Capacity Exchange

TECHNICAL PLAN

Extra year

Objective

The purpose of this technical plan is to delineate the technical activities that the Capacity Exchange (CapX) development team will conduct during the third year of the project under Wikimedia Brasil (WMB) coordination. It follows up its previous versions, and aims to guide the extra year of the second cycle of development until June 2026.

Our primary goal is to improve the tool's performance, the user experience, and the current functionalities, building upon the enhancements that were previously planned and implemented (see Grant Page and Technical Plan 3.0.).

The second iteration of the Capacity Exchange (CapX) project was extended to consolidate the integration of CapX's and Let's Connect (LC) profiles and design the project's future coordination. Therefore, we are committed to guaranteeing the success of this integration, making sure it satisfies the community's requirements and safeguards the privacy of users. From now on, the Capacity Exchange platform will incorporate LC Network's profiles, and new members will sign up to LC initiative through a special form inside the tool. Sensitive data will be stored on a database only accessed by Wikimedia Foundation staff.

The first version of the current software was launched at Wikimania 2024 (capx.toolforge.org). After several workshops, events and focal groups meant for user testing, the team developed an updated and enhanced version that incorporates the community feedback. The software's current version offers a unique look and feel and includes all the improvements envisioned on the Technical Plan 3.0.

Background

The vision of Capacity Exchange dates to the Wikimedia Movement Strategy discussions about capacity building. In 2022, a former working group (2021-2023) delivered CapX's first prototype, which was derived from OER World Map software. It was based on Java and Ruby programming languages, and hosted at *wmcloud.org*.

The initial prototype became unstable shortly after being initially tested, in late 2022. Later on, the OER World Map repository on Github was archived.

In mid-2023, Wikimedia Brasil's diagnosis was that geospatial mapping — a central aspect of the first prototype — was counterintuitive, given the nature of the Wikimedia Movement, and considering users' privacy concerns. Nonetheless, some other main functionalities served CapX collective vision. Profile edition and view, tag search, and mobile-desktop scalability should then be migrated during the development of a new solution for CapX.

Our decision was to develop a new prototype using a different infrastructure: a new code language and library, Django and React, and host it at *toolforge.org*. Such an instance is an optimal platform for tools developed by and for the Wikimedia Movement.

We took advantage of the robustness and widespread adoption of the aforementioned Python and JavaScript frameworks, enabling the project to benefit from a larger pool of potential developers, and an increased likelihood of long-term maintenance.

During the development of the current version, all technical decisions were made with the user's privacy in mind, resulting in the creation of a database that contains minimal saved data. Capacity Exchange primarily mirrors data from Wikidata and Wikimedia Commons, relying on the Wikimedia projects themselves for content moderation and verification.

Regarding the tool data storage, CapX database currently contains profile minibio texts and links to Wikimedia projects added by profile owner, such as those related to the capacities, Wikidata QID, affiliation, languages, among others. We also store the usernames with which profiles were created, bug reports submitted, and log information about exchanges made using the tool.

Current version

The Capacity Exchange is a platform designed for an open, global, and diverse social movement, not for commercial purposes. It recognizes that the knowledge and skills needed for community capacity building are already within our reach, among us. It aims to efficiently match existing needs with available resources, in decentralized peer exchange between wikimedians.

CapX vision focuses on:

- Mapping Human and Knowledge Resources Across the Wikimedia Movement
- Profiling Skills and Services to Facilitate Peer Connections
- Enabling Exchanges as the Ultimate Goal

Internal Management Processes

Each Technical Plan iteration and its activities are conducted by the whole CapX team, taking in consideration the specialty of each team member (See Team). Additional guidance is sought with Advisory Committee members, project supporters, and in Wikimedia Events.

Weekly sprints and meetings organize the deployment of the present technical plan, assisted by our GitHub work board.

The source code for the project is hosted on GitHub under the WMB repository, divided into two separate components: capx-frontend for the user interface and capx-backend for server-side functionalities. Both components are automatically deployed to Wikimedia Toolforge through a Continuous Deployment pipeline. Every change made to the codebase is reviewed through pull requests, ensuring that all modifications are tested and approved before being merged into the main branch. This deployment process is managed using scripts together with Toolforge's infrastructure, which supports continuous integration and secure credential handling for database access and other services.

