

Blackboard®



Making course content accessible

Problems



Institution



Instructor



Student

Institutional Problems



No insight into
how institution is
doing



Difficult to track
and identify what
to focus on



Manual
remediation
workflow



Lawsuits because
of legal
requirements

Instructor Problems



Lack of
awareness of
what to do



Lack of understanding
on how it can affect
students



Lack of guidance on
how to improve
accessibility

Student Problems



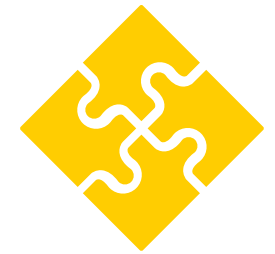
Explicit
alternative
format requests



Long delays on
receiving
requested format



Excludes many
students



Closely related to
quality and
usability



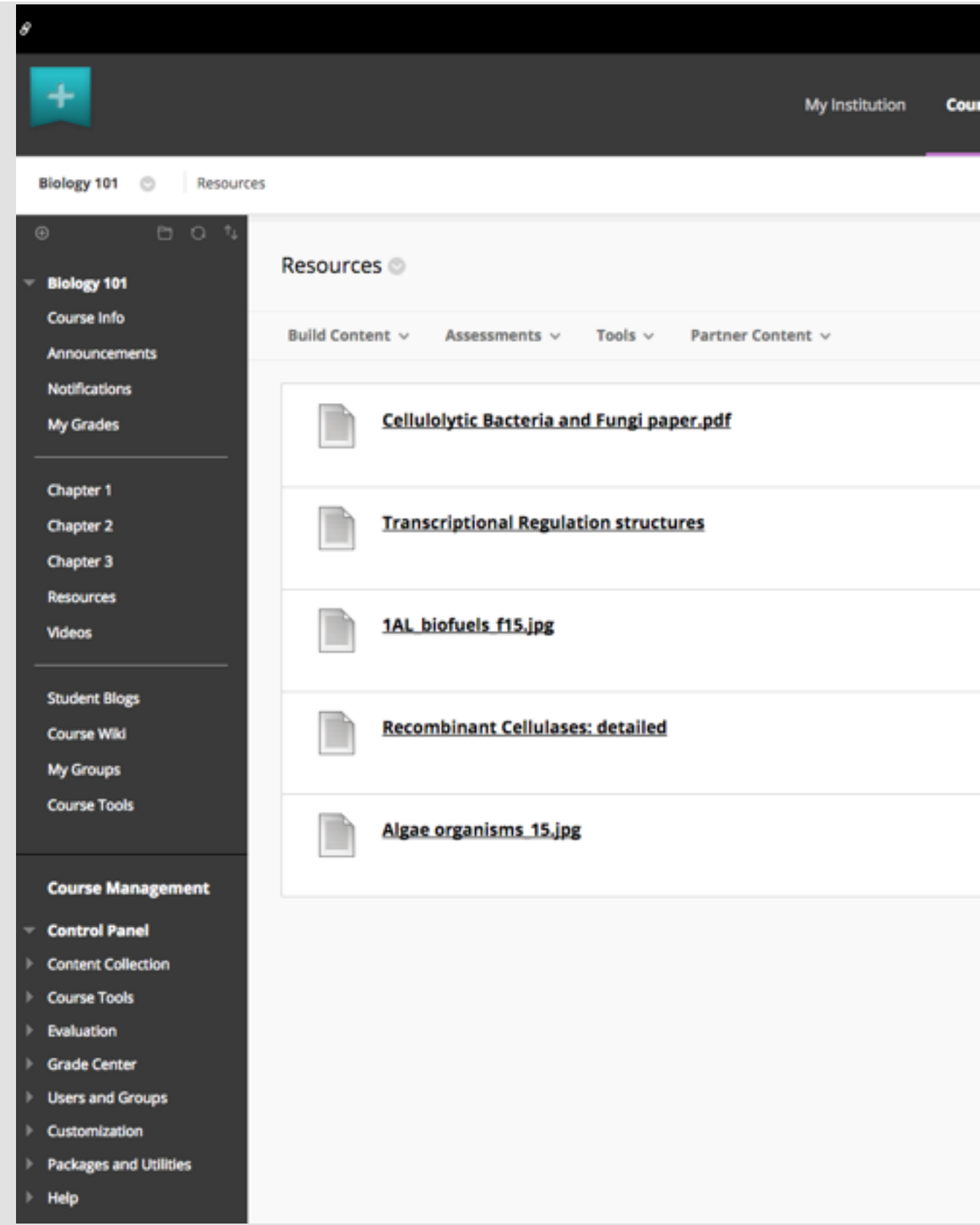
Learning Management System

- The Learning Management System is an important player in this
- Committed to providing Ally to everyone, including non-Blackboard products
- Potential for other integrations



Workflow

- Instructor adds course content to course site



Automated Accessibility Checklist



- Automated accessibility checklist based on content type
- Based on WCAG 2.0 AA

Machine Learning Algorithms

- Full structural and visual analysis to learn semantics of document
- Identify headings, heading structure, paragraphs, footers, tables, lists, mathematical formulas, etc.

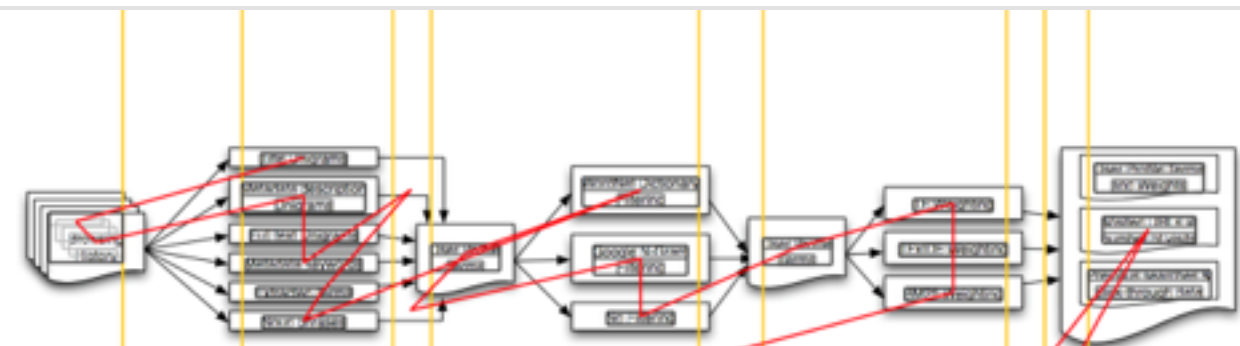


