



PathGen  
Diagnostik Teknologi  
Molecular Diagnostics for All



21 June 2023

# ViuMe: Digital Pathology Platform using Artificial Intelligence for Cervical Cancer Diagnosis

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<sup>4</sup>YARSI Hospital, Jakarta, Indonesia

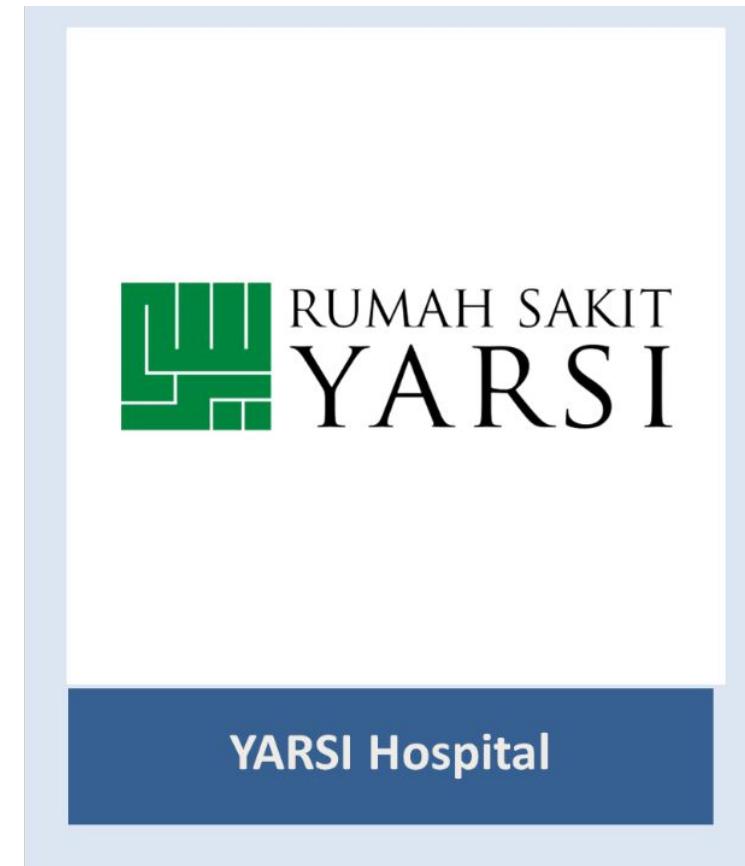
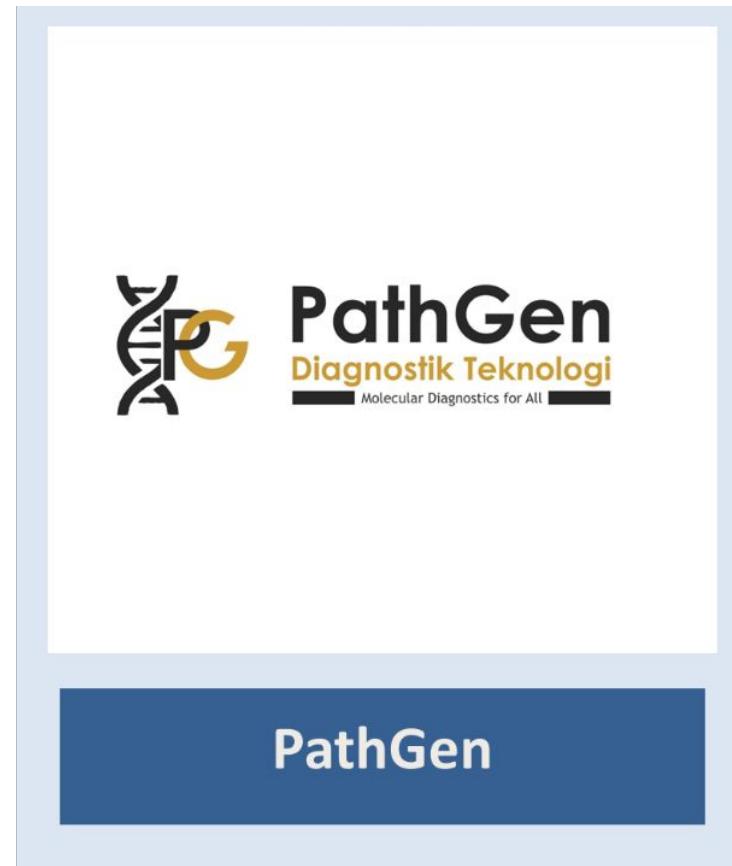
[www.pragma-grid.net/pragm39](http://www.pragma-grid.net/pragm39)

# COLLABORATOR



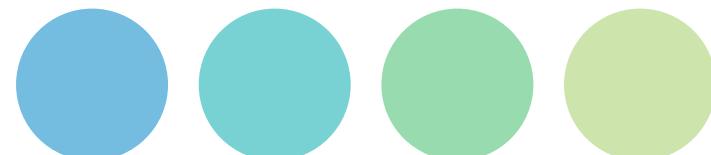
Universitas YARSI and  
Yarsi e-Health Research Center  
(YeHRC)

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# Presentation Flow

- Introduction
- Related Works
- Proposed Method
- Result and Evaluation
- Conclusion
- Future Work

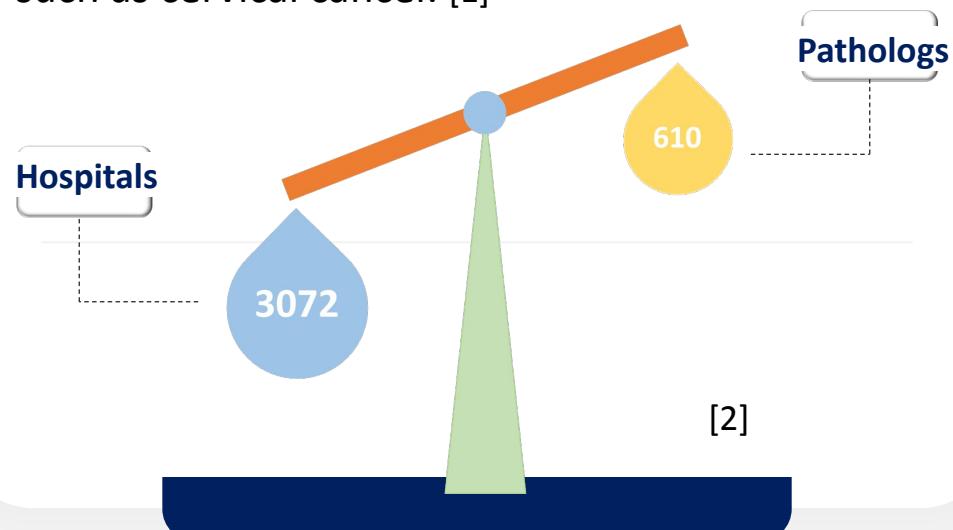


# INTRODUCTION

## Pathology

### What is Pathology?

Pathology is the study of functional cellular changes in the human body, including diseases such as cervical cancer. [1]



The Higher Cancer Stadium



The Lower Life Expectancy.

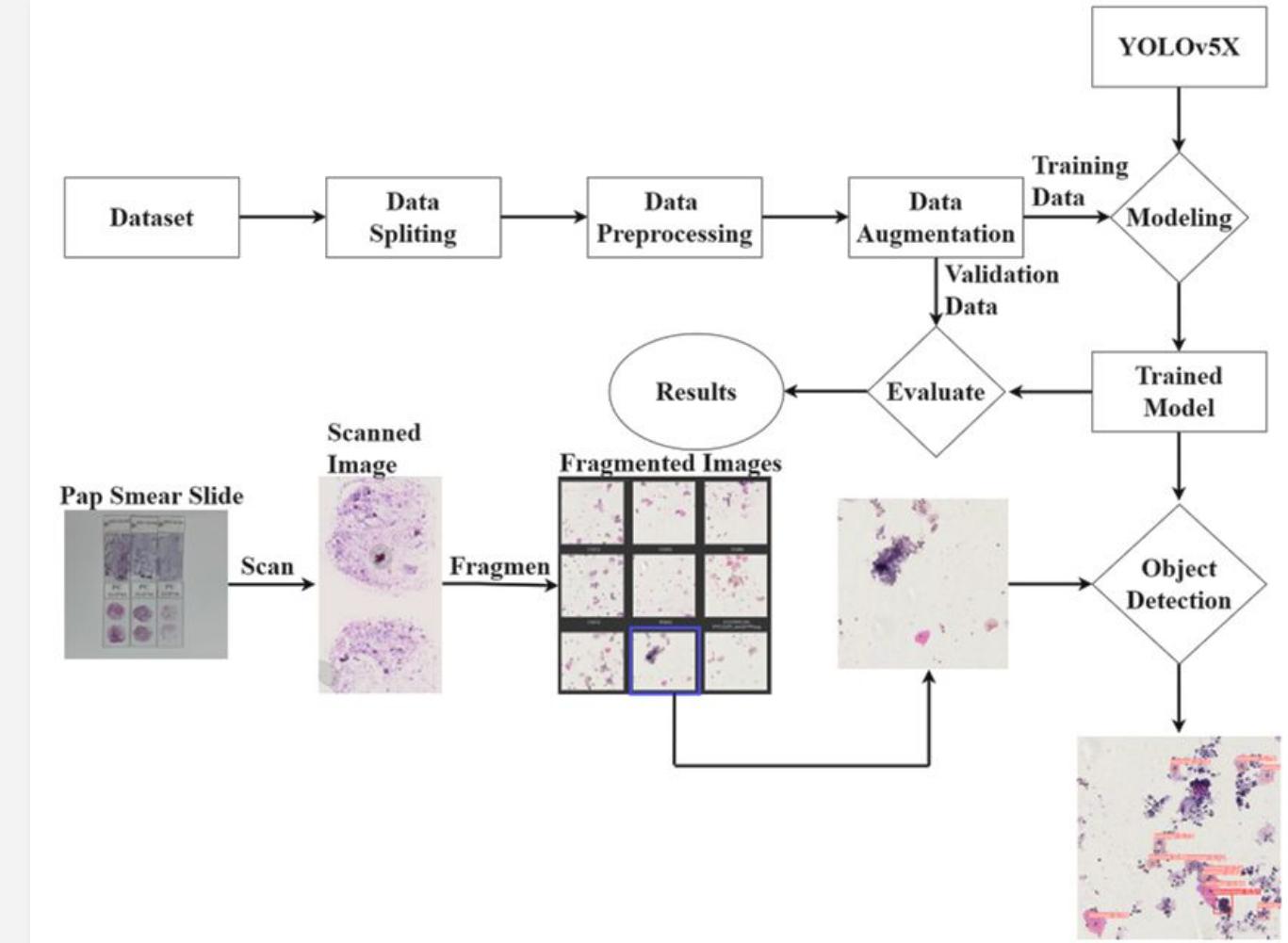
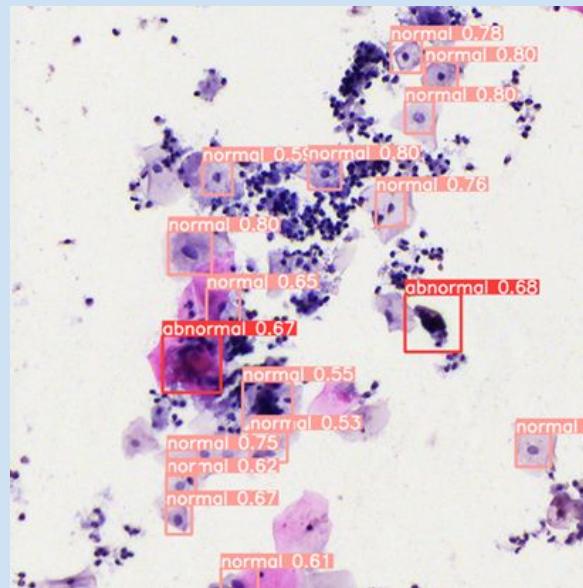


