

## Digitalization of Business Processes in Healthcare

# Improving Histopathology Analysis Process by Digitalization







Team



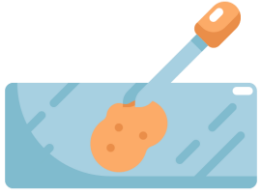
Divya Sarah Abraham  
Saengrawi Gogniat  
Aleksandra Iskrzynska  
Sunita Vijay Shelke



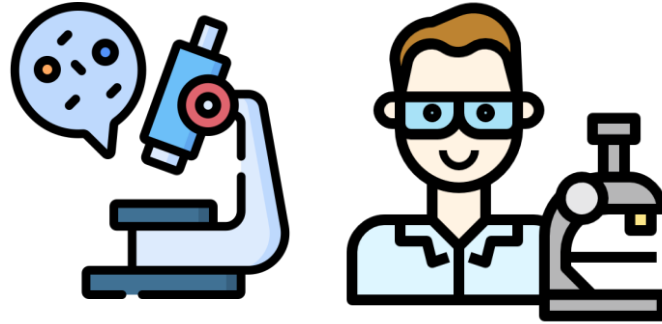
# Overview

-  Challenges in histopathological analysis
-  AS-IS process
-  TO-BE process
-  ARTIDIS® nanomechanical Biomarker
-  AI Histopathological Image Recognition
-  Conclusion

# Challenges in Traditional Histopathology Analysis

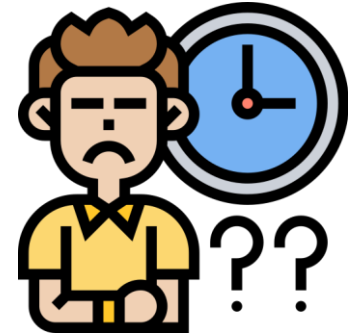


Sample preparation

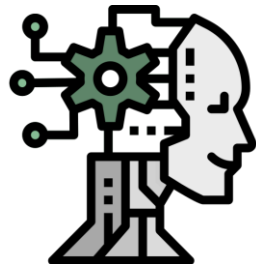


Manual Microscopic  
Examination and Report  
analysis

Time consuming  
leading delay diagnosis



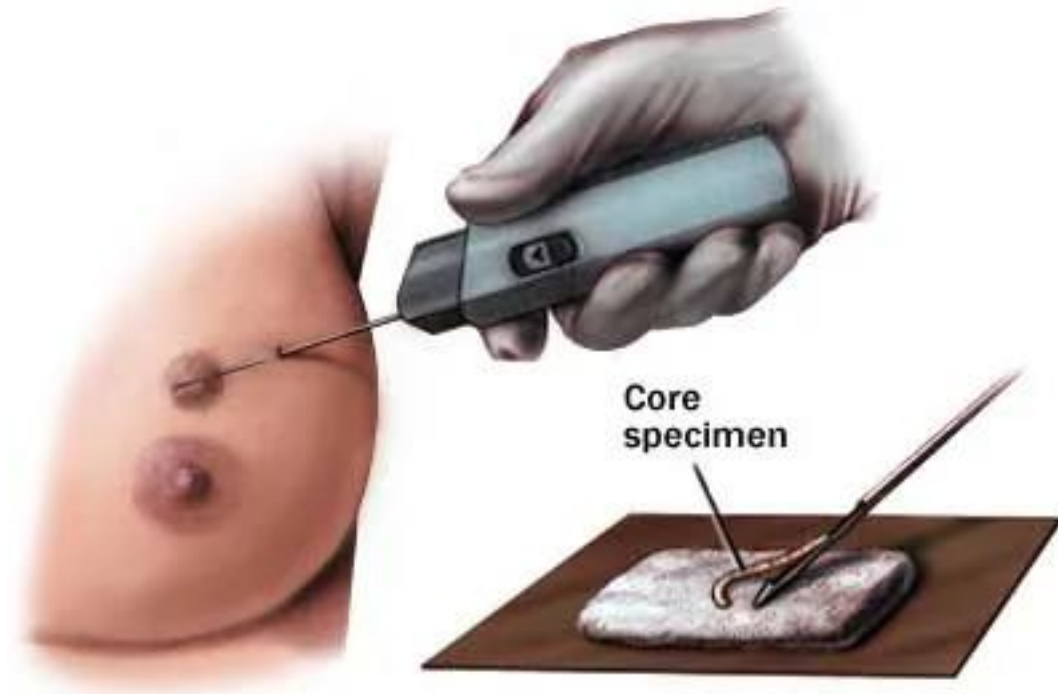
Improve the histopathology process through  
digitalization and advanced technology.



