

Integrated Web Tools for Innu Language Maintenance

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How can we create a strong presence on the web for Aboriginal languages and make use of Information and Communication Technologies to support language maintenance?

The goal of this paper is to report on a series of projects aimed at bilingual speakers (Innu-French, based in Quebec) who wish to preserve their Innu mother tongue and become literate in their language. Additional users are bilingual Innu-English speakers from Labrador, second-language learners, and the general public. Using a collaborative (participatory action) research framework with partners involved in language teaching, we have been developing the following modules:

- online language lessons and games that include basic literacy skills, vocabulary enrichment, the teaching of grammatical concepts, and the discovery of language structure (jeux.tshakapesh.ca)
- online oral stories database, categorized and searchable, with audio and video files download (histoires.tshakapesh.ca)
- online catalogue, categorized and searchable, to help the dissemination of educational and cultural resources in the Innu language (catalogue.tshakapesh.ca)
- a blog in Innu to discuss language-related issues (innu-aimun.ca/blog)

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- grammatical web pages to support the online Innu dictionary (www.innu-aimun/dictionnaire) and the grammatical modules of the games (innu-aimun.ca/blog)
- an interactive integrated Verb Conjugation applet (verbe.innu-aimun.ca) and a Media Manager for upload and management of sound files, videos, and images shared across modules
- a Facebook page to promote Innu language activities (Innu-Aimun Facebook page)

For the language games, different interfaces allow ongoing creation of new lessons and exercises. Features include: sound and image, computer generated random variation, trackable results and progress. Similarly, different interfaces allow further development of the oral stories, book catalogue and grammatical pages. Our design emphasizes the integrated aspect of such tools to create an enriched learning environment, as well as easy resource transfer from one language group to another. Archiving of the language data is facilitated by the common infrastructure and database design, but for lack of space, will not be discussed here.

In the rest of this paper, we will discuss successes and challenges in developing those tools, starting with the framework adopted.

PARTICIPATORY ACTION RESEARCH

The framework of this research is participatory action research, as defined by Manoukian (1989) for international development. This means that the research process as important as the goal, which is defined right from the start in a collaborative framework (Leonard & Haynes, 2010). In our context of language maintenance, all partners are therefore

involved in language documentation and teaching. In the context of information and communication technologies allowing us to build collective intelligence, we are open to feedback and contribution from the general population: we view learning as an emergent phenomenon (Mitra, 2011), and we work with open-source programs (<http://opensource.org>).

ON-LINE LANGUAGE LESSONS AND GAMES

Innu people do speak their language but do not know how to write in the recently standardized orthography. Of the 10,000 Innu speakers targeted in these projects, 200 at most have had training in the standard orthography, and fewer than 50 have really mastered it. Some people over 60 years old are still monolingual speakers of Innu, while the others are bilingual speakers of Innu-French or Innu-English in Labrador. All Innu communities in Quebec have a primary school, but only two have a secondary school. There is no course offered in Innu at an advanced level (beyond primary school), and no Innu language is spoken in schools outside the Innu communities. Innu has never been the language of instruction in schools. There is a tendency, once the colonial language orthography has been mastered, to use this orthography to write the language phonetically. This is ineffective and does not allow for communication across dialects and across idiosyncratic speakers. The main objective is thus to promote the standard orthography through online games. Literacy in the Aboriginal language is seen as a desirable goal in terms of Aboriginal language and culture preservation (Drapeau, 1992, Burnaby, 2005). As many Innu live in large Canadian cities outside of their community, language maintenance is an issue for them and can be assisted by the use of online language games. The same is true for one Innu community that has lost the language and

wishes to regain it; for them, the language has to be taught as a second language and our site can be a good complement.

While the main objective is to promote the use of standard orthography through these online games, there is also a desire to slow down, or reverse as much as possible, language attrition. We therefore identified areas of vocabulary ignored by young people. Promoting knowledge of grammar in general, not only for grammatical orthography but also for language retention and accuracy, was also identified as another goal of the games. Finally, support for language teachers was another desirable outcome. In addition to managing each learner's profile, we added a class management module so that teachers may use the games as a part of a language course, to track their students' progress.

Another function of the class management module is to allow teachers to create their own sets of lessons and exercises progression, by combining different existing lessons and exercises to fix their goal.

The current games consist of three major sets of lessons and exercises, built on two different programs. The first set is aimed at teaching basic literacy skills to people who have already mastered the colonial language orthography. A lesson, available in three different dialects to choose from, presents some roman letters used in the standard Innu orthography, with words to which sound and images are attached (offering both a phonic and a global reading approach). The user is then asked to proceed with 5 to 15 different types of exercises that use sound, image, and spelling matching in different ways: missing letter(s), word searches, crossword puzzles, and so on. The order of items in the exercises is randomly generated, so they are never the same if a user plays again. Written instructions are available in French and oral instructions in Innu. Thematic vocabulary

lessons using the same software include weather expressions, plants, animals, days of the week, months, etc. An example for Innu is given in Figure 1.

