Bazur – Linking the Languages of the Caucasus[1]

Magomed Magomedov, Emine Şahingöz

1. Language Endangerment in the Caucasus

The Caucasus is home to several dozen languages from various language families: Northwest Caucasian (NWC, also: Abkhaz-Adyghe), Northeast Caucasian (NEC, also: Nakh-Dagestanian), South Caucasian (SC, also: Kartvelian), Turkic (Karachay-Balkar, Kumyk, Nogai), and Indo-European (IE; Armenian, Ossetic, Tati). Moseley (2010) speaks of six levels of language endangerment in the UNESCO Atlas of World's Languages in Danger. These are shown in Table 1:

Degree of Endangerment		**Intergenerational Language Transmission**
0	*safe*	language is spoken by all generations; intergenerational transmission is uninterrupted
1a	*vulnerable*	most children speak the language, but it may be restricted to certain domains (e.g., home)
1b	*definitely endangered*	children no longer learn the language as native language in the home
2	*severely endangered*	language is spoken by grandparents and older generations; while the parent generation may understand it, they do not speak it to children or among themselves
3	*critically endangered*	the youngest speakers are grandparents and older, and they speak the language partially and infrequently
4	*extinct*	there are no speakers left

Table 1: Degrees of Endangerment (cf. Moseley 2010, UNESCO Atlas of World's Languages in Danger)

Five of these endangerment-levels are adopted by the project *Languages of Russia* ("*Языки России*", 2020) by the Institute for Linguistics at the Russian Academy of Science, grading the endangerment of the languages spoken in the Russian Federation by means of factors such as the number of speakers, use in education and others. The project covers 152 languages in total, 54 of them being languages spoken in the Caucasus[2] – a remarkable amount are languages that had been classified as dialects, mainly languages of Dagestan. Already extinct languages (endangerment level 4) are not included.[3]

[1] The name of the application was changed due to technical reasons. A previous version existed under the name *Avzag* (cf. Ossetic *ævzag* "language"). The screenshots in the current article were made in the mobile application of *Bazur*, version (v) 1.1.4.

[2] In a newer version of the list from 2022, they included seven more languages. However, there is no information on language endangerment in the newer version. Thus, the additional languages are added to Table 2, but their degree of endangerment is left blank. The list from 2020 does not cover Kartvel languages except for Mokhev Georgian. In the list from 2022 on the other hand, Mokhev Georgian is simply designated as Georgian.

[3] The table is given as Table 5 at the end of this paper.

The complete dataset (of 2020) shows how the languages are distributed among the degrees of endangerment, (cf. Table 2); Most languages in the Russian Federation are considered to be definitely endangered.

Degree of Endangerment		**Distribution**	**Percentage**
0	*safe*	14	9,2%
1a	*endangered*	30	19,7%
1b	*definitely endangered*	64	42,1%
2	*severely endangered*	19	12,5%
3	*critically endangered (nearly extinct)*	25	16,5%
		152	100%

Table 2: Language Endangerment in the Russian Federation (cf. Project *Languages of Russia*)

Based on Table 5 (appendix), the distribution and degree of endangerment of the languages spoken in the Caucasus is shown in Table 3. According to the dataset, none of the language is critically endangered. In both tables, the majority of languages is classified as definitely endangered.

Degree of Endangerment (DoE)		**Distribution**	**Percentage**
0	*safe*	3	5,5%
1a	*endangered*	16	29,1%
1b	*definitely endangered*	33	60%
2	*severely endangered*	2	3.6%
3	*critically endangered (nearly extinct)*	–	–
		55	100%

Table 3: Language Endangerment in the Caucasus (cf. Project *Languages of Russia*)

Among the reasons that promote language loss, not passing the language to children is probably the main factor. This is often justified with the lack of prestige of a language. Furthermore, mainstream media is often in the more widespread language, e.g., in the Northern Caucasus it is almost exclusively in Russian. This enhances the fact that a heritage language is encountered more rarely in daily life. Thus, even the youth that does have access to its heritage language only uses it in certain *domains*. *Domains of language* are used to classify the role of a language in one's life. This term was introduced by Georg Schmidt-Rohr (1932) and further elaborated by Joshua Fishman (1972) as *nine domains of language*. These domains include family, street and playground, school, church, literature, newspaper, military, tribunal and administration.

Most of the languages spoken in the Caucasus are classified as *definitely endangered*, followed by a big group of *vulnerable* languages, *severely endangered* languages, and one *extinct* language and another that is *revitalized*. Table 4 provides an overview of some of the languages of the North Caucasus and their degree of endangerment in accordance with Table 1:[4]

[4] The complete table is found in the appendix, Table 5.