# Motivation

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- 1**  Saving time
  - 2**  Faster Diagnoses
  - 3**  Remote Consultation
  - 4**  Improved productivity

## Related Work 1

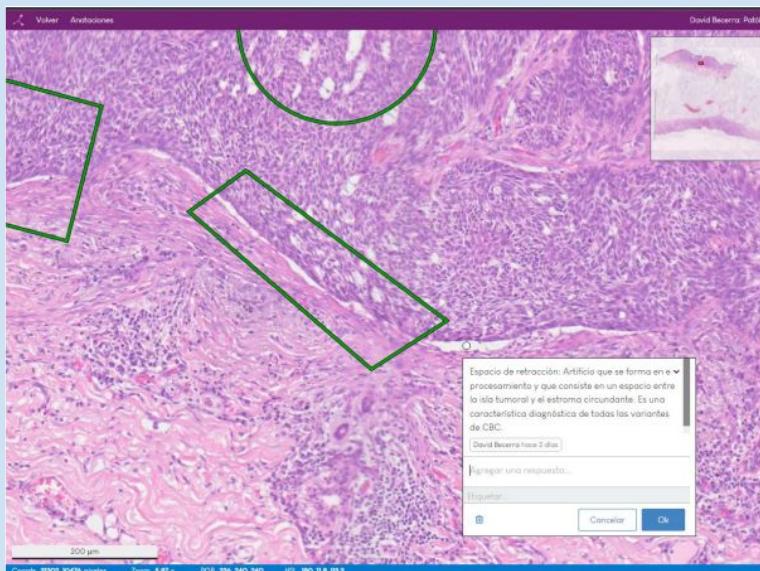
The previous research has been developed an AI model based on object detection, they use YOLO algorithm which is can detects all objects in an image



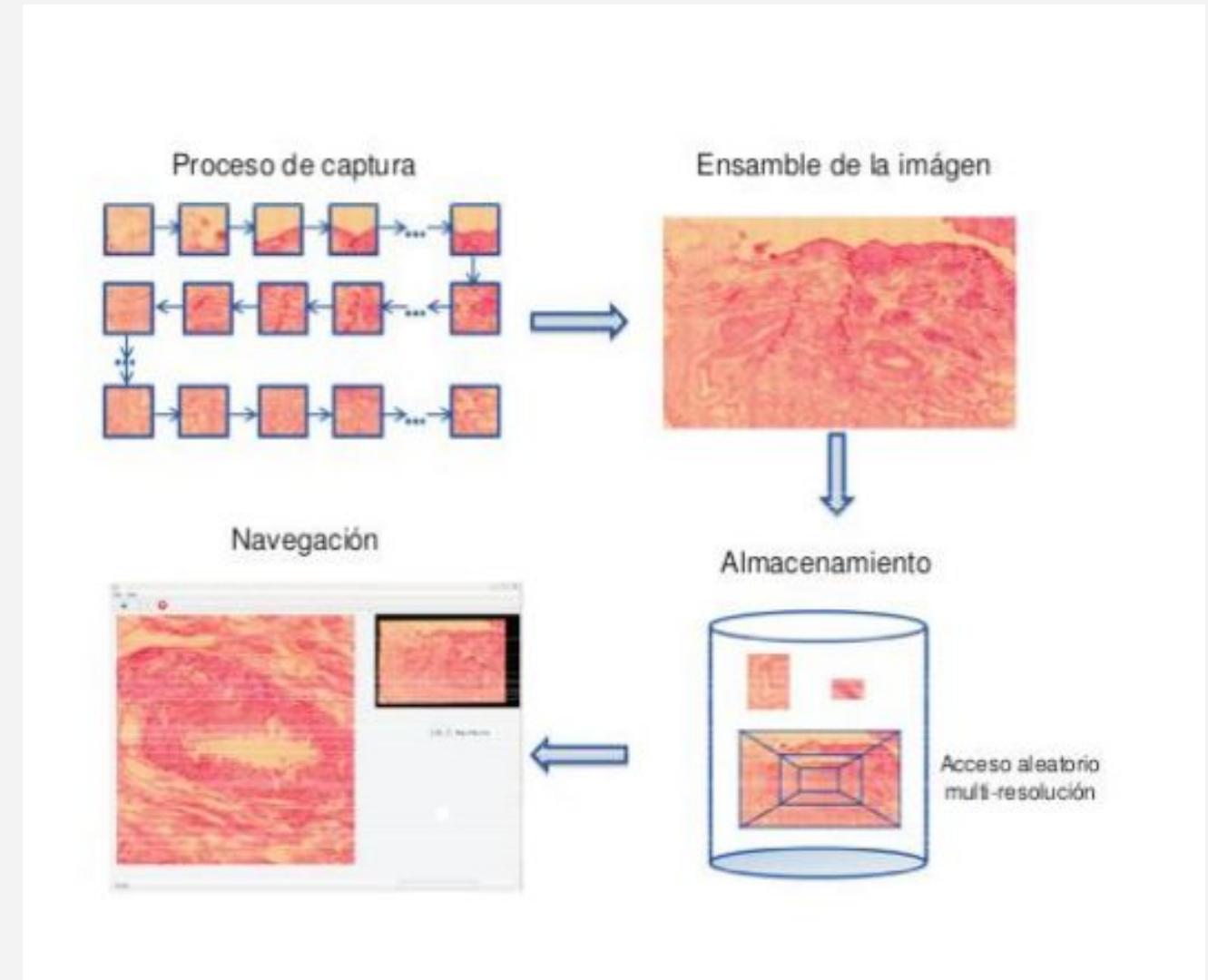
- [1] N. A. R. Chandra Prasetyo Utomo, Muhamad Fathurahman, Ahmad Rusdan Utomo, Yulia Suciati and M. R. and R. P. Indra Kusuma, "A Novel Framework for Cervical Cancer Diagnosis based on Artificial Intelligence in Indonesia," 2022

## Related Work 2

Research innovation digitizer slide pathology to predict the variant of carcinoma.

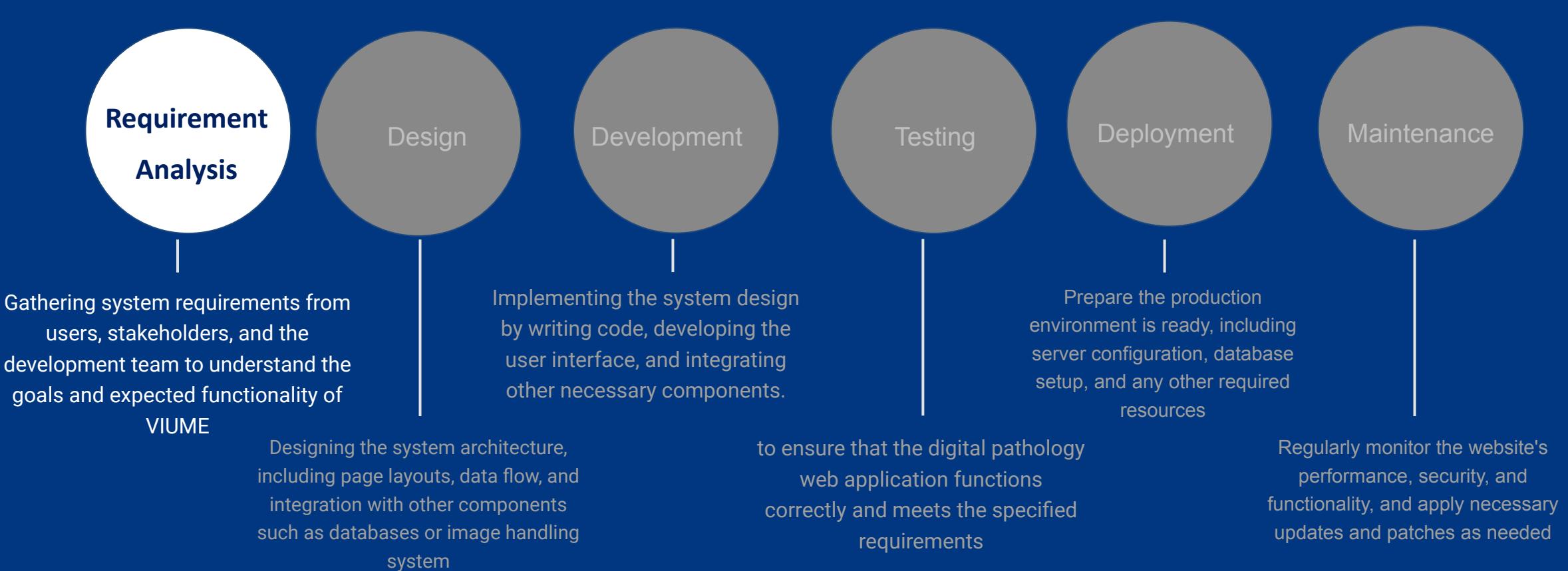


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- [2] D. S. B. Tovar, "Application of virtual sheet tools navigable with annotations, in Carcinoma pathology teaching basal cells and their variants," 2022.

