

AI assisted Breast Cancer Screening with GNU Health and Orthanc

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About ... AXXITE

Business Consulting Company since 2001

Focus on logistics processes (SCM, SAP, PM)

GNU Health Core Team

Various roles in

Free Software Projects



About ... VARA

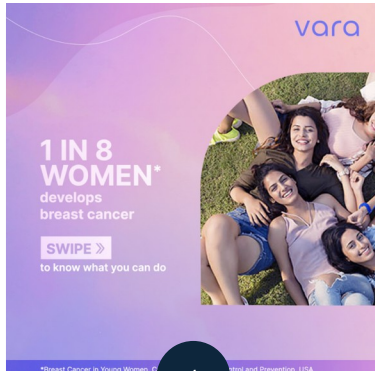
Spin-off from Merantix, Europe's leading venture studio for Artificial Intelligence

Located in AI-Campus, Berlin

Goal: We won't rest until every deadly breast cancer is detected early

VARA – General information

Vara is an AI powered software platform that powers end to end breast cancer screening



vara

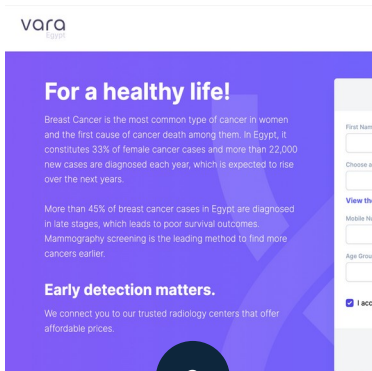
1 IN 8 WOMEN* develops breast cancer

SWIPE >>
to know what you can do

*Breast Cancer In Young Women, Centers for Disease Control and Prevention, USA

1

Vara supports awareness campaigns for its B2B customers



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For a healthy life!

Breast Cancer is the most common type of cancer in women and the first cause of cancer death among them. In Egypt, it constitutes 33% of female cancer cases and more than 22,000 new cases are diagnosed each year, which is expected to rise over the next years.

More than 45% of breast cancer cases in Egypt are diagnosed in late stages, which leads to poor survival outcomes. Mammography screening is the leading method to find more cancers earlier.

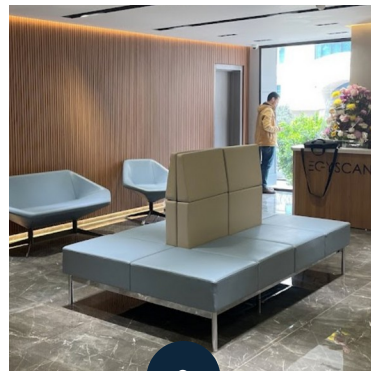
Early detection matters.

We connect you to our trusted radiology centers that offer affordable prices.

