GeoBlacklight

Concept Overview

CC BY SA

GeoBlacklight is an open source, multi-institutional software project started at Stanford University Libraries. Its goal is to provide a world-class discovery platform for geospatial (GIS) holdings. GeoBlacklight is part of a larger effort to preserve and provide access to geospatial data.

GeoBlacklight

Concept Overview

Problem:

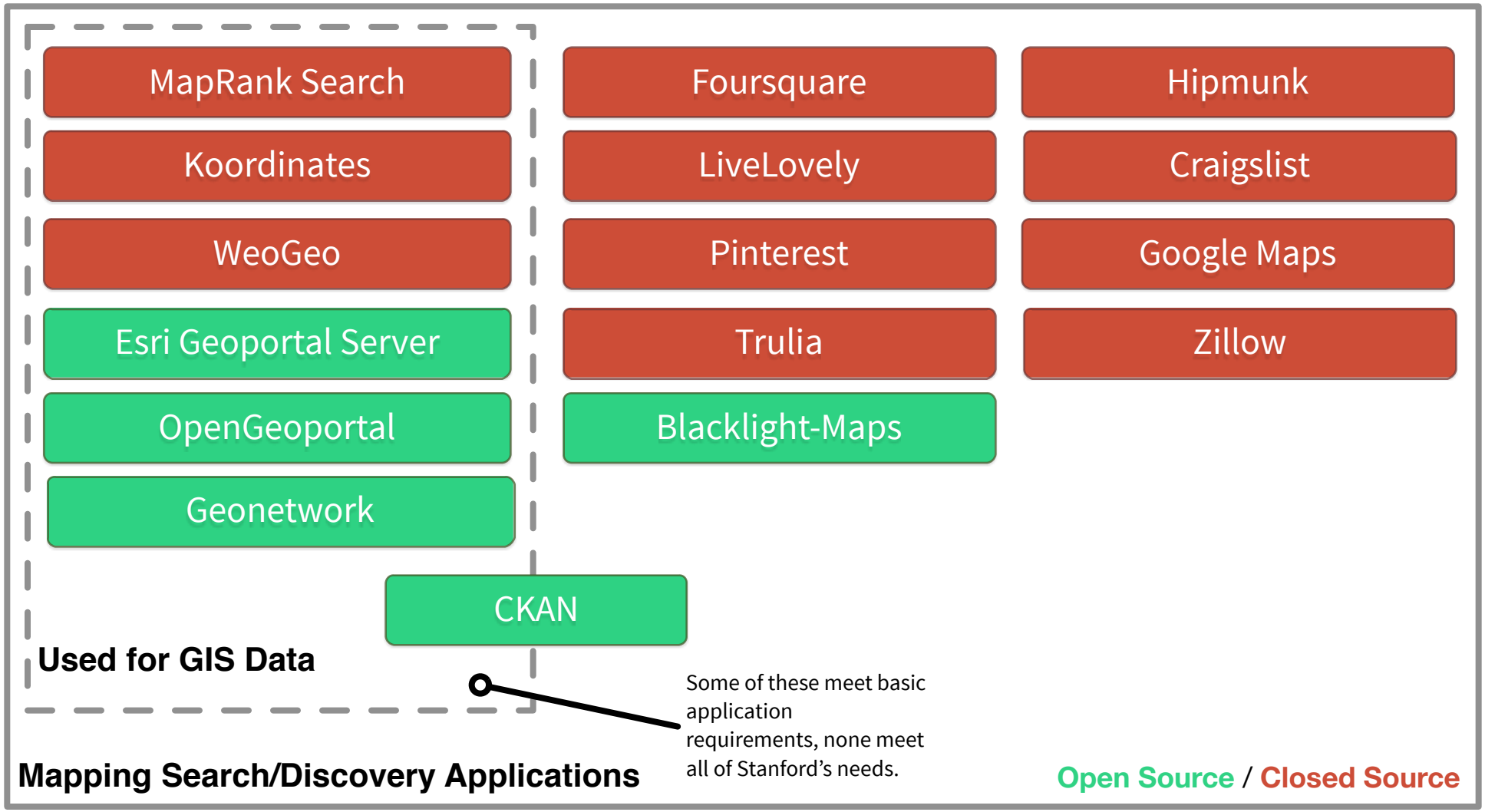
Discovery of GIS data is broken. It is overly complicated and incomplete. Organizations spend time and money on creation and acquisition of data, yet it sits on hard drives, DVDs, and shelves without a straightforward way for others to discover it. Discovery tools that do exist have usability issues that alienate users and prevent wide adoption. Too often, data discovery is an afterthought, grafted onto tools that have been designed for analysis, or treated as one feature among many in a map portal. These tools attempt to serve every possible user need and in the process become unusable.

