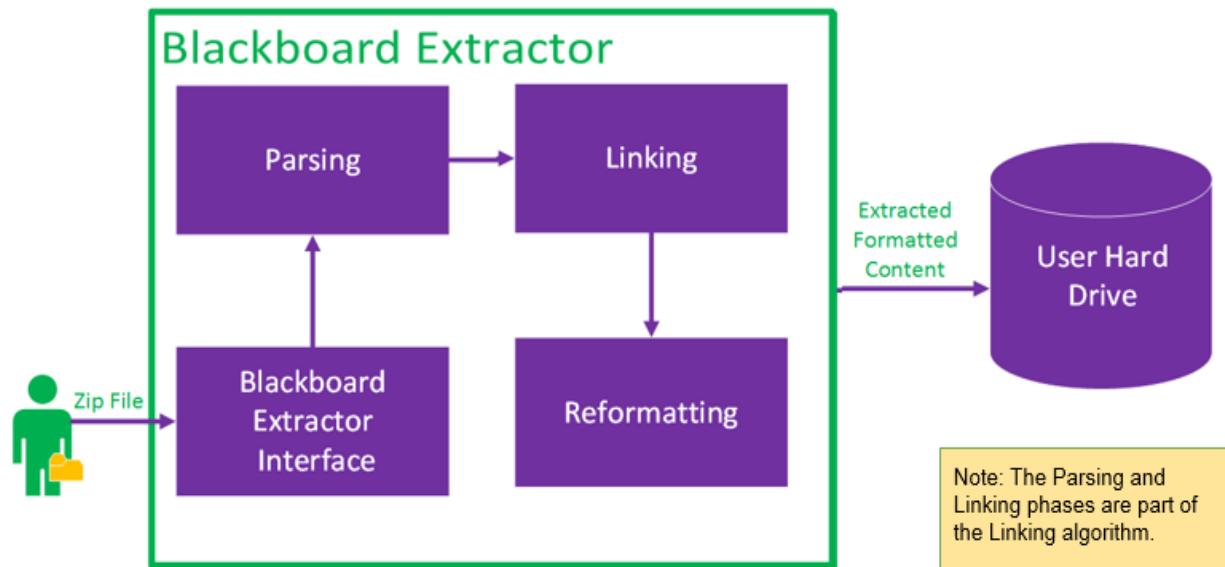


Figure 4. Major Functional Components

2.3 Customer Base

Blackboard Extractor was designed for faculty members responsible for course delivery. Professors and lecturers would mostly benefit from this tool since they are responsible for course delivery. Blackboard extractor was designed for lectures and professors at Old Dominion University.

3 Blackboard Extractor Prototype

The Blackboard Extractor prototype will have almost all the capabilities and features of the real world product. Table 2 shows the comparison between the real world product and the prototype. The real world product will have capability to extract all content from a Blackboard archive, while the prototype will only support downloadable files, assignments, journal entries and forum posts. The prototype will be designed to work on the current version of Blackboard.

Features	Real World Product	Prototype
Can extract all content from an archive	Fully Functional	Partially Functional
Saves archive on hard disk	Fully Functional	Fully Functional
Checks every URL that points to an outside website	Fully Functional	Partially Functional
Execute application from command line interface	Fully Functional	Fully Functional
Execute program from a GUI	Fully Functional	Fully Functional
Doesn't break on future Blackboard versions	Fully Functional	Partially Functional
Executes from a web application	Fully Functional	Eliminated
Creates web content from archive	Fully Functional	Fully Functional
Responsive website design	Fully Functional	Partially Functional

Table 2. Real World vs. Prototype

3.2 Prototype Challenges

One of the challenges for constructing Blackboard Extractor is that with future version of Blackboard the Archive structure may change. These types of changes include adding or removing content types or changing the organization of the archive manifest file.

4 Glossary

Blackboard: An online course management system used by educational institutions around the globe.

Blackboard Archive: A compressed file of Blackboard course content

GUI: Graphical User Interface

ODU: Old Dominion University

5 References

- Corcoran, B. (2014, July 23). Blackboard's Jay Bhatt Strikes Up the Brass Band. Retrieved October 19, 2016, from <https://www.edsurge.com/news/2014-07-23-blackboard-s-jay-bhatt-strikes-up-the-brass-band?elq=29068c31188e4150bde7dd6db8a3dab7&elqCampaignId=7599>
- ODU Faculty Handbook. (2005, December 21). Retrieved October 26, 2016, from <http://ww2.odu.edu/ao/facultyhandbook/index.php?page=ch07s01.html>