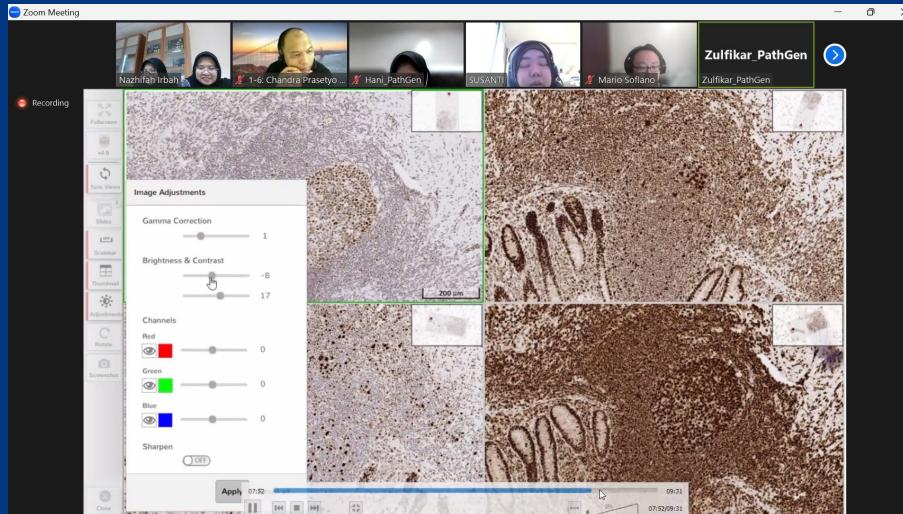
# Machine Learning Development Life Cycle



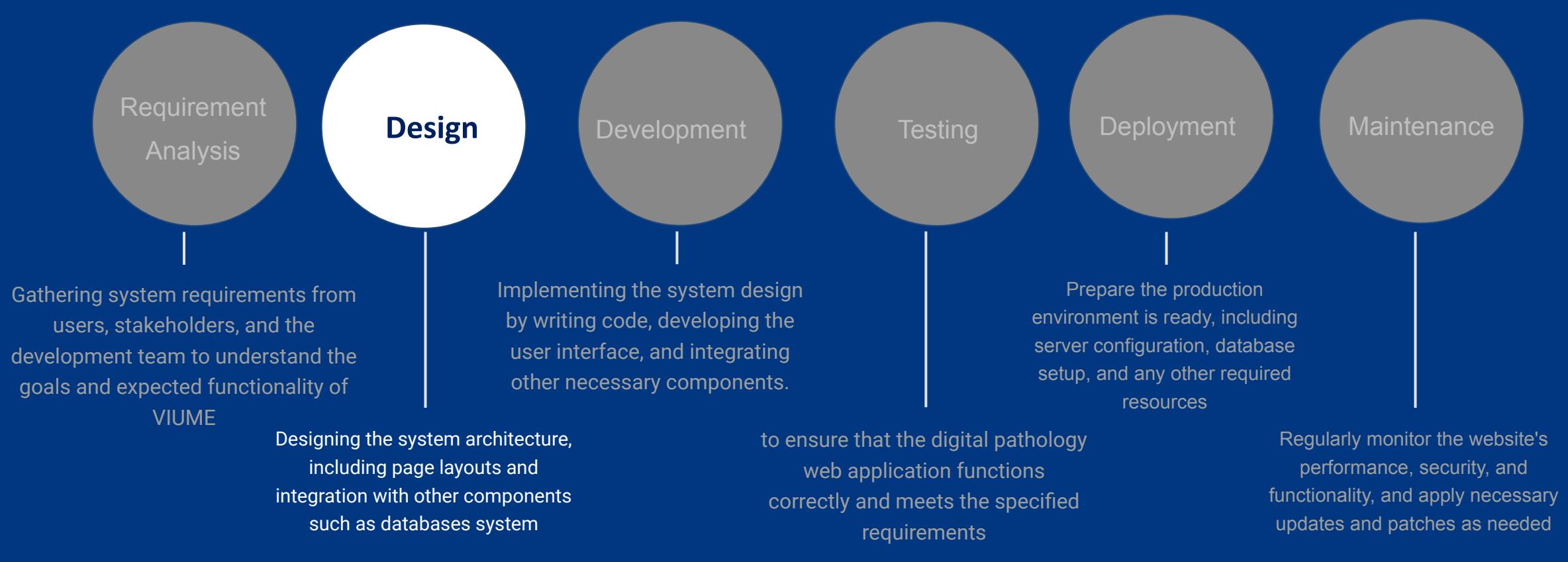
# Machine Learning Development Life Cycle

# Requirement Analysis

Online meeting with PathGen, RS YARSI, pathologist, doctor, and others to discuss feature for development prototype of digital pathology system.



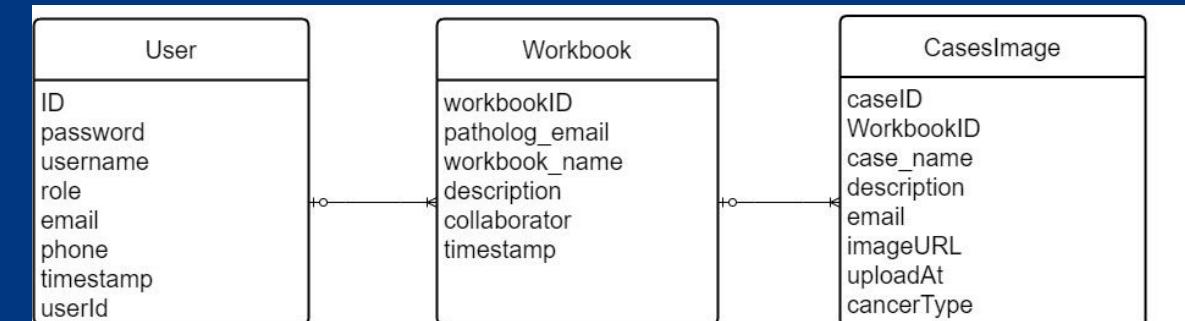
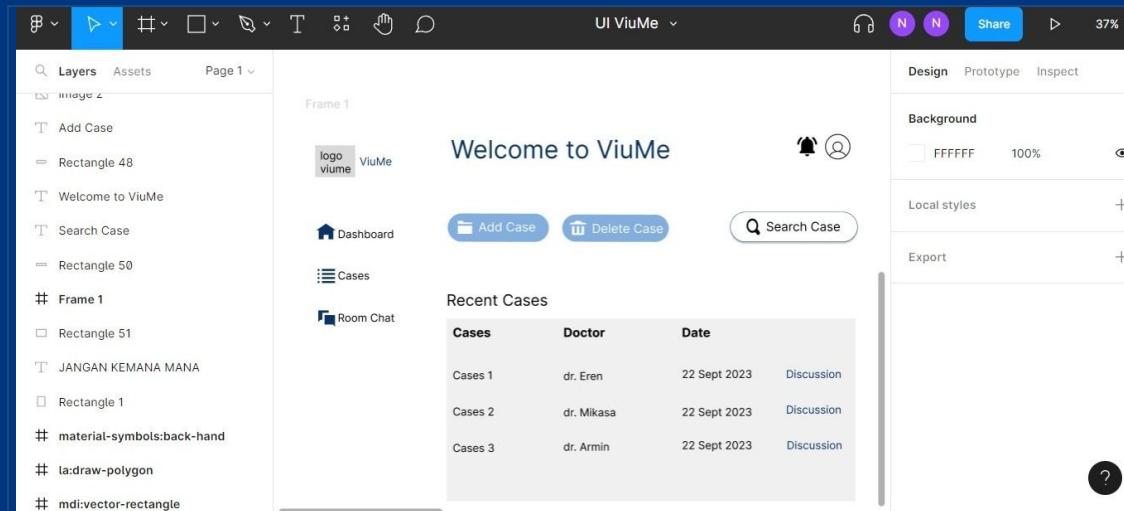
# Machine Learning Development Life Cycle