Simply put, we need an application which enables discovery of GIS data with an emphasis on user experience, integrates seamlessly with other tools, and streamlines the use and organization of geospatial data.

GeoBlacklight

Environmental Scan

Though many mapping applications exist which display search results on a map or include some type of spatial search, few actually are built specifically with GIS data in mind.



GeoBlacklight

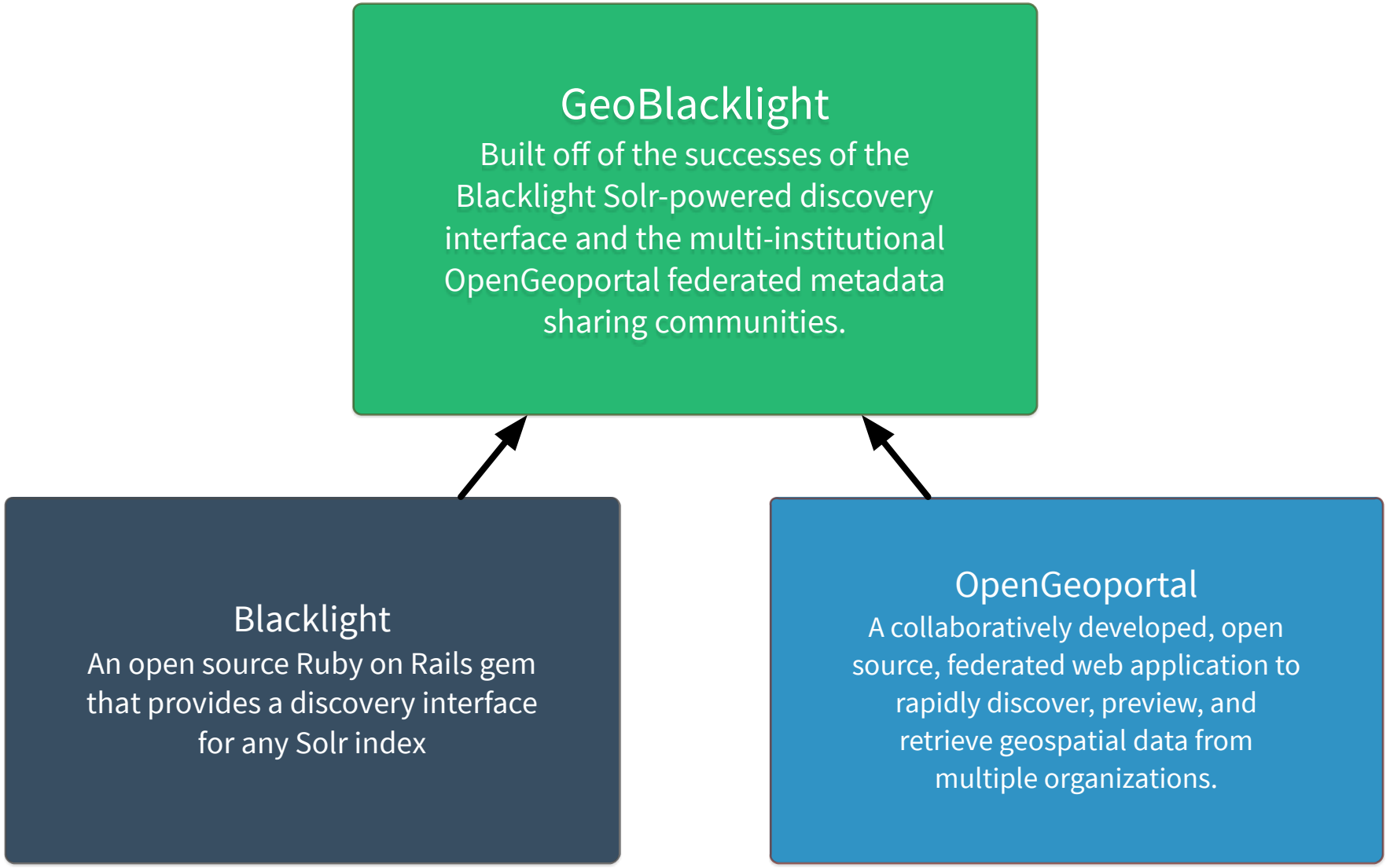
Environmental Scan

Geospatial/mapping search features included in studied applications:

	Results: Map View	Results: Text View	Clustered Results	Faceted Search	Text Search	Spatial Search	Preview Layer	Related Items	Groupings	Suggested Search
Google Maps	☑	☑	☐	☐	☑	☑	☐	☑	☐	☑
Foursquare	☑	☑	☑	☑	☑	☑	☐	☐	☐	☐
LiveLovely	☑	☐	☑	☑	☑	☑	☐	☐	☐	☐
Craigslist	☑	☑	☑	☑	☑	☑	☐	☐	☐	☐
Pinterest	☑	☑	☑	☐	☐	☐	☐	☐	☑	☐
Trulia	☑	☑	☐	☑	☑	☑	☐	☑	☐	☐
Zillow	☑	☑	☐	☑	☑	☑	☐	☑	☐	☐
MapRank Search	☑	☑	☐	☑	☑	☑	☑	☐	☐	☐
Koordinates	☐	☑	☐	☐	☐	☑	☑	☐	☑	☐
WeoGeo	☑	☑	☑	☑	☑	☑	☑	☑	☑	☐
Esri Geoportal Server	☑	☑	☐	☐	☑	☑	☐	☐	☐	☐
OpenGeoportal	☑	☑	☐	☑	☑	☑	☑	☐	☐	☐
CKAN	☐	☑	☐	☑	☑	☑	☑	☑	☑	☐
Blacklight-Maps	☑	☑	☑	☑	☑	☐	☐	☐	☐	☐
Geonetwork	☐	☑	☐	☑	☑	☑	☑	☐	☐	☐