- ✓ Faster
- ✓ More effective
- ✓ More accurate process



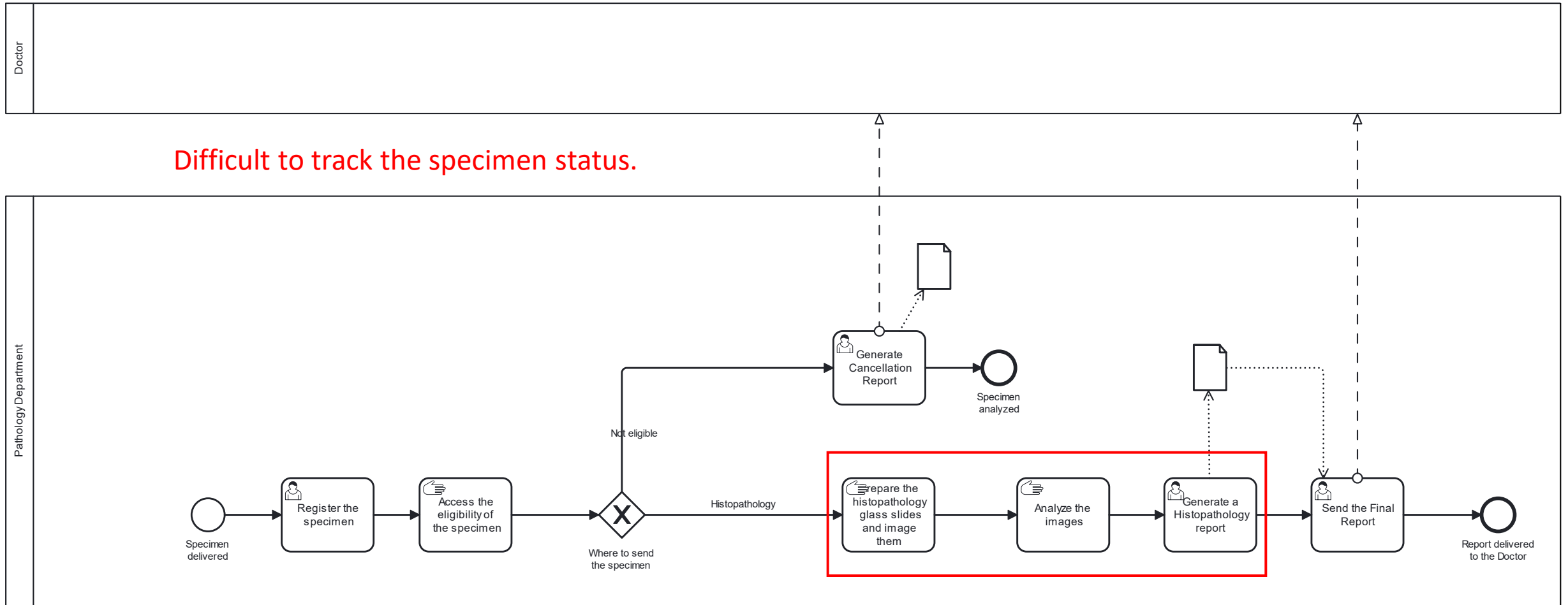
# Specimen collection



© Mayo Foundation for Medical Education and Research. All rights reserved.