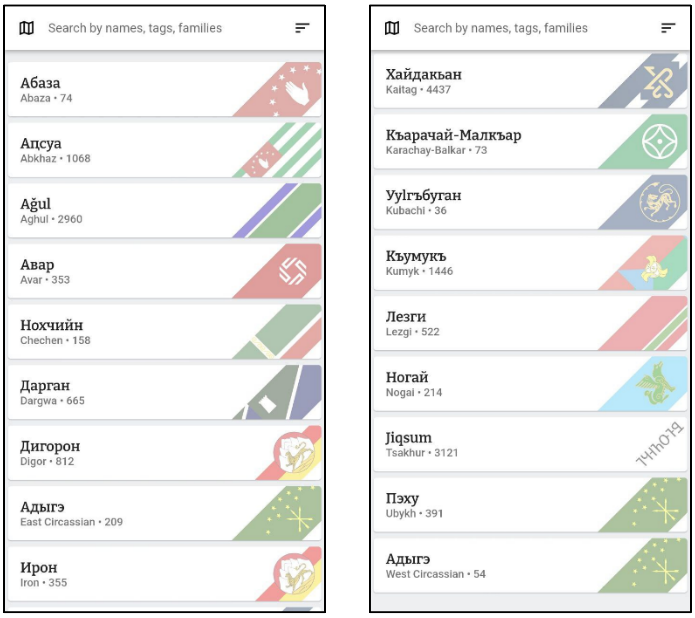
Degree of Endangerment	Language
revitalized	**Indo-European**: Ossetic
vulnerable	**Nakh-Dagestanian:** Avar, Chechen, Dargwa, Ingush, Lak, Lezgian, Tabasaran **Turkic:** Karachay-Balkar, Kumyk **Abkhazo-Adyghean:** Circassian (East & West)
definitely endangered	**Nakh-Dagestanian:** Agul, Akhvakh, Andi, Archi, Bagvalal, Bezhta, Botlikh, Chamalal, Godoberi, Hinuq, Hunzib, Inkhokvari, Juhur, Kaitag, Karata, Khvarshi, Kubachi, Rutul, Tsahkur, Tsez, Tindi **Turkic**: Nogai **Abkhazo-Adyghean**: Abaza, Abkhaz
severely endangered	**Indo-European**: Homshetsma (Armenian)
critically endangered	–
extinct	**Abkhazo-Adyghean**: Ubykh

Table 4: Degrees of Endangerment of the languages spoken in the North Caucasus

Whenever languages are only spoken in certain domains, a speaker's vocabulary naturally becomes restricted to these. This can have an impact on the development of newly created domains such as the internet - instead of promoting neologisms in the heritage language, the already existing language for this domain is being used. In the case of the Caucasus this is Russian and English.

2. Functionality

Bazur (Digor Ossetic "wing") is available as a mobile application for Android, since February 2022 for iOS, and as a desktop version. The first time it is opened, a list of the currently available 18 languages and dialects appears, from which the user can choose one or more languages or dialects of interest.