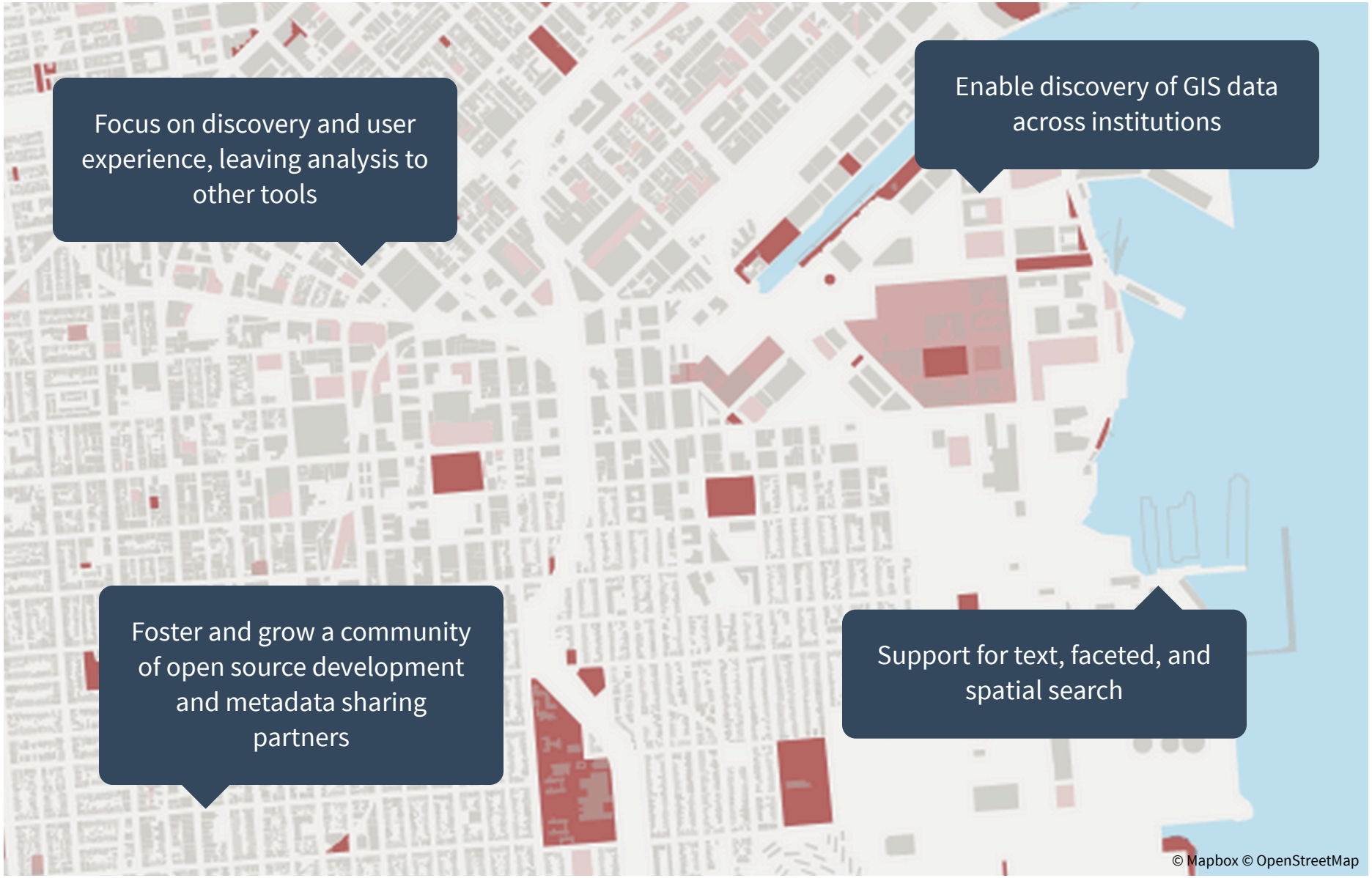
GeoBlacklight

Concept Overview



GeoBlacklight

Goals



GeoBlacklight

Persona Overview

Application End Users

Brian Diaz
Professor of History

Andrea Payne
PhD Candidate in Environmental Sciences

Sandip Nagarkar
Sophomore in Planning/Urban Studies

Project Stakeholders

Beverly Arnold
Earth Sciences Librarian

Brandon Chavez
GIS Instructor and Lab Manager

Debra Gordon
Library Web Engineer

GeoBlacklight

Personas - Application End User

Brian Diaz
Professor of History

Experienced scholar, not a GIS user, looking for specific data

"I don't have time to search through the stacks or a book catalog."

Brian is an experienced scholar who is busy juggling research, teaching, and professional commitments. He would like to add more historic maps and geospatial components to his research, but finds that GIS software and applications are not that user friendly and he doesn't have time to relearn a new discipline.

	Motivation	Scenario	Website Goals
1	Quickly find historic maps for my area of study	As a researcher, I am usually looking for data about a specific area during a specific time period. I am used to searching through the library's paper maps or their online catalog but often times it can be a time intensive task. I wish there was a quicker, easier way to find the digital maps at my or any other institution, I need to augment my research.	• Quick text search • Facet results by keyword • Narrow results by spatial extent • Facet results by temporal metadata • Preview georectified scanned maps • Preview non-georectified scanned maps • Browse maps from multiple institutions
2	Use a tool that thinks like I do to find the information I need	Many of the GIS tools I have seen are complex and don't seem to be made for "normal" people. I do use Google Earth, and it would really cool if the map catalog integrated with Google Earth.	• Download as shapefile to integrate with desktop GIS software • Download as KML to integrate with Google Earth • Copy web service urls to use with GIS software • Simple, familiar interface design • Intuitive controls and buttons
3	Point my students to a great campus resource for data and historic maps	I would like to be able to point my students to an application that was reliable and contained relevant and available resources for their coursework and research. This resource also needs to be accessible for all of my students.	• Sharable unique layer urls • Resource availability is made apparent • New resources added regularly • Usable by a non technical user • Discovery results and basic map functionality accessible by keyboard • Text results and record page accessible by a screen reader

GeoBlacklight

Personas - Application End User

Andrea Payne
PhD Candidate in Environmental Sciences

Power user, experienced professional, focused on getting the job done

"I usually just use Google to find the data I need. Portals seem so 1990's."