# AS-IS process



Manual tasks are time consuming and resource demanding.  
Some hospital, where is short of pathologist,  
can take longer than one month.

# Tools



Model

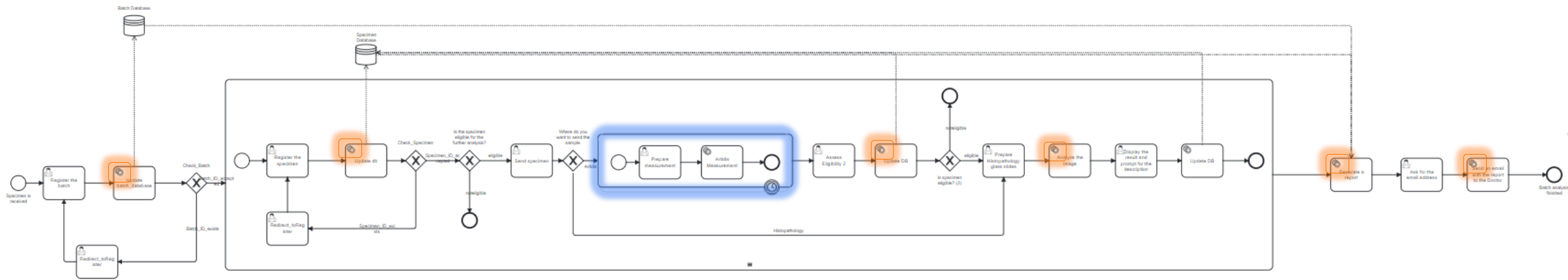


Service Tasks

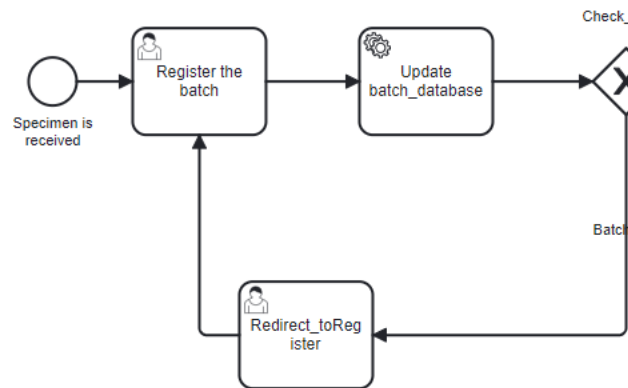
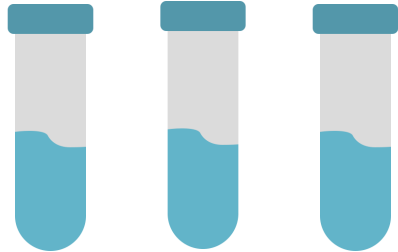


Data

# TO BE process



# TO BE process



## Register the batch

MI14

SpecimenJourney\_experiment [🔗](#)

[📅 Set follow-up date](#) [🔔 Set due date](#) [👤 Add groups](#) [👤 Aleksandra Iskrzynska ✕](#)

[Form](#) [History](#) [Diagram](#) [Description](#) [Audit Log](#)