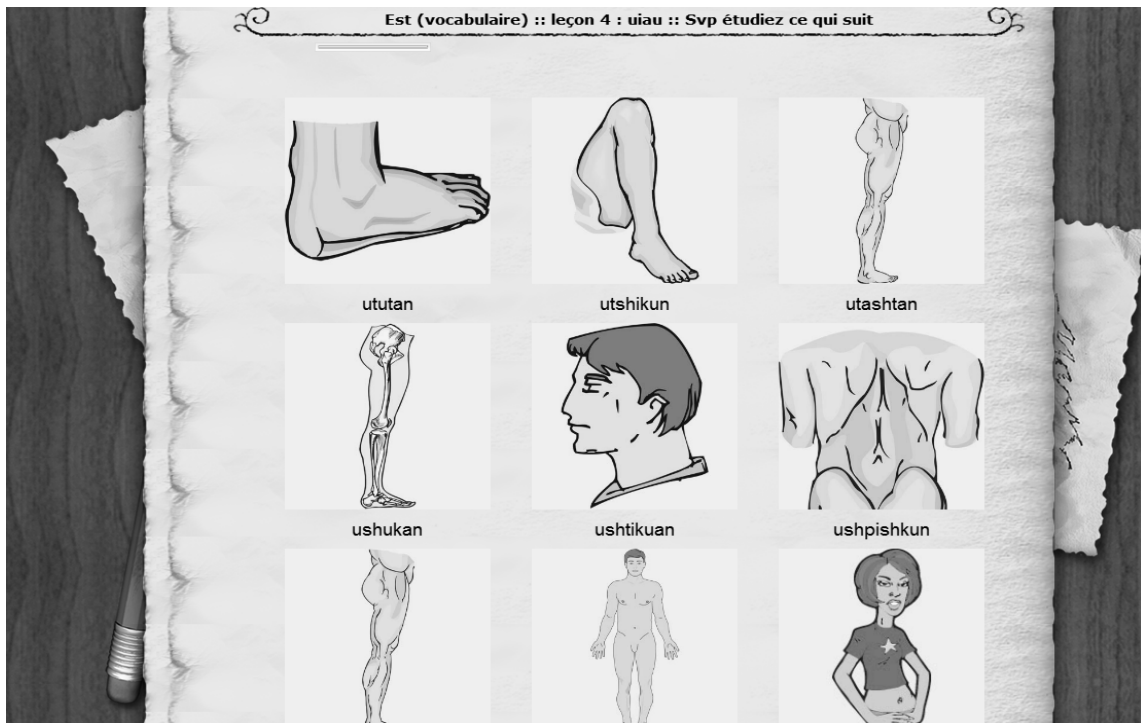


Figure 1. Thematic vocabulary for Innu lesson on the body

The exercises are automatically generated from a defined vocabulary list. Each vocabulary item (in text form) is expected to have at least two media items (audio and image). To create a series of lessons and exercises, the content provider has to first set up the variables of the exercise possibilities (whether words will be sourced from this lesson only or from previous lessons as well), then upload images and sounds for a particular lesson, choose the words and letters of this lesson, and select between 13 different types of exercises (Figure 2). On the public user end, this generates dynamic exercises based on selected options (Figures 3 & 4).



Tester l'activité leçon 4 : uiau

Syllabes/Lettres

Nom

leçon 4 : uiau

Ordre de tri

4

voir leçon

Ajouter ▾

Syllabes

☒ Rendre public

Ajouter un mot ▾

ututan, utshikun, utashtan,
 ushukan, ushtikuan, ushpishkun,
 upuam, uiau, ushkatai,

voir exercices

☒ Reconnaître les mots

☒ Faire correspondre les mots et les images

☐ Lettre manquante

☐ Lettres manquantes

☒ Jeu de mémoire (avec des mots)

☒ Reconnaître tous les mots*(utilise la leçon précédente)*

☐ Ordonnez les lettres des mots

☐ Mot mystère*(utilise la leçon précédente)*

☐ Mot mystère (grand)*(utilise la leçon précédente)*

☐ Plusieurs lettres manquantes

☒ Ecrivez les mots

☐ Mots croisés

☐ Inverser tout sélectionner

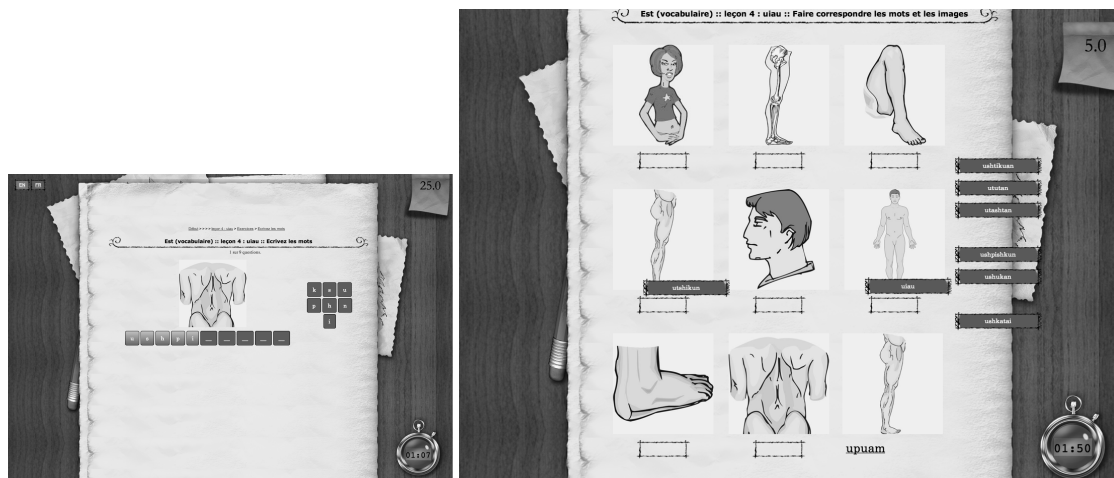
Mise à jour

voir média

Média

ututan		
utshikun		
utashtan		
ushukan		
uiau		
ushkatai		

Figure 2. Content provider interface for a thematic vocabulary lesson



Figures 3 & 4. General user interface with two exercises/games for a thematic vocabulary lesson on the body

A second type of software was developed for advanced levels of Innu to feature text-oriented games such as:

