

AUGMENTED DEMOCRACY PROPOSAL



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1 Gaps and problems

Today there is a need to build democratic governments that encourage continuous debate and build their decisions from the opinion of the public, which is why the creation of an efficient system in decision making is becoming increasingly necessary. The accelerated progress in technological advances and the great interaction that exists between the human being and the artificial intelligence makes that the idea of a digital government or a model of increased democracy is no longer a utopian thought at present.

This propose identifies and describes the main problems in the political decisions of the indigenous communities in Chile, and how they allow for the development of an augmented democracy model that can increasing the participation and representation of the communities in the country, this through the effective and automated transmission of their interests with related entities, whether governmental or private entities that develop their corporate social responsibility in aid of indigenous peoples.

For the analysis and development of the model of augmented democracy, we worked with the Mapuche community Eugenio Araya Huiliñir located in the commune of Renaico, Araucania region, Chile. This Community, like many others in the country, has the need to express its concerns to the government, increase its representativeness, and improve the direct participation of its members in local or regional political and social decisions, as well as attract the attention of the governmental and private entities in a more efficient manner, generating mutual agreements that improve relations and the targeting of resources in social, cultural and economic activities aligned with the interests of their peoples.

The demands of the indigenous peoples rescue the right to continuity of origin, the importance that exists for their culture, the vindication of their ancestral lands and the need to create their own forms of self-government, in order to promote their customs, spirituality and determine their own future by controlling their economic models and natural resources. These demands are undoubtedly relevant for the decision-making of the government and related entities, since it helps to detect the main preferences of the communities and how solutions can be generated focused on their growth and autonomous development.

1.1 The gap in the world

The demands for a historic reparation to indigenous peoples and communities are not exclusive to Chile. In the world there are experiences of different countries with effective actions and results that have initiated strategies to rebuild trust with their native peoples from the recognition of the historical postponement of their economic and cultural development.

In New Zealand, based on a Compensation Agreement, the government focused efforts to repair the injustices committed against the Maori people, through financial compensation, the handing over of land and the transfer of rights to exploit the resources of these lands. In fact, private companies that occupy land resources belonging to Maori compensate these communities economically, helping to improve aspects of infrastructure, health, education and generating development plans for these indigenous peoples. To himself, in the United States the Law of Regulation of the Indian Random Games (IGRA) was promulgated, where from the raising of funds of game casinos, the economic development of the indigenous tribes is promoted and the opportunities for increase the self-sufficiency of these tribes in their territories.

In reviewing the experiences of the United States and New Zealand, it is agreed that the actions carried out by governments are related to self-determination, a term that refers to the right of peoples to govern themselves according to their own style and way of seeing the world (for the Mapuches would be the Worldview) and the right to articulate their relationships.

1.2 “Indigenous Vision” Model

All the actions mentioned above are relevant to promote the development of indigenous communities in the countries, and have allowed indigenous peoples to maintain their traditions and empower them through the creation of local sub-markets and even the best of cases, expanding their relationships, contributing significantly to the growth of their country. But, how to know if the governments foment the development from the interests of the communities? Will it be that all need a same model of development? Are native people happy with these initiatives? Do these represent their interests? In response to these questions, the model of augmented democracy "Indigenous Vision" is born, an intelligent tool that collects, integrates and automates the decisions and preferences of all members of indigenous communities in Chile, updating their information based on the feedback of their users, allowing them to learn and project their future positions in political, cultural, social and economic aspects. Undoubtedly, this tool will change the way decisions are made by governments and society in general, will give way to a more just and

representative democracy, will foster the participation of communities and will allow public policies to be focused and aligned with the interests of people, redirecting resources to mitigate the problems that affect today and will affect in the future the sustainability and progress of indigenous peoples.

2 Mockups

Indigenous Vision is an intelligent platform that will serve to give an estimate of the opinions held by different members of the indigenous communities in the face of various inquiries made by private and state entities about projects they have in mind. Therefore, three types of users are identified (Government, private and indigenous communities). The first two types of users can only access the platform, after registration, to make inquiries about the perception of communities about projects they want to carry out. On the other hand, the members of indigenous communities have a profile that allows giving feedback to the predictive model.