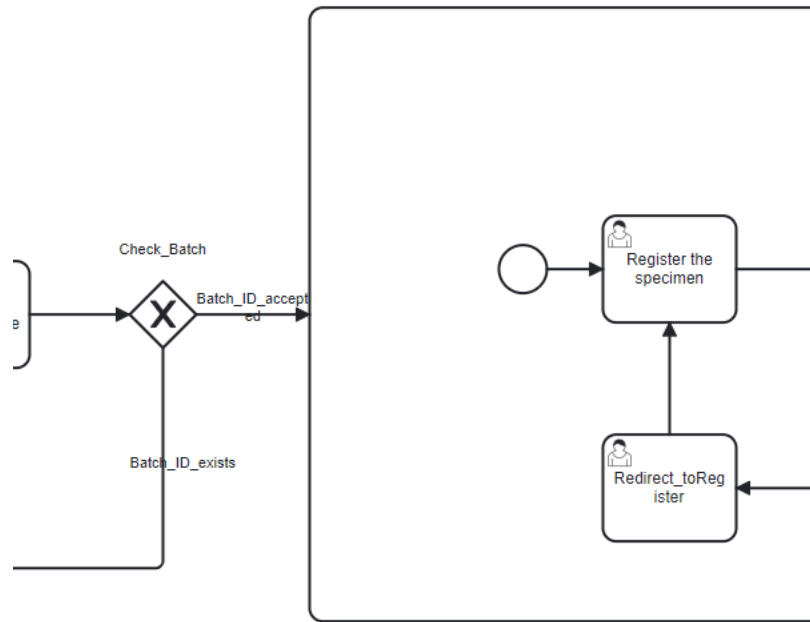
**Batch ID**

**Number of Specimen in the Batch**

[Save](#) [Complete](#)



# TO BE process



## Register the specimen MI14

SpecimenJourney\_experiment [🔗](#)

[📅 Set follow-up date](#) [🔔 Set due date](#) [👤 Add groups](#) [👤 Aleksandra Iskrzynska](#) ✕

Form History Diagram Description Audit Log

---

**Patient ID**

**Patient Name**

**Specimen ID - make sure to place the correct Specimen ID**

**Doctor Name**

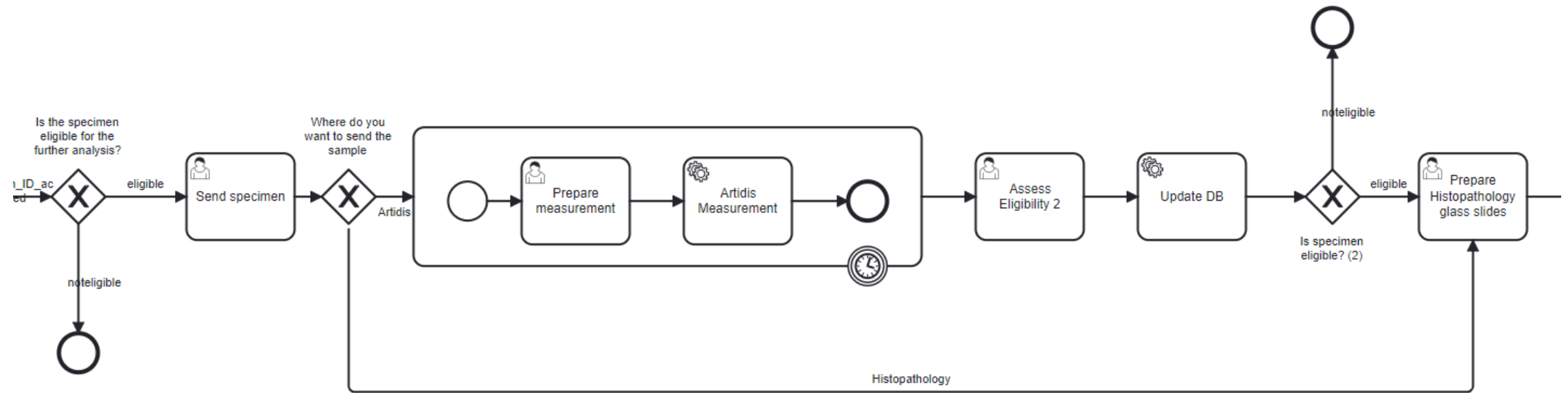
**Batch ID is**

**Is the specimen eligible for the analysis?**

☒

[Save](#) [Complete](#)