Figure 1: User Profile Generation Steps and Workflow

Table 1: Captured Data Statistics

Metric	Total	Min	Max	Mean
Page Visits	530,334	51	53,459	10,607
Unique Page Visits	218,228	36	26,756	4,365
Google Searches	39,838	0	4,203	797
Bing Searches	186	0	53	4
Yahoo Searches	87	0	29	2
Wikipedia Pages	1,728	0	235	35

Table 2: Extracted terms from the AlterEgo website and the Wikipedia page about Mallorca

AlterEgo	Mallorca
add-ons	majorca
Nicolaus	palma
Matthijs	island
STTT	spanish
Nicolaus Matthijs	balearic
Language Processing	cathedral
Cambridge	Palma de Mallorca
keyword extraction	port

Every time a user leaves a non-secure (non-https) web page, the add-on transmits the user's unique identifier, the page URL, the visit duration, the current date and time, and the length of the source HTML to the server. The server then attempts to fetch the source HTML of this page. This is performed server-side to ensure that only publicly-visible data is used. Once the source HTML is received, the server compares its length to the length received from AlterEgo. If the length difference is smaller than 50 characters, the HTML is accepted and saved along with the other page visit data. Otherwise, we assume the content probably came from a password protected but non-secure site (e.g. Facebook, Hotmail, etc.) and the record is discarded.