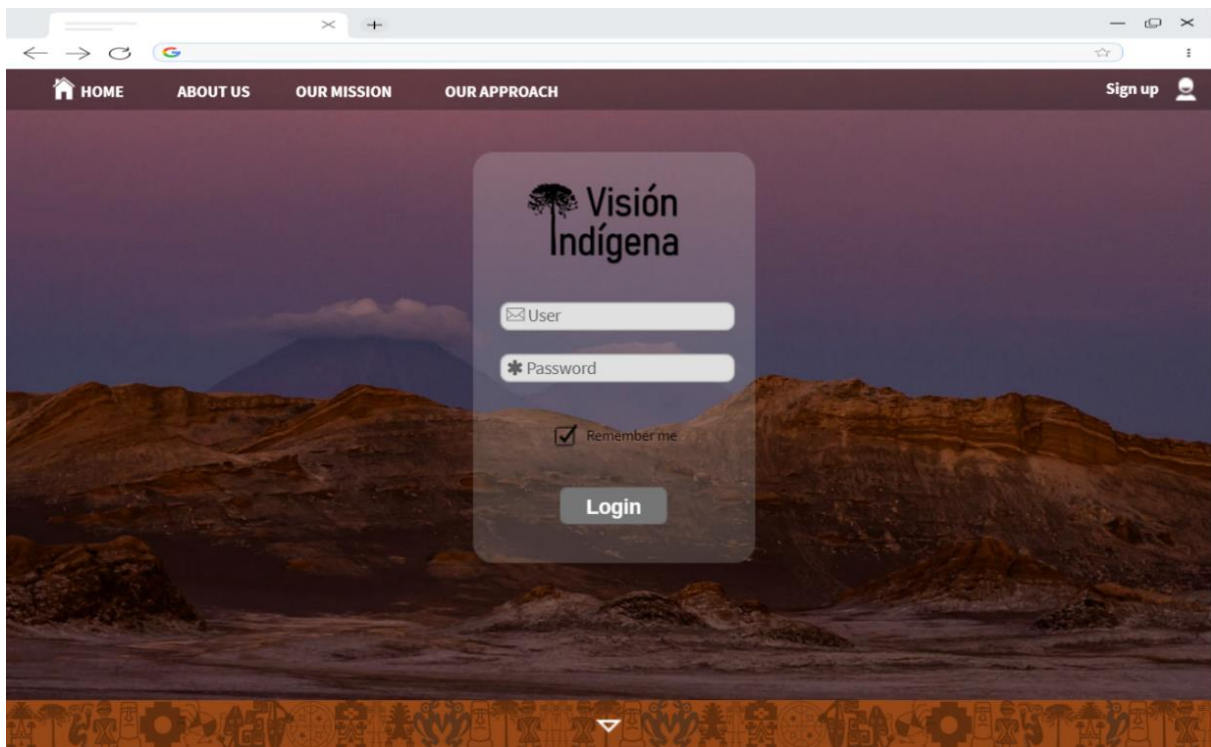


Figure 1. User interface one.

In the first interface of Indigenous Vision, Figure 1, the user will be able to see in the upper right corner the "sign up" button, when entering this section there will be two registration options (External or members of an indigenous community):

External: Both government users and private entities have the option to register on the platform to be able to ask questions, where they must enter their personal data, corporate data, institution ID, username, email and industry to which they belong. This information is corroborated by the application with data previously obtained from the database of these entities, later with the confirmed account, the user's access to the platform is allowed.

In the opposite case, for the members of the indigenous communities, the platform will provide a user and a password to each of these, where CONADI¹ (a collaborator for the development of the platform) will serve as an intermediary to corroborate the indigenous quality of each individual and provide the corresponding password. It is the decision of the members of the communities to activate the account, but even if they do not, there will also be an avatar that will participate in the predictions made by the platform in face of consultations, only that the user's feedback on this prediction will not be available.

In the navbar you can find different sources of information about the application, about us, our mission and our approach. In addition to having the option to return to the main page by pressing the "home" tab. To access these, you can click directly on each icon or directly use the arrow located at the bottom of the interface.

Finally, the individual with the account created and confirmed by the platform can access by entering their username and account in the central section.

¹ The National Indigenous Development Corporation (CONADI), according to its mission statement, is a Chilean institution, created in 1993 through Law 19253, whose objectives are the promotion, coordination and execution of state action the development plans of the people belonging to the indigenous peoples of Chile.