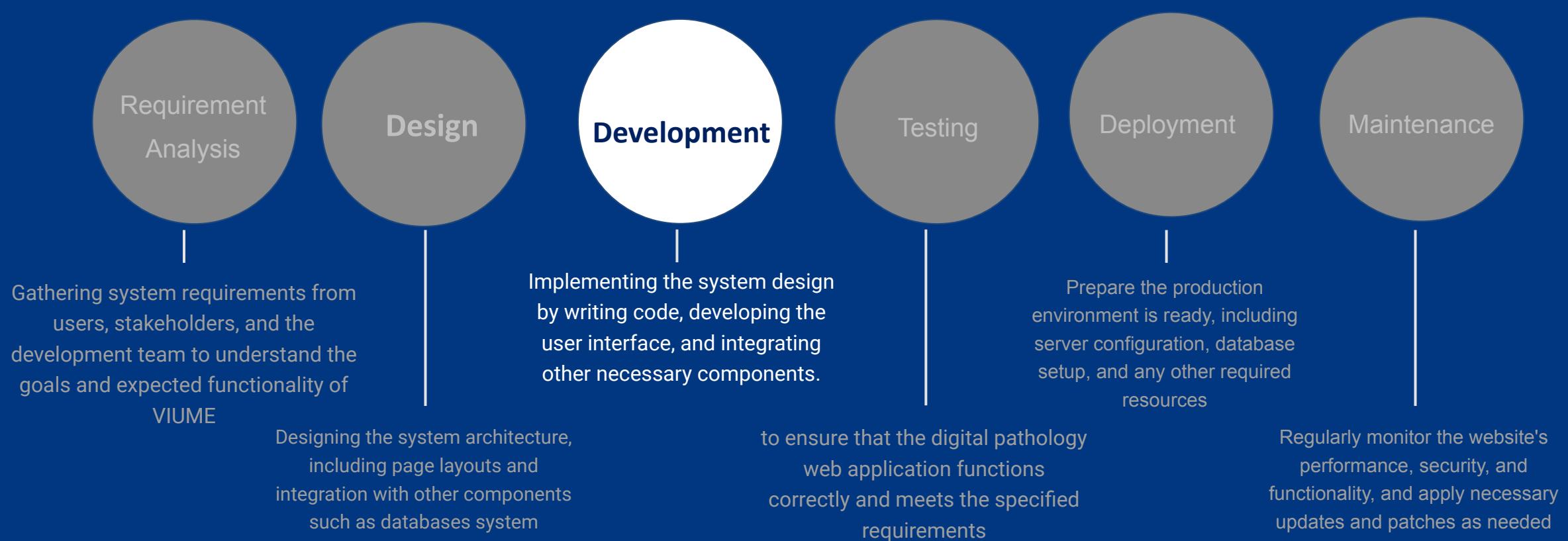
# Machine Learning Development Life Cycle



Designing our website UI using FIGMA collaboration, and the database flow using draw.io to make entity and its attributes



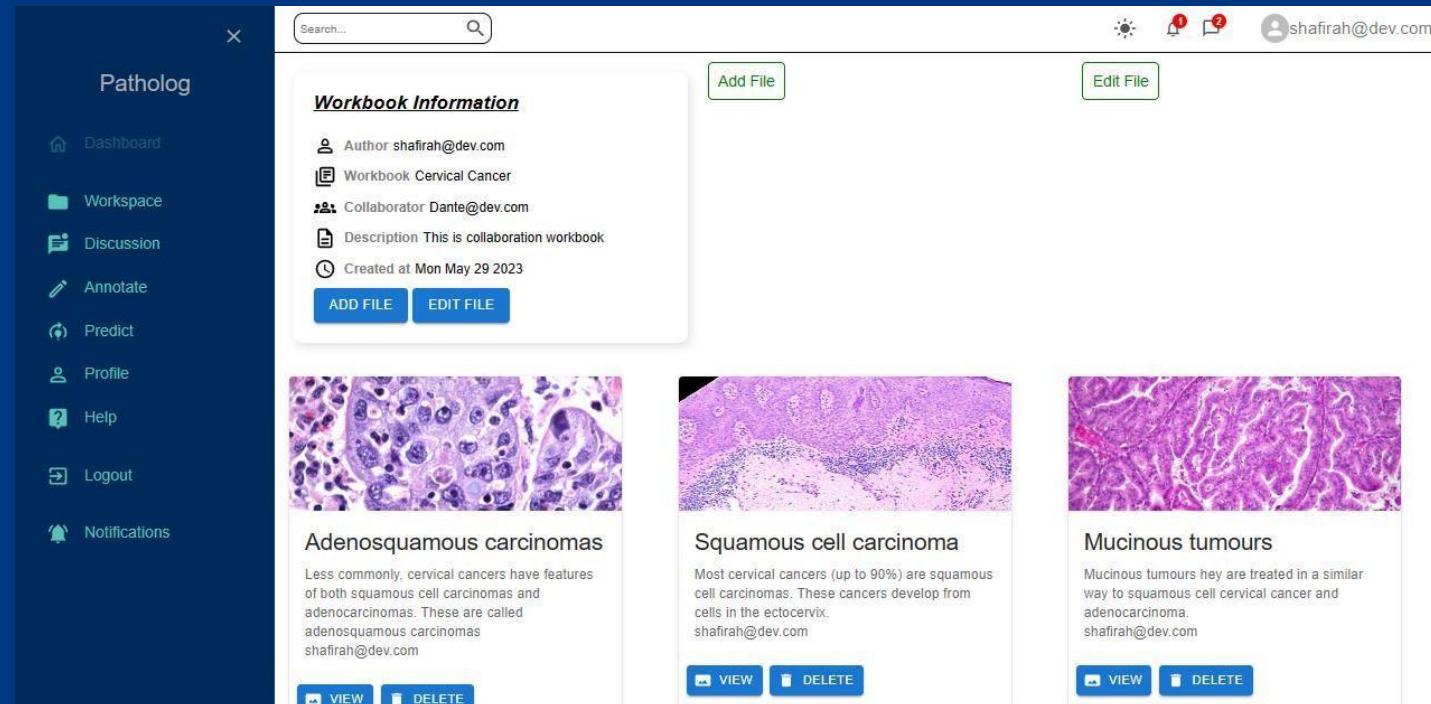
# Machine Learning Development Life Cycle



# Machine Learning Development Life Cycle



We use Visual Studio Code to develop our prototype website using React Javascript, save our data in Firebase, and using GitHub for Collaborating on coding



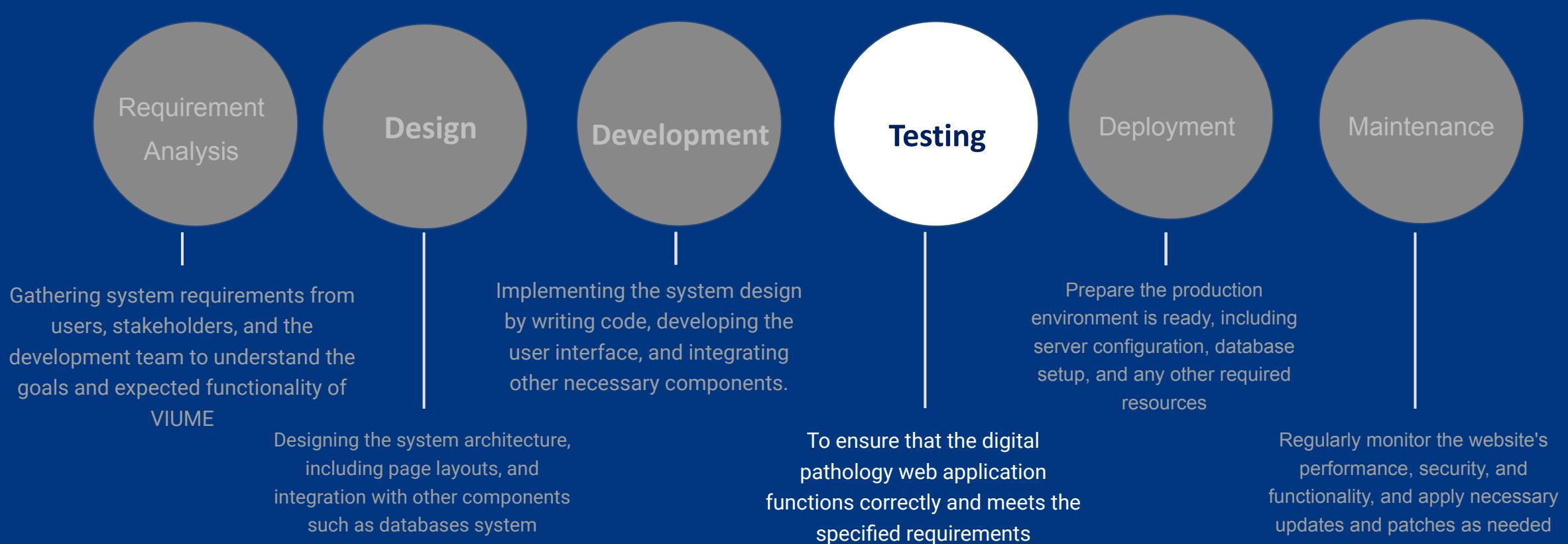
Adenosquamous carcinomas  
Less commonly, cervical cancers have features of both squamous cell carcinomas and adenocarcinomas. These are called adenosquamous carcinomas.  
shafirah@dev.com

Squamous cell carcinoma  
Most cervical cancers (up to 90%) are squamous cell carcinomas. These cancers develop from cells in the ectocervix.  
shafirah@dev.com

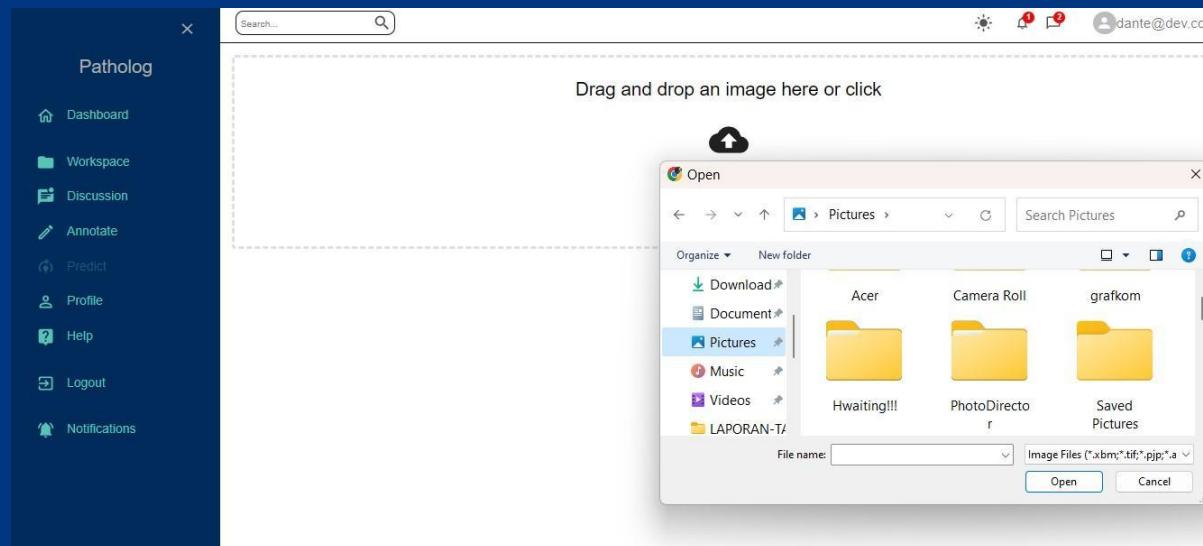
Mucinous tumours  
Mucinous tumours are treated in a similar way to squamous cell cervical cancer and adenocarcinoma.  
shafirah@dev.com