Participants for this study were recruited via a website explaining the purpose and consequences to potential users, publicized on various e-mail lists, resulting in 50 participants taking part. Whilst we expect that most of these participants are employed in the IT industry due to the recruitment process, a number of people outside of the IT industry without significant web search experience participated as well. The add-on captured data for three months from March to May 2010. As shown in Table 1, a total of 530,334 page visits (or an average of 10,607 page visits per user) were recorded. 58% of the visits were to unique pages. The add-on also recorded 39,838 Google searches, 186 Bing searches and 87 Yahoo! searches, indicating that our users were strongly biased towards Google as their search engine, hence Google was used as the baseline in our experiments. An average user issued 797 queries over the three months, indicating that at least 7.5% of all non-secure web requests were search related.

3.1.2 Data Extraction

We considered the following summaries of the content viewed by users in building the user profile:

Full Text 4-grams

Title Unigrams

The words inside any <title> tag on the html pages.

Metadata Description Unigrams

The content inside any <meta name="description"> tag.

Metadata Keywords Unigrams

The content inside any <meta name="keywords"> tag.

Extracted Terms

We implemented the Term Extraction algorithm as presented in [31], running it on the full text of each visited web page. It attempts to summarize the web page's text into a set of important keywords. This algorithm uses the C/NC method, which uses a combination of linguistic and statistical information to score each term. Term candidates are found using a number of linguistic patterns and are assigned a weight based on the frequency of the term and its subterms. This is supplemented with term re-extraction using the Viterbi algorithm. The outcome of this algorithm run on two sample web pages can be seen in Table 2.

Noun Phrases

Noun phrases were extracted by taking the text from each web page and splitting it into sentences using a sentence splitter from the OpenNLP Tools². The OpenNLP tokenization script was then run on each sentence. The tokenized sentences were tagged using the Clark & Curran Statistical Language Parser³, which assigns a constituent tree to the sentence and part of speech tags to each word. Noun phrases were then extracted from this constituent tree.

3.1.3 Term List Filtering

To reduce the number of noisy terms in our user representation, we also tried filtering terms by removing infrequent words or words not in WordNet. However, neither of these were found to be beneficial. Therefore we do not discuss

Alternative Accessible Versions



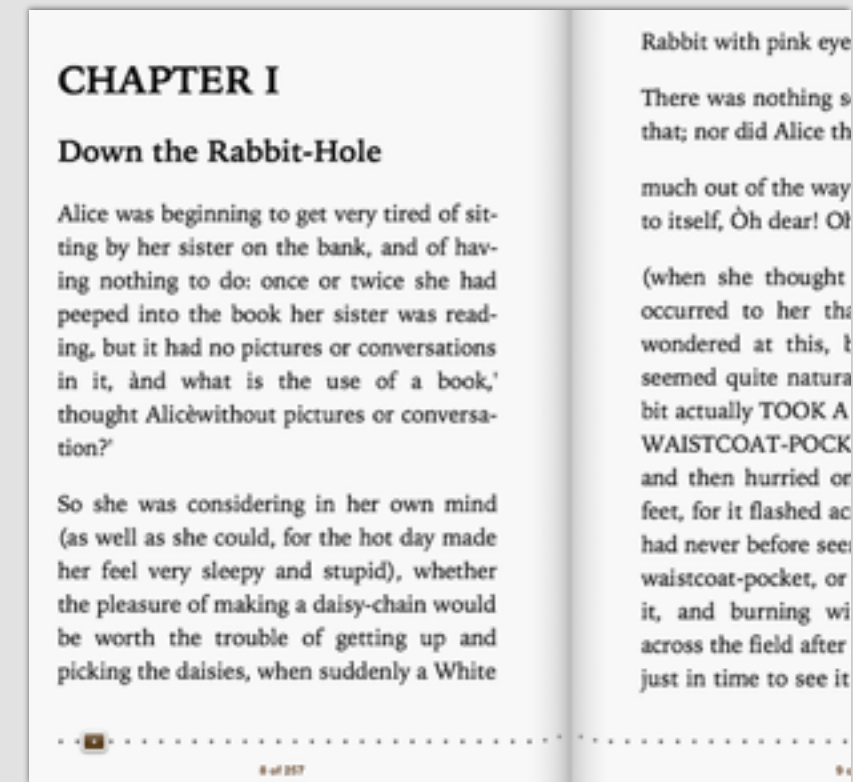
HTML

High quality semantic
HTML version of the
content



Enhance original

Automatically inject
fixes into the original
document



Other alternative formats

ePub, audio, electronic
braille, etc.