# TO BE process



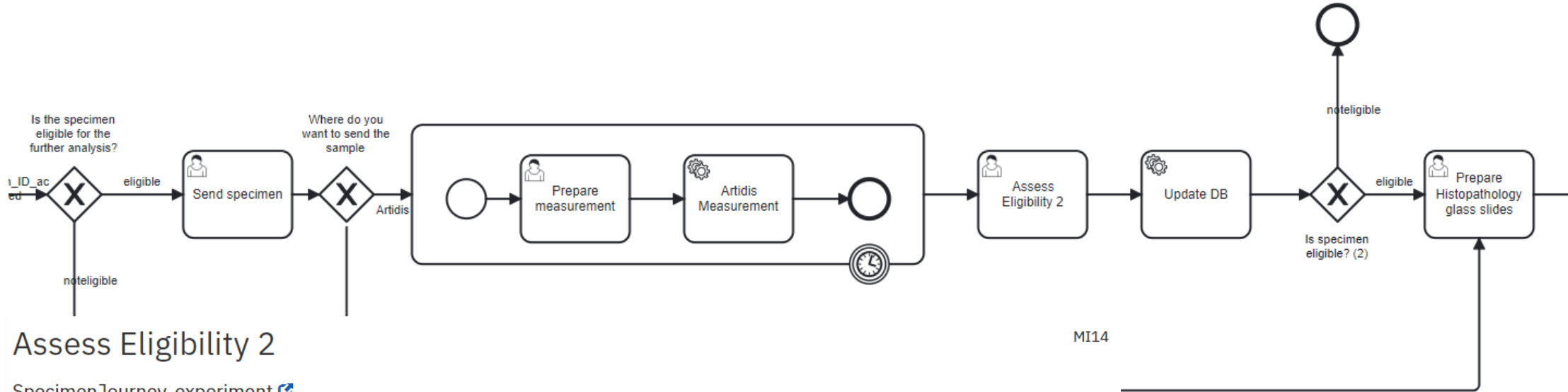
# ARTIDIS<sup>®</sup> nanomechanical biomarker

- ✓ Acquires a nanomechanical profile of the specimen in 3 hours
- ✓ Defines the imminent aggressiveness of tumors

Scan the code  
for more background



# TO BE process



## Assess Eligibility 2

SpecimenJourney\_experiment [🔗](#)