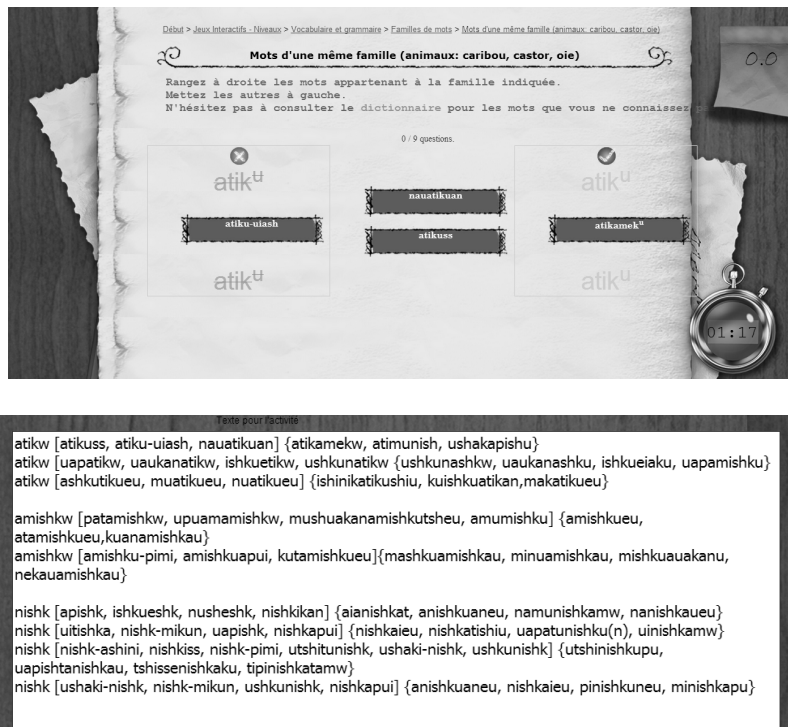
- Dictation exercises: single words or sentences. After listening, the user types in the correct answer.
- Dictation in cloze texts: the user hears an entire sentence and has to type in the missing written parts.
- Cloze texts: The user has to fill in the missing words in a text by choosing from a selection of words, which can all be correct but need to go in specific places, or can include incorrect or incorrectly-inflected words.

Other types of activities for advanced users consist of categorization games such as:

- Simple categorization: the user has to match the given word or expression with one of the categories provided by clicking on it.
- Word-to-word matching: the user establishes a relationship between words shown in different columns, for example, antonyms or synonyms.

- Theme-word matching: the user has to group words that do not belong to a given category by dragging and dropping them in the appropriate area of the screen.

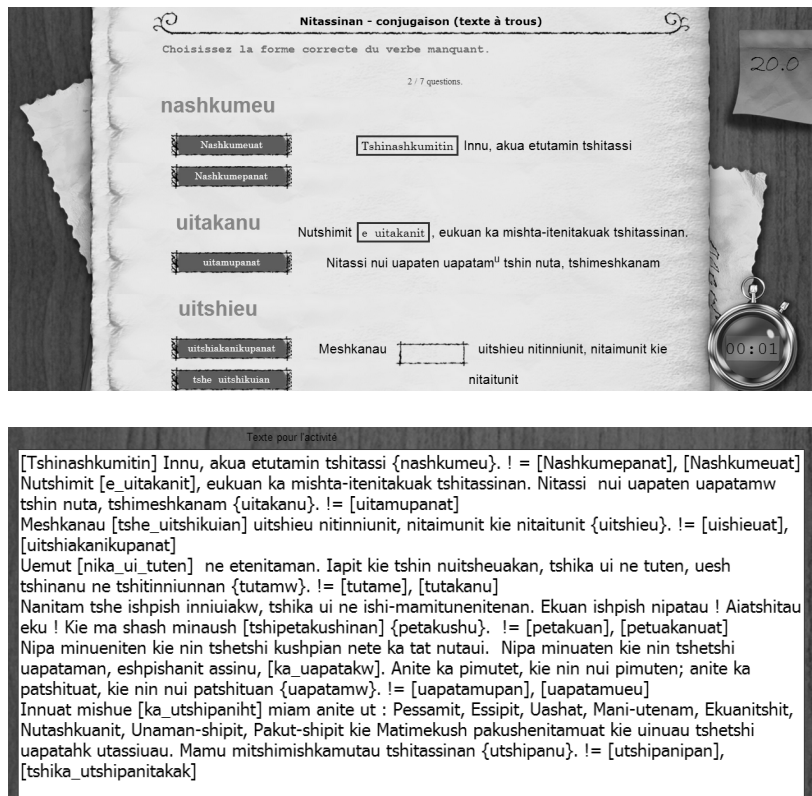
This module requires markup language to generate lessons. A markup language is a set of symbols that determine the way text is presented. Each type of activity has a special markup language. The creation of the lessons and games happens in a special 'content developer' interface. For example, the family of words related to *caribou* can be identified by the morpheme *atikw*. The activity illustrated in Figures 5 & 6 below is created by indicating in brackets words that do belong to the given category, and in curly brackets, some words that do not. The markup language has the following form¹: **atikw** [**atikuss**, **atiku-uiash**, **nauatikuan**] {atikamekw, atimunish, ushakupishu}. This form has proven easy to learn and use for our content developers.



Figs. 5 & 6. A theme-word matching activity (caribou words) with its markup language

¹ The final <w> is used to generate the Innu raised <u> character.

The content provider has total control over each activity. For example in cloze text activities, the content provider can specify the missing parts of the sentence and the options made available to the player. The program, guided by markup language, generates the activity as specified. Figures 7 & 8 show data with markup and the generated activity:



Figures 7 & 8. Creating a cloze text exercise: markup by the content provider and corresponding activity

Such tools allow the content provider to add or update game content with very little training and no technical support.

To summarize, there are several levels of users in our games, as shown in Figure 9. The General user plays the games, and when registered, can keep track of his or her scores, compare them with the top scores, and be registered to a class with an Instructor. The

Content provider inputs data for the creation of all the various lessons, games and exercises. The Instructor is able to see scores of specific registered users, manage a classroom and create lesson plans. The system contains two programs, one program for teaching vocabulary and basic reading and writing of standard orthography and the other program for teaching grammar and advanced reading and writing.