Search by names, tags, families

Абаза
Abaza • 74

Аԥсуа
Abkhaz • 1068

Ağul
Aghul • 2960

Авар
Avar • 353

Нохчийн
Chechen • 158

Дарган
Dargwa • 665

Дигорон
Digor • 812

Адыгэ
East Circassian • 209

Ирон
Iron • 355

Search by names, tags, families

Хайдакьан
Kaitag • 4437

Къарачай-Малкъар
Karachay-Balkar • 73

Уylгъбуган
Kubachi • 36

Къумукъ
Kumyk • 1446

Лезги
Lezgi • 522

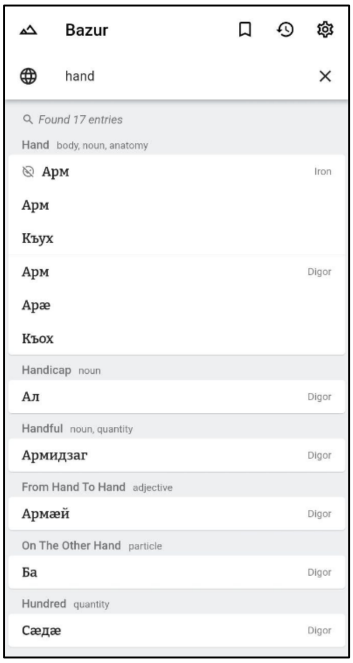
Ногай
Nogai • 214

Jiqsum
Tsakhur • 3121

Пэху
Ubykh • 391

Адыгэ
West Circassian • 54

Figure 1: Home screen of *Bazur*



Found 17 entries

Hand body, noun, anatomy
Арм Iron
Арм
Къух
Арм Digor
Арæ
Къох

Handicap noun
Ал Digor

Handful noun, quantity
Армидзаг Digor

From Hand To Hand adjective
Армæй Digor

On The Other Hand particle
Ба Digor

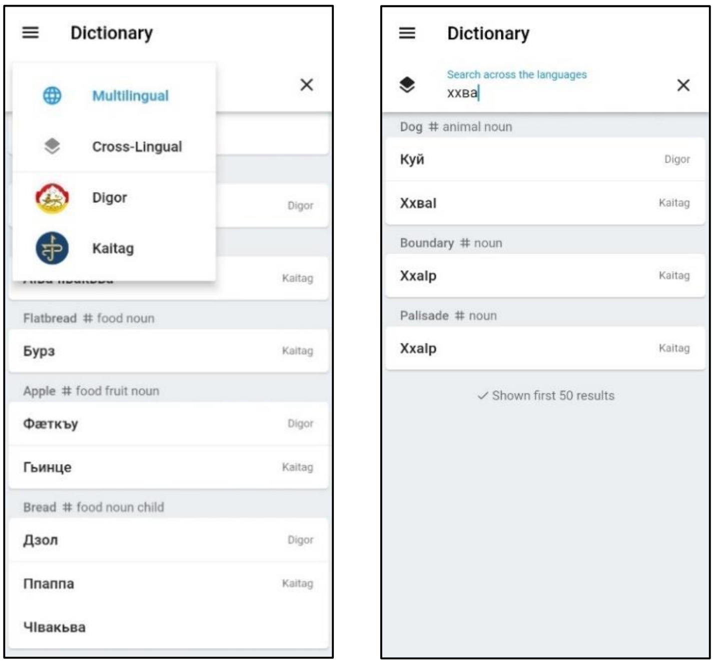
Hundred quantity
Сæдæ Digor

Figure 2: Multilingual search query

After choosing the languages and dialects of interest, the user can proceed to the query mode where words both in English and the selected languages can be searched. Choosing a single language will result in a traditional dictionary where not only translations but further information such as part of speech is provided. The results are grouped according to their meaning. For example, if one has selected both dialects of Ossetic, Digor and Iron, the query 'hand' will show all results under each other: *arm* and *k'ox* for Digor and *arm* and *k'ux* for Iron. Thus, users can easily compare the lexemes with each other.

As can be seen in Figure 2, there are seemingly unrelated words at the end of the list. This is due to *typo tolerance* so that even if one produces a typo the dictionary might still show the correct word. Further, the graphic shows hashtags that are followed by several words. These are tags that are used to describe the entries more closely, as semantic tags that also include information on part of speech. Users can use hashtags in the query to narrow the search for specific domains.

Apart from the so far described multilingual query, the dictionary also provided a cross-lingual query in previous versions of the application (*Avzag* v0.4.30). This mode was taken down in recent versions of *Bazur* due to technical reasons. It might be brought back in future versions. For this purpose, the query feature needed to be selected as Figure 3 shows:



Digor
Kaitag

Flatbread # food noun
Бурз Kaitag

Apple # food fruit noun
Фæткъу Digor
Гьинце Kaitag

Bread # food noun child
Дзол Digor
Ппаппа Kaitag
Чӏвакьва

Dog # animal noun
Куй Digor
Хxвal Kaitag

Boundary # noun
Xxalp Kaitag

Palisade # noun
Xxalp Kaitag

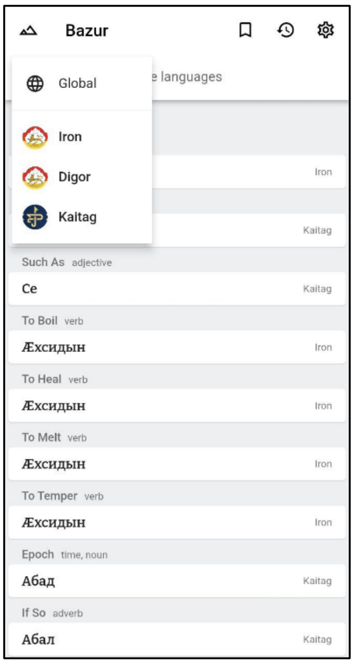
✓ Shown first 50 results

Figure 3: Search modes and cross-lingual search query (pre-version *Avzag* v0.4.30)

In the cross-lingual mode, users are able to search for words in one of the languages they selected at the beginning to receive the output in another language, directly translating the words between languages without needing English.

If more than one language was selected at the beginning the user can easily switch to the single language function. In this mode, all entries in the dictionary are listed alphabetically and the user can scroll through the whole dictionary. Due to the technical complexity of grouping entries, multi-lingual and cross-lingual modes only show the first 50 results in an alphabetical order. Monolingual search has no such limitation and supports so-called infinite scroll.

Due to the lack of the cross-lingual mode, the most recent version of *Bazur* (v1.1.4) has a slightly different search mode, as can be seen in Figure 4. The drop-down window for the search modes was modified and the *multilingual query* is now designated as *Global query*.



Iron

Kaitag

Such As adjective
Ce Kaitag

To Boil verb
Æхсидын Iron

To Heal verb
Æхсидын Iron

To Melt verb
Æхсидын Iron

To Temper verb
Æхсидын Iron

Epoch time, noun
Абад Kaitag

If So adverb
Абал Kaitag

Figure 4: Search modes (recent version *Bazur* v1.1.4)

3. Crowdsourcing and Entry Creation

Allowing native speakers to make contributions to the dictionary concerning their own tongue is a crux in maintaining the project afloat and keeping users involved. After all, the technology matters little on its own without humans utilizing it to their benefit. The languages of the North Caucasus are low-resource languages, many of them, especially in Dagestan, being hardly documented (Koryakov 2021). The recent years have seen raising usage of crowdsourcing techniques for the various purposes of collecting and annotating natural language data (Sabou et al. 2012). This is no surprise, as the crowdsourcing techniques coupled with modern internet technologies open the untapped potential of new modes of collaboration and the diverse power of the crowds. Thus, crowdsourcing seems to be a plausible tool (and perhaps the only one available at the moment) to fill in the knowledge gaps for the languages of Caucasus through the collective efforts by the members of the communities. This makes our crowdsourcing solution belong to the Wisdom of the Crowds (WotC) type of systems which allow members of the general public to collaborate to build a public resource (Wang et al. 2013). Wikipedia is one of the most remarkable instances of WotC systems.