Instructor Feedback

- Provide feedback to instructors about accessibility of their course content
- Provide guidance on how to fix accessibility issues
- Aims to generate change in behavior over time

Accessibility score for:
Kingdoms of Organisms

5%

Score ⓘ

This document is untagged

What this means

How to make PDFs tagged

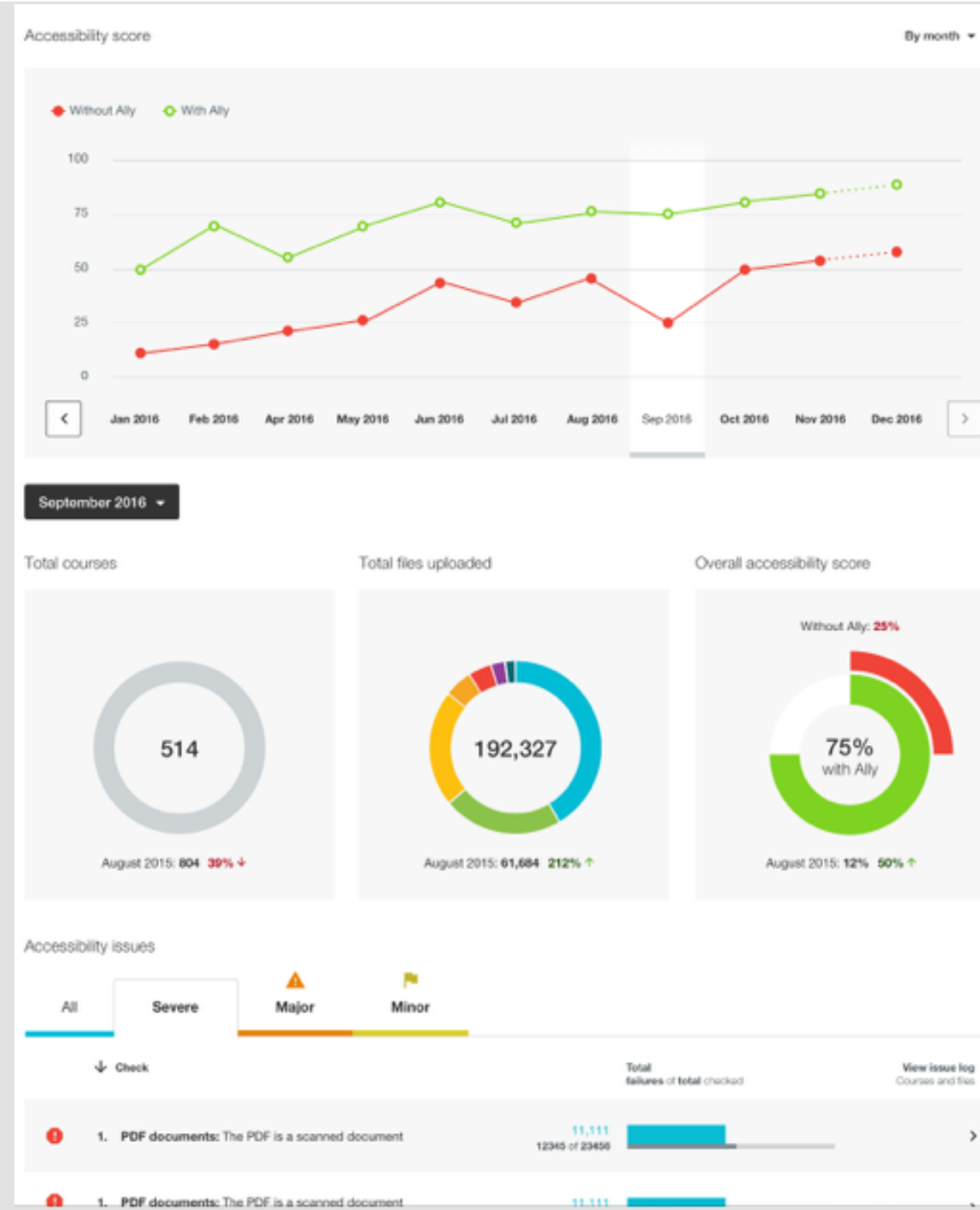
Upload an original text-based version

Drop files to upload
or

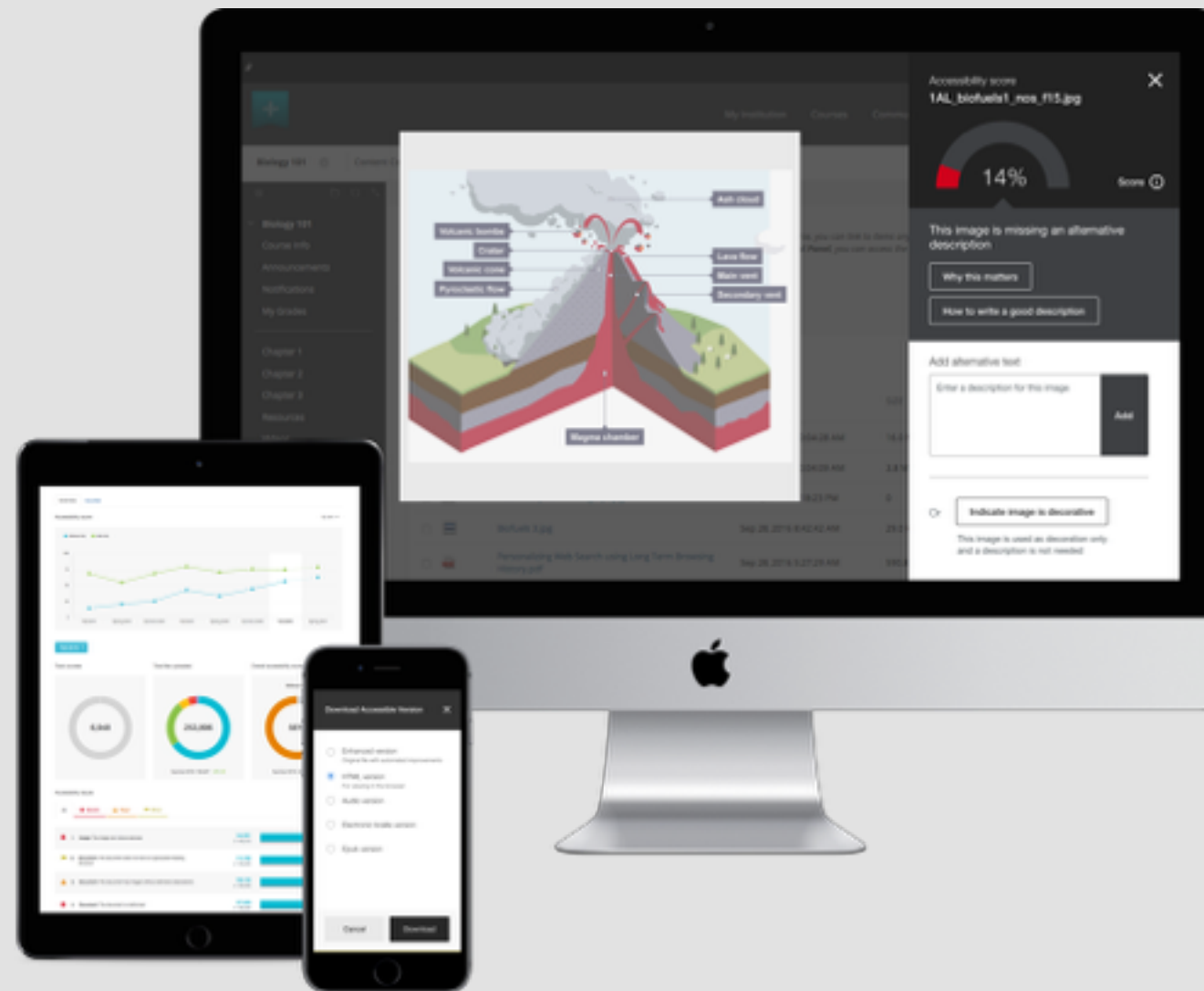
Browse