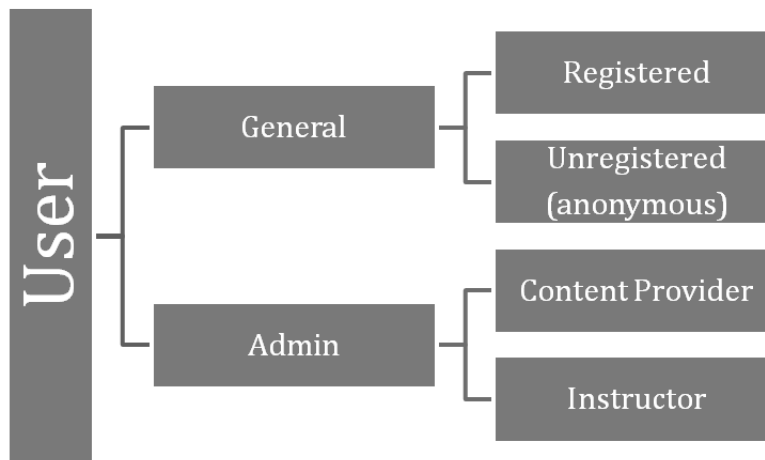


Figure 9. Level of users for the on-line games

ON-LINE ORAL STORIES DATABASE

This database contains audio and video files that are categorized by topic, storyteller, genre, Innu dialect, community, levels and teaching topics. The topics were developed by Innu teachers, based on their needs. Information about who collected the story and edited the sound or video is also available. The database can be browsed or searched, and the audio files can be freely downloaded. The caption below (Figure 10) shows the stories associated to a particular storyteller.

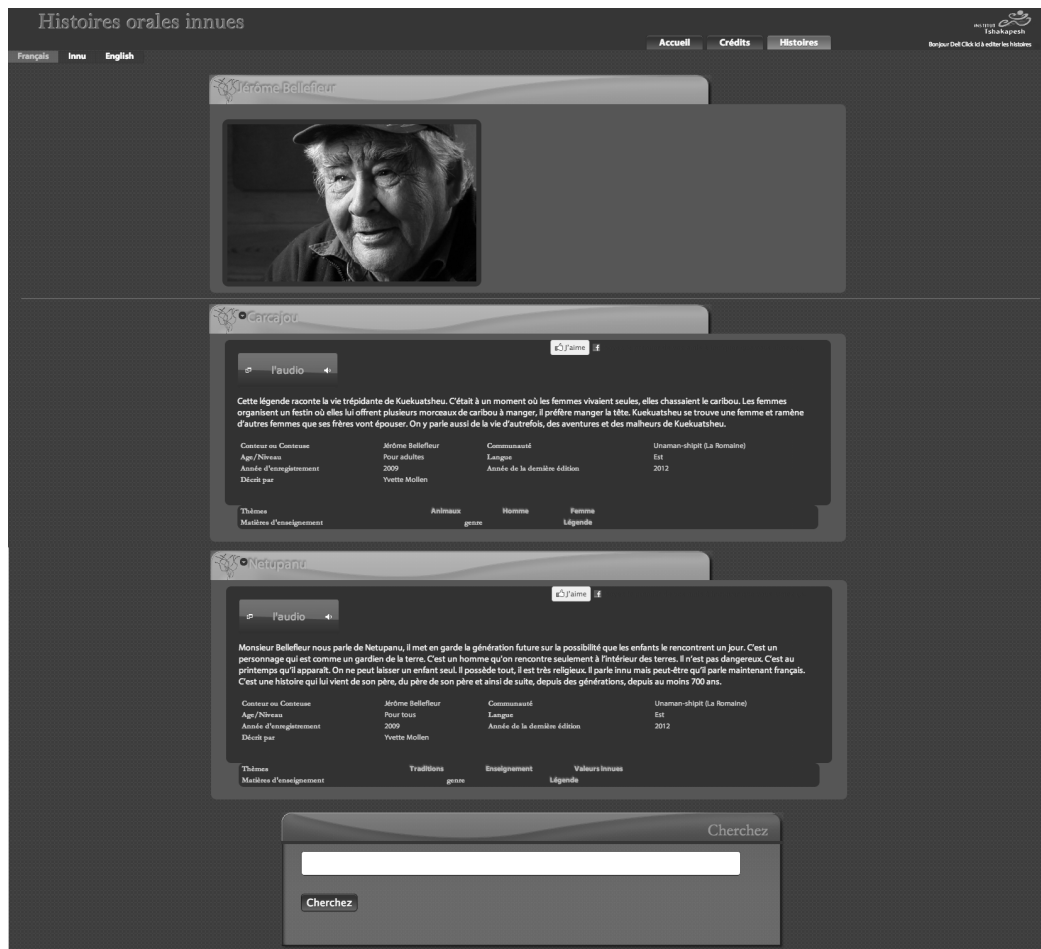


Figure 10. General user view: a storyteller with his stories

In addition to the general public's interface, there is an accessible content provider interface that allows editing of the data, for example the description of the stories in three languages: Innu, French and English. See Figures 11 & 12. There is also a link to a database of storytellers' biographies in the three languages, which can be read on line.

ON-LINE CATALOGUE

The on-line catalogue is categorized and searchable, much like the oral stories database, and its goal is to help the dissemination of educational and cultural resources in the Innu language. It contains an on-line ordering system that is automated to streamline and support stock management and distribution (Figure 13). The development phase and the design included consultation and feedback of the person in charge of distribution.

INSTITUT Tshakapesh

Catalogue en ligne des publications de l'Institut Tshakapesh

Pour commander:
Courriel: reception@tshakapesh.ca
Téléphone: 418-968-4424 ou 1-800-391-4424 (sans frais)
Télécopieur: 418-968-1841

Langue
Anglais
Français
Innu

Type
Livre
CD
DVD
Vidéo
Poster
Cartes éclair

Thème
Adulte
Enfants
Pour tous
Précolaire
Primaire
Secondaire

Genre
Comptines
Contes ou légendes (atankana)
Exotisme
Guide d'apprentissage
Guide pédagogique
Humour
Jeux
Lexique
Musique
Photographies
Poésie (ashineu-tipashimunt)
Récit (tipashimunt)
Récit de vie
Roman

Source
Édités à Tshakapesh
pédagogique fait à Tshakapesh
Édités ailleurs mais en vente à Tshakapesh

Séries
Ashinukash tipashimunt
Carnet
Conversation de l'Innu
DVD éducatif
L'apprentis
Lexique grand format
Lexique petit format
Livre-photos de Unaman-shipu
Mashkuss
Uapikun mak Tuma

Thèmes
Études sociales
Aînés
Activités traditionnelles
Animaux
Arbres
Arts
Autrefois
Chansons religieuses
Contes et légendes
Culture
Enseignement
Famille
Femme
Fille
Formes géométriques
Garçon
Habitations
Histoire
Homme
Humour
Interculturel
Langue
Noël
Nourriture
Personnages de légende
Photographies
Plantes

Connexion

actualiser les résultats

Chercher

Arranger par : Titre ISBN Type Niveau Année de publication

Fou Floue Fléau

Année de publication 2008
ISBN 978-2-920791-51-0
Résumé Recueil de poésie écrit par une jeune poétesse gréco-innue.
Type Livre
Niveau Adulte
Source édités à Tshakapesh

lisez plus >>
Soyez le premier de vos amis à indiquer que vous aimez ça.