Andrea is an experienced GIS user who worked as a GIS analyst for several years before pursuing her PhD. She is used to scouring the web to find data she needs for her research. Her experience with user-focused GIS software has been frustrating, and the idea of another portal application is met with skepticism.

	Motivation	Scenario	Website Goals
1	Quickly evaluate potential data sources	In order to complete my coursework and research, I need to be able to quickly find and evaluate many potential data sources. Spending my day downloading files I'm never going to use is time consuming and frustrating. I want to be able to evaluate the data source efficiently without having to download it.	• Quick text search • Faceted search • Quickly view most important metadata for a given layer • Ability to access complete metadata for a given layer • Quickly preview a layer on a map • Inspect a layer's variables at different geographic locations • View a layer's geographic extent
2	Download and save discovered layers	While discovering data needed for my research, I want an easy way to download a layer and go back to see what I have used.	• Download as shapefile to use in GIS software • Download as KML to use in Google Earth • Bookmarked layers viewable on a map • Bulk download bookmarked layers • Copy web service urls • Download in original projection
3	Discover hard to find localized data sources	Much of my research focuses on the developing world. Data sets for these locations can be difficult to find. I need a range of ways to search for my specific locations of interest.	• Search by geographic location • Faceted search by data type • Results sorting by: relevance, date, and title • Keyword search • Topical facet search • Relevance algorithm returns useful/valid results • Combine spatial, text, and faceted search

GeoBlacklight

Personas - Application End User

Sandip Nagarkar

Sophomore in Planning/Urban Studies

New to GIS and research, tech savvy, eager to learn

"The promise of GIS is great, but it seems really hard to find good data."

Sandip is a tech savvy sophomore looking to do more work in GIS but doesn't know where to start. He expects the tools he uses to make his work easier not harder. An early adopter, Sandip is eager to learn new things and adapt new technology to his workflow.

	Motivation	Scenario	Website Goals
1	Finding GIS data to get started seems daunting	I don't even know where to start to find data. Are there some suggested datasets or places where I can start?	• Browse resources, such as by curated and most popular records • Simple, familiar interface design • Unobtrusive UI hints for new users
2	Hard to determine which data are reliable	As a new GIS user, I really don't know what datasets are reliable or how to find out more information about them. Are the best results at the top of my search, like in Google?	• Quickly view most important metadata for a given layer • Quickly preview a layer on a map • Inspect a layer's variables at different geographic locations • Results bump for records with more complete metadata • Results bump for records that are available for use
3	All of these GIS tools seem to have been designed 10 years ago	There's an amazing app for most of the things I do in my life. I expect that the applications I use for my schoolwork and research should be designed in a similar way. Can I use this on my iPad?	• Responsive design allows for mobile and tablet discovery • Experience is similar mainstream online applications (Google Maps, Foursquare, Pinterest) • Feedback and fallback for all services

GeoBlacklight

Personas - Project Stakeholder

Beverly Arnold
Earth Sciences Librarian

Passionate about geospatial and access, wants to provide more patron services

"What we really need is a visual catalog for our geospatial data"

Beverly has been working with geospatial data for most of her career. With the advent of new online tools, she is excited about the possibility of enhancing accessibility to the large collection that the university has access to. One concern of Beverly's is that this new application be focused on geospatial assets and not the same as the library's other tools.