In the crowdsourcing system of *Bazur*, users can be a contributor or an administrator (admin). A contributor is potentially any signed-in user who enables the editor mode and fills in some language data. The only functional limitation is that they cannot delete entries. Upon being done with modifying an entry or creating a completely new one, the user submits the data, creating a copy object and referencing the original entry to be overwritten ("null" in case of a new entry). Such objects are marked with an *unverified* badge in search and entry view until an admin approves (or rejects) it. Admins can perform all the editing, including the deletion of entries. Needless to say, their edits are verified by default. As of moderation capabilities, admins can quickly filter out all the pending entries and act upon each of them (by accepting or rejecting). Admins are assigned by the application developers in the cloud console. The main body of work for the editors was towards making the user interface accessible and easily comprehensible.

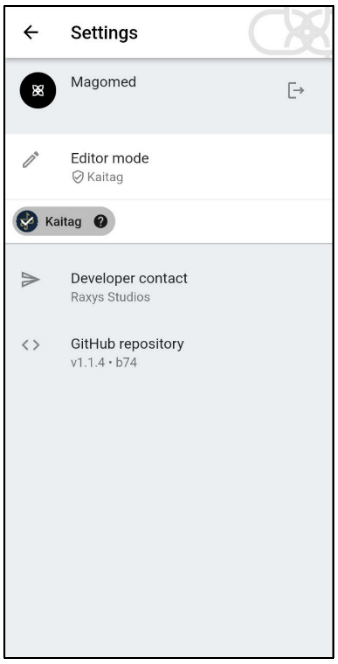
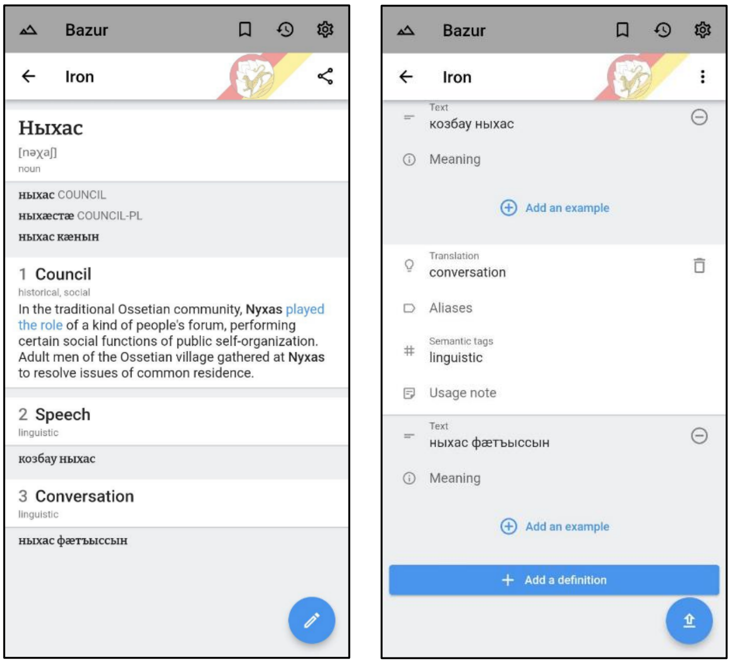


Figure 5: Editor mode

This means that if a user knows how to use the app and can consume the information on the entry screen, they should automatically be able to contribute with almost no additional knowledge. In our early experiments, the editor UI was implemented as a module completely separated from the core user UIs. The main disadvantage of that was the overly complicated interface demanding much additional training from a user. After many iterations, the final product implements an in-place form of editor.



Ныхас
[nəχaʃ]
noun

ныхас COUNCIL
ныхæстæ COUNCIL-PL
ныхас кæнын

1 Council
historical, social
In the traditional Ossetian community, **Nyxas** played the role of a kind of people's forum, performing certain social functions of public self-organization. Adult men of the Ossetian village gathered at **Nyxas** to resolve issues of common residence.

2 Speech
linguistic
козбау ныхас

3 Conversation
linguistic
ныхас фæтъыссын

козбау ныхас
conversation
linguistic
ныхас фæтъыссын

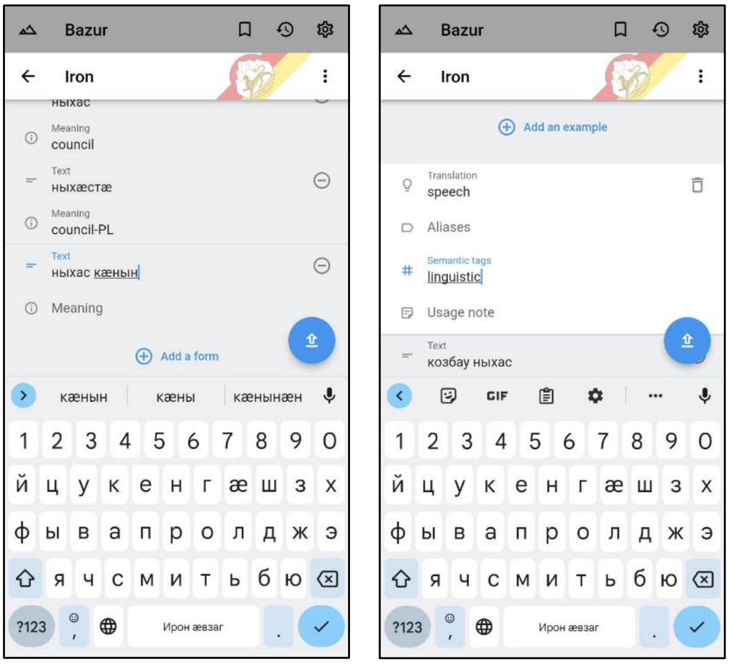
Figure 6: Comparison between viewing and editing modes