Coup d'œil sur le monde merveilleux des Montagnais de la Côte-Nord

Année de publication 1992
ISBN 2-920791-13-3
Résumé Résumé : Regard sur la vie des Innus de la Côte-Nord écrit par le frère Jean Fortin OMI. Il a vécu près de vingt ans dans la communauté innue de Natashquan.
Type Livre
Niveau Adulte
Source édités à Tshakapesh

lisez plus >>
Soyez le premier de vos amis à indiquer que vous aimez ça.

Je me souviens...des Premiers Contacts

Année de publication 2008
ISBN 978-2-920791-55-8
Résumé Cet ouvrage est l'œuvre de plus de 70 personnes dont 28 écrivains autochtones et non-autochtones qui, par le biais de l'art et de textes, veulent mettre en lumière certaines périodes ignorées de l'histoire du Québec.
Type Livre
Niveau Adulte
Source édités à Tshakapesh

lisez plus >>
Soyez le premier de vos amis à indiquer que vous aimez ça.

Figure 13. Public interface for the catalogue of language-related materials

A BLOG IN INNU

The Innu blog was developed to discuss language-related issues (Figure 14). It complements the Facebook page (see below) to discuss more substantial language-related issues and it explores ways to use the Innu language as a meta-language for Innu grammar.

**BLOG INNU BLOG
AIMUN-UAUITAMU**

ACCUEIL FRANÇAIS INNUAIMUN ENGLISH

Entrez votre recherche

BILLETS DANS LA CATÉGORIE BLOG D'YVETTE

Innu-aimun, eshk' nanitam innu-aimun

Mishta-shashish ute innuat eshpish taht. Shashish uet ashu-patshitnahk utaitunaua kie utaimunaua, utaassimaua kie ussimaua manaht. Alanishkat, nanitam eshk' tshika tau innu muk' ua ishinakushit, muk' ua ishinuiut kie muk' ua ishi-aimit. Mishta-shutshishikupan tapue katshi shaputueshak kie nikanutet, inniunnu niashatak.

Ume pishim', ishi-tshissinuatshitakanu miam innu-aimun-pishim'. Ui kanapua uapatiniuenanu eshpish ishpiitenitakuak innu-aimun. Nutim ute eshpitashkamikat assit etatik innu-aimuna. Anutshish, etatu ui ishpiitenitakanu innu-aimun. Anu mitsheha mashinaikana enushteti, anu mitshetuat aassat tsheshkutamuakaniht tan etashtenit innu-aimunnu mak tan eshi-mashinataikannit. Mitshetishuat ashit innuat ka tshishkutamuakaniht tshetshi nitau-tshitapatahk mak nitau-mashinatshetht.

Tshinuau ma, eshk' a tshinishtutauauat tshimushumauat kie ma tshukumauat eimitau? Tanite shash neni passe aimuna apu shuk' uitakaniti. Tshinishtutenua a neni aimuna : nipitshituan, nelau, kie ma nishkatshiu? Anutshish aassat kie ussinitshishuat kutakanu aimunnu apashtauat eimitau. Mamen mishitkushiu-aimunnu, kakuseshiu-aimunnu kie ma akaneshau-aimunnu apashtauat, apu mesheku innu-aimunnu apashtauat.

E ma takuaki neni aimuna, atushkan-tshishikua, pishimuat, atishaulana, atshitashuna, mak mitshet kutaka. Mate : ushkat-atushkan, minashtakan, tshishe-pishim', epishiminishkueu, kamikuat (mikushiu, mikaua), kauasheshkunat (uasheshkunishiu, uasheshkunau), peik', nish', nishit', nishunnu, patetat-tatunnu, peikumitashumitanu, peikutishemitahtumitanu.

Anu minupannu mani tshetshi uitahk mishitkushiu-aimunnu, akaneshau-aimunnu, tanite apu mishta-tshinuapekashetit! (lundi, mardi, vert, rouge, un, deux, cent, mille...)

Nanitam ma ui minu-kanuenitamutau tshitaimunnu, tshishkutamatishutau kie ashineuatshetau mak ashu-minatauat anitshtenat aassat, tanite minutakushu aass meshta-nitau-innu-aimiti.

Innu-aimun

Uetshitshpaniti uinashku-pishim', ishi-tshissinuatshitakanu miam « innu-aimun-pishim' », eshpish an ishpiitenitakuak aimun, innu-aimun.

Peikushu ne eshi-aimiak' nutim etashiak' tshinanu innuat. Shash tshipa ui ishpiitenitanen innu-aimun, shash tshipa ui akua tutenan tshetshi minekash eshk' ishi-aiminanut nete tshitassinat.

Mitsheha innu-assia anite innuat etah : nete itetshie mamit takuan Pakut-shipu, Unaman-shipu, Nutashkuan kie Ekanitshu. Nete nutshimit takuan Matimekush, Tshishe-shatshiu mak Natuashish. Minuat ekue takuak Mani-utenam mak Uashat. Ek' nete natamit, nishitina innu-assia: Pessamit, Essipit mak Mashteuatsh. Tapue tshimishetunan e innuak'.

Eukuan uet ui tutanan, eshakumitshishikua tshetshi mamitunenitaman meshekut innu-aimun tshetshi apashtalan ennu-aimiani, apu tshika ut ui mamu uitaman mishitkushiu-aimun kie ma akaneshau-aimun.