In compliance with the best practices of software development and culture of Wikimedia Brasil, each modification should include the actions of:

- Reviewing the code for quality and adherence to the project's coding standards
- Testing the code to ensure it works as intended
- Documenting the code to facilitate understanding and future maintenance

System Overview

Framework

During the development process, the team was empowered to propose working frameworks for both the backend and frontend areas, which integrate with each other effectively. The framework choices were based on several factors, starting with future software sustainability and performance optimization, as well as scalability and accessibility.

Area	Technology	Justification
Back end	*Django*	A high-level Python framework that encourages rapid development and clean, pragmatic design. It is easy to work with, has a large community for support, and is well-suited for managing complex data models and relationships.
	Django Rest Framework	An extension of Django focused on building robust APIs, allowing integration with front-end frameworks like React.
Front-end	*React + Next.js + NextAuth*	React is a JavaScript library for building user interfaces, while Next.js adds server-side rendering and static site generation for improved performance and SEO. It is also integrated with NextAuth, an open source library to safely manage authentication.
	Tailwind CSS	A utility-first CSS framework for fast, responsive UI development, which promotes consistency in design while minimizing custom CSS.
	Jest + Storybook	Two open source libraries to make unit tests, render tests and component documentation.
Design UX/UI	*Figma*	Figma is ideal for projects with a solo designer due to its maturity, advanced features, and integration with built-in functionalities for brainstorming, team collaboration, presentations, and animated prototypes, which helps streamline workflows.

Available features

At the end of the second year of the second iteration of the Capacity Exchange project (June 2025), the platform is composed of the following features, all of them planned in the Technical Plan 3.0.. They are functional and available on the current online version. A few needed improvements are listed below in “Identified Issues”.

Feature (App)	Description
Landing page	The landing page has the main information about the application, featuring the video section, which has an overview of the whole application; the platform statistics section, which presents an overview of the application numbers.
Home page	The Home page it's the first page that the user will access after logging in. It contains a welcoming message, buttons to access the user's profile and the Explore feature, and CapX team direct contact for feedback.
User profile	The User Profile allows users to edit and customize their information through optional fields. The only non-editable fields are usernames (that come from users' Wikimedia unified login) and Wiki birthday (that is automatically calculated). On their profile, users can choose to display an avatar or a personal image from their QID on Wikidata (if existent). They can share as much as they are comfortable within their mini biography self-written text. They can also display the languages they are comfortable sharing with peers (and display their fluency in each one), their territories through region and/or country, and their affiliations within the Movement. Users can display alternative accounts (for example, for staff), their Wikidata item QID, and the Wikimedia projects they have interest in. They are also allowed to display their accomplishments on their profiles by selecting from several badge options. Through their profile, they can sign up for the Let's Connect peer support program through a special form, and be contacted by other wikimedians. Finally, users are invited to share their known, available, and wanted capacities, which are, respectively, the skills and abilities they already have, those they are willing to share with others, and those they want to learn.

Feature (App)	Description
Organization profile	The organization profile is a space for any Wikimedia affiliate, group, or initiative to display information about themselves. It is edited by one or several admin users, who have to be namely indicated by the organization to be added as such by the CapX staff. The organization profile only appears on CapX's tool once there is someone administering it. On their profile, organizations can display their logo images (from Wikimedia Commons), their report of activities (from a Meta-wiki link, if applicable), and their contacts as their Meta page, email, and website (if existent). They can also choose to display their main projects and documents, and their news from Diff publications. They can create a mirror of their Wikimedia events, and display some of them on their profile. Finally, organizations are also invited to share their known, available, and wanted capacities, which are, respectively, the skills and abilities they already have, those they are willing to share with others, and those they want to learn.
Capacity Directory	The Capacity Directory features a structure of capacities organized in cards composed of a main capacity, and its subcategories. Currently, there are seven main capacities with different colors that contain more specific capacities inside them. Each capacity card shows its QID and its description, either from Wikidata or Metabase. On the card, there is also a button that users can click to be sent to the Explore feed. Once one clicks on that button, it automatically filters and displays all the CapX's profiles related to that capacity as “learner” or “sharer.” The capacities are the main function of the tool because user profiles, organization profiles, and events are organized and filtered around them.