First Name*
Choose a title
View the list
Mobile Number
Age Group
 I accept

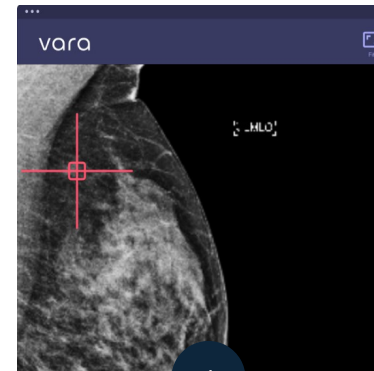
2

Women can book appointments in Vara's booking system



3


Vara's trusted radiology centers provide highest quality screening process



vara

4

Our partner's radiologists all work with Vara's AI to ensure highest quality

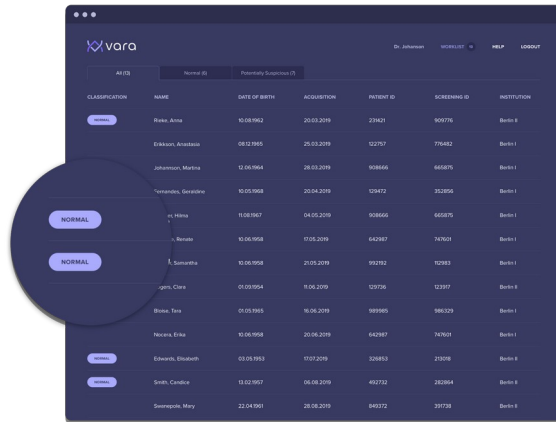


5

Medical consultants support women to receive follow-up & treatment

VARA – General information

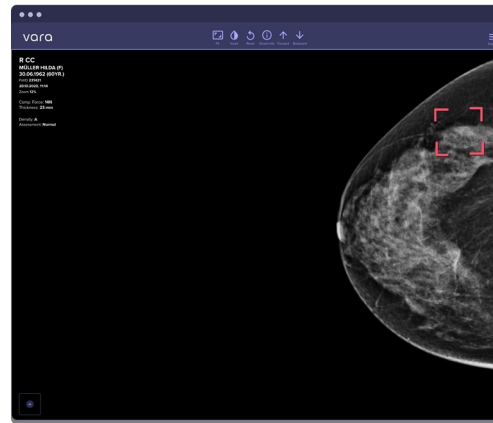
Vara is based on world-class Artificial Intelligence research from Germany and makes world's highest quality screening affordable around the world.



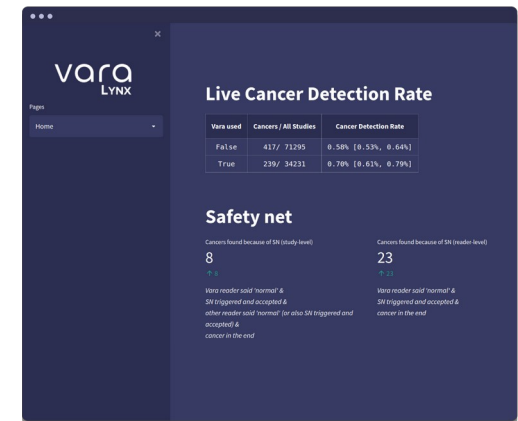
The screenshot shows a table of patient data in the VARA interface. A callout bubble highlights the word 'NORMAL' in a blue pill shape, which is also present in the 'CLASSIFICATION' column of the table.

CLASSIFICATION	NAME	DATE OF BIRTH	ACQUISITION	PATIENT ID	SCREENING ID	INSTITUTION
NORMAL	Riska, Anna	10.08.1962	20.03.2019	22821	900776	Berlin 8
	Elksson, Anastasia	08.12.1965	25.03.2019	122707	776482	Berlin 1
	Johannsen, Martina	12.06.1964	28.03.2019	908666	665675	Berlin 1
	Tornheden, Gertrude	10.05.1968	20.04.2019	120472	322066	Berlin 1
NORMAL	vi, Henna	11.08.1987	04.05.2019	908666	665675	Berlin 1
NORMAL	vi, Beate	10.06.1958	17.05.2019	642987	767901	Berlin 1
	Samurcay, S.	10.06.1958	21.05.2019	992782	102983	Berlin 1
	gryk, Clara	01.03.1994	11.06.2019	120758	123317	Berlin 8
	Blanke, Tessa	01.05.1965	16.06.2019	989965	986329	Berlin 1
	Neukirch, Erika	10.06.1958	20.06.2019	642987	767901	Berlin 1
	Edwards, Elizabeth	03.05.1953	17.07.2019	120493	23008	Berlin 8
	Smith, Caroline	13.02.1967	05.08.2019	492732	282864	Berlin 8
	Sauerwald, Mary	22.04.1961	28.08.2019	849372	29778	Berlin 8

