

**KA HAKU HUA‘ŌLELO ‘ENEHANA:**  
Lexicon Creation, Implementation and Issues For  
Technology Use in the Hawaiian Language

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# DIACRITICS

‘

‘Okina  
Glottal Stop

—

Kahakō  
Macron

# OVERVIEW

- ◆ Overview of Hawaiian Language
- ◆ Historical review: technology and lexicon development
- ◆ Ke Kōmike Huaōlelo Hawaiian Lexicon committee: policies, progress and issues
- ◆ Font Issues: Custom fonts to Unicode transition and support issues
- ◆ Maintenance and publication of lexicon

# HISTORICAL OVERVIEW: LANGUAGE DECLINE AND REVITALIZATION

- ◆ < 1778 - monolingual society
- ◆ 1820 - missionary arrival
- ◆ 1893 - overthrow of monarchy
- ◆ 1896 - Hawaiian outlawed as a medium of education
- ◆ 1980s - survey found @30 children under 18 who would speak Hawaiian
- ◆ 1984 - immersion preschools started, elementary, high schools followed.

# HISTORICAL OVERVIEW: LEXICON DEVELOPMENT

- ◆ January 7, 1822 - First printing press arrived in Hawai'i.
  - *pa'i* = print. Also, "To slap, spank, beat, hit, clap... (several old types of tapa begin with *pa'i*: *pa'ipa'inahā*, *pa'iua*, *pa'i'ula*; preceded by *ke*)"
  - *palapala* = document. From *pala* - daub, smear, smudge, blot... *ho'opala* To daub, besmear.
  - *pepa* (paper), *peni* (pen), *'inika* (ink) - 1835 newspaper

# HISTORICAL REVIEW: LATER 19th AND EARLY 20th CENTURY

## ◆ Transliterated examples:

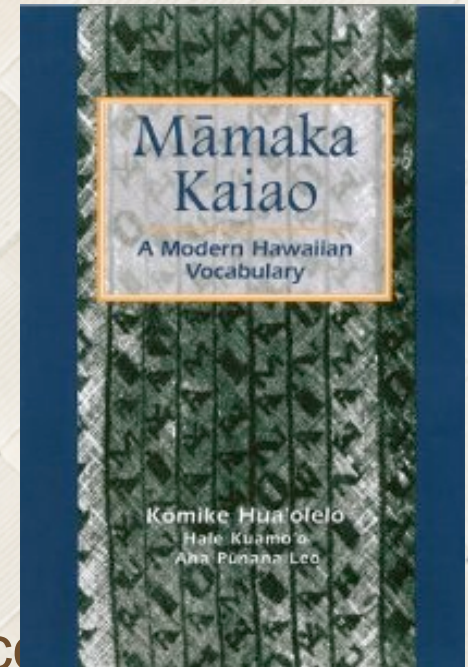
- *mīkini* = machine
- *kelepona* = telephone
- *kīwī* = television/TV
- *lēkiō* = radio

## ◆ Combined/descriptive example

- *mokulele* = airplane (*moku*=boat, *lele*=fly/flying)
- *pā leo* = record (*pā*=plate/disc, *leo*=voice)
- *pahu ho'olele ki'i'oni'oni* = television/TV (box that sends out moving pictures)
- *pahu ho'olele leo* = radio (box that sends out voices)

# KE KŌMIKE HUA‘ŌLELO (HAWAIIAN LEXICON COMMITTEE)

- ◆ Founded 1987
  - Members include language and subject experts from around the state
- ◆ Māmaka Kaiao: New Lexicon
  - Published in 1996, 1998, 2003 and... ?
- ◆ Hawaiian <-> English
- ◆ Includes new lexicon in addition to clarifications/newly discovered uses of Pukui/Elbert (P/E) dictionary lexicon