# Machine Learning Development Life Cycle

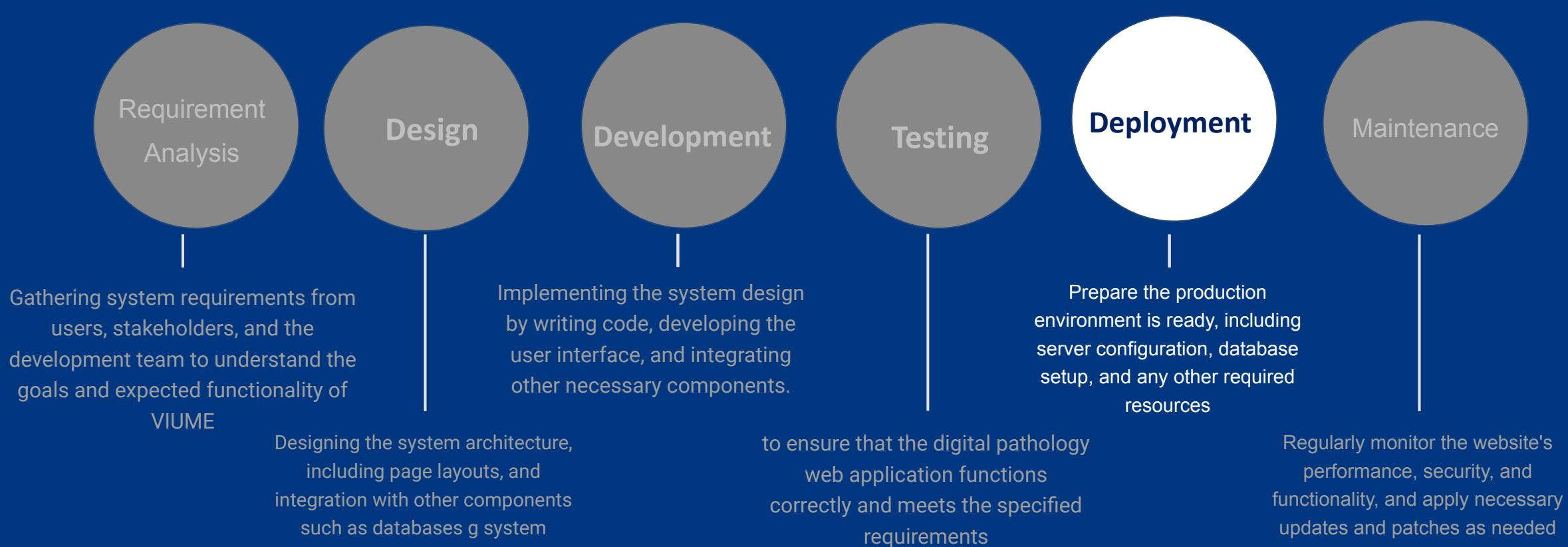


# Machine Learning Development Life Cycle

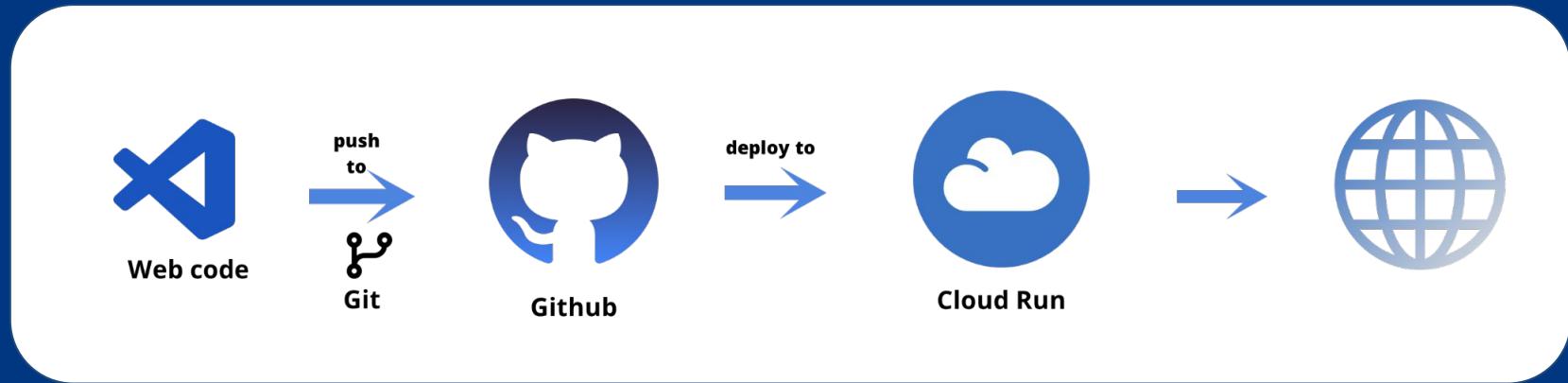


We do a comprehensive test plan  
that outlines the test case of the  
system and AI.