NORMAL PRE-SELECTION

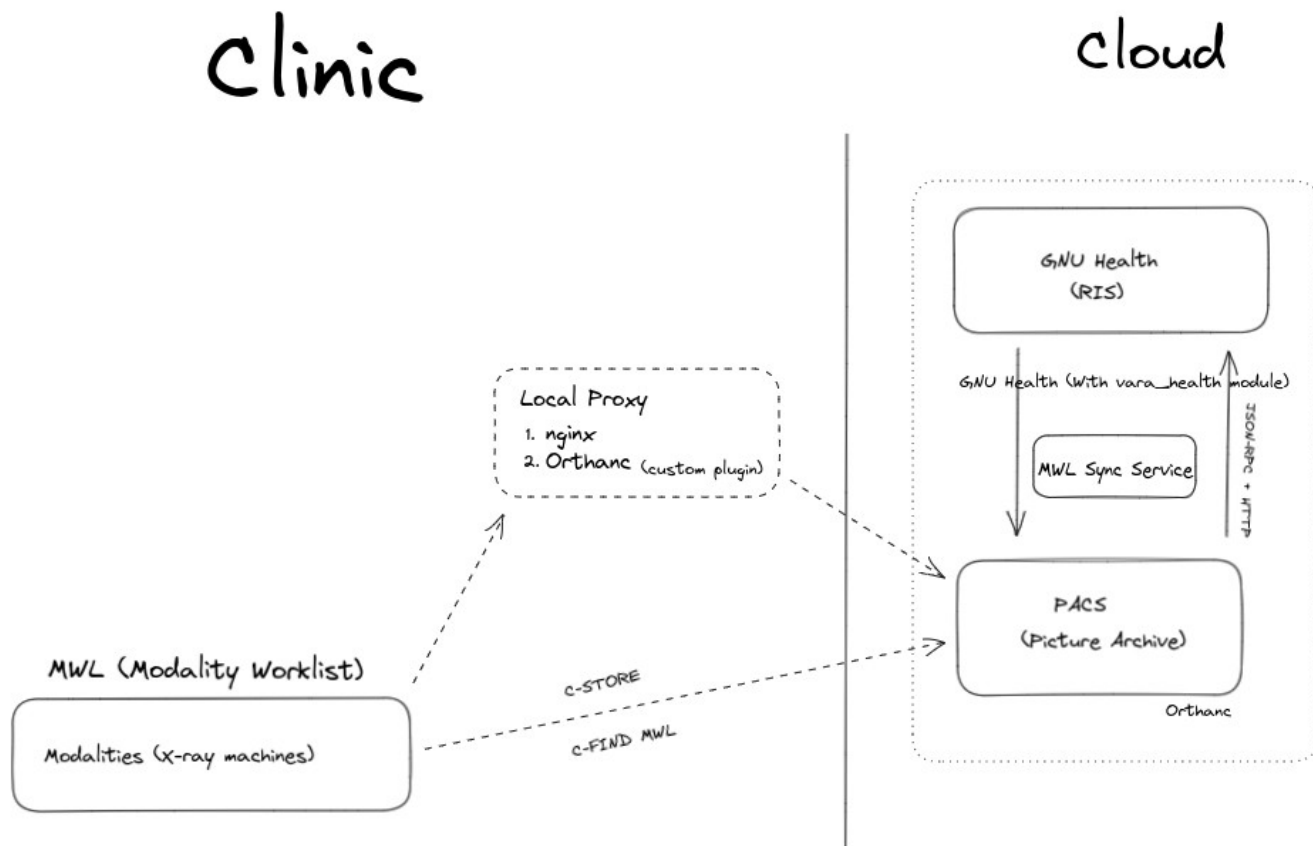


SAFETY NET



REAL-WORLD EVIDENCE

Architecture



How GNU Health is used

vara has chosen GNU Health as HMIS/RIS backend

AXXITE was asked to support the adaption of GNU Health

Together with MBSolutions a project was set up to

- 'Emulate' (RIS) functionalities needed for Vara AI and Vara Viewer to work as intended
- Create a streamlined patient registration
- Add further relevant information like Anamnesis, Dr. Referral, Previous Findings
- Send imaging requests to Mammography unit
- (Radiologists assess in Vara Reader and send findings back to GNU Health)
- Write and download patient report

GNU Health patient list

Create patient

<input type="checkbox"/> Patient ▾	Date of Birth	Patient ID	Mobile	Last Imaging Request
<input type="checkbox"/> Amaze, Honda	12/09/1966			05/02/2023
<input type="checkbox"/> Aman Anand	05/29/1970			06/09/2023
<input type="checkbox"/> Anders, Francesca	08/19/1961			04/03/2023
<input type="checkbox"/> Ansari, Husna	05/02/1981			
<input type="checkbox"/> Arya, Shraddha	05/19/1976			08/09/2023
<input type="checkbox"/> Aumann, Viktoria	11/16/1944			04/03/2023
<input type="checkbox"/> Austermuhle, Erica	11/07/1962			04/03/2023
<input type="checkbox"/> Samuel Badree	07/31/1980		+91 95619 25331	
<input type="checkbox"/> Bahr, Adelheid	12/03/1962			04/03/2023
<input type="checkbox"/> Kali Baniyan	12/06/1980			06/28/2023
<input type="checkbox"/> Barth, Irena	03/26/1944			04/03/2023
<input type="checkbox"/> Becker, Raisa	04/08/1953			04/03/2023
<input type="checkbox"/> Beckmann, Babett	09/27/1963			04/03/2023
<input type="checkbox"/> Achanak Bhayanak	05/01/1970			05/26/2023
<input type="checkbox"/> Bien, Rose-Marie	07/26/1950			04/28/2023
<input type="checkbox"/> Blumel, Agnes	06/09/1962			04/28/2023
<input type="checkbox"/> Blumel, Silva	07/09/1947			04/03/2023
<input type="checkbox"/> Blumel, Gertraude	04/28/1954			04/03/2023