# KE KŌMIKE HUA‘ŌLELO: LEXICON CREATION GUIDELINES

- ◆ Make minor changes to words that already appear in dictionary; join or separate parts of words.
  - Ex: *‘enehana* (*‘enekini*= engine, *‘mea hana* = (tool))
  - Ex: *‘enelule* (*‘enehana* = technology, *‘elelule* = Ni‘ihau Hawaiian for cockroach)
- ◆ Record a word used by a native speaker but not in P/E dictionary, and words that appear there but with different use by native speaker.
  - Ex: *Kalisahana* / *Kalihakana* (ClarisWorks)

# KE KŌMIKE HUA'ŌLELO: LEXICON CREATION GUIDELINES

- ◆ Reduplicate an existing word to create new or altered meaning.
  - Ex: *lakolako* (computer accessory)
- ◆ Adding a prefix or suffix to an existing word.
  - Ex: *pāku'ina* (attachment)
  - Ex: *kākomo* / *kāpuka* (import / export)



## KE KŌMIKE HUA'ŌLELO: LEXICON CREATION GUIDELINES (cont'd)

- ◆ Explain the meaning using existing words.
  - Ex: *helu kuhi henua* (URL - “number that points to a location”)
- ◆ Combine two words (or parts of words) in a way that creates a totally new meaning not readily apparent.
  - Ex: *poelele* (*poe* = something round, *lele* = fly.

# KE KŌMIKE HUA'ŌLELO: LEXICON CREATION GUIDELINES (cont'd)

- ◆ Combine two words and shorten one
  - Ex: *awe'ama* (optic fiber cable. Awe = strand / thread, *mā'ama'ama* = bright)
- ◆ Repurpose meaning of existing word:
  - Ex: *kā'ele* = darken. New meaning - bold, as in a font style
  - Ex: *hiō* = titled/leaning. New meaning - italic, as in a font style
  - Ex: *'oneki* = deck of a ship. *New meaning* = computer desktop / Finder.

# KE KŌMIKE HUA‘ŌLELO: LEXICON CREATION GUIDELINES (cont’d)

- ◆ Use a word or part of a word from another Polynesian language.
  - Ex: *hua ma‘aka* (upper-case letter. *hua* = letter, *ma‘aka* is Rarotongan for “big”)
  - Ex: *hua na‘ina‘i* (lower-case letter, *na‘ina‘i* is Tahitian for “small”)
- ◆ Hawaiianize the orthography of a word from a non-Polynesian language.
  - No technology examples.
  - Ex: *pekikulali* (pedicularis, greek term for Lousewort plant)

# KE KŌMIKE HUA'ŌLELO: LEXICON CREATION GUIDELINES (cont'd)

- ◆ Though not common, the committee has coined new words to replace existing ones that have fallen into disuse, and it was felt the new words better represented the contemporary concepts.
- ◆ While not complete, these guidelines have been used for the vast majority of new words coined by the committee
- ◆ Approval requires discussion and multiple approvals before publication or dissemination

# KE KŌMIKE HUA'ŌLELO: REVISITING PROBLEMATIC LEXICON

- ◆ *kahua pa'a* - homepage
  - Used broadly for homepage, web page and webs site
  - *paena* (a place of landing) coined by a Kōmike member, but not yet approved
- ◆ *mo'okāki* = account
  - Issue - *kāki* implies a monetary value or charge. Appropriate for bank account but not a user account.
  - Action pending
- ◆ Blog / weblog = ? Puke mo'omana'o pūnaweale puni honua? Mo'omana'o pūnaweale? Undecided

# KE KŌMIKE HUA'ŌLELO: CONTESTED LEXICON

- ◆ *kamepiula* - computer
- ◆ *lolo uila* (electric brain)
  
- ◆ Why contested
  - Some say *lolo uila* more Hawaiian perspective
  - But...
  - In Hawaiian, the seat of emotions and intelligence is the *na'au* (intestines)
  - *na'au uila*? Electric intestines?