Nika ui ashit tshissitutuauat aassat tshetshi nanitam innu-aimikau kie uinuau tshetshi innu-aimiaht utauassimaua. Eukuan patush alanishkat tshe kanuenitamak' tshitaimunnu.

Tshimushuminuat kie tshukuminat nanan shash minu-kanuenitamupanat kie eukuan an tshiminikutanen innu-aimunnu tshe apashtaiak' almiakui.

Nanitam nakatuenitamakui mamu, kassinu etashiak' eshk' minekash tshika innuimakan innu-aimun.

Eukuan kanapua, ume anutshish innu-aimi kie ma lelu-aimi!

Jeux interactifs

CATÉGORIES

- > Blog d'Yvette
- > Kukuetshishemuna
- > Questions (français)
- > Uncategorized

PAGES

- > Bienvenue ! Kuei ! Welcome !
- > Français
- > Grammaire
- > Innu-Aimun
- > Grammaire
- > English
- > Grammar

Figure 14. The Innu language blog, in Innu

GRAMMATICAL WEB PAGES

The grammatical web pages in French and English were developed to support the on-line Innu dictionary and the grammatical modules of the games. They follow the model of the on-line East Cree grammar (www.eastcree.org/grammar) in providing quick reference to grammatical concepts, dictionary abbreviations, and include an interactive integrated Verb Conjugation applet, shown in Figure 15, which can be linked to from parts of speech, verb stem information or type of conjugations.

Conjugaisons des verbes innus

Classe de verbes: **vai** **vii** **vta** **vti**

Conjugaisons: **01** **02** **03** **05** **07** **09** **10** **11a** **11b** **12a** **12b** **14a** **14b** **15** **17a** **17b** **17c**

Radical: **i** **m** **t** **u**

uapameu

	Direct		Inverse	
local:	2-1	tshuapamin	1-2	tshuapamitin
	2p-1	tshuapaminau	1-2p	tshuapamitinau
	2(p)-1p	tshuapaminan	1p-2(p)	tshuapamitinan
mixte:	1-3	nuapamau	3-1	nuapamik ^u
	1-3p	nuapamauat	3p-1	nuapamikuat
	1-4	nuapamimaua	4-1	nuapamikunua
			4-1	nuapamimik ^u
	2-3	tshuapamau	3-2	tshuapamik ^u
	2-3p	tshuapamauat	3p-2	tshuapamikuat
	2-4	tshuapamimaua	4-2	tshuapamikunua
			4-2	tshuapamimik ^u
	1p-3	nuapamanan	3-1p	nuapamikunan
	1p-3p	nuapamananat	3p-1p	nuapamikunanat
	1p-4	nuapamimanana	4-1p	nuapamikunana
			4-1p	nuapamimikunan
	21p-3	tshuapamanan	3-21p	tshuapamikunan
	21p-3p	tshuapamananat	3p-21p	tshuapamikunanat
	21p-4	tshuapamimanana	4-21p	tshuapamikunana
			4-21p	tshuapamimikunan
	2p-3	tshuapamauau	3-2p	tshuapamikuau
	2p-3p	tshuapamauauat	3p-2p	tshuapamikuauat
	2p-4	tshuapamimauaua	4-2p	tshuapamikuaua
			4-2p	tshuapamimikuau
non-local:	3-4	uapameu	4-3	uapamik ^u
	3p-4	uapameuat	4-3p	uapamikuat
	3-5	uapamimeu	5-4	uapamikuñua
	3p-5	uapamimeuat		
	4-5	uapameñua		
	4-6	uapamimeñua		

Figure 15. General user's view of a model verb selection in the Conjugation Applet

MEDIA MANAGER

In order to allow content providers to freely upload and manage sound files, videos and images shared across modules, without depending on a computer technician, a media manager was created (Figures 16 & 17). It is a database, not visible to the general public, which keeps meta-information. The metadata stored allows for modules to automatically connect to media based on their orthography and other related data.

Orthography	Url	Dialect	Type
kananissipitakanit miush	 /img/dictionary/kananissipitakanit miush.jpg	n/a	word
kananissipitakanit	 /img/dictionary/kananissipitakanit.jpg	n/a	word
kanashtishiht	 /img/dictionary/kanashtishiht.jpg	n/a	word
kaneukatet	 /img/dictionary/kaneukatet.jpg	n/a	word
kanipashiu-mashinaikanuan	 /img/dictionary/kanipashiu-mashinaikanuan.jpg	n/a	word
kanishtu-tshitsheiat	 /img/dictionary/kanishtu-tshitsheiat.jpg	n/a	word
kapakunaitshemakak	 /img/dictionary/kapakunaitshemakak.jpg	n/a	word
kapimautishunanut	 /img/dictionary/kapimautishunanut.jpg	n/a	word
kashikueun	 /img/dictionary/kashikueun.jpg	n/a	word
kashikueuniss	 /img/dictionary/kashikueuniss.jpg	n/a	word
kashipekt	 /img/dictionary/kashipekt.jpg	n/a	word
kashitinanakan	 /img/dictionary/kashitinanakan.jpg	n/a	word
kashiuasht	 /img/dictionary/kashiuasht.jpg	n/a	word
kashkanamekush	 /img/dictionary/kashkanamekush.jpg	n/a	word
kashkatshau-tipaikan	 /img/dictionary/kashkatshau-tipaikan.jpg	n/a	word
kashkun	 /img/dictionary/kashkun.jpg	n/a	word

Limit: 20 Orthography: Containing: Search: All mime: Audio Files, Image Files, PDF Files