New Patient Creation

Health / Mammography Patients ▾

Fill out fields

1 / 289

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Patient Summary

Name: _____ **Last Names:** _____

Gender: Female **Date of Birth:** _____ 📅

Patient ID: _____ **Mobile:** _____

PUID: _____

Automatically generated for internal use

Patient ID can be used as centers prefer. In Egypt, centers requested a field for their national ID, a Indian center has a center internal ID that is used to track patients within the center (other examinations)

Dr. Referrals and Anamnesis

Create new entry

Doctor's Referrals

Navigation bar for Doctor's Referrals: Refresh, Previous, 0/0, Next, Add (+), Edit, Delete, and Refresh.

<input type="checkbox"/>	Name	Summary	Last User	Last Modification	Last Modification Time	Type	Data	Link
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Create new entry

Anamnesis

Navigation bar for Anamnesis: Refresh, Previous, 0/0, Next, Add (+), Edit, Delete, and Refresh.

<input type="checkbox"/>	Code	Visit	Chief Complaint
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The Dr. Referrals field is used for any kind of document that originates from the process of why the patient is coming to the examination.

The Anamnesis field is used to capture relevant medical information to show to the radiologist during the mammography read.

Medical Image Request and Findings

Send image request
to modality

CREATE IMAGING REQUEST

Mammography Reports

List of mammo.
reads

<input type="checkbox"/>	Order	Number	Requ. Date	Study	Acqu. Date	Assessment	Ass. Date	Pr. st... csd.	RCC	RMLO	LCC
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Patient's historical
imaging results

MEDICAL IMAGING RESULTS 0

Imaging Findings

List of findings in
patient's mammo.

<input type="checkbox"/>	Date	Time	Method	Laterality	Localisation	BI-RADS	Comment	Biopsy Recommendation	Lesion Type	Imaging Test Result
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Reporting Fields

Field for general observations

General Observations

- Observation 1
- Observation 2
- Observation 3

Field for medical opinion

Opinion

This is an opinion
with two lines.

Field for doctor's recommendations

Recommendation

I recommend to take this recommendation seriously.

Resulting Patient Report

Patient info

Medical findings
and observations

Opinion and
recommendation

Legend for non-
radiologist

Patient Name: Alfredo, Pasta
Patient's Date of Birth: 04/03/1980
Patient ID: 6
Date: 08/15/2023
Date of Assessment: 04/03/2023 08:26:31

Digital soft tissue mammography revealed:

- Breast density (ACR): B
- Mammography showed Architectural distortion in Left Breast at 02:00 o'clock measuring 16mm.
- Observation 1
- Observation 2
- Observation 3

BIRADS: 4B

Opinion:
This is an opinion
with two lines.

Recommendation:
I recommend to take this recommendation seriously.

Best regards,
Doctor Danny

BIRADS classification of breast lesions according to the American College of Radiology used for breast assessment combined with recommendations:

Category & recommendations	Suspected Cancer Risk
BIRADS 0: Non-informative study.	
BIRADS 1: Normal study, routine screening.	0 %
BIRADS 2: Benign findings, routine screening.	0 %
BIRADS 3: Probably benign, for close follow up.	2 %
BIRADS 4: Probably malignant, for biopsy.	50 %
A: mild suspicion.	
B: moderate suspicion.	
C: high suspicion.	
BIRADS 5: Malignant, for biopsy.	98-100 %
BIRADS 6: Pathologically proven malignant lesion.	

American college of radiology (ACR) scoring of breast density:

- ACR_A: almost entirely fatty.
- ACR_B: scattered areas of fibro-glandular density.
- ACR_C: heterogeneously dense.
- ACR_D: extremely dense.

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This mammography was conducted using advanced AI technology developed in Germany by Vara. Know more at www.eg.vara.ai

Current Users and Outlook

Egypt:

- Today: 3 centers in Cairo
- 2024: 10+ centers in Egypt

India:

- Today: 2 centers in Mumbai
- 2024: 30+ centers in India

Resonance from vara

- Positive:
 - The translation module lets us adapt our solution to local markets quite easily
 - Support for right to left interfaces is very helpful for Arabic markets
 - The flexibility of the platform lets us adapt rapidly to unforeseen edge cases and user requests
- Negative:
 - Centers resist when it comes to accepting a software that disrupts their existing workflows, specially if their system's UI/UX is friendlier than what they see on GNU Health

Thank you!

Questions?