Set follow-up date

Set due date

Add groups

Aleksandra Iskrzynska

Form

History

Diagram

Description

Audit Log

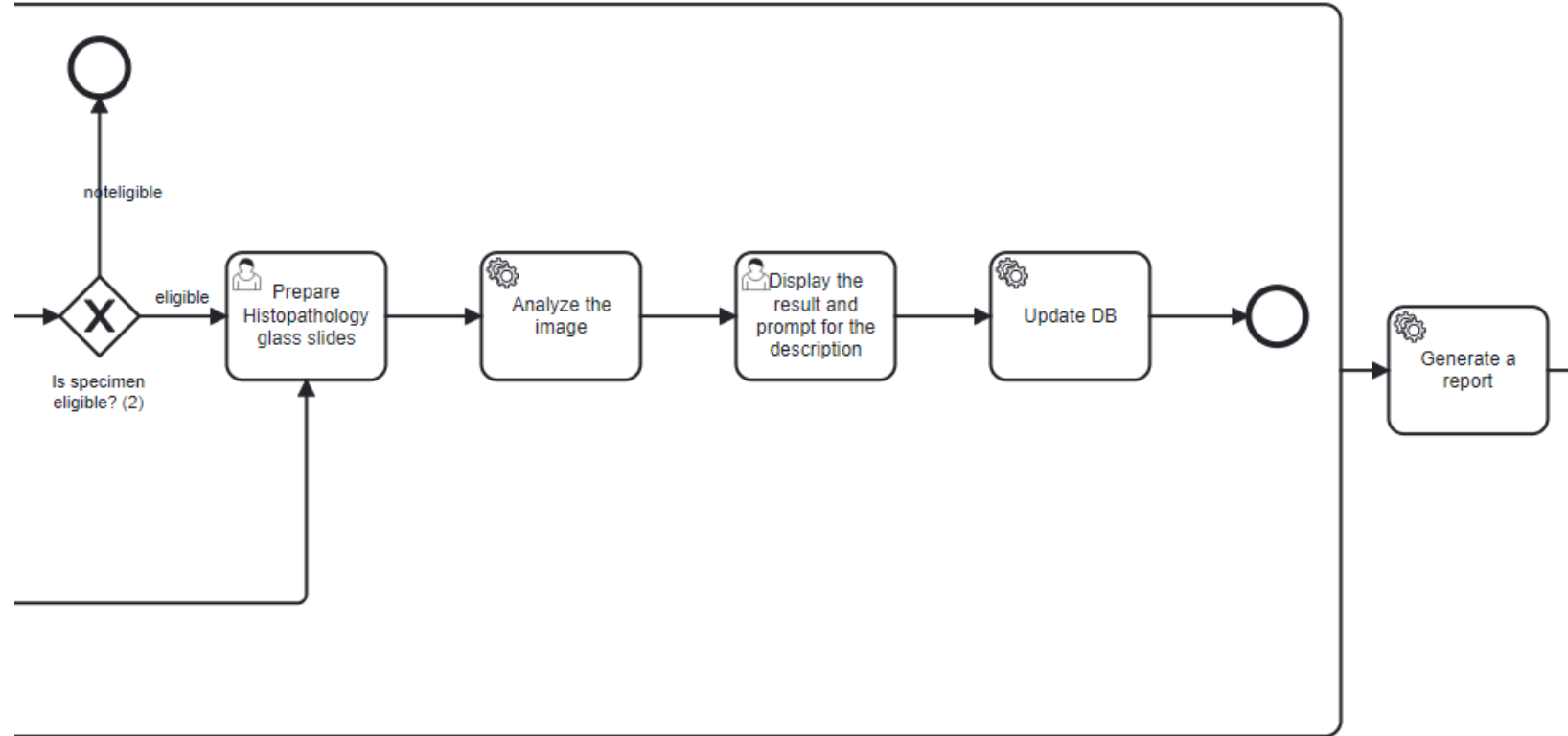
Is the specimen eligible for Histopathology Analysis?