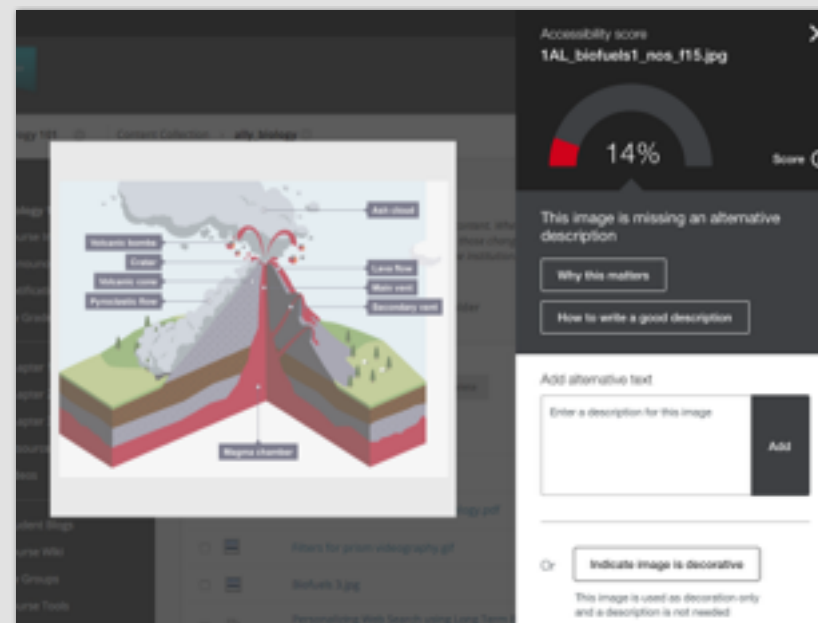
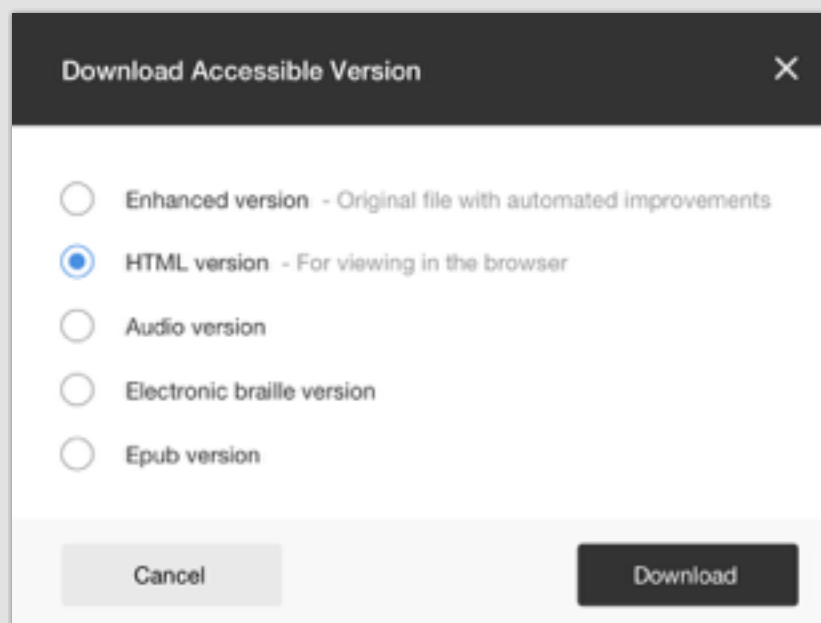
Institutional Report

- Provide detailed understanding of how institution is doing
- Helps identify where problem areas are, what to focus on, who to target, etc.