	Motivation	Scenario	Website Goals
1	Provide a visual catalog to libraries' GIS data and maps	Many of our resources are currently sitting on hard drives, a network drive, or DVDs. We need a way for our employees and patrons to access these in an easy and scalable way. This should be done in a way that takes into account the geospatial nature of these data.	• Browse resources • Explore resources with a map • Combined text list and map view of search results
2	Give patrons access to other institutions shared GIS data and metadata	Creating metadata records can be expensive for us and we realize that we do not have the capacity to create records for everything. We would like to leverage the OpenGeoportal metadata sharing community, by allowing our patrons to access resources from metadata shared at other institutions. This way our users can either access the data if it is publicly available or request access to it from our library.	• Facet by institution • Convert OGP metadata to GeoBlacklight schema • Clearly designate layer's availability • Other institution's holdings are discoverable • Ability to automatically harvest and update from resources held at other institutions • Internal layers and datasets are harvestable by other institutions • Support several types of hosted services: WMS, WFS, file download, IIIF, tile server
3	Understand how and what users are downloading/using the resources we provide.	By gaining access to more specific analytics I will be able to understand which data and services our patrons are using. This will enable us to make better data purchasing decisions and better use of our budget.	• Per item, search term, and custom variable tracking through Google Analytics • Configurable analytics per GeoBlacklight install • Download and view count per resource

GeoBlacklight

Personas - Project Stakeholder

Brandon Chavez
GIS Instructor and Lab Manager

Experienced professional, wears many hats, helping and training many

"Moving our data into an online application sure would make my job easier."

Brandon's job consists of managing the GIS lab, training and providing consultations to students, and providing the campus community access to geospatial data. By putting the GIS data resources online in an easy to use application, more people will gain access to available data and Brandon can concentrate on other areas of his job.

	Motivation	Scenario	Website Goals
1	Easily share GIS data sources with students	When giving a workshop or consultation, I need an easy way to share layers with students by sending them a link. Sometimes there are many layers in a specific dataset, sharing these together would also be useful.	• Shareable unique layer urls • Shareable unique dataset (grouping of layers) urls • View metadata for a dataset • Layer is denoted when it belongs to a dataset • Sharable download links • Downloads can handle 40 simultaneous users
2	Provide instructions and demonstrate discovery of GIS data	Through the course of my job, I usually instruct students on how best to find GIS resources. Giving them and demonstrating step by step repeatable instructions on how to find certain data sets is important.	• Url history to enable repeatable steps in creating a search • Search modifiers are clearly displayed and interactive • Interaction consistency between search, results, and display pages
3	Have one place for students to go to obtain GIS data	Rather than spend my time helping one student at a time find GIS data, it would be much more efficient if there was a centralized place for them to find all of the resources that are available. I have limited time and by putting these resources in one place I can be productive in other areas of my job.	• Allow a trusted user the ability to feature curated resources or datasets • Show related layers and datasets • Automatically group curated datasets/layers by thematic, geographic, and temporal characteristics • Feedback and fallback for all services

GeoBlacklight

Personas - Project Stakeholder

Debra Gordon
Library Web Engineer

Code contributor, open source advocate

"We want to contribute to the project to make it better for everyone!"

Debra has been working as a software engineer in the university library for several years. She is excited about the possibility of a new application dedicated to the vast geospatial assets the university holds. Her knowledge of open source software and specific GIS needs are useful to the project.

	Motivation	Scenario	Website Goals
1	Install and customize an instance of GeoBlacklight for university's users	We need to be able to install, customize, and upgrade an instance of GeoBlacklight at our university. The customization is important so that it has the look and feel of our other applications and meets our university's style guide standards.	• Take advantage of core functionality already built into Blacklight • Ability to easily skin and customize • Software updates do not lose local customizations • Documentation for implementers • Use semantic versioning for upgrade compatibility
2	Be able to contribute code to the GeoBlacklight project	Contributing to the project is important to our organization. Having a test suite, style guidelines, and an active community are important to a healthy open source software project.	• Test suite allowing for new contributions to be tested agains core functionality • Follow Test Driven Development practices • Follow Rails style guide • Documentation for contributors • Community engagement and outreach to augment contributors to the project
3	Share metadata records with community	We need a way to share and harvest metadata records accross institutions. Hopefully the GeoBlacklight project can help figure this out.	• Automated way to share institutional metadata records as they are added and updated • Resource show pages adhere to schema.org conventions

GeoBlacklight

Feature Priorities

Which end user features to focus on?