To begin with, toggling the "Editor Mode" switch on the side menu and then signing in with a personal Google account is necessary to be able to edit an entry. *Bazur* does not provide the option of creating an individual user account on our own server yet. Nowadays, Google accounts are needed for a large number of other services and applications as well. Thus, we assume that the majority of *Bazur*-users also has a Google account[5] and therefore will not be exposed to complicated first-steps of creating an account before being able to use or contribute to the dictionary. In addition, this measure is necessary to prevent spam and other destructive behaviours possible on an open platform like *Bazur*.

Upon signing in, the user will see the list of all selected languages where he or she can choose the one(s) he or she wants to edit (cf. Figure 1). On the same list the administrators responsible for verifying the language contents can be contacted in case of any content-related issues. Finally, right above the list, textual info is displayed regarding the languages for which the user has admin rights, if for any.

Coming back to the dictionary search screen, the user will notice a floating *new*-button. Similarly, an *edit*-button is displayed on the entry view screen. The former button creates a blank entry, while the latter one makes a copy of an existing one allowing to edit it.[6] Ultimately they both lead to the entry editor UI which is the same as the entry view UI with only a few additional buttons and the key ability to click on any field to edit it. To keep the UI simple and similar to the non-editor mode, all the textual data insertion happens on the dialogue panels, such as *tags*, *notes*, *wordforms*, etc., appearing after a tap on the tiles.

An important usability detail about reviewing contributions by admins is that the pending contributions are not editable. This is the outcome of a tradeoff between functionality and technical robustness of the system. If an admin wishes to make some additional editing to a contribution, they must accept it first. In case when a contribution as a whole is to be rejected, editors still can copy particular fields to their clipboard (by the long tap at the UI tiles) and then enhance the original data entry later.



ныхас

Meaning
council

Text
ныхæстæ

Meaning
council-PL

Text
ныхас кæнын

Meaning

Translation
speech

Aliases

Semantic tags
linguistic

Usage note

Text
козбау ныхас

Figure 7: Some of the editor input dialogues

[5] Further, Google is the biggest search engine worldwide; Online statistics show that for the year 2021 over eleven billion search queries in Google were recorded (cf. Statista).

[6] It creates a local duplicate of the entry. Then upon submitting it to the cloud it creates actually a dedicated object. The only specific part is that the object has a field containing the ID of the word it replaces if accepted. That's how the system knows it is unverified.

Crowdsourcing solutions are inherently dependent on motivating the members of the crowd to be successful. Since *Bazur* is a non-commercial project, we believe that altruism and sense of community (Jiang et al. 2018) should become the main motivational drivers for the users. Selection of the most correct contributions by admins implements a "competition" rather than a "marketplace" mode of crowdsourcing (Vukovic, 2019). Coupled with the display of a daily updated word count per language on the home screen, this brings additional incentives for the users to enhance the public volume of knowledge of their languages.

4. Implementation and Technical Details

From the technical point of view *Bazur* can be characterized as a cross-platform crowdsourcing-enabled cloud-based multilanguage dictionary. The implementation of the project is based on the three most actual technologies: Firebase, Flutter, and Algolia. They help to overcome the three major technical challenges: maintainability, scalability, and usability. Those challenges were identified during the rapid prototyping at the early stages of development. Simultaneously with that, we have conveyed a preliminary study of the market of mobile dictionary solutions for the languages of the North Caucasus. Combined, the experimentation and the market overview have enabled us to perform educated decision making on technology and design choices. All of that is to address current *pain points* (reoccurring UX issues) and also to bring innovation where possible. It is worth mentioning that all of our source code (constituting both client and backend functions) is freely available on a public GitHub repository under MIT license.[7] On the same page we have outlined our public roadmap for the year 2022 (naturally subject to change). More work is to be done on the repository: documentation, backlog, contribution guide, more detailed roadmap, etc.

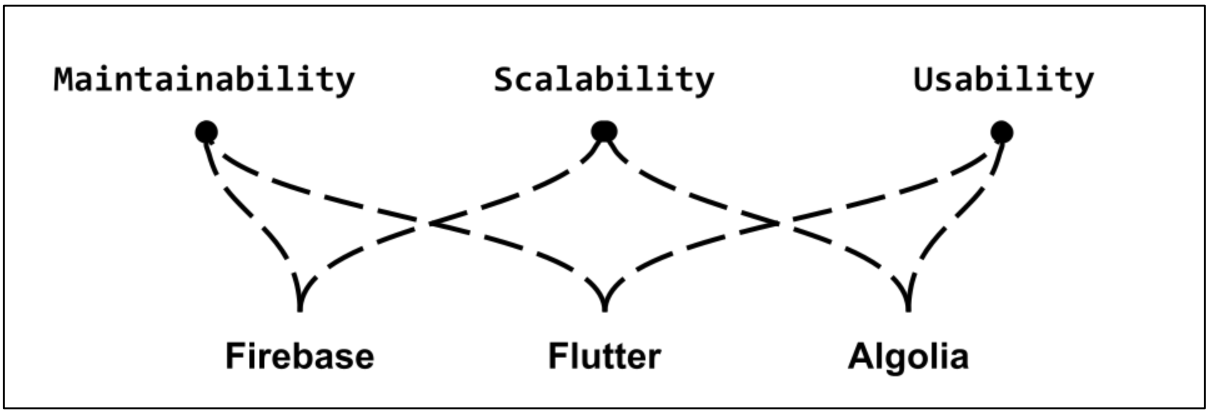


Figure 8: The technologies and the problems

[7] GitHub repository of *Bazur*: https://www.github.com/raxysstudios/bazur.