Save

Complete

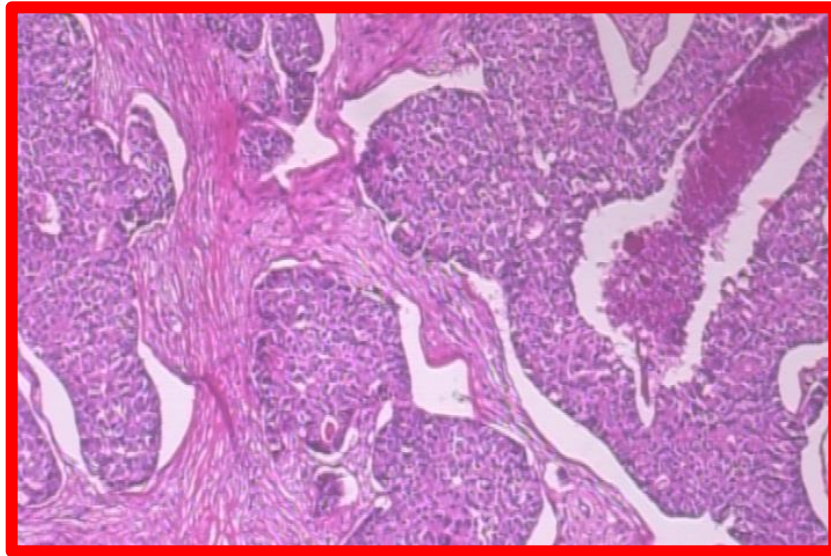
# TO BE process



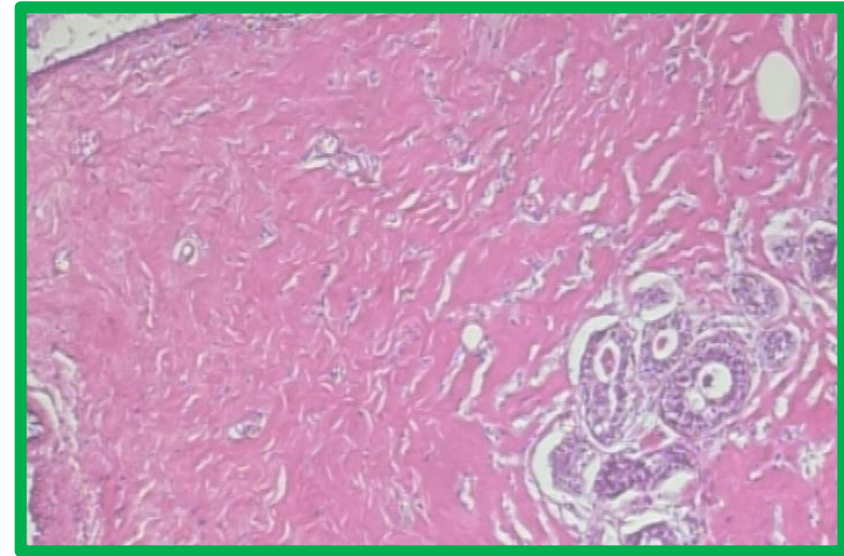


# Histopathological Image Classification

Malignant



Benign



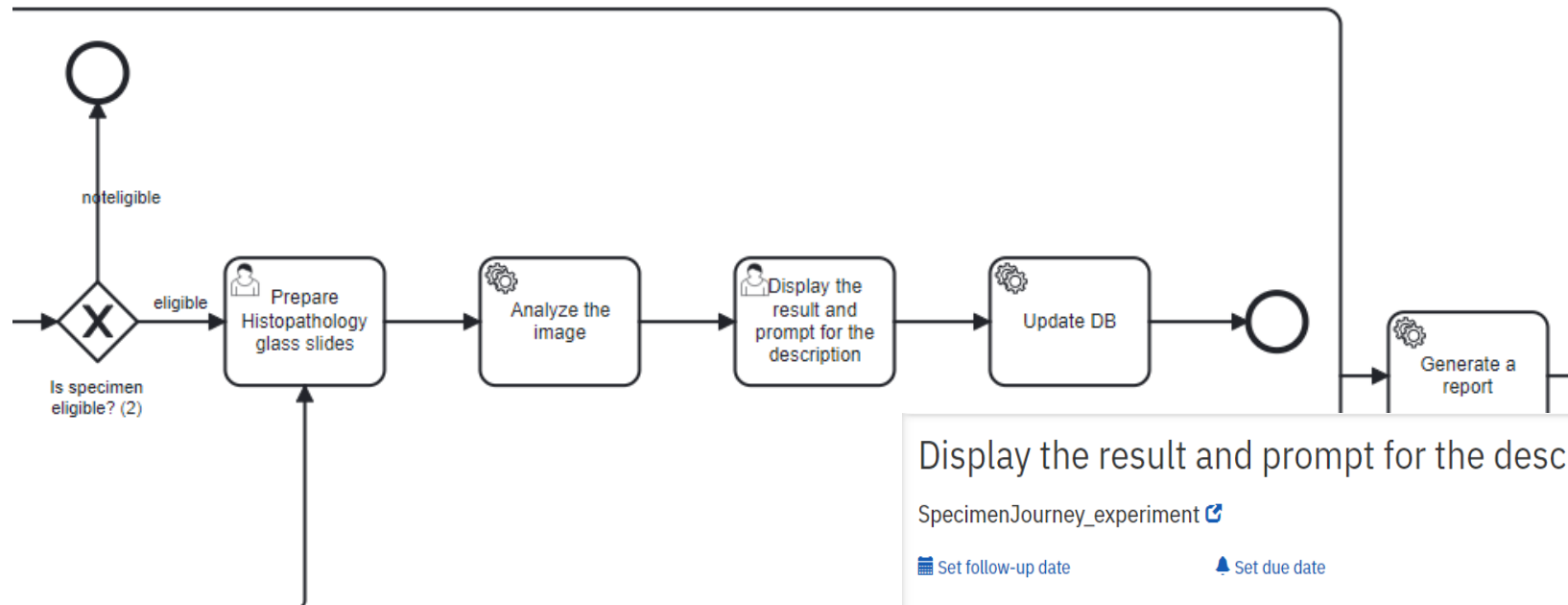
1995 images (B: 625, M: 1370)