Figure 16. Media manager list view

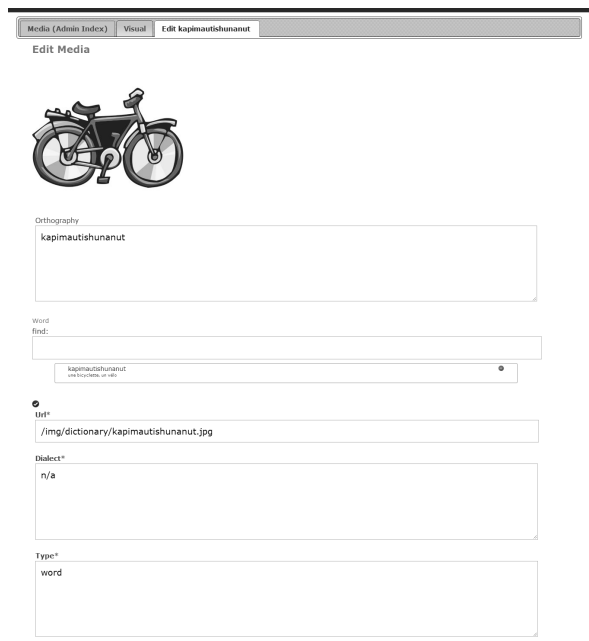


Figure 17. Media manager item view

FACEBOOK PAGE

The Facebook page (Figure 18) is used to promote Innu language activities, generate more interest in the Innu language, and for feedback and questions. Created in June 2011, it became extremely popular, totaling 1346 followers in the fall of 2012. Statistics indicate that most followers are from Canada and are from Innu communities. There are more females, with a peak in the 25-44 year age group, representing the mothers who are most likely to be transmitting the Innu language to the children. See Figure 19.