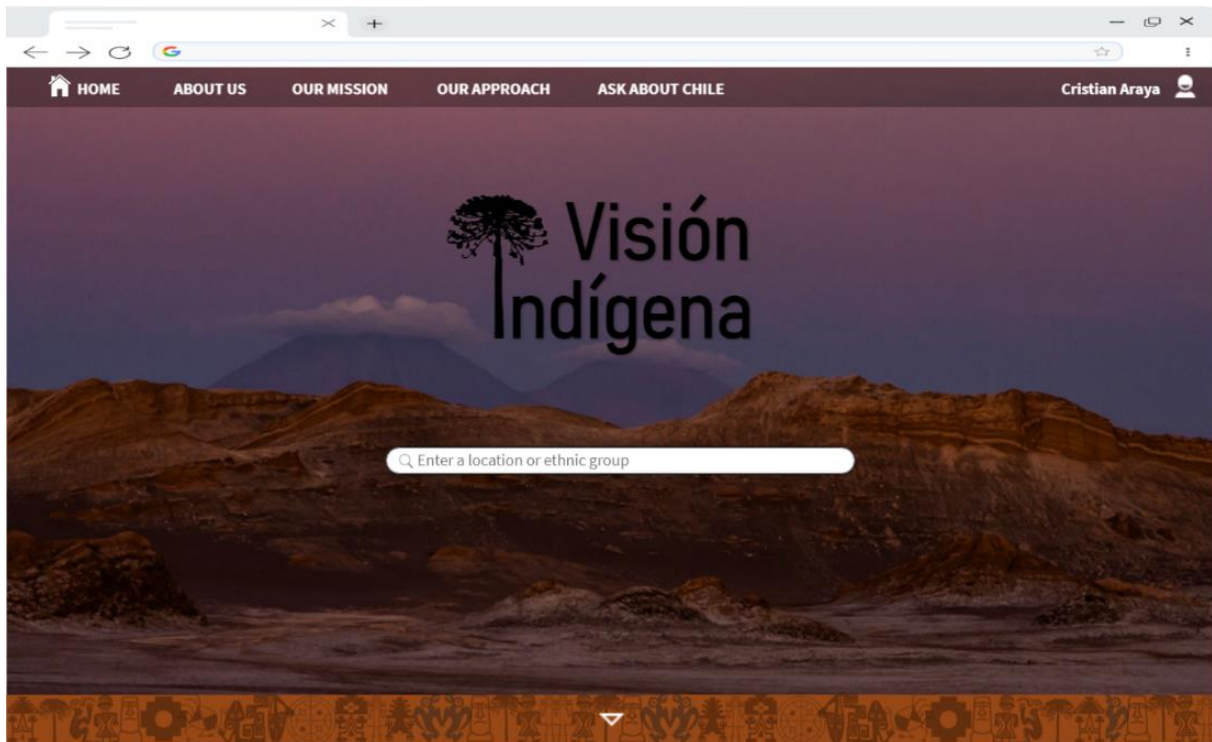


Figure 2. User interface two.

In this interface shown in Figure 2, the user with the account already started, can enter in the search bar the location on which the query will be made or the ethnic group to which they want to go. The search by location is focused for those users who want to know the impact and perception about certain projects in a specific area. This location can consider one or multiple communities and even from different ethnic groups.

In contrast, the search by ethnic group is exclusively for those users who want to consult about projects that may affect indigenous peoples throughout the country.

In case you want to make a general query that includes different ethnicities and localities without any exception, the user can go to the top bar of this interface and press the option "ask about chile" to get results to this type of query, interface that will work in the same way as the next section. If the option chosen by the user in this section was by ethnicity, the platform will display the different options of ethnic groups that are in the national territory (Mapuches, Picunches, Selknam, Atacameños, Diaguitas, etc). When choosing one of these ethnic groups, the platform will direct the user to a new tab that will be explained below.

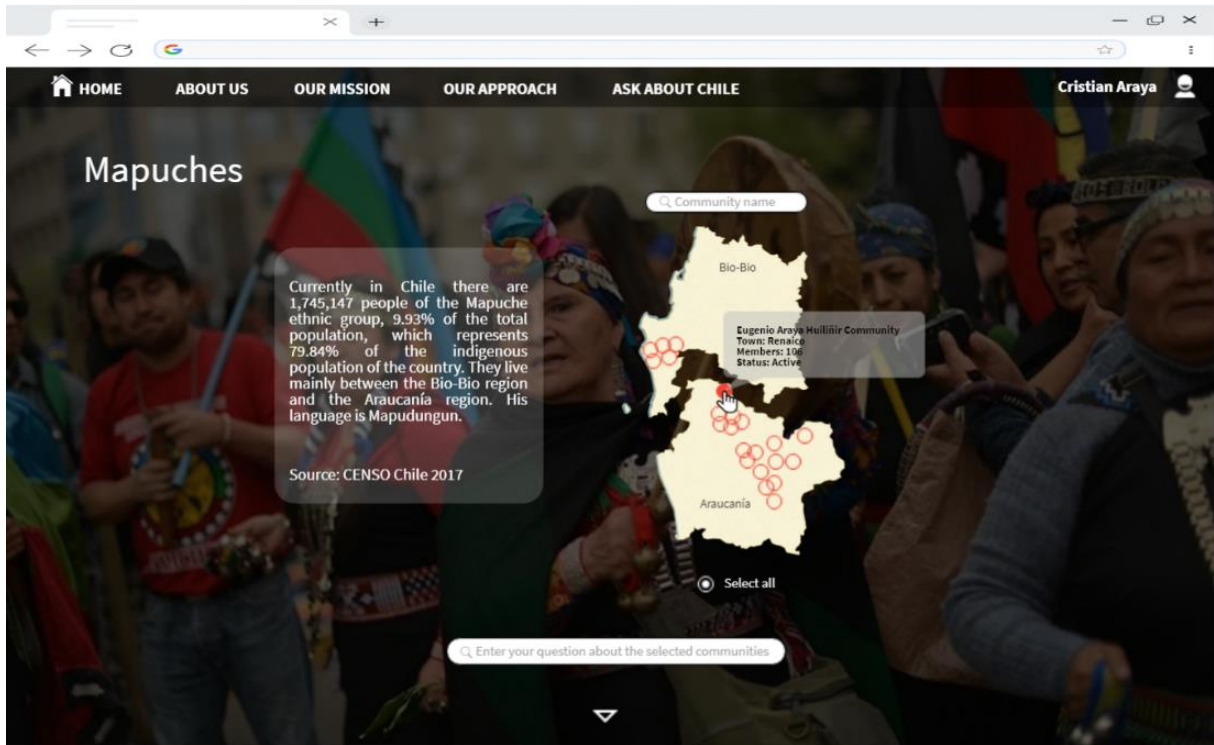


Figure 3. User interface three.

