



# Design, development and implementation of a Dentistry module for GNU Health: experience at the Humberto D'Angelo Primary Care Center in Argentina

# GHCon2020





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**GHCon2020**



# Content

- Introduction
- The need
- Design and development
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- Next steps

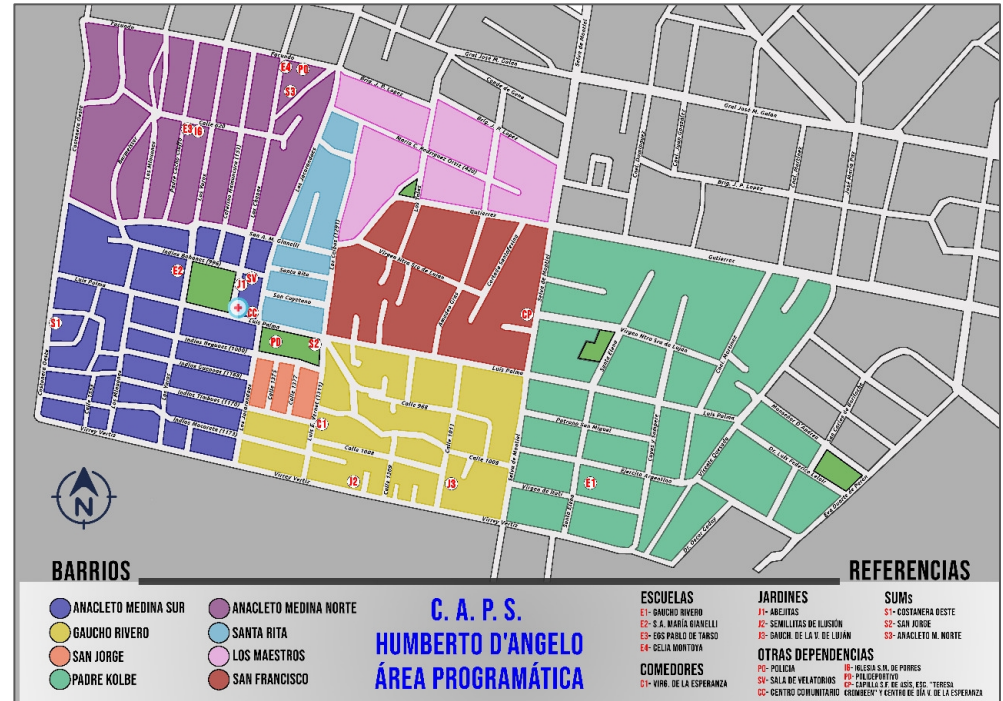
# Introduction

- Entre Ríos has 210 provincial health providers at the first level of care, of which 136 have dental services (not counting municipal ones).
- They are organized and function according to the requirements of the Department of Dentistry of the Provincial Ministry of Health
- -The province has a "Dental Clinical History" and PAPER forms where data are collected for the service's care statistics

# Primary Health Care Center “H. D’Angelo”

GNU Health Information System implemented since 2014

- Public organization
- More than 10,000 people
- 8 neighborhoods
- More than 2000 monthly appointments



# GNU Health in the Health Center

- Patient Management (SISA, PUCO and ReNaPer) -> Unique Identification
- Pharmacy Management
- Adult and Pediatric Medical History
- Gynecology and Obstetrics (Pregnancy Control)
- Nursing Service (Relationship with Evaluations)

## **Provincial and National Programs**

- Adults with chronic diseases
- Maternity and Childhood
- Sexual and Reproductive Health
- Medicaments program
- Social Area, Mental Health and others

# The Dentistry Service

- 4 professionals
- more than 200 monthly consultations
- 4 schools within the programmatic area (a lot of children)
- Dental records separated from medical history

# The Need

- From knowing the work that takes place in the dental offices of the first level of health care,
- the prevalence of dental problems in the community
- the desire to improve the work processes of the health team
- Need to collaborate with the international development of GNU Health