# KE KŌMIKE HUA'ŌLELO: REVISITING PROBLEMATIC LEXICON

- ◆ Issue: Dealing with trademarked names.
  - Current policy - do not translate: Apple Computer, Inc., iPod, Microsoft.
  - OK to translate generic names *hualono* is generic term for a device that can play audio, but keep iPod
  - However... Pōkāmana (PowerPoint) is widely used for presentation software of any kind, including Keynote.
  - Also... community sometimes transliterates - Walamaka (Walmart) widely used

# NON-KŌMIKE LEXICON: ORGANIC CREATION

- ◆ *ho'olele hualono* - podcast
  - “broadcast held in a pod/seed that you listen to.”
  - Created (by yours truly and friends) and used widely, not yet addressed by Kōmike.
- ◆ *pihi pua* - command key on a Mac
  - ‘official’ term - pihi kauoha
  - *pihi pua* (flower key) created by students  
a Nāwahīokalani'ōpu'u immersion school



# ACRONYMS

- ◆ No policy, committee does not address
- ◆ Sometimes used (by me only it seems)
  - HKH (URL - *helu kuhi henua*)
  - PPH (WWW - *pūnaewele puni honua*)
  - Generally I'll use the full term once, follow it with acronym (in caps) in parenthesis, then uses acronym from that point on: *E kaomi ma luna o ka helu kuhi henua (HKH)...*

# MAINTENANCE AND PUBLICATION OF LEXICON

- ◆ pre-2006 and pre-Unicode
  - Filemaker Pro database w/custom routines to accommodate customized Hawaiian fonts and alphabetization
- ◆ Issues:
  - Late implementation of Unicode support in FMP
  - Single field held all entry data-stylized text
  - No support for export of rich text-plain text only
  - Single user maintenance
  - Extensive reformatting required for publication

# MATAPUNA: OPEN SOURCE DICTIONARY SYSTEM

- ◆ Open source, web-based, multi-user, Unicode - capable multilingual dictionary writing system
- ◆ Used for *Te Taura Whiri i te Reo Māori* - the Māori Language Commission's monolingual Māori dictionary
- ◆ *Māmaka Kaiāo* implementation customized by Thinktank Consulting Limited in Aotearoa (NZ).
- ◆ Customized export module generates RTF of lexicon for publishing
- ◆ <http://www.matapuna.org/>



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**a** [ *And, when, until, to, etc. Dic., sp. var.* ]

a *And, when, until, to, etc. Dic., sp. var.*

save

delete

Entry

a

headwordid

1

syllablised

a

Sense

1

: 1

categoryid

0 - unassigned

wordclassid

secondarywordclass

ham

heh

i'oa

kik

'a'

subentry

Definition

And, when, until, to, etc.

precededbyke

pronounced

usually

Example

exampletranslation



Mamaka Kaiiao Headword

usage

dic  +

extmng

newmng

spvar

borrowedlangid

Not Borrowed ▾

borrowingterm

borrowingtranslation

combiningterm

shortened

abbreviation

also

cf

see

seeentriesbelow

Essay

neweditorialcomment

allocateduserid

anyone ▾

QA1 (self-check)

passed ▾

QA2 (1st edit)

not yet reviewed ▾

importedtext

**a** And, when, until, to, etc. *Dic., sp. var.*

residualtext

owneruserid

kiele

createuseranddate

[none]



# MATAPUNA: COMPARISON WITH OTHER SYSTEMS

<b>Feature</b>	<b>Mātāpuna</b>	<b>SIL Toolbox</b>	<b>Tshwanelex</b>	<b>IDM</b>
<b>Cost</b>	Free	?	\$	\$\$\$\$\$
<b>Client platform</b>	Windows, Linux, Mac, any browser	Windows	Windows	Windows & Browser
<b>Flexibility</b>	Unlimited	None	Good	Send Money
<b>Team coordination</b>	Real-time collaboration, workflow, reports	No	Merge copies	Workflow
<b>Ease of use</b>	Excellent	Hard	Very good	Complex
<b>Database</b>	Postgres	Custom	Custom	SQL Server
<b>Unicode support</b>	Yes	Yes	Yes	Yes
<b>Validation</b>	Yes, customisable	No	Some	Yes
<b>Corpus access</b>	Yes	No	No	Yes
<b>Server platform</b>	Linux on cheap hardware	N/A	N/A	Windows on expensive hardware