Must Have	Should Have	Nice to Have
• Quick text search • Faceted search by: keyword, time, data type, topic • Narrow results by spatial extent • Preview georectified scanned maps • Preview non-georectified scanned maps • Browse maps from multiple institutions • Download as shapefile to use in GIS software • Simple, familiar interface design • Intuitive controls and buttons • Shareable unique layer urls • Resource availability is made apparent • Usable by a non-technical user • Quickly view most important metadata for a given layer • Quickly preview layer on a map • View a layer's geographic extent • Search by geographic location • Relevance algorithms return useful/valid results • Results sorting by: relevance, date, and title	• Download as KML to use in Google Earth • Copy web service urls to use with GIS software • A way to report errors or issues to administrators • Way to find popular or featured data • Mobile and tablet usable • Feedback and fallback for all services • Discovery results and basic map functionality accessible by keyboard • Text results and record page accessible by a screen reader • Inspect a layer's variables at different geographic locations • Combine spatial, text, and faceted search • Responsive design allows for mobile and tablet discovery • Experience is similar to mainstream online applications (Google Maps, Foursquare, Pinterest)	• New resources added regularly • Ability to access complete metadata for a given layer • Bookmarked layers viewable on a map • Bulk download bookmarked layers • Unobtrusive UI hints for new users • Browse resources, such as by curated and most popular records • Results bump for records with more complete metadata • Results bump for records that are available for use

GeoBlacklight

Feature Priorities

Which stakeholder features to focus on?

Must Have	Should Have	Nice to Have
• Shareable unique layer urls • Explore resources with a map • Browse resources • Facet by institution • Convert OGP metadata to GeoBlacklight schema • Clearly designate layer's availability • Other institution's holdings are discoverable • Support several types of hosted services: WMS, WFS, file download, IIIF, tile server • Shareable unique dataset (grouping of layers) urls • View metadata for a dataset • Interaction consistency between search, results, and display pages • Ability to easily skin and customize • Software updates do not lose local customizations • Documentation for implementers • Documentation for contributors • Take advantage of core functionality already built into Blacklight • Feedback and fallback for all services • Follow TDD practices	• Ability to automatically harvest and update from resources held at other institutions • Internal layers and datasets are harvestable by other institutions • Configurable analytics per GeoBlacklight install • Download and view count per resource • Layer is denoted when it belongs to a dataset • Downloads can handle 40 simultaneous users • Url history to enable repeatable steps in creating a search • Search modifiers are clearly displayed and interactive • Follow Rails style guide • Use semantic versioning for upgrade compatibility • Community engagement and outreach to augment contributors to the project	• Per item, search term, and custom variable tracking through Google Analytics • Shareable download links • Allow a trusted user the ability to feature curated resources or datasets • Show related layers and datasets • Automatically group curated datasets/ layers by thematic, geographic, and temporal characteristics • Automated way to share institutional metadata records as they are added and updated • Resource show pages adhere to schema.org conventions

GeoBlacklight

Overall focus

The focus of GeoBlacklight is on end user experience, rather than adding features.

Project Risks

Low user adoption - Many factors could influence user adoption across partner institutions. By providing a great user experience to the end user and collaborative design end user adoption can be increased. Community building, documentation, and test suites will enhance the deployment experience and increase the number of installations.

Data / metadata pipeline bandwidth and activity - A discovery interface is only as good as the data and metadata behind it. In conjunction with GeoBlacklight, GeoHydra and other similar projects will need to continue to provide accessioned data and quality metadata.

Too much influence from one stakeholder - Input from a broad range of users and stakeholders is important so the design and features are used. Often times applications can be influenced by a particular silo of stakeholders detracting from overall usefulness by adding boutique features that are not widely used and detract from overall experience.

Dependencies on external services - The inherent nature of federated metadata sharing and discovery of resources from many institutions relies on service endpoint availability that cannot be controlled. Proper feedback and fallback design consideration should be taken to account so that end user experience is not hindered for services that are not available.

GeoBlacklight

Sustainability Plan

Build on previous successes - By using the proven Blacklight platform as a basis for the discovery interface and OpenGeoportal for metadata standards and sharing, GeoBlacklight engages and brings together partners from existing communities.