A development for the service began to be considered



# The Proposal

Design, develop and implement in the GNU Health System a module that allows to computerize the processes of the Dentistry Service:

- Integrate dental information into the EHR
- Improve patient care
- automate reports

# How (resources)



Facultad de  
**Ingeniería**

## Technological and Social Development Project

"Development and  
Implementation of an  
interoperable information  
system to address data  
fragmentation at the first level  
of health"

# How (participants)

## Design → Faculty of Engineering (Public Health)

- Provincial regulations
- Dental Worksheet
- User needs

**Development** → **Silix** "Free computer solutions"  
([www.silix.com.ar](http://www.silix.com.ar))

**Implementation** → CAPS "Humberto D'Angelo

- Since July 2020

# Key points

- Odontogram
  - Permanent
  - Temporary
- Dental Procedures (provincial standard)
- Access and registration permissions
- Reports
- Translation

# Results (development)

**Patients** 1/5

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Main Info  
🔗 Francescoli, Renzo Male Age: 4y 5m 3d

Critical Information  
A01.1 : Paratyphoid fever A

Disabilities / Barriers:

General Info | Functioning and Disability | Socioeconomics | Lifestyle | **Dentistry** | Medication

Odontogram  
Legends: (\*) Decayed (X) Missing (#) Filled (=) For Extraction

Right	18:	17:	16:	15:	14:	13:	12:	11:	21:	22:	23:	24:	25:	26:	27:	28:	Left
	48:	47:	46:	45:	44:	43:	42:	41:	31:	32:	33:	34:	35:	36:	37:	38:	

Primary Schema:

Right	55:	54:	53:	52:	51:	61:	62:	63:	64:	65:	Left
	85:	84:	83:	82:	81:	71:	72:	73:	74:	75:	

DMFT Index:  dmft index:

New tab  
"Dentistry"  
with the  
odontogram

# Odontograms

**Set Odontogram (Francescoli, Renzo)**

Permanent Primary

Upper

11:	<input type="text"/>	V: <input type="checkbox"/> I: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>	21:	<input type="text"/>	V: <input type="checkbox"/> I: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>
12:	<input type="text"/>	V: <input type="checkbox"/> I: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>	22:	<input type="text"/>	V: <input type="checkbox"/> I: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>
13:	<input type="text"/>	V: <input type="checkbox"/> I: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>	23:	<input type="text"/>	V: <input type="checkbox"/> I: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>
14:	Filled	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input checked="" type="checkbox"/> D: <input checked="" type="checkbox"/> P: <input checked="" type="checkbox"/>	24:	<input type="text"/>	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>
15:	<input type="text"/>	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>	25:	<input type="text"/>	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>
16:	Filled	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>	26:	<input type="text"/>	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>
17:	<input type="text"/>	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>	27:	Filled	V: <input checked="" type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>
18:	<input type="text"/>	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>	28:	Missing	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> P: <input type="checkbox"/>

Lower

41:	Filled	V: <input type="checkbox"/> I: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input checked="" type="checkbox"/>	31:	<input type="text"/>	V: <input type="checkbox"/> I: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input type="checkbox"/>
42:	<input type="text"/>	V: <input type="checkbox"/> I: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input type="checkbox"/>	32:	<input type="text"/>	V: <input type="checkbox"/> I: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input type="checkbox"/>
43:	<input type="text"/>	V: <input type="checkbox"/> I: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input type="checkbox"/>	33:	<input type="text"/>	V: <input type="checkbox"/> I: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input type="checkbox"/>
44:	For Extraction	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input type="checkbox"/>	34:	<input type="text"/>	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input type="checkbox"/>
45:	<input type="text"/>	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input type="checkbox"/>	35:	<input type="text"/>	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input type="checkbox"/>
46:	<input type="text"/>	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input type="checkbox"/>	36:	Decayed	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input checked="" type="checkbox"/> D: <input checked="" type="checkbox"/> L: <input type="checkbox"/>
47:	<input type="text"/>	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input type="checkbox"/>	37:	<input type="text"/>	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input type="checkbox"/>
48:	<input type="text"/>	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input type="checkbox"/>	38:	<input type="text"/>	V: <input type="checkbox"/> O: <input type="checkbox"/> M: <input type="checkbox"/> D: <input type="checkbox"/> L: <input type="checkbox"/>