# Machine Learning Development Life Cycle

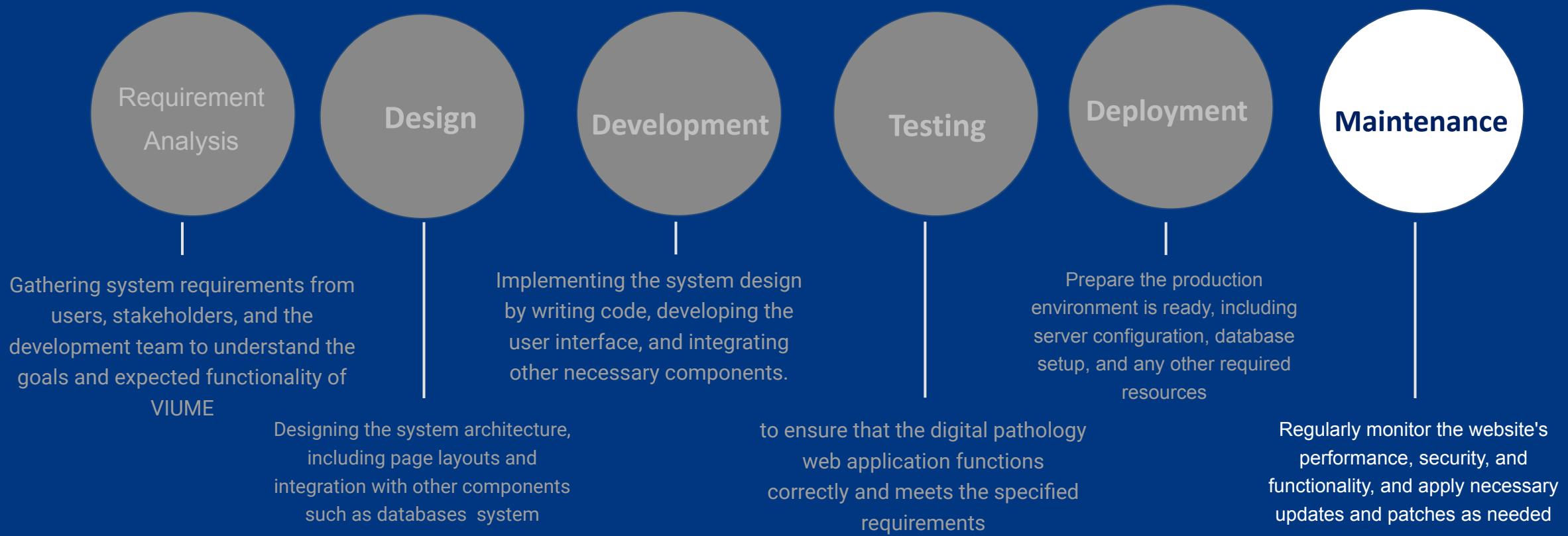


# Machine Learning Development Life Cycle



We plan to deploy the model  
using Cloud Run form Google  
Cloud Platform

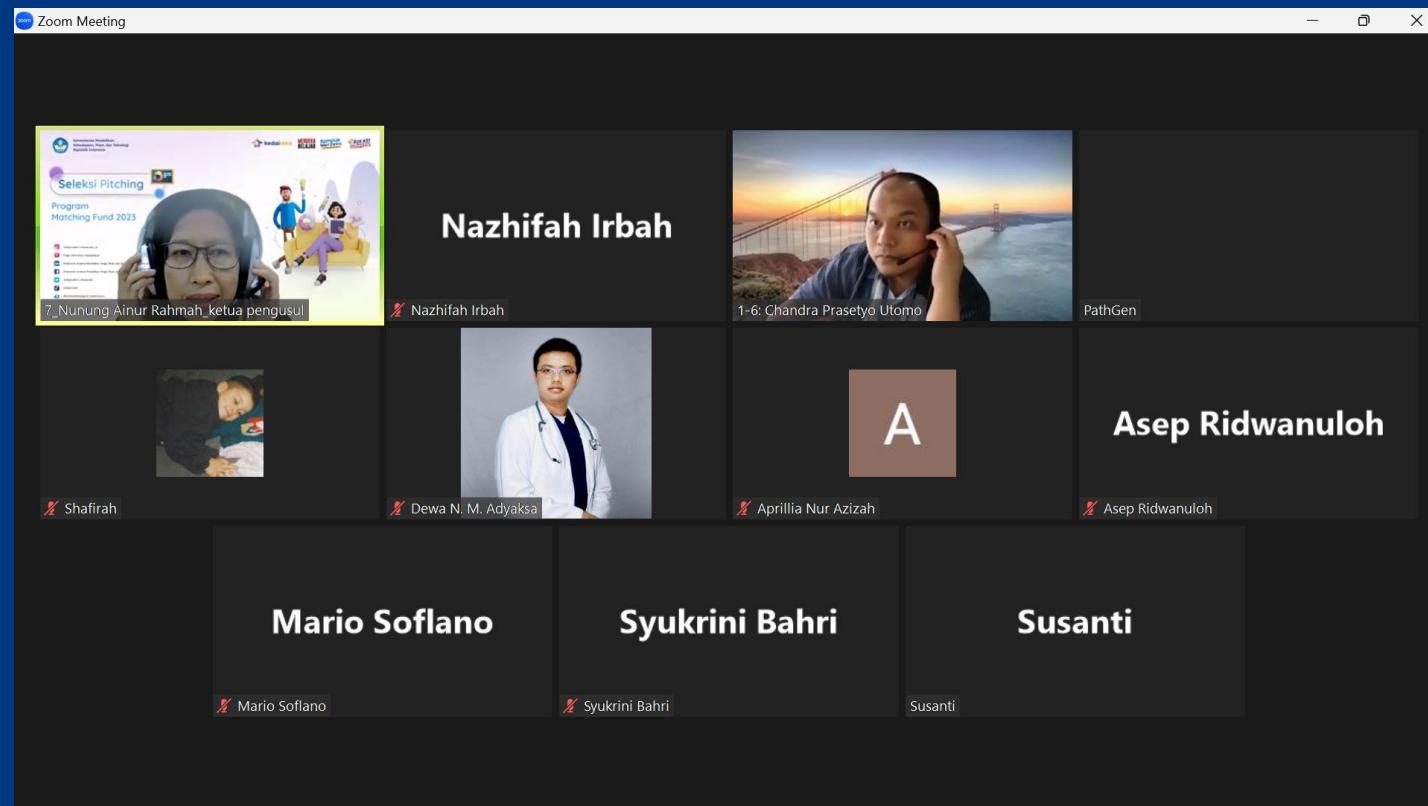
# Machine Learning Development Life Cycle



# Machine Learning Development Life Cycle

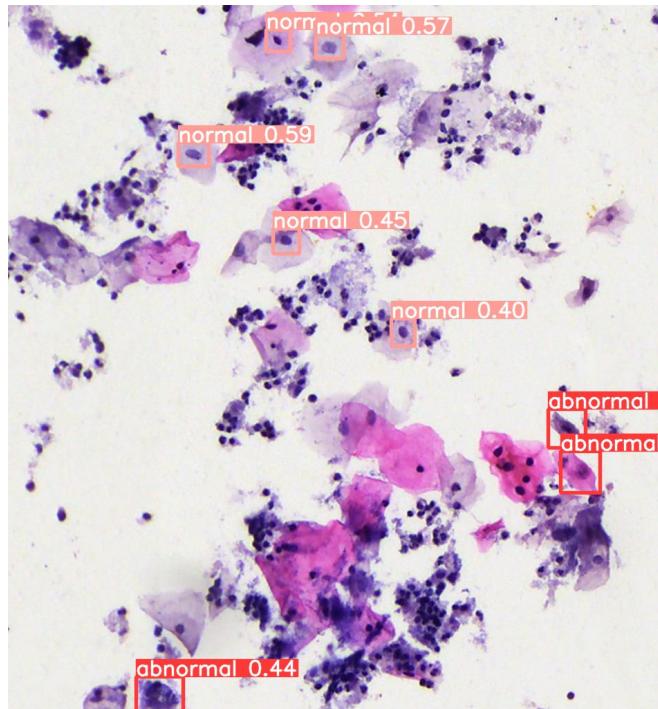


We currently do consultation with our advising professor about our research and project progress



# RESULT AND EVALUATION

BEFORE



AFTER



This research has entered the development phase, resulting in a prototype as a follow-up to the previous study.

# RESULT AND EVALUATION

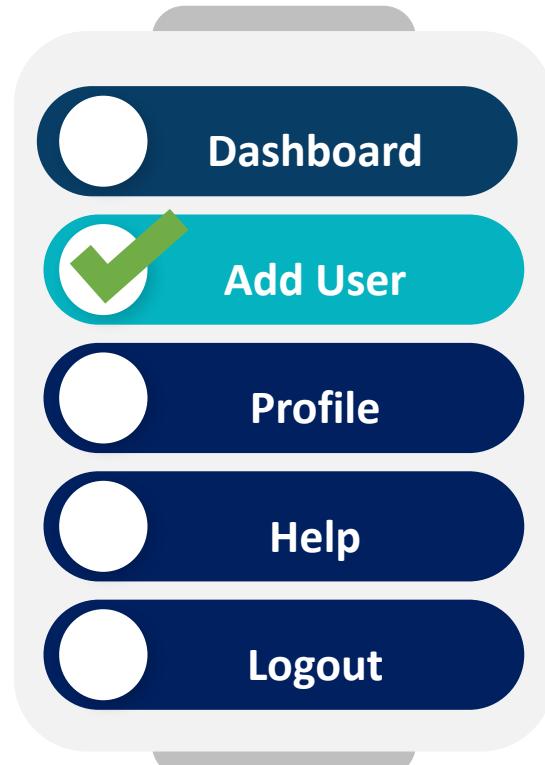
X Search... 

Admin rara@dev.com

ViuMe Member : Pathologists and Doctors ADD NEW USER

<input type="checkbox"/>	ID	Name	Email	Role	Phone	Action
<input type="checkbox"/>	0dffed49-21fa-4a...	Laura	laura@dev.com	Patholog	+62 895 4632 1755	<span>VIEW</span> <span>DELETE</span>
<input type="checkbox"/>	3e374825-bd62-4...	anggun	anggun@dev.com	Patholog	+62 895 6427 421	<span>VIEW</span> <span>DELETE</span>
<input type="checkbox"/>	45e95b78-3090-4...	candraiw	candraiw@dev.c...	Doctor	+62 848 8954 64	<span>VIEW</span> <span>DELETE</span>
<input type="checkbox"/>	68032933-71ac-4...	Adit	adit@dev.com	Doctor	+62 895 6354 570...	<span>VIEW</span> <span>DELETE</span>
<input type="checkbox"/>	7ZTaBg8r9RxrXz...	Jipeh	jipeh@dev.com	Doctor	109827722	<span>VIEW</span> <span>DELETE</span>
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<input type="checkbox"/>	990ee6da-e9f5-4...	cipeng	cipeng@gmail.com	Admin	+62 928 98390123	<span>VIEW</span> <span>DELETE</span>
<input type="checkbox"/>	GSU2OvxKmub3t...	Shafirah Doe	shafirah@dev.com	Patholog	+62 898 9378 1732	<span>VIEW</span> <span>DELETE</span>
<input type="checkbox"/>	b292b2b1-1fc4-4...	Aldin	aldin@dev.com	Doctor	+62 895 6354 570...	<span>VIEW</span> <span>DELETE</span>

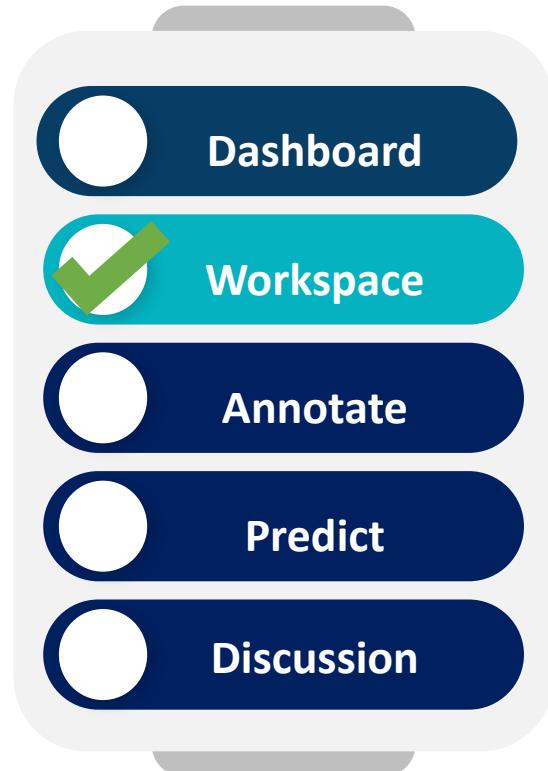
1–9 of 13 < >



# RESULT AND EVALUATION

The screenshot shows the 'Workspace' section of the Patholog application. The left sidebar contains navigation links: Dashboard, Workspace (which is selected), Discussion, Annotate, Predict, Profile, Help, and Logout. The main area has a search bar at the top right. The 'Workspace' title is displayed above a table. The table has columns: Name Author, Workbook, Collaborator, Description, and Action. A single row is shown with the following data: dante@dev.com, Servical Cancer, rara@dev.com, Stadium 3, and two buttons: 'VIEW' and 'DELETE'. At the bottom of the table, it says '1-1 of 1'. The top right corner of the main area shows the user's email: dante@dev.com.

Name Author	Workbook	Collaborator	Description	Action
dante@dev.com	Servical Cancer	rara@dev.com	Stadium 3	<a href="#">VIEW</a> <a href="#">DELETE</a>



# RESULT AND EVALUATION

Patholog

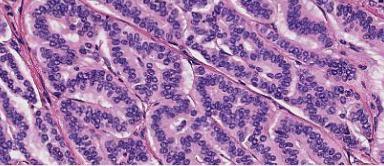
Dashboard Workspace Discussion Annotate Predict Profile Help Logout

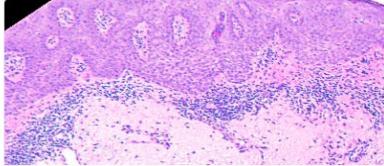
Search... 