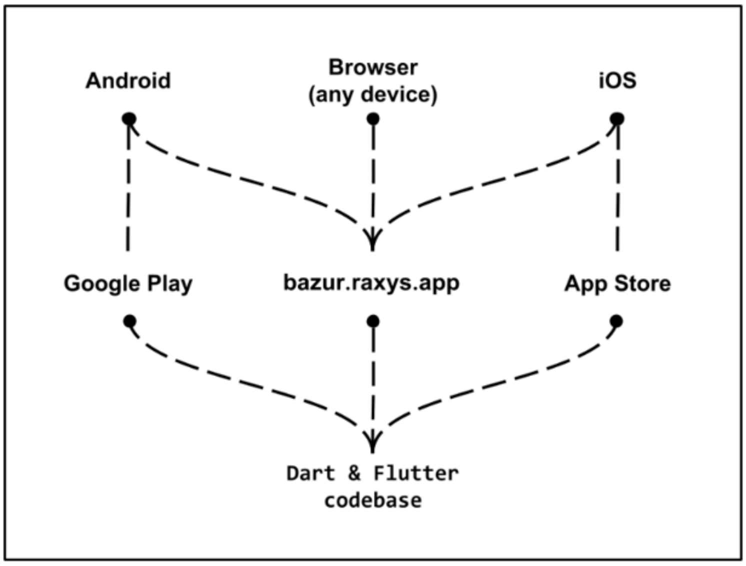


Figure 9: The product distribution model

For the client part, we use Flutter, an open-source UI development kit by Google. The main benefit of Flutter is maintainability. Its cross-platform capabilities enable us to develop and publish the application on Android, iOS, and as a Web-app from a single codebase. We provide the same UI and functionalities on each of the three platforms. Similarly, all the coming features and fixes will be available on the platforms nearly simultaneously and at no additional development cost. Today we live in an increasingly mobile world, where smartphones have become the primary tool of communication and content consumption. Having a modern mobile-first and user-friendly client is vital for making the tools and knowledge accessible to as many people as possible.

For the backend, we use Firebase, a backend-as-a-service platform by Google. The platform bundles common resources needed for modern applications, such as a database, authentication, file and website hosting. It allows us to bypass a significant amount of work on our own backend development and focus on the end-product and customer value instead.

Firebase facilitates the implementation of our mobile cloud application with thin clients. The clients offload all the heavy computations (e.g., indexing, searching) to its remote cloud servers, and only provide the UI themselves. There are two key implications of that. First, the performance does not depend on the user device nor on the size of the database, which facilitates scalability. Second, all the data is available for viewing and editing nearly instantaneously to all connected users, turning the project into a collaborative shared repository of language knowledge.

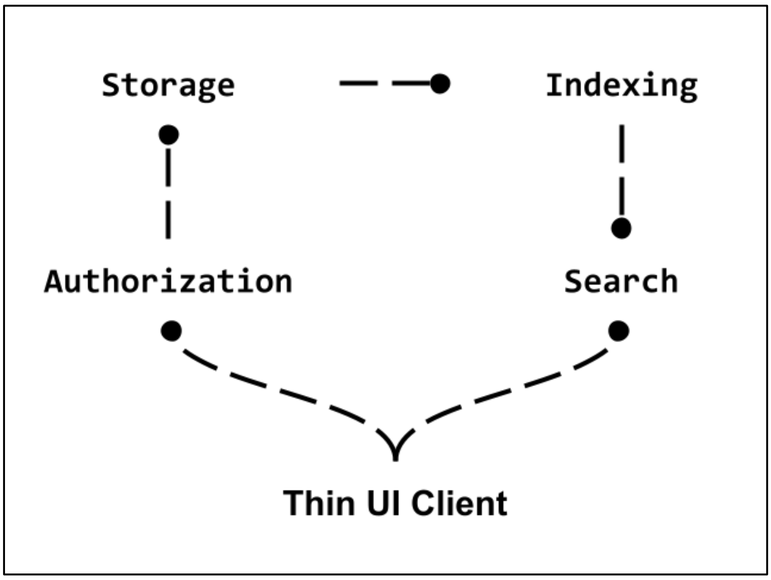


Figure 10: The services co-operation

That approach naturally requires users to have internet connection for being able to use the application. While that might have been a disadvantage even a decade ago, today, we believe, it is a small trade-off to benefit all, even more so since the recent pandemic has accelerated digitalization and increased the connectivity of our world.