Demo





Alternative Accessible Versions

Automatically checks for accessibility issues and generates alternative accessible formats

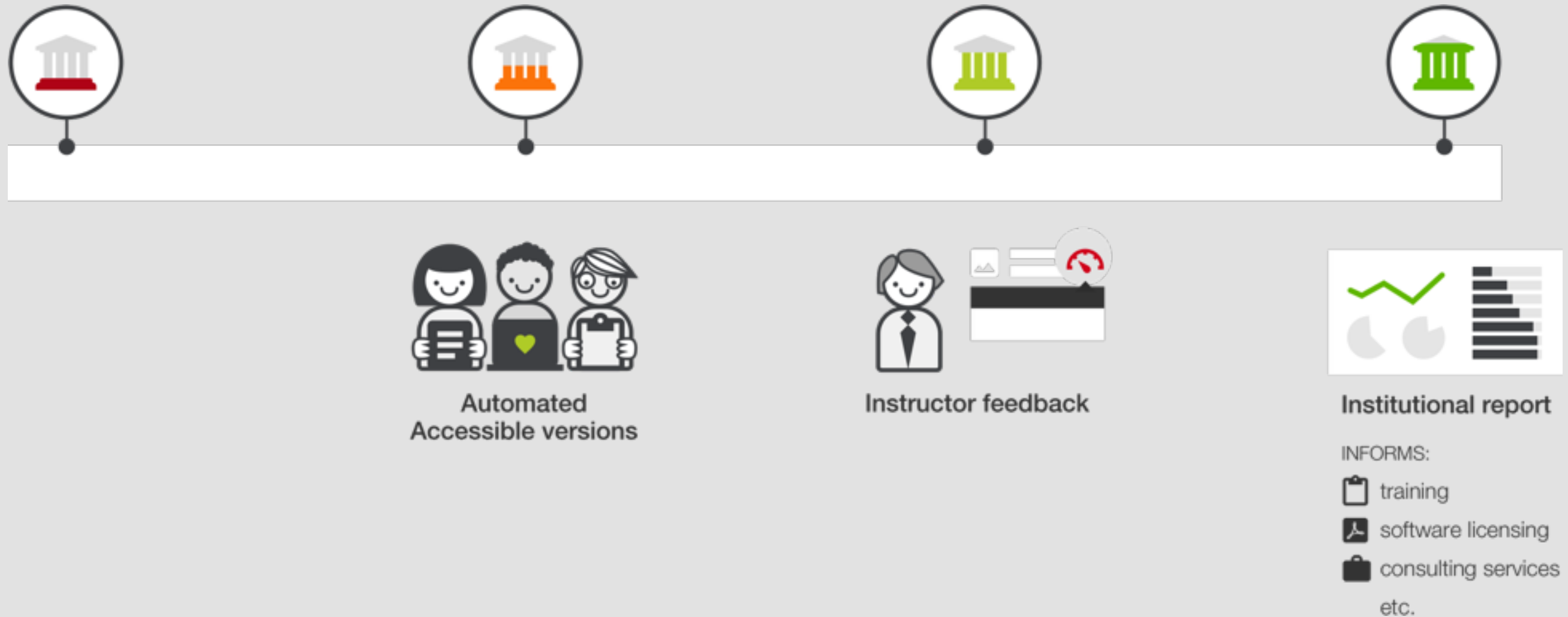
Instructor feedback

Guides instructors on how to improve the accessibility of their course content and alters future behavior