As an example, Mapuche ethnic group has been chosen. In this section, shown in Figure 3, a brief information about this indigenous group is presented, with the objective of informing the individual, in addition to its right side the geographic zone where each one of the communities belonging to the Mapuche culture are located, which are represented by transparent circles and have the peculiarity of taking a red color and display basic information of the community, when you position the cursor on its location.

Another way to choose a community is to press the bar at the top of the map and enter its name. The particularity of this section is to be able to choose between one, several and even all the necessary communities to make a query, which can be done in the bar that is at the bottom of the map.

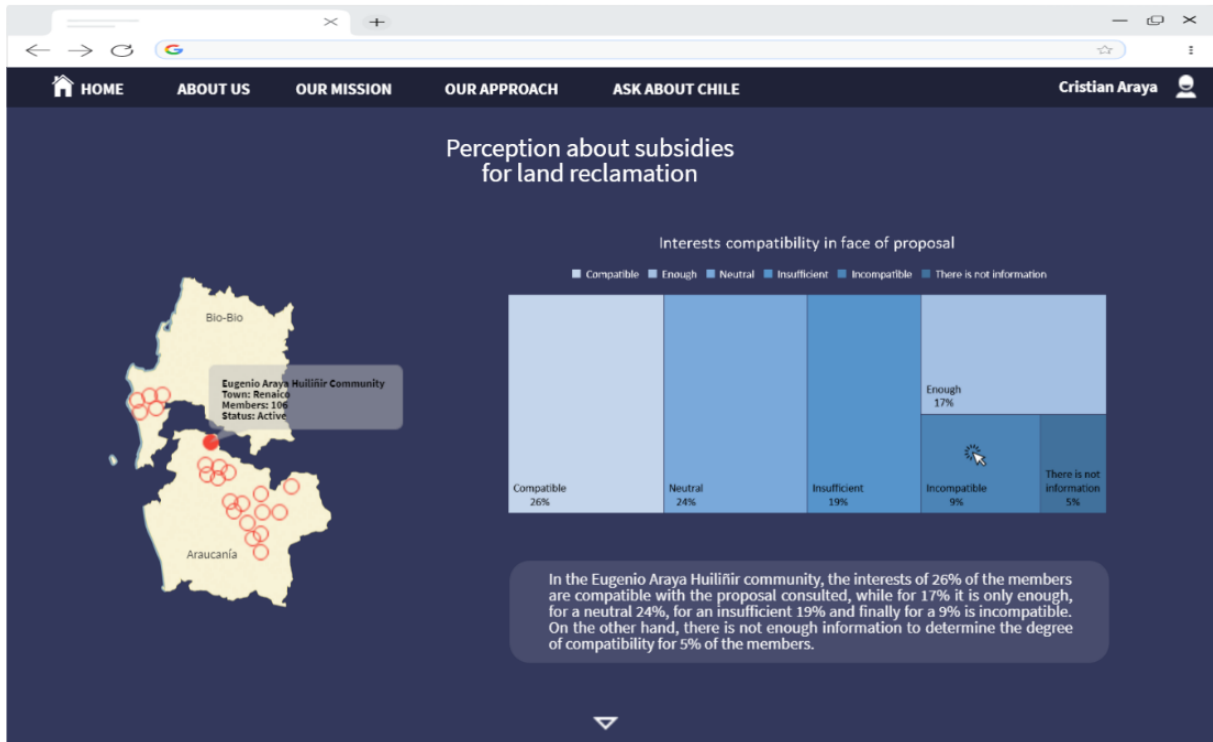


Figure 4. User interface four.

Once the query is done in the previous interface (Figure 3), this section of the platform, shown in Figure 4, can be accessed, where the results will be displayed in a tree map that is made up of different clusters, which represent the degree of compatibility in percentage presented by the members of the community in face of the proposal consulted. This section represents a very useful tool for the consultant since it provides enough information to predict if a community is synchronized with the project to be implemented. In addition, in the lower part of the diagram, there is an explanation of the results obtained in order to improve its interpretation. The user can access the groups of the diagram by clicking on each of the clusters, to find more information that will be detailed below.