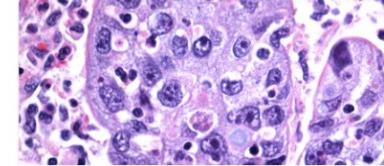
Workbook Information

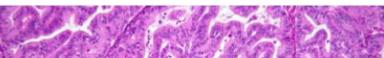
Author dante@dev.com  
Workbook Servical Cancer  
Collaborator rara@dev.com  
Description Stadium 3  
Created at Mon May 29 2023

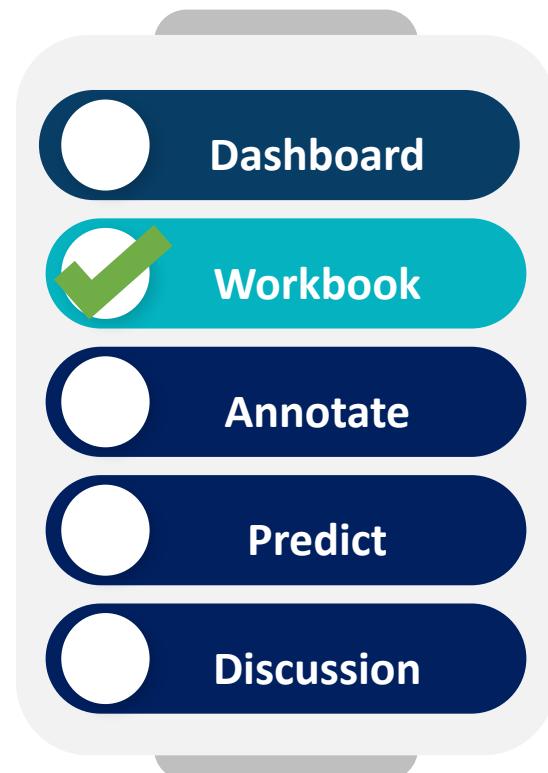
 

  
neuroendocrine carcinoma  
Neuroendocrine tumors are cancers that begin in specialized cells called neuroendocrine cells. Neuroendocrine cells have traits similar to those of nerve cells and hormone-producing cells.  
dante@dev.com  
 

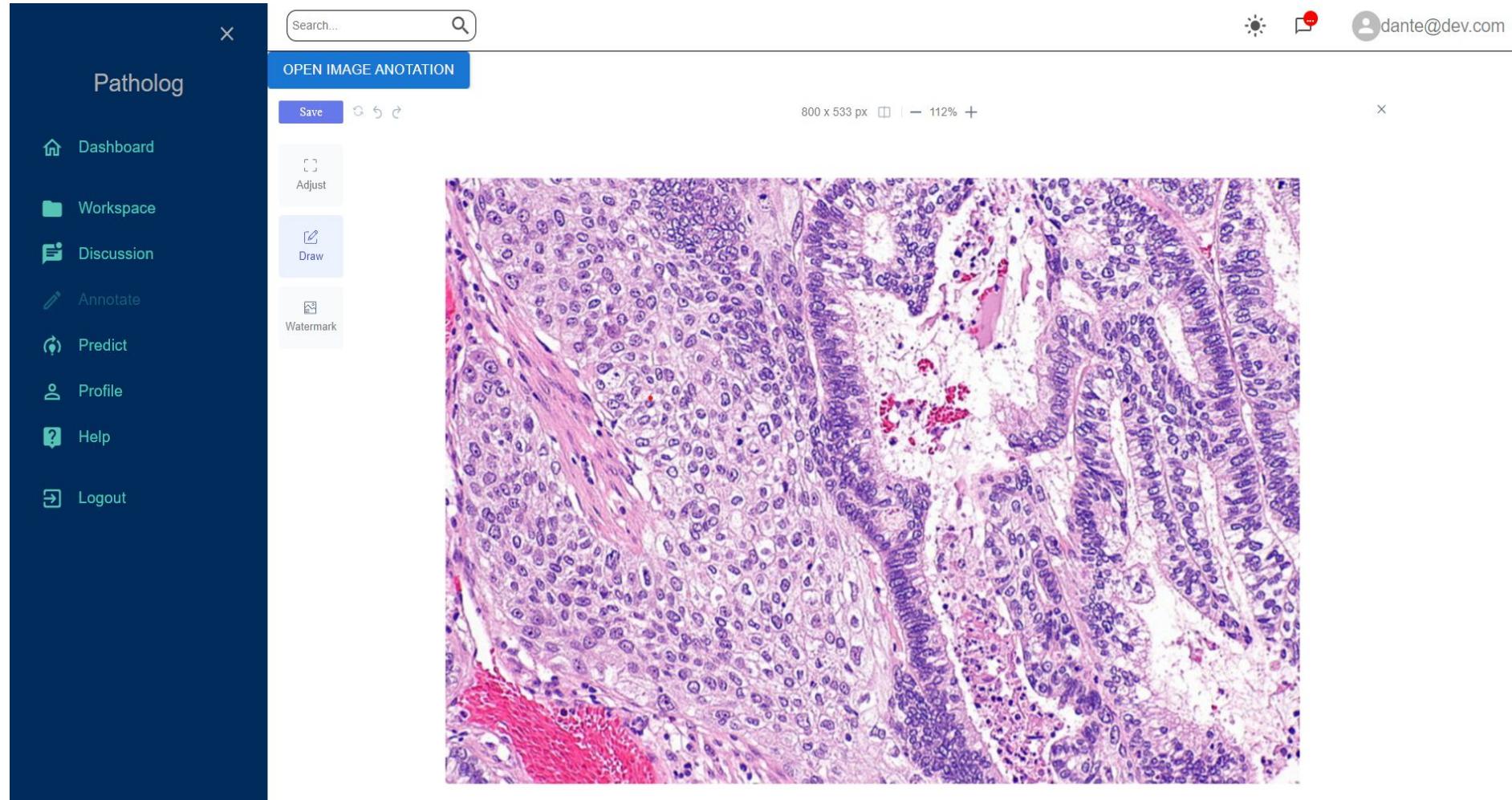
  
Squamous cell carcinoma  
a common form of skin cancer that develops in the squamous cells that make up the middle and outer layers of the skin.  
dante@dev.com  
 

  
Adenosquamous carcinomas  
Less commonly, cervical cancers have features of both squamous cell carcinomas and adenocarcinomas. These are called adenosquamous carcinomas.  
dante@dev.com  
 