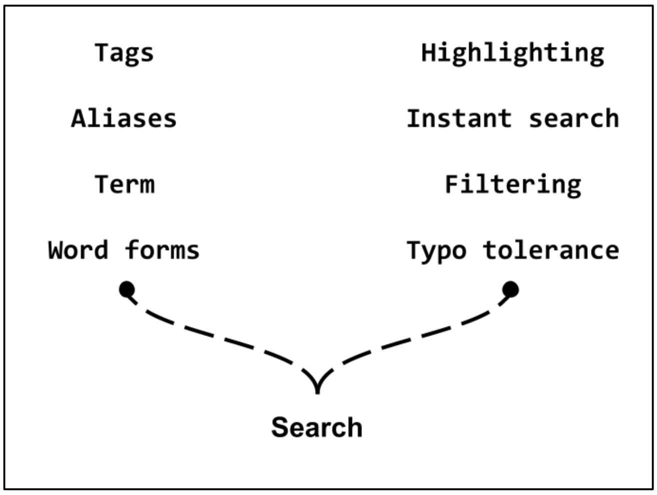


Figure 11: The services co-operation

Search functions are fundamental to any dictionary; they are what defines the user experience. Searching tools are not limited to any particular genre of application, they are an integral part of many, if not all, modern online services, from Wikipedia to Amazon and everything in between. Google, consistently the most visited website in the world, is a search service itself. Consumers of contemporary online services such as YouTube shall not experience any restraint by these means when they use *Bazur*. To avoid that, we utilized Algolia, a cloud provider of state-of-the art search technology. It is the same service that powers many digital storefronts and other products where ability for users to quickly find what they want is crucial. As with Firebase, utilization of Algolia allows us to avoid heavy work on implementing what would only be a fraction of Algolia capabilities. The key advantages we have received are as follows: instant (real-time) search, simultaneous search across various fields (e.g., word-forms, aliases), soft and hard filtering by tags, *typo tolerance*, and highlighting of matching parts of text.

Combined, they allow users to efficiently explore the dictionary, showing precisely what they look for, and also what they might have wanted to see. Thus, the application implements the search experience that any user implicitly expects nowadays by being constantly exposed to the big online services.

5. Conclusion

The languages of the North Caucasus have traditionally been overlooked by large consumer-oriented language enterprises such as Google Translate or Duolingo; this is partly due to the small number of speakers, partly due to the absence of consistent institutional support and simple lack of resources. Many solutions have been emerging from the grounds over the last decade with the increased availability and the general spread of technologies and software engineering.

However, mainly due to the mentioned lack of resources, several products were not able to keep up in the race with the rapid technological progress and ever-increasing user-expectations. The apparent obsolescence of existing solutions demands for an updated approach and new initiatives.

Using state-of-the-art technologies and avoiding reinventing the wheel, we have focused on building a great consumer product that is beneficial to anyone from professional linguists to language enthusiasts. A friendly user interface, powerful search capabilities, and convenient cloud-availability were the key areas of the development. Then, on top of an already valuable product on its own, we have built the crowdsourcing functionality, making every speaker a potential contributor. Finally, we have opened the source code and outlined our public roadmap, giving people confidence in the future of the project.

References

Fishman, J. A. (1972): *Language in sociocultural change*, (ed.: Dil, Anwar S.). California: Stanford University Press.

Jiang, Y. & Schlagwein, D. & Benatallah, B. (2018): *A Review on Crowdsourcing for Education: State of the Art of Literature and Practice*. In: Proceedings of the Twenty-Second Pacific Asia Conference on Information Systems.

Maisak, T. A. & Sumbatova, N. R., Testelec, Ya. G. (eds). (2021): *Durqasi xazna*. Sbornik statej k 60-letiju R.O. Mutalova. Moscow: Buki Vedi.

Moseley, C. (ed). (2010): *Atlas of the World's Languages in Danger*, 3rd edn. Paris, UNESCO Publishing.

Sabou, M. & Bontcheva, K. & Scharl, A. (2012). *Crowdsourcing research opportunities: lessons from natural language processing*. In: Proceedings of the 12th International Conference on Knowledge Management and Knowledge Technologies, 1-8.

Schmidt-Rohr, G. (1932). *Die Sprache als Bildnerin der Völker*. Jena: Eugen Diedrichs.

Vukovic, M. (2009). "Crowdsourcing for Enterprises". In: *Congress on Services* 1, 686-692.

Wang, A. & Hoang, C. D. V. & Kan, M. Y. (2013). *Perspectives on crowdsourcing annotations for natural language processing*. In: Lang Resources & Evaluation 47, 9–31.

Online Sources

Bazur Web app: https://bazur.raxys.app/

Bazur on Google Play: https://play.google.com/store/apps/details?id=com.alkaitagi.avzag (accessed December 12, 2022)

Bazur on App Store: https://apps.apple.com/ru/app/avzag-languages-of-caucasus/id1603226004 (accessed December 12, 2022)

GitHub Repository: https://www.github.com/raxysstudios/bazur (accessed December 12, 2022)

Koryakov, Yu. B. et al. (ed) (2020): *List of Languages of Russia* (*“Список языков России”*). Available online at http://www.jazykirf.iling-ran.ru/list_concept2020.shtml (accessed December 12, 2022)

Statista: https://de.statista.com/themen/651/google/#dossierKeyfigures (accessed December 12, 2022)