# MATAPUNA: ISSUES?

- ◆ Conversion of text from FMP to Matapuna
  - Mapping of data from single text field to multiple fields cumbersome
  - Thinktank automated/scripted some conversion, but each record required manual verification/correction
  - Four years later, conversion not complete, several thousand new words await importing
    - Staffing and funding issues, not technology

# IMPLEMENTATION OF TECHONOLGY TERMS IN LOCALIZATION

- ◆ Pre-2000: Tricky
  - Required use of custom fonts, INITs, control panels, keyboards, Macintosh-only
- ◆ Post-2001: Better but not perfect
  - Mac OS support of Hawaiian in OS X 10.2 (2002) included keyboard and many fonts (not all) that supported Hawaiian
  - Some key applications (FirstClass Client, FileMaker Pro) slow to support Unicode

# IMPLEMENTATION OF TECHONOLGY TERMS IN LOCALIZATION

- ◆ Today: Sky's The Limit
  - Mac OS / iPhone / iPod all support Hawaiian
  - Working on Android support
  - FirstClass localization since 1994, now Unicode and in its 5th localization
  - Google search engine, Ning localized
  - Microsoft has some community programs & tools, so far hasn't agreed to including Hawaiian keyboard

# IMPLEMENTATION OF TECHONOLGY TERMS IN LOCALIZATION

## ◆ Issues:

- Localization maintenance and leveraging previous translation
- Length of translations-Hawaiian tends to be longer. (slight to significant)
  - In binary translations, menus, dialog boxes, more of an issue than web translations.
  - Ex: Select All = “E koho i nā mea a pau”. Shortened to “Koho pau loa”. “E” particle indicating command dropped

Nā Puke Wehewehe 'Ōlelo Hawai'i

http://wehewehe.org/ Google

Nā Puke Wehewehe 'Ōlelo Hawai'i

Pa'a Lima **ulukau** HAWAIIAN ELECTRONIC LIBRARY English Text Kōkua

**Nā Puke Wehewehe 'Ōlelo Hawai'i** E HULI I KA HUA'ŌLELO A I 'OLE KA MANA'O KA HO'OHANA 'ANA I K

ā ē ī ō ū ' NĀ PIHI KAHAKŌ A ME 'OKINA

E KIKOKIKO I KA HUA'ŌLELO  e huli

NO KA HO'OLOLI IKI I KA HULI

Hwn Dict/Māmaka

ka pela kahiko

e huli i ka hua'ōlelo wale nō

Ua hiki nō ke huli piha ma nā puke wehewehe 'ōlelo pākahi, mai kinohi a ka pau 'ana, [ma 'ane'i](#).  
Aia kekahi mau hua'ōlelo Hawai'i hou i loa'a 'ole ma Māmaka Kaiao [ma 'ane'i](#).  
Hawaiian Dictionary (Ka puke wehewehe a Pukui/Elbert) Kuleana kope © 2003 na ka [Hale Pa'i o Ke Kulanui o Hawai'i](#),  
Māmaka Kaiao Kuleana kope © na ka ['Aha Pūnana Leo](#) a me ka [Hale Kuamo'o](#),  
Place Names of Hawai'i (Ka Puke Inoa Wahi a Pukui/Elbert) Kuleana kope © 1974, 2004 na ka Hale Pa'i o Ke Kulanui o Hawai'i,  
a me ka Hawai'i Place Names (John R.K. Clark) Kuleana kope © 2002, 2004 na ka Hale Pa'i o Ke Kulanui o Hawai'i,  
nona wale nō ke kuleana o ia huahana.  
['Enehana](#) | [Hō'ike hou](#)