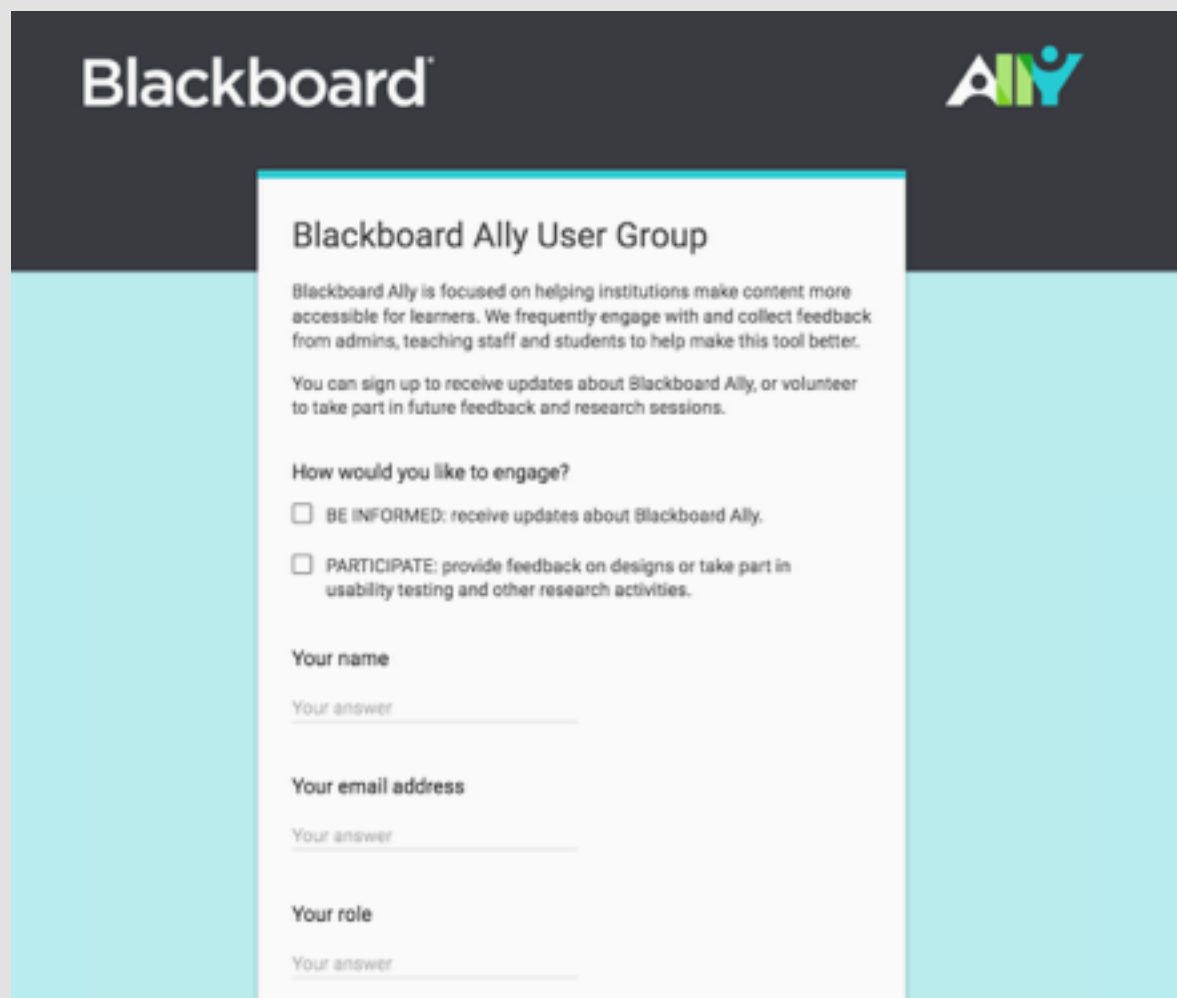
Institutional report

Provides detailed data and insights to help further improve course content accessibility at the institution

Accessibility Spectrum



Ally User Group



The image shows a sign-up form for the Blackboard Ally User Group. The form is titled "Blackboard Ally User Group" and includes a description of the group's purpose: "Blackboard Ally is focused on helping institutions make content more accessible for learners. We frequently engage with and collect feedback from admins, teaching staff and students to help make this tool better." It also states: "You can sign up to receive updates about Blackboard Ally, or volunteer to take part in future feedback and research sessions." The form asks "How would you like to engage?" with two options: "BE INFORMED: receive updates about Blackboard Ally." and "PARTICIPATE: provide feedback on designs or take part in usability testing and other research activities." Below these are three input fields: "Your name", "Your email address", and "Your role", each with a placeholder "Your answer".

Blackboard

Ally

Blackboard Ally User Group

Blackboard Ally is focused on helping institutions make content more accessible for learners. We frequently engage with and collect feedback from admins, teaching staff and students to help make this tool better.

You can sign up to receive updates about Blackboard Ally, or volunteer to take part in future feedback and research sessions.

How would you like to engage?

☐ BE INFORMED: receive updates about Blackboard Ally.

☐ PARTICIPATE: provide feedback on designs or take part in usability testing and other research activities.

Your name

Your answer

Your email address

Your answer

Your role

Your answer

- Receive updates about Blackboard Ally
- Participate in UX research, usability testing, early access, etc.

Sign up at <http://tinyurl.com/blackboard-ally-user-group>

Blackboard®



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