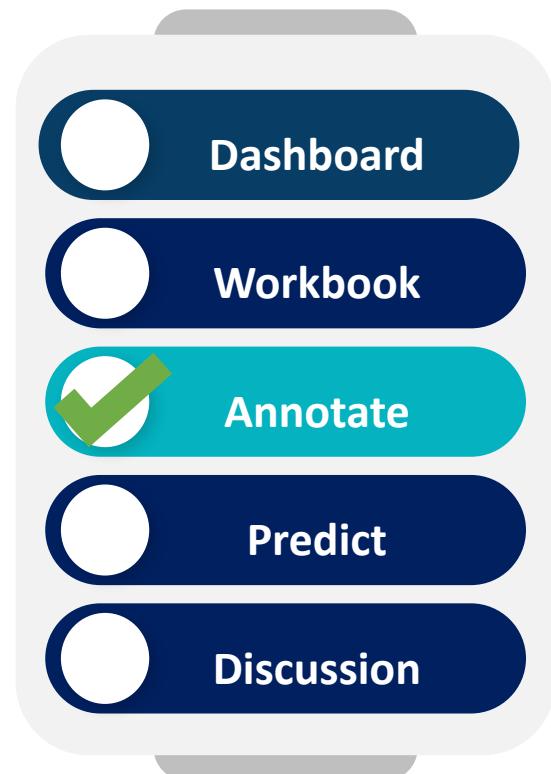


# RESULT AND EVALUATION

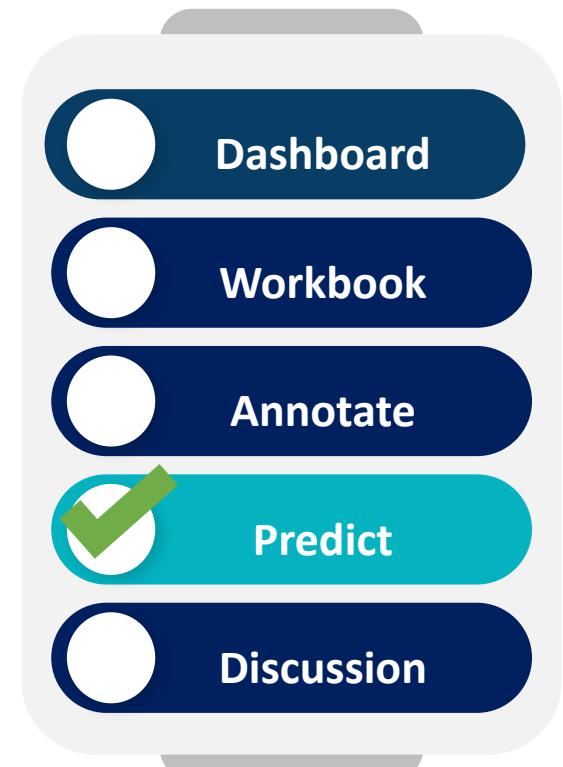
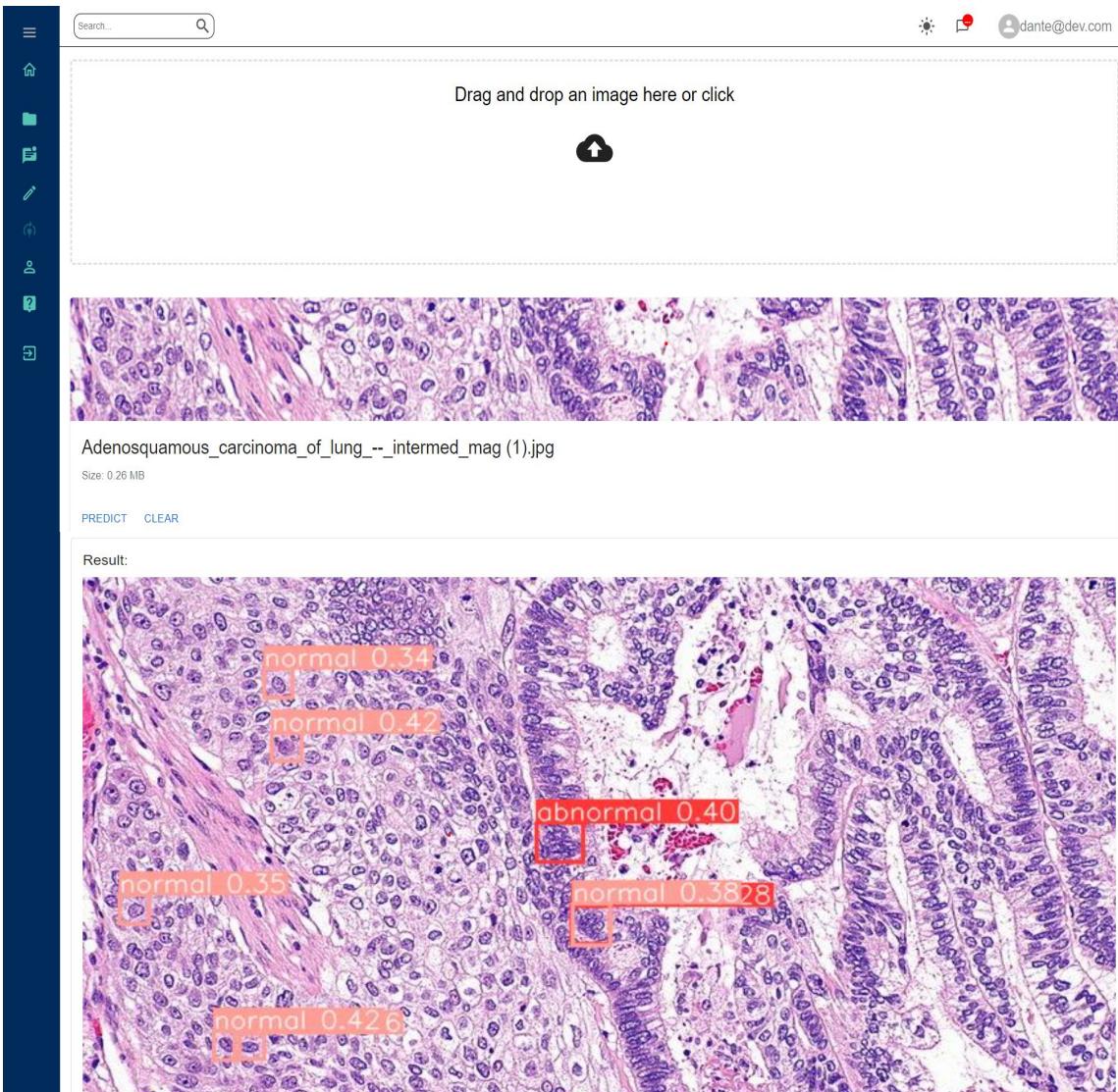


The screenshot shows the PathGen AI pathology platform interface. On the left, a dark sidebar menu lists navigation options: Dashboard, Workspace, Discussion, Annotate, Predict, Profile, Help, and Logout. The main area displays a histopathology image of tissue sections stained with hematoxylin and eosin (H&E). The image is labeled "800 x 533 px" and "112%". To the right of the image are several controls: a search bar with a magnifying glass icon, a brightness slider, a message icon, and a user profile with the email "dante@dev.com". A blue button labeled "OPEN IMAGE ANNOTATION" is visible above the image. On the far left of the main content area, there is a small "X" icon.

VIUME in Patholog Role



# RESULT AND EVALUATION



# RESULT AND EVALUATION

X

Patholog

Dashboard

Workspace

Discussion

Annotate

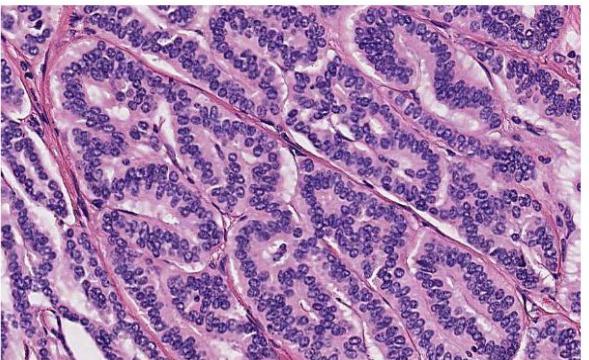
Predict

Profile

Help

Logout

Search...



neuroendocrine carcinoma

Posted on: Wed Jun 14 2023

Author: dante@dev.com

Desc: Neuroendocrine tumors are cancers that begin in specialized cells called neuroendocrine cells. Neuroendocrine cells have traits similar to those of nerve cells and hormone-producing cells.

Cancer Type: Cervical Cancer

What do you think?

3 Responses

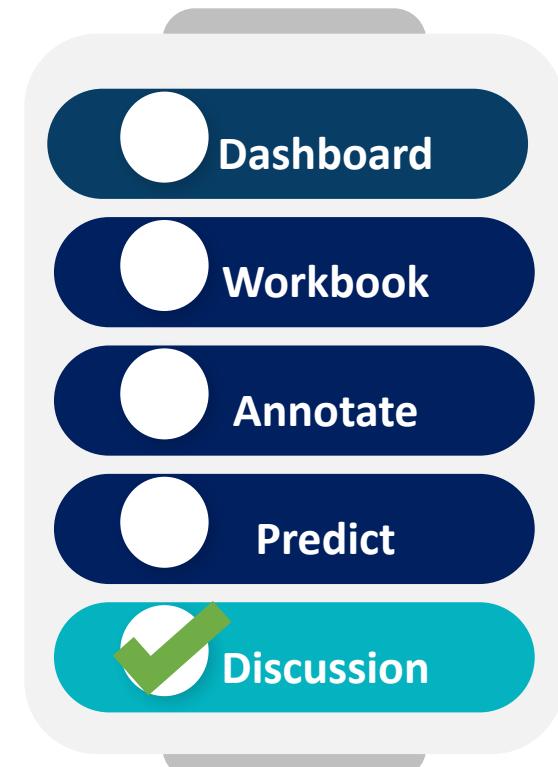
Upvote Funny Love Surprised Angry Sad

3 Comments

G Join the discussion...

LOG IN WITH OR SIGN UP WITH DISQUS ?

D f t G Name



# Limitation

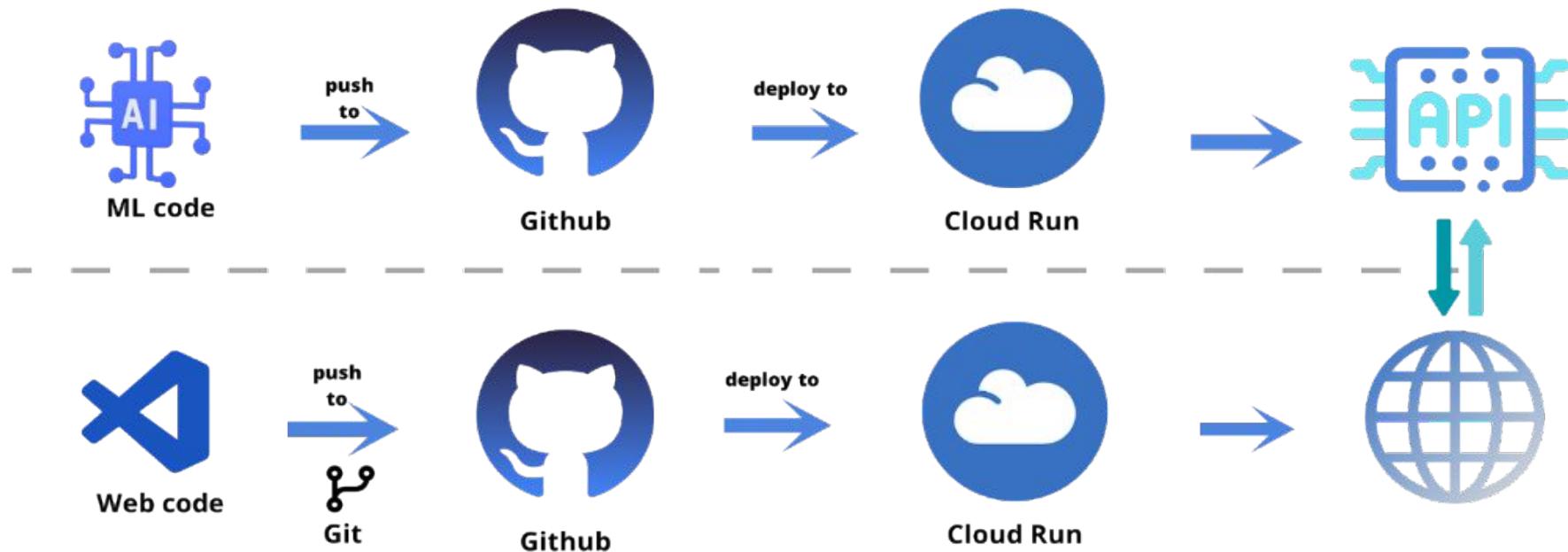
- The coordinate lines of the annotated pathology object cannot be automatically saved into the website's database.
- still under development to provide a summary result from the prediction output

# Conclusion

This research is expected to make a valuable contribution to the field of pathology by providing an interactive, efficient, and secure platform for managing pathology data.



# Future Work



In the next stage, the deployed models from previous research will be combined using Docker, stored on GitHub, and then deployed on Cloud Run.



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## Acknowledgment

This project is partially funded by the Ministry of Education Research and Technology, Republic of Indonesia, via Matching Fund Kedaireka schema 2022 with Grant ID: 16/E1/KS.06.02/2022.



**Thank you**