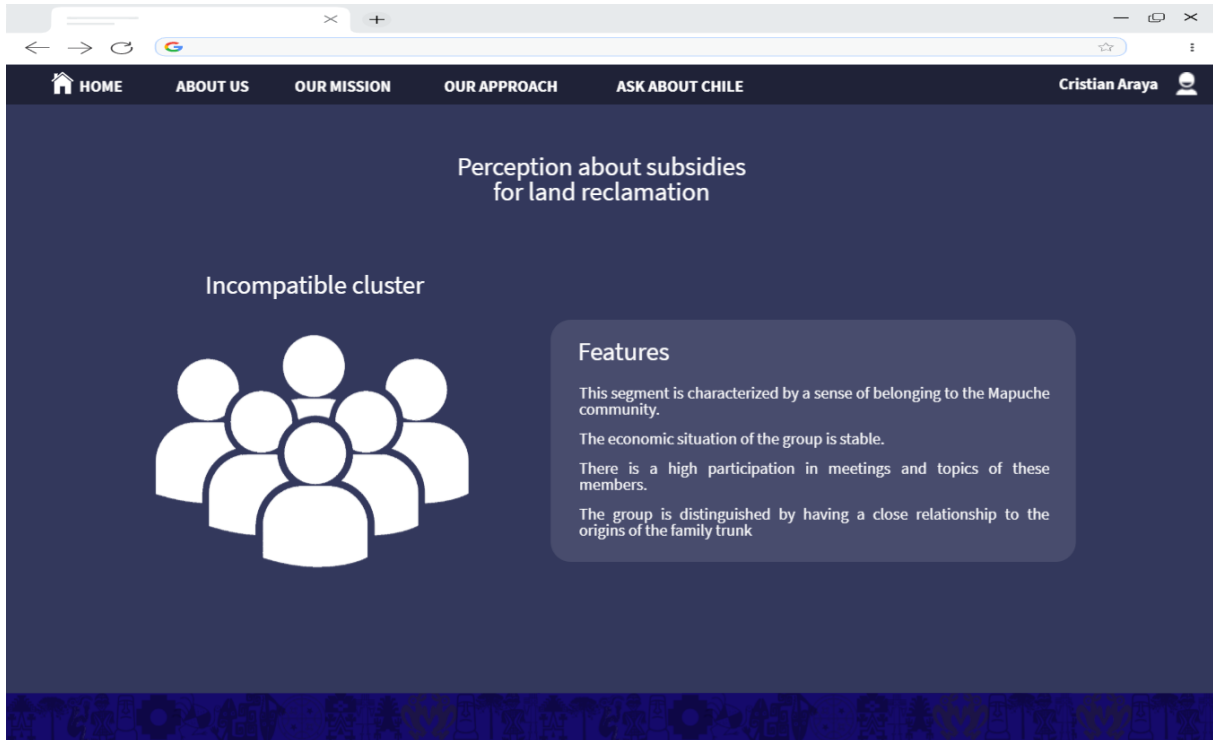


Figure 5. User interface five.

In this section, Figure 5, you can recognize the common characteristics of the selected interest group, justifying the reason why they are grouped in the same set of compatibility in front of a query. It was created in order to serve as a support tool and feedback for the consultant, where you can find a better way to identify the interests of the community to get more information.