Feature (App)	Description
Explore (feed)	Users can browse and filter organization and user profiles by capacities, by their status as “learner” or “sharer,” and by their informed territories and languages. The Explore feed displays organization and user profiles separated into two categories: “learner” and “sharer”. “Learners” are those with the selected capacities listed as wanted. “Sharers” are those with the selected capacities listed as available. Through the feed, users can find and visit profiles they have interest in connecting with and save them to look at later.
Saved profiles	Saved profiles is a page related to one specific user profile. It is private and shows all the profiles that account has saved on the Explore feed.
Bug reports	Bug Reports is a page linked to the user profile where users can report issues, and suggest new features or improvements to the CapX development team. It provides a simple form composed of a title, a description, and the type of issue to be selected. After submitting it, users can follow up the report status on the tab “Submissions”. Reports are visible only to their creators and the CapX development team.
Organization list	The Organizations List page provides a dedicated directory of all Wikimedia affiliates, groups, and initiatives registered in CapX. The page features a robust filtering system similar to the Explore feed, allowing users to search by capacities and territories. Organizations are presented through profile cards displaying their logos, names, related capacities, territories, and direct links to their complete profiles. It displays 10 organizations per page, with efficient pagination, and includes a capacity selection modal for targeted searches. It is available for both logged-in and logged-out users.

Feature (App)	Description
Messages	Messages are sent through Meta-Wiki and, therefore, offer the same privacy and options. There are two ways of messaging users through the CapX tool: by email or by writing a topic on the user's Talkpage. If both users, the sender and the recipient, have email addresses linked to their Wikimedia unified account, then the sender will have both options to choose from. In the case of a message sent by email, the sender will receive a copy of it in its email by default. But if one of the parties does not have an email linked to their account, then the message can only be sent via the recipient's Talkpage. In both cases, the recipient can decide where to reply to the message. If (and only if) the user replies by email, then its address will be disclosed to the sender, as is the case in the Meta Wiki. If the user decides to keep the conversation on Wiki, its privacy will be maintained. All message logs are displayed in the "Sent" tab, within the Messages feature. The tool only registers the date the message was sent, the recipient's username, and the message status. The message's content is not stored in the database.
Events	The Events page serves as an interactive and capacity-related platform to discover Wikimedia community events, featuring a search and filtering system. Users can look for events through a real-time search bar and apply advanced filters, including skills from the Capacity Directory, location types (online, in-person, or hybrid), date ranges, and specific organizations. Events are shown on informational cards that include the date, time (in UTC format), location, the organization that is putting on the event, and related capacities. The page implements pagination with 6 events per page and includes integration with organization profiles, allowing organization administrators to select which events to showcase on their profiles. The interface is fully responsive and adapts seamlessly between mobile and desktop layouts. At the moment, it needs a Wikimedia Projects URL as a reference and can only be made by organization profiles.

Available Documentation

All functions in the code will be continued to be documented, including their purpose, what variables they receive, and what values they return. Aside from technical documentation, we will also keep on improving non-programmer-friendly documentation versions, such as the User Guide and FAQ on Meta-Wiki.

Below are listed all the available documentation on the software.

Document	Objective and content	Link
Source code: front-end	Contains the source code for the Capacity Exchange (CapX) project's web interface. Developed with React and Next.js, using TypeScript for static typing; Styling with Tailwind CSS; Internationalization, with support for multiple languages through localization files; Configuration files for ESLint, Jest, and others, to maintain code quality and consistency; Documentation, with detailed instructions for setting up the development environment, including prerequisites, installation, and running the development server.	GitHub/ Front-end
Source code: back end	Contains the source code for the Capacity Exchange (CapX) project's backend services. Developed with Django and Django REST Framework, using Python for the backend logic; Database models and migrations, to define the data structure and manage changes; API endpoints, to provide access to the data and functionality of the application; Authentication and authorization, to secure access to the API; DRF Spectacular, to generate OpenAPI documentation for the API; Configuration files for Django, including settings, URLs, and WSGI; Documentation, with detailed instructions for setting up the development environment, including prerequisites, installation, and running the development server.	GitHub/ Back end
User guide	The user guide is available on the project's Meta page and is constantly updated. Its purpose is to serve as a step-by-step tutorial for all the possibilities found in the tool.	Meta-Wiki/ User Guide
FAQ	The Frequently Asked Questions (FAQ) is constantly updated and contains answers to the community's main questions.	Meta-Wiki/ FAQ