Accuracy on the test data: 0.80

Source: <https://web.inf.ufpr.br/vri/databases/breast-cancer-histopathological-database-breakhis/>

[1] Spanhol, F., Oliveira, L. S., Petitjean, C., Heutte, L., A Dataset for Breast Cancer Histopathological Image Classification, IEEE Transactions on Biomedical Engineering (TBME), 63(7):1455-1462, 2016

# TO BE process



## Display the result and prompt for the description

MI14

SpecimenJourney\_experiment [🔗](#)

[📅 Set follow-up date](#)

[🔔 Set due date](#)

[👤 Add groups](#)

[👤 Aleksandra Iskrzynska](#) ✕

Form

[History](#)

[Diagram](#)

[Description](#)

[Audit Log](#)

Specimen Classified as:

malignant

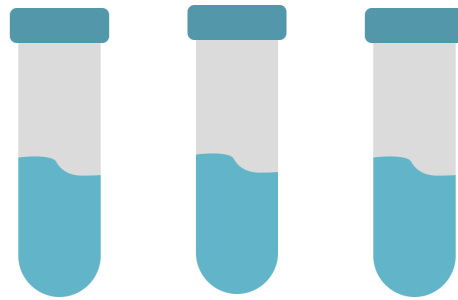
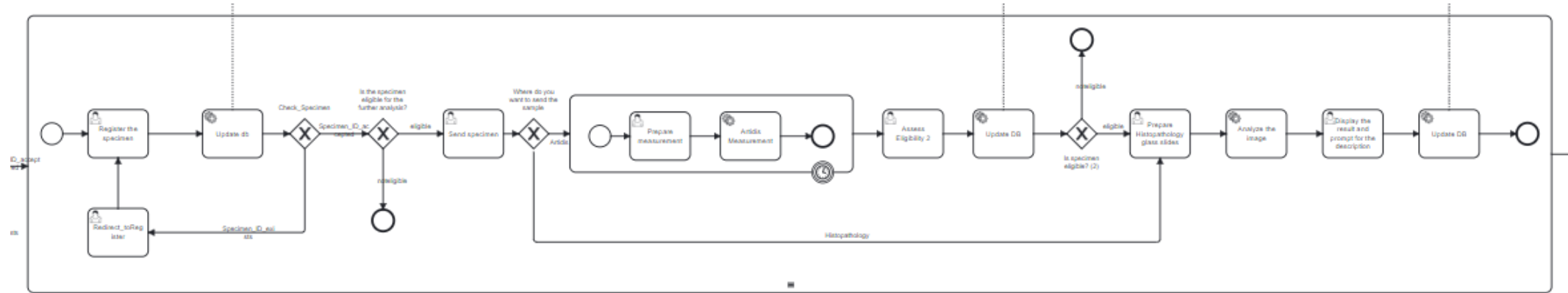
Describe Histopathology Slide

Macroscopic Examination: The slide reveals a tissue section obtained from a breast biopsy. On initial observation, the tissue appears to have irregular borders, su

Save