Registry of interventions in primary or permanent teeth

# Odontogram

General Info	Functioning and Disability	Socioeconomics	Lifestyle	Dentistry	Medication												
Odontogram																	
Legends: (*) Decayed (X) Missing (#) Filled (=) For Extraction																	
Right	18:	17:	16: #	15:	14: #	13:	12:	11:	21:	22:	23:	24:	25:	26:	27: #	28: X	Left
	48:	47:	46:	45:	44: =	43:	42:	41: #	31:	32:	33:	34:	35:	36: *	37:	38:	
Primary Schema: <input checked="" type="checkbox"/>																	
Right		55:	54:	53:	52:	51:			61:	62:	63:	64: =	65:				Left
		85:	84:	83:	82: X	81:			71:	72:	73: #	74:	75:				
DMFT Index:			6		dmft index:			2		<input checked="" type="button" value="Set Odontogram"/>							

Odontogram with information and indicators

# Patient Treatments

▼ Dentistry Treatments (Francescoli, Renzo)

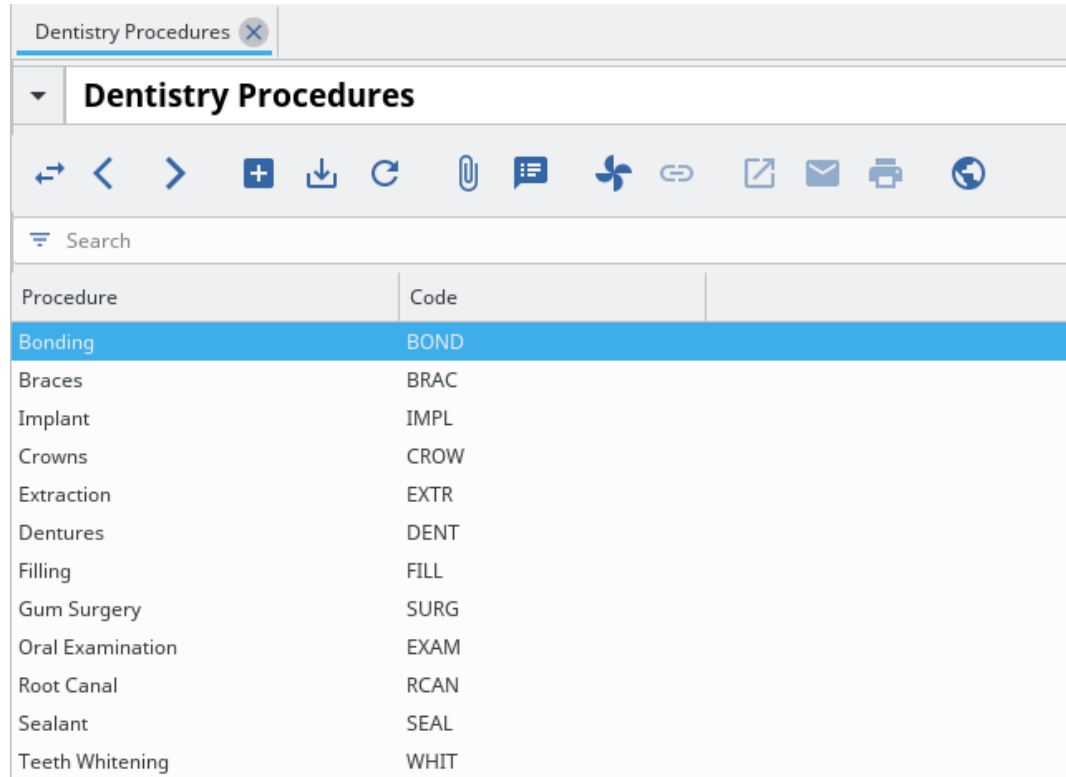
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🔍 Search