- Mea Hou
- Wehe**
- Pani ⌘W
- Ho'ouka... ⌘T
- Ho'oili...
- Kākomo
- Kāpuka...
- Mālama ⌘S
- Mālama...
- Holoi ⌘D
- Ho'ihoi mai Holoi
- Ki'i 'Ike... ⌘I
- Ho'onohonoho Pa'i
- Pa'i... ⌘P
- Puke Leka Uila
- Trash Can
- Workspaces
- Hale Kuamo'o
- Help
- Kahuwaiola 2007
- Kakoo Leoki
- Koleke
- Leokī
- mailbox\_kahiko
- Mokuna Ha'awina Hawai'i
- Nā Maka o Kana
- Nā Pailaha
- Nā Papa Pūnaewe
- Nā Polopeka
- Nuhou APPLE
- Papa Hua ŷōlelo**
- Papa Lawelawe Ho'olaha

- Wehe ka mea i koho 'ia ⌘O
- Wehe Loulou
- 'Oneki ⌘O
- Mail ⌘1
- Hoa Ho'oka'a'ike ⌘2
- Lepe Puke ⌘3
- Ho'opuka Pūnaewe
- Mo'omō'ali ⌘5
- 'Alemanaka ⌘6
- Ho'olaha Leo ⌘7
- Nā Memo ⌘8
- Ka'u mau palapala i ka'ana like 'ia ⌘9
- Ho'āhu Waihona
- Nā Palapala
- Nā Wahi Hana



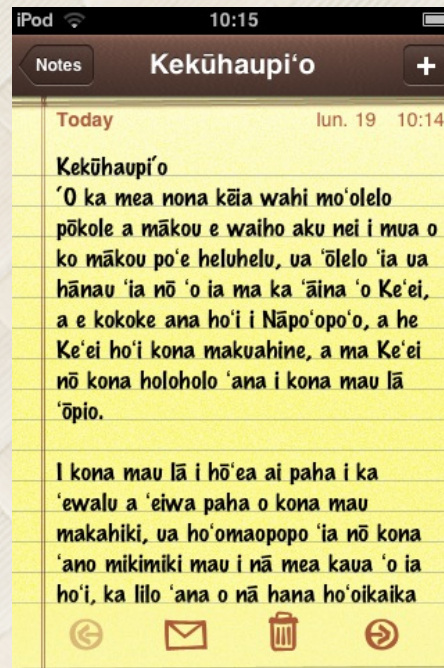
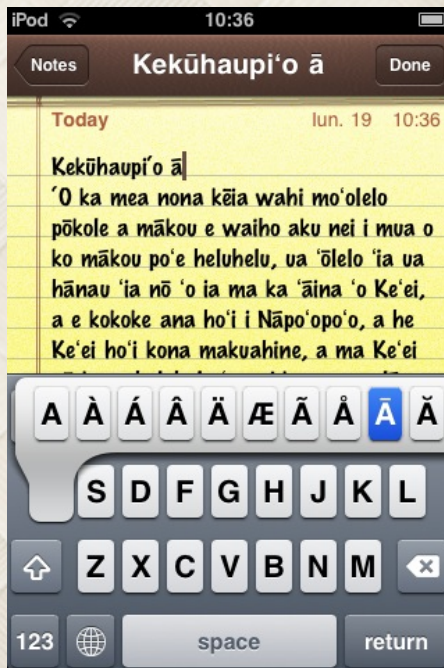
Kekahi Heluhelu 'ole 'ia Kekahi Iho Kekahi Aku