Near future — the extra year

The priorities for the project management in the extra year (June 2025 to June 2026) are to consolidate the integration with Let's Connect, have clarity about the future of the project coordination, and present a draft strategy for software scalability and maintenance. Such a plan will include protocols for refactoring and updating dependencies, and the project's governance. The team will also design a financial plan to guarantee its future funding, with the help of the Advisory Committee and any other interested parties.

During the extra year, the team will undergo a major community outreach work, focusing on the growth of user participation, tool awareness and feedback gathering (as described on the internal document — Outreach Plan[1]). The validation of CapX activities will continue to be made through monthly meetings with the Advisory Committee, periodically reporting to the Wikimedia Foundation, and consultations with key Wikimedia Movement stakeholders. Additionally, localized focus groups and workshops will be used to validate and enhance the software in accordance with community needs.

Identified issues

- ➔ Needed Updates: some released components need to be improved for enhanced usability and better suit community needs;
- ➔ Testing routine: we need to establish a testing regimen to ensure correct functionalities, and software integrity and quality;
- ➔ Bugs: a few bugs must be fixed to ensure the system's dependability and stability;
- ➔ UX/UI testing: we need to test the Let's Connect profile integration and other new features to understand their performance.

What Will Be Done

To ensure that the tool continues to serve the Wikimedia community interests and is aligned to the project's vision, changes, and additions must be suggested and/or approved by the Advisory Committee and the Wikimedia Community.

[1] Since the Capacity Outreach Plan includes sensitive information, such as community members' names and emails, it is shared only with the development team, the Advisory Committee and the Community Outreach Facilitators.

Research-oriented planning and implementation are fundamental for delivering User Interface (UI), User Experience (UX) and community-led solutions for Capacity Exchange. Research activities may be conducted to understand the needs and priorities of the community to be developed during the project's extra year. The priorities should be listed strategically for project's future coordination and governance, and in accordance with the available work hours.

Improve navigation and usability based on global community consultation, considering not only Equity, Diversity, and Inclusion principles, but also the Global Majority Wikimedia Technology Priorities continues to be a major goal of the project development team.

Software improvements

- ➔ Dashboard page for statistical data of the software, such as number of users, capacities, and sent messages through the tool;
- ➔ Enhance the Capacity Directory to be even more intuitive for users;
- ➔ Create unit tests in more components to optimize software functionality and reliability;
- ➔ Review alternative texts to enhance accessibility;
- ➔ Design and provide more avatar options;
- ➔ Include “Affiliation” as a filter option on the Explore feed.

Work Plan

As mentioned before, on the ‘Internal Management Processes', the Capacity Exchange team works by weekly sprints and meetings to organize the deployment of the tool. We implement an agile methodology and adjust our demands in response to shifts in delivery priorities.

The following timeline may be changed as new demands arise and/or development priorities are changed.

Work Plan Timeline

2025 work plan

Activities	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Technical improvement	🟩	🟩	🟩	🟩	🟩	🟩	🟩
Bug fixing	🟩	🟩	🟩	🟩	🟩	🟩	🟩
Increase code test coverage	🟩	🟩	🟩	🟩	🟩	🟩	
Increase storybook coverage	🟩	🟩	🟩	🟩	🟩	🟩	
LC's integration implementing	🟩	🟩					
LC's testing and improvement			🟩	🟩	🟩	🟩	
Development of Dashboard page for statistical data		🟩	🟩				
User testing	🟩	🟩	🟩	🟩	🟩		
Community reporting	🟩		🟩		🟩		

2026 work plan

Activities	Jan	Feb	Mar	Apr	May	Jun
Technical improvement	🟩	🟩	🟩	🟩		
Bug fixing	🟩	🟩	🟩	🟩	🟩	🟩
Development of Dashboard page for statistical data					🟩	
User testing		🟩	🟩	🟩		
Community reporting		🟩		🟩		🟩
Coordination and team transition					🟩	🟩

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