Appendix

	Language	**Language Family**	**DoE**
1.	Abaza	NWC	1b
2.	Abkhaz	NWC	n/a
3.	Adyghe	NWC	1a
4.	Agul	NEC	1a
5.	Amzugi-Shirinski	NEC	1b
6.	Andi, Upper Andi	NEC	1b
7.	Archin	NEC	1b
8.	Armenian, Eastern Armenian	IE	0
9.	Avar	NEC	1a
10.	Azerbaijani	Turkic	0
11.	Bagvalin, Bagualin	NEC	1b
12.	Bezhta	NEC	1b
13.	Botlikh	NEC	1b
14.	Chamalin, Chamalal	NEC	1b
15.	Chechen	NEC	0
16.	Chirag	NEC	1b
17.	Gapshimin	NEC	1b
18.	Gigatlin	NEC	n/a
19.	Godoberi	NEC	1b
20.	Hinuq	NEC	1b
21.	Hunzib	NEC	1b
22.	Ingush	NEC	1a
23.	Inkhokvarin	NEC	n/a
24.	Itsarin	NEC	1b
25.	Kabardino-Circassian; Kabardian, Circassian	NWC	1a
26.	Kaitag	NEC	1b
27.	Karachai-Balkar; Karachai, Balkar	Turkic	1a
28.	Karagash	Turkic	1b
29.	Karatin	NEC	n/a
30.	Khvarshin	NEC	1b
31.	Koshan	NEC	n/a
32.	Kubachi-Ashtin	NEC	1b
33.	Kumyk	Turkic	1a
34.	Kunkin-Amukh-Khuduts, Upper Vuruk	NEC	1b
35.	Kvankhidatl'-Munij, Lower Andi	NEC	1b
36.	Lak	NEC	1a
37.	Lezgi	NEC	1a
38.	Mehveb	NEC	1b
39.	Mokhev Georgian	SC	1b

40.	Muirin	NEC	1b
41.	Nogai	Turkic	1a
42.	Northern Akhvakh	NEC	1b
43.	Northern Dargi	NEC	1a
44.	Ossetic	IE, Iranian	1a
45.	Rutul	NEC	1a
46.	Sagadin	NEC	1b
47.	Sanzhi	NEC	1b
48.	Sharin	NEC	1b
49.	Southern Akhvakh	NEC	1b
50.	Southern Rutul	NEC	n/a
51.	Tabassaran	NEC	1a
52.	Tanty-Sirkhin	NEC	1b
53.	Tat, Mountain Hebrew	IE, Iranian	2
54.	Tindin, Tindal'	NEC	1b
55.	Tsakhur	NEC	1a
56.	Tsez, Didoic	NEC	1a
57.	Tsudakhar	NEC	1b
58.	Tukitin, Tokitin	NEC	1b
59.	Udi	NEC	2
60.	Usisha-Butrin	NEC	1b

Table 5: Endangerment of the Languages of the Caucasus (cf. Project *Languages of Russia*)

Bazur - კავკასიის ენები თანამედროვე ტექნოლოგიურ სივრცეში

მაგომედ მაგომედოვი, ემინე შაჰინგიოზი

უმცირესობათა ენებს, ისევე როგორც საფრთხეში მყოფ ენათა უმეტესობას, ხშირად არ გააჩნიათ ელექტრონული რესურსები, მათ შორის ლექსიკონებიც. იმ ენებს, რომლებსაც უფრო „გაუმართლათ“ და მეცნიერთა ინტერესის სფეროში მოხვდნენ, დღეისათვის გააჩნიათ არა მხოლოდ დიგიტალური რესურსები, არამედ მობილური აპლიკაციებიც, თუმცა ისინი ძირითადად ვერ აკმაყოფილებენ დღევანდელი ტექნოლოგიურად განვითარებული ახალგაზრდების მოლოდინებს. ჩვენ მიერ შექმნილი ელექტორნული ლექსიკონი **ბაზური** („ფრთა“) წარმოგიდგენთ ახალ ექსპერიმენტულ გადაწყვეტილებებს, რომელიც მოწოდებულია დაძლიოს დღეისათვის არსებული დაბრკოლებები ახალგაზრდა თაობის ინტერესების გათვალისწინებით და ენის ტექნოლოგიების განვითარების მეშვეობით დააინტერესოს ისინი მშობლიური ენით. ლექსიკონი შექმნილია თანამედროვე მოთხოვნების შესაბამისად ორივე ფორმატში - როგორც მობილური, ისე ვებაპლიკაციის ფორმით.

წინამდებარე სტატიის მიზანია, პირველ რიგში, მკითხველს გააცნოს კავკასიის ენები და მათი საფრთხეში მყოფობის ხარისხი იუნესკოს **საფრთხეში მყოფი ენების ატლასის** მიხედვით. სტატიის მეორე ნაწილში აღწერილია ლექსიკონის სტრუქტურა და ფუნქციონირების მექანიზმი, მესამე ნაწილი კი ეთმობა აპლიკაციის საგანგებო ფუნქციას, რომელიც საშუალებას აძლევს ინტერნეტმომხმარებელს, აქტიურად ჩაერთოს აპლიკაციის განვრცობა-განვითარებაში. ნაშრომის ბოლო, მეოთხე ნაწილში მოცემულია პროექტის განხორციელების ძირითადი მიმართულებები და სამომავლო გეგმები.