Date	Health Prof	State	Procedures info
11/25/2020	Fava, Renato	Pending	EXTR (45)
08/06/2020	Fava, Renato	Done	SEAL (54)
08/06/2020	Fava, Renato	Done	WHIT (21, 22), EXAM ()
08/06/2020	Fava, Renato	Done	CLEANING (32, 46, 47, 48)
05/04/2020	Larreta, Domingo	Done	SEAL (32)
05/04/2020	Fava, Renato	Done	FILL (43)
04/30/2020	Fava, Renato	Done	FILL (42, 53), WHIT (41, 42, 43)
04/29/2020	Fava, Renato	Done	SURG (52, 53)
04/23/2020	Fava, Renato	Done	RCAN (15), WHIT (11, 12, 21, 22, 31, 32, 41, 42)
04/11/2020	Fava, Renato	Done	RCAN (82)
04/01/2020	Fava, Renato	Done	EXTR (42)
03/15/2020	Fava, Renato	Done	FILL (14, 15)



# Dentistry Procedures



Procedure	Code
Bonding	BOND
Braces	BRAC
Implant	IMPL
Crowns	CROW
Extraction	EXTR
Dentures	DENT
Filling	FILL
Gum Surgery	SURG
Oral Examination	EXAM
Root Canal	RCAN
Sealant	SEAL
Teeth Whitening	WHIT

- Standard provincial treatment
- Possibility of adding new treatments

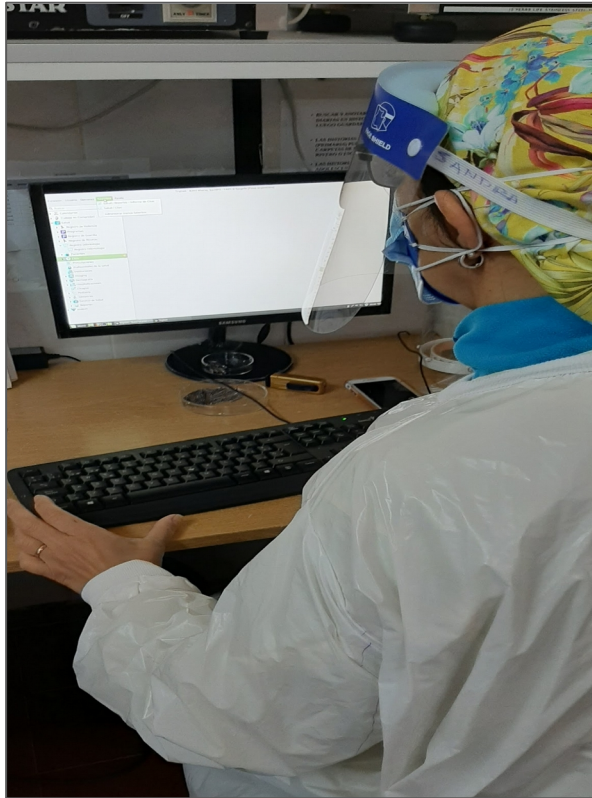
# Implementation

- A terminal was incorporated into the service and it is added to the Health Center Network.
- The module and the interface are presented to the users. New adaptations (Procedures)
- New presentation, training in the use and accompaniment.

# Results (implementation)

- Users using the system
  - Odontograms
  - Treatments
- Users managing appointments schedules, registering patients and consulting medical records
- Proposal for Improvements from users
- Development available for use, study, share and improvement ([https://gitlab.com/gnuhealth\\_fiuner/3.6](https://gitlab.com/gnuhealth_fiuner/3.6))

# Training and use



Professionals are already registering odontograms, treatments and consulting medical records

(thank Dra. Sandra Baez for the picture)

# Next steps

- Strengthen the use of the system and evaluate the evolution of the records \*
- Replicate it in other effectors
- Adaptation to incorporate GNU Health international development
- Incorporate international standards for dental procedures and findings (eg SNOMED-CT)
- Incorporate automatic statistics reports
- Graphic tools for the representation of the Odontogram

# Thanks!!

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