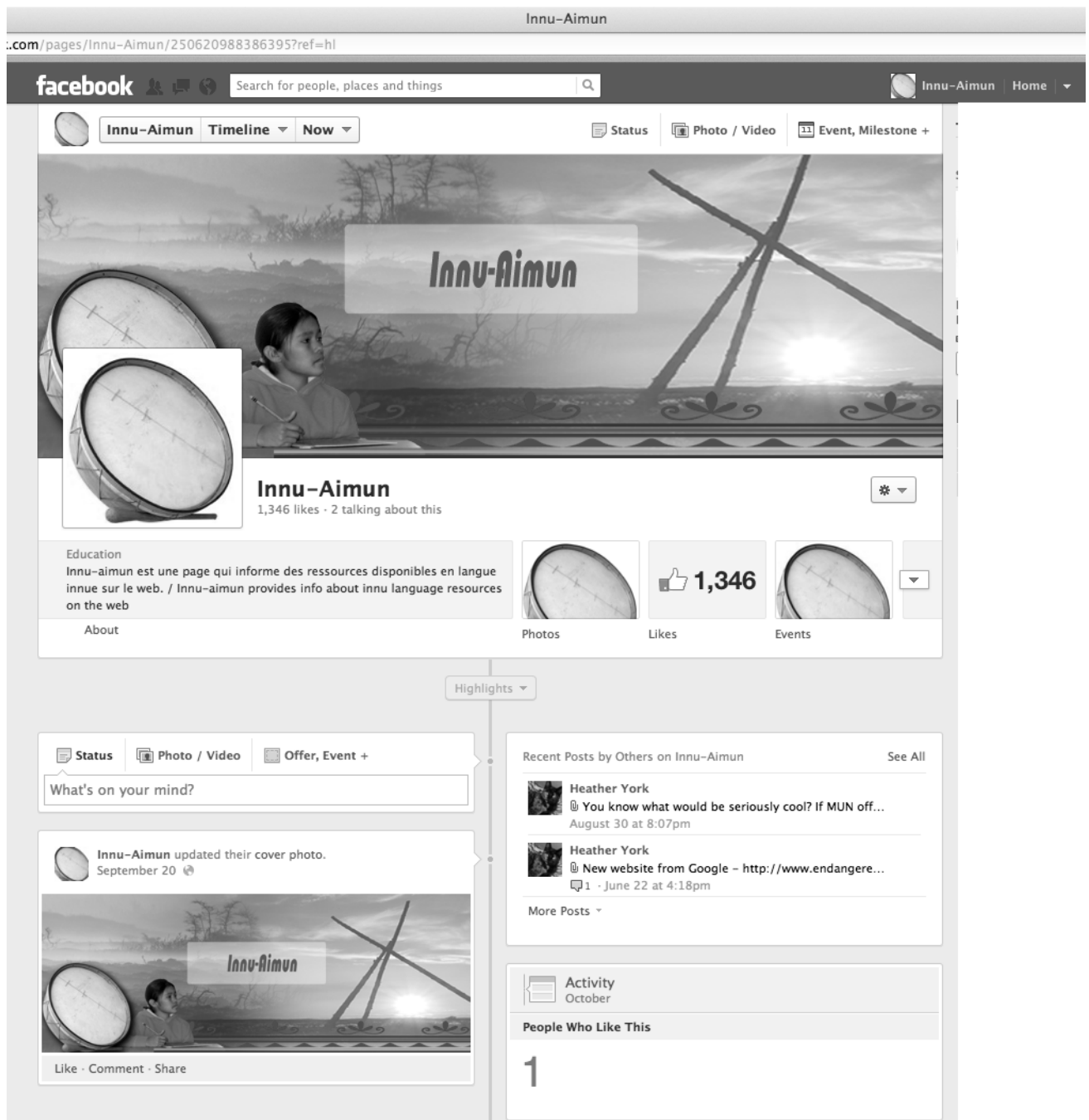


Figure 18. Innu Facebook page

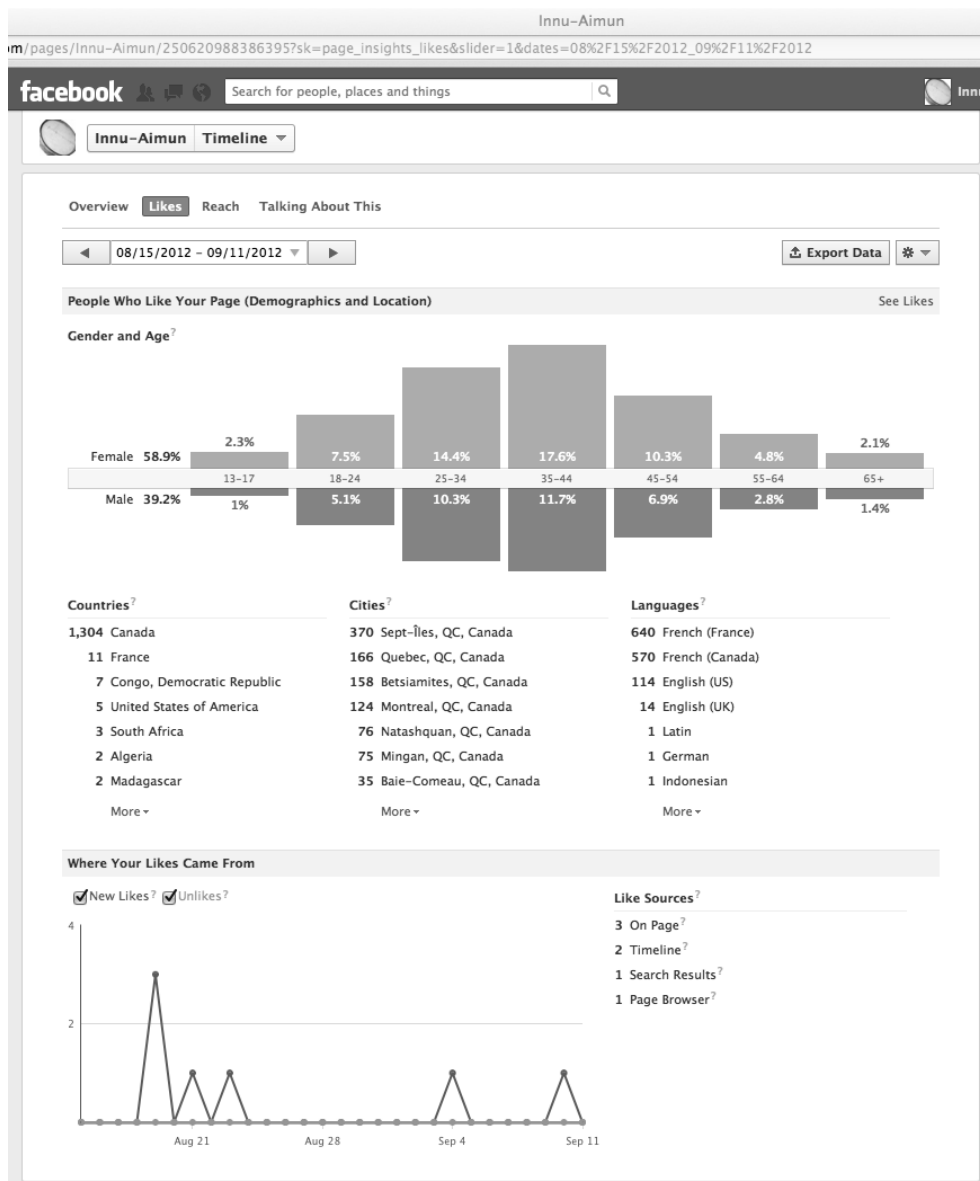


Figure 19. Innu Facebook usage statistics

WHY INTEGRATED WEB TOOLS?

All modules described above share Media, Interfaces and Architecture. We adopted an integrated approach to the system design in two ways: via an internal data connection or an external data connection. See Figure 20.

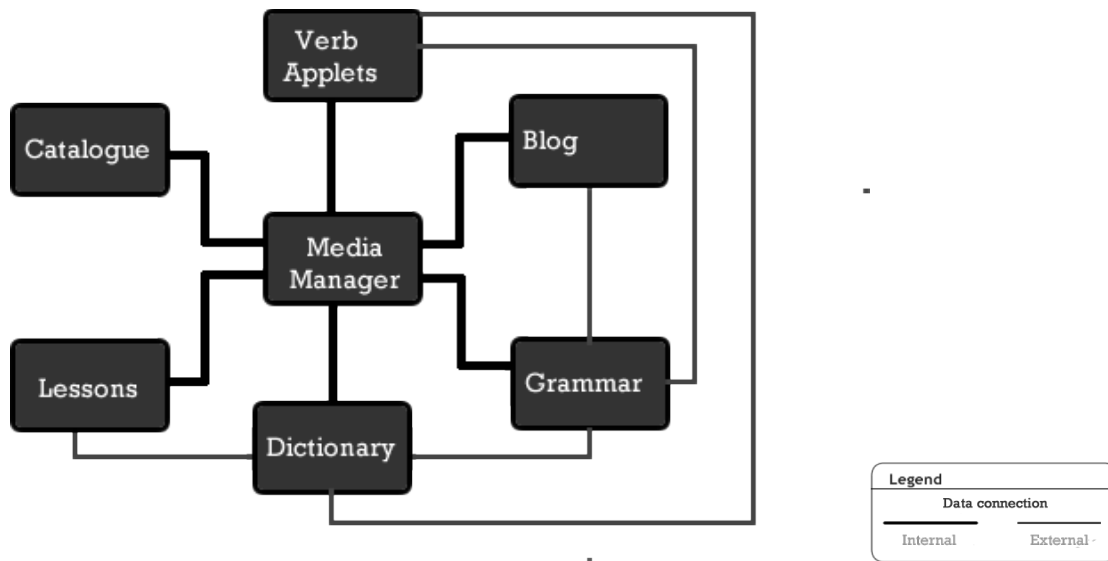


Figure 20. Architecture of the web tools

The internal data connection uses an API (Application Programming Interface) to share and exchange data between systems. These are specifications that allow the various components to communicate with each other. The Media Manager system shares its data via an API, which the Blog, the Grammar, the Dictionary, the Verb Applet, the Lessons and the Catalogues (Books and Stories) utilize for communication.

The external data connection uses hyperlinks for data sharing. A good example is the connection between the dictionary and the verb applet: when looking up a verb entry in the dictionary you get a hyperlink to the model verb (same stem, same class) in the applet.

This general integrated approach has several advantages: First, it creates ease of use for the general public with a web environment that looks and feels familiar for all Innu language resources. It also allows ease of access for content providers and technical support people, who are in limited number. It promotes consistency of content across tools (dictionary, grammar, games, books). Finally, the use of Open Source software

gives us a better connection to and support from the Open Source software development community. This is vital in an ever-changing technological world, since it makes long-term maintenance of such tools a real possibility.

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