naghy Palena 'ole

B12-3

ha Kenekoa

	Inoa	Nui	Ho'ololi hope 'ia
▼ Kumuhana			
▼ Re(2): Pale ŷili Mai ka ŷOHā Mai	Lei Kapono	4K	2010-10-04 19:22
Re: Pale ŷili Mai ka ŷOHā Mai	Keiki Kawaiaea	4K	2010-10-04 18:18
▼ Re: Amy Stillman	Kalena Silva	2K	2010-10-04 15:03
Amy Stillman	Lei Kapono	642K	2010-10-04 11:23
ⓧ Fwd: Fw: [ILAT] Working Papers in Literacy, Culture, and ...	Keola Donaghy	15K	2010-10-02 11:17
▼ Re(3): Mo'okāki UHHL	Pila Wilson	4K	2010-09-30 15:09
Re(2): Mo'okāki UHHL	Keola Donaghy	3K	2010-09-29 12:57
Re: Mo'okāki UHHL	Kale Langlas	2K	2010-09-29 12:43
Re: Mo'okāki UHHL	Keola Donaghy	3K	2010-09-29 11:32
ⓧ Mo'okāki UHHL	Kamuela Miller	70K	2010-09-29 10:28
▼ Re: ka ha'i'ōlelo a Kaleimamo	Pila Wilson	3K	2010-09-30 15:05
Re: ka ha'i'ōlelo a Kaleimamo	Kalena Silva	2K	2010-09-30 12:42
Re: ka ha'i'ōlelo a Kaleimamo	Kale Langlas	3K	2010-09-30 11:26
ka ha'i'ōlelo a Kaleimamo	Scott Saft	2K	2010-09-30 11:02
Hālāwai Koleke	Lei Kapono	2K	2010-09-30 11:59



Google

http://www.google.com/webhp?hl=haw

IMPELEMNTATION

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Pūnaewele Puni Honua [Nā Ki'i](#) [Nā Hō'ano hou](#) [Nā Pū'ulu Kūkākūkā](#) keoladonaghy@gmail.com | [Kāu Mau Koho Pa'amau](#) | [Ha'alele](#)

# Google

Hawai'i

Hulina Kūlana Kīeki'e  
Nā Mea Hana 'Ōlelo

Huli iā Google Laki Paha Au

[No Google](#) [Google.com in English](#)

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Google Hulina Kūlana Ki'eki'e

http://www.google.com/advanced\_search?hl=haw

IMPELEMNTATION

Google Hulina Kūlana Ki'eki'e

**Google** Hulina Kūlana Ki'eki'e [Nā Mana'o Kōkua](#) | [No Google](#)

**E huli i nā hualoa'a**

i loa'a nā hua'ōlelo a pau.  10 nā hualoa'a ▾

i loa'a kēia māmala'ōlelo piha

i loa'a ma ka li'ili'i loa ho'okahi o kēia mau hua'ōlelo

i loa'a 'ole nā hua'ōlelo

**'Ōlelo** E hō'ike i nā palapala i kākau 'ia ma ka 'ōlelo

**Māhele 'Āina** Huli i nā palapala ma ke aupuni 'o:

**Hulu Waihona**  hō'ike i nā hualoa'a ma ia hulu waihona

**Lā** E hō'ike i nā palapala pūnaewe i 'ike mua 'ia ma ka

**Ma Hea** E hō'ike i nā hualoa'a ma kahi e 'ike 'ia ai ka'ua (mau) hua'ōlelo

**Inoa Kikowaena Pūnaewe**  hō'ike i nā hualoa'a ma ka paena a kikowaena pūnaewele paha  e la'a me google.com, .org ['Ike hou aku](#)

**Nā kuleana ho'ohana** Hō'ike i nā hualoa'a i

**Hulina Palapala Kiko'i**

**Nā Mea Like** E huli i nā palapala i like me ka palapala   e la'a me [www.google.com/help.html](http://www.google.com/help.html)

**Nā Loulou** E huli i nā palapala e kuhikihi ana i ka palapala

# CONTACT AND ONLINE CLASS INFORMATION

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or email me!