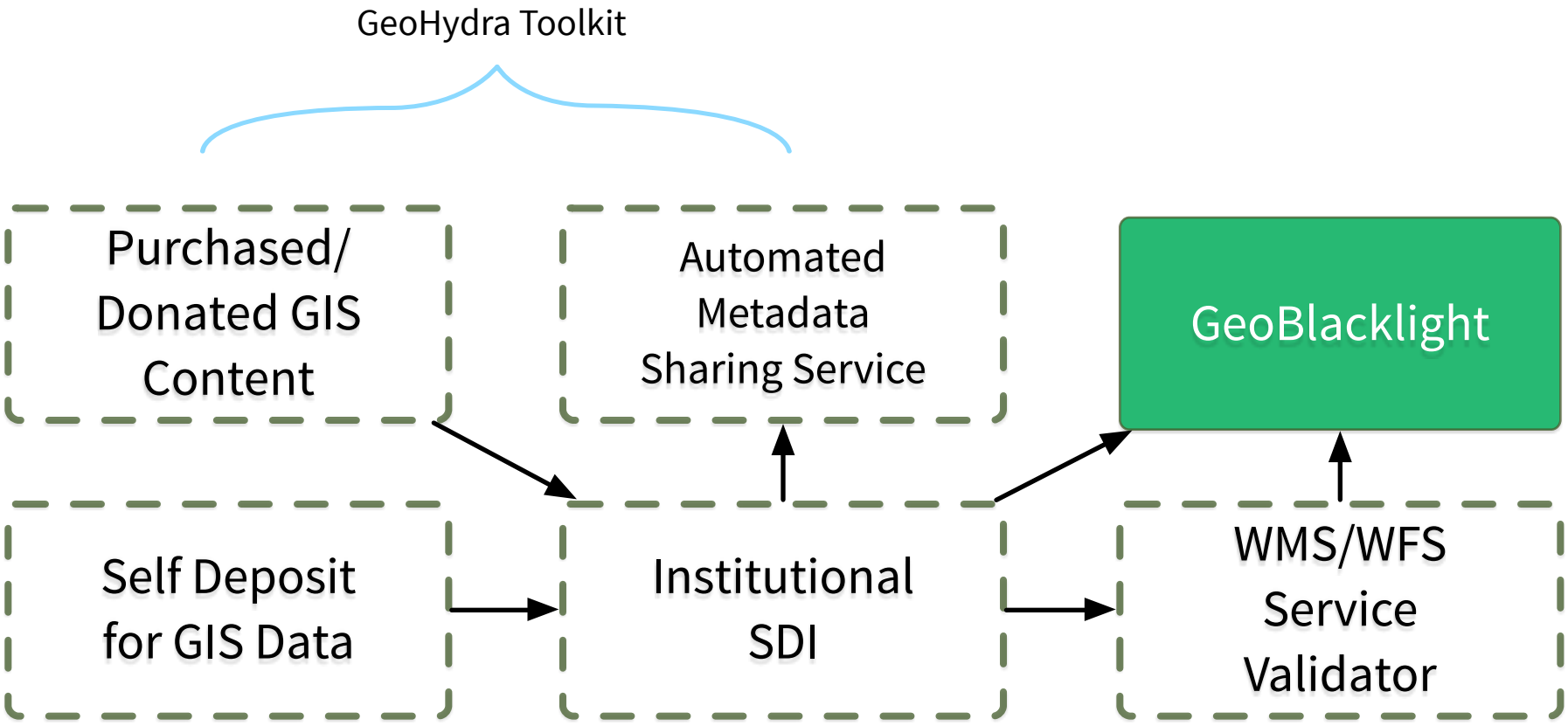
Test driven development - Providing tests and document for software allows for a wider adoption and lowers the barrier for development partners to start collaborating. Coupled with semantic versioning best practices, adopters will have a clear upgrade path when new versions of GeoBlacklight are released.

Partner with committed organizations - Collaboration with committed development partners ensures that the software development continues beyond one organization. “If you want to go fast, go alone. If you want to go far, go together.”

Engage new communities - GeoBlacklight will surely garner interest beyond the academic/library communities. Engagement and adoption with these communities will be important to the longevity and quality of the project.

Adhere to and develop metadata standards - Institutional collaboration on development and adherence to metadata standards for sharing and discovery

GeoBlacklight

Additional Services/Applications

GeoBlacklight could function as a standalone discovery application, but would be more powerful as a part of a suite of tools used for geospatial data preservation, delivery, and metadata authoring in an organization.