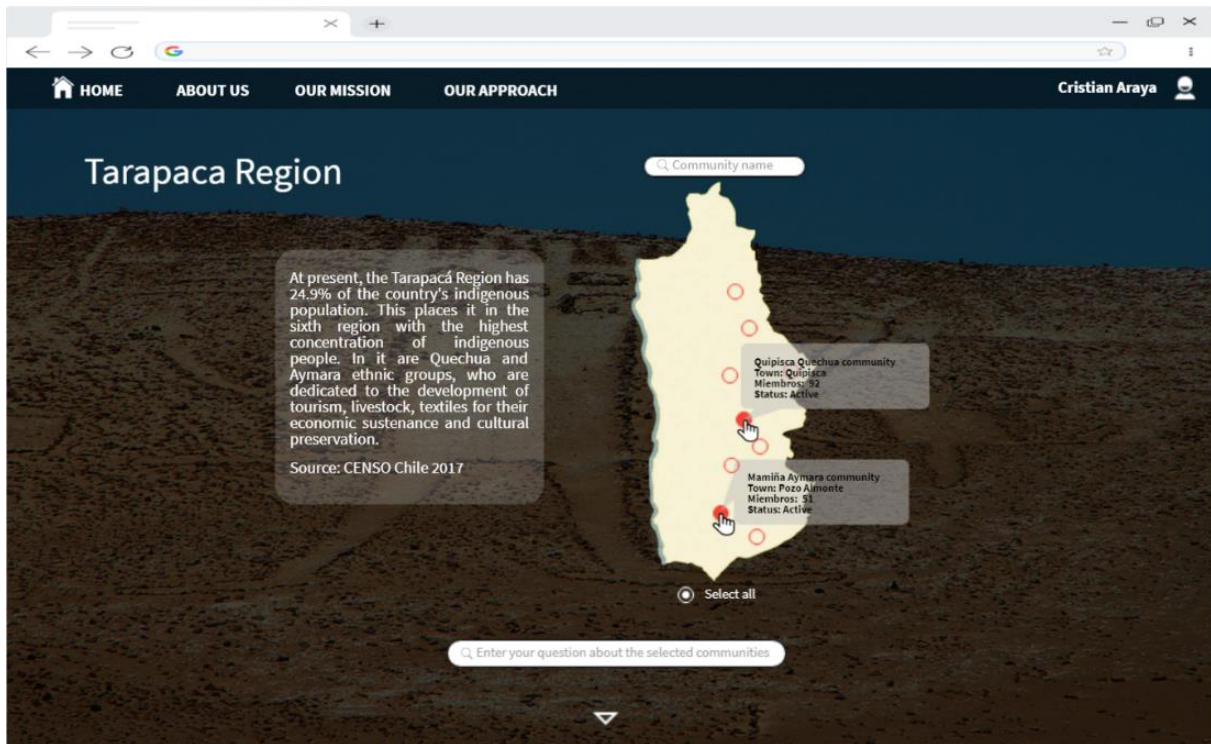


Figure 6. User interface six.

On the other hand, if the option chosen by the user in the interface shown in the Figure 2, was by location, the platform will display the different options of existing regions in the country. (Arica and Parinacota, Tarapacá, Metropolitana, Bío Bío, etc). By choosing one of these regions, the platform will direct the user to a new tab that is displayed in Figure 6.

As an example, the Tarapacá Region has been chosen, where certain characteristics related to the ethnic groups that inhabit this area are described with the objective of informing the individual, as well as a map of the region that has the geographical location of each one of the indigenous communities, which are represented by transparent circles and have the peculiarity of taking a red color and display basic information of the community, when you position the cursor on its location.

Another way to choose a community is to press the bar at the top of the map and enter its name. The particularity of this section is to be able to choose between one, several and even all the necessary communities to make a query, which can be done in the bar that is at the bottom of the map. The operation of a query in this tab will be in the same way as detailed above.

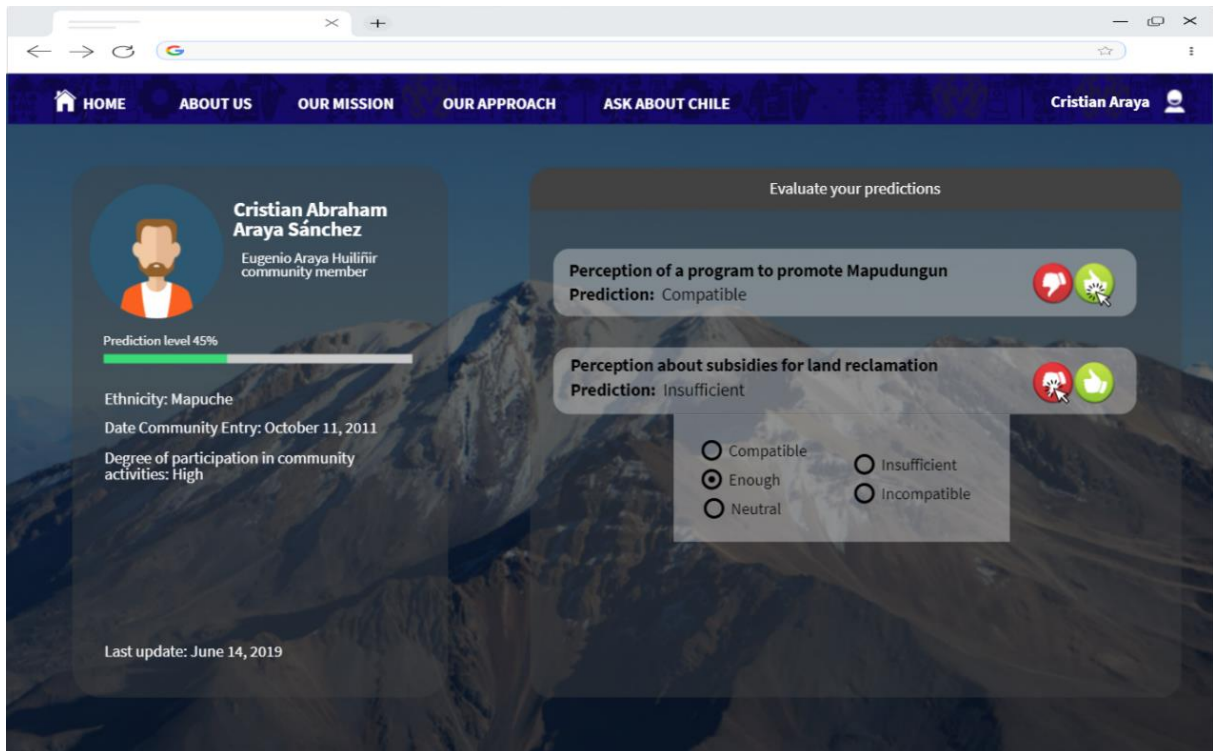
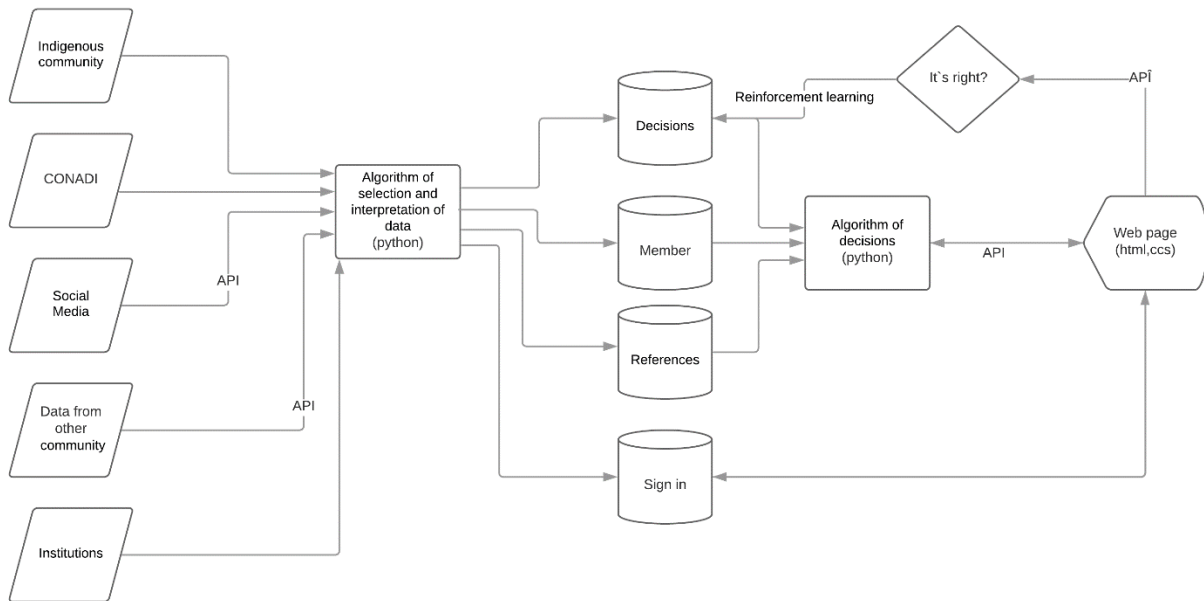


Figure 7. User interface seven.

This interface, shown in Figure 7, will be focused exclusively on users belonging to indigenous communities and is the main tool that has the platform to feed back the knowledge we have of each individual according to his perspective on the projects that involve him. To access it, just click on the username located on the far right of the navbar. In the navbar, you will find the same commands of the previous interface. This UI include in the left part, the identification of the user, which includes name, indigenous ethnic group, community to which it belongs and degree of participation in the activities called by the community, and in each rectangle located on the right will be located the queries that different entities made about the community to which it belongs, where the user will have the power to approve the prediction or disapprove the prediction made. In the case that disapproves the prediction, a tab is displayed that shows the different alternatives for that particular query. The user can choose one of them, generating a feedback to the model.

3 Technological Stack



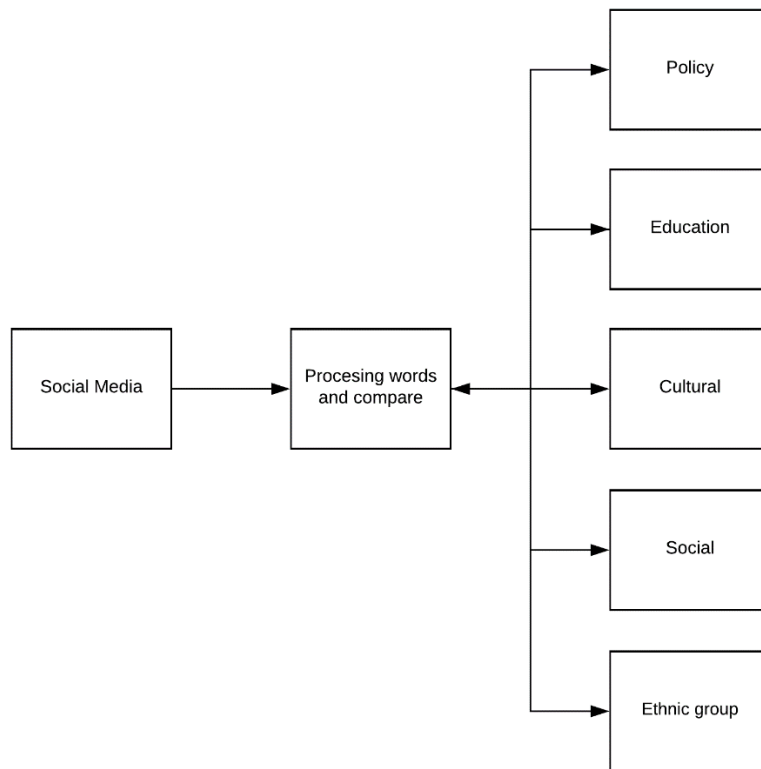
Source: Own elaboration.
Figure 8. System diagram of the technologies to be used.

The operation of this intelligent platform requires a great source of information, with the aim of creating a profile of each member that belongs to an indigenous community. For this, the collaboration of the state entity CONADI, which has an extensive database of each person that is part of an indigenous community, is considered first. The data obtained from this source include the Name, DNI, Age, Occupation, Income of head of household, Schooling, Housing and/or property (Own, lease, subsidy, close, assigned, succession, real right of use, without land), Land area, Mapudungun level, Subsidies, Ascendancy and Descent, among others. A second source of data comes from the information collected by each community, such as the minutes of the meetings, which record the level of participation of each member in the activities of different nature that are developed and the option chosen in the voting that allows identify the preferences of each profile.

On the other hand, data of individual interests will be obtained by monitoring the activities and interactions with news in social media, to reinforce the profile of each of them in relation to their behavior and opinions on various topics of economic, political events, social and other relevant dimensions for its characterization. Also, it is considered as a data source, the good practices of other indigenous communities that are published through their web pages or in news, with the

objective that the predictive model considers these for decision making. The data collection is done through an API of each source.

For the collection of data through social networks, people are identified through their email names and telephone numbers, to make the link with the profiles of each member of the community already created in the database. Then you get the data of the post they have published, comments made in the social network and interactions with news. These data are classified into five main dimensions of interest: political (to identify political trends), social (to know the degree of interest in the current social event), cultural (with the aim of defining a degree of belonging to a particular culture) , educational and ethnic. From the interactions that are recognized around these dimensions, key words are identified to determine the result in each of the mentioned dimensions. This data is stored in the member's data. This process is illustrated in the Figure



Source: Own elaboration.
Figure 9. System diagram of the technologies to be used.

All of this data will be processed by means of a selection and interpretation algorithm developed in a Python environment, to be stored in a relational database that will have data from each member and a database of references with the individual decisions passed, taken at the meetings of each community.

The platform will be developed using different tools to work in conjunction with HTML, CSS, JavaScript, among others, and thus create an intuitive interface for the user as shown in section 2. This platform is connected to a model Predictive, which will have the ability to issue, for each profile, a judgment on the queries that are made in it. Said model will be constructed using machine learning techniques through a Python interface. This will use the data source that you have, plus the interactions that occur in the same platform, that is, the model will be reinforced by storage and learning of the queries that are made, and the approval or rejection of users about of the predictions that have been made about them.

4 Problems

We must be aware of the importance of identifying the different problems that can alter the proper functioning of the platform, with the aim of being prepared for different eventualities. The problems that can be identified are the following:

4.1 Accessibility to model data

The members of the indigenous communities in Chile are characterized as distrustful and insecure people with steps taken by people who are not of their ethnicity. This situation can generate a difficulty in the access of information, which will result in a direct result of having poorly representative predictive results. In addition, it is important to mention that the user will have the need to be informed about the use that is being given to their data, which external entities are making use of their information, knowing what the intelligent platform consists of and the benefit it will bring to the communities its implementation.

Similarly, it is assumed that the collaboration of CONADI (government entity that has the current records of all indigenous communities in the country), to provide essential information that allows the correct functioning of the platform, if not thus, a serious problem for this idea would be added.

Solution: This is why it is important to offer a transparent platform for the different users that interact with the platform, where they know the reasons why their information is needed and to be able to make a feedback of it, in addition to the purposes that the entities can give that they will

use this tool, this in the measure of delivering a good use of their data that allows the best possible prediction of the model to be made and to achieve more representative decisions for the benefit of indigenous communities and society in general.

4.2 Poor prediction

At present the model could not predict in its entirety the interests of some groups of people who do not have registration in the networks, in this case older adults, or people who do not have the means to communicate on the web, because in Chile there are still sectors where connectivity and economic resources are scarce, mainly in some communities or more rural towns.

Solution: The model can better predict those segments that have more information on the web and records in the sources analyzed, these will have greater influence on decisions than those who do not have much information and their opinion could be defined as indifferent.

4.3 Security problems of the platform

4.3.1 Computer attacks

The tool could be hacked by organizations that have purposes other than those proposed by the model, which may harm the profiles of users or violate security and privacy restrictions imposed by the system. For example, there may be external attackers or intruders that are not registered in the social media and dominate false profiles to alter the actual information of community members or even export sensitive data in order to damage the integrity of the platform and its related entities.

Solution: maintain several database backups and a high index of system security.

4.3.2 Identity theft

Verification of the user's identity record, it is necessary to be sure that the people who provide feedback on the model's decisions are actually those who represent a member of an indigenous community. Therefore, it is very important to create a secure user identification system. This is mainly to avoid the misuse of information or possible feedback that does not represent the preferences or interests of the members of a community.

Solution: It is supposed to have the collaboration of CONADI to verify the identity of the people as legitimate members of a community, in this case this organization could act as an intermediary of

both the registered information and the delivery of the passwords of each user profile corresponding to a member of the community, this delivery could be made in the assemblies of each community, to directly verify the identity of the people and make the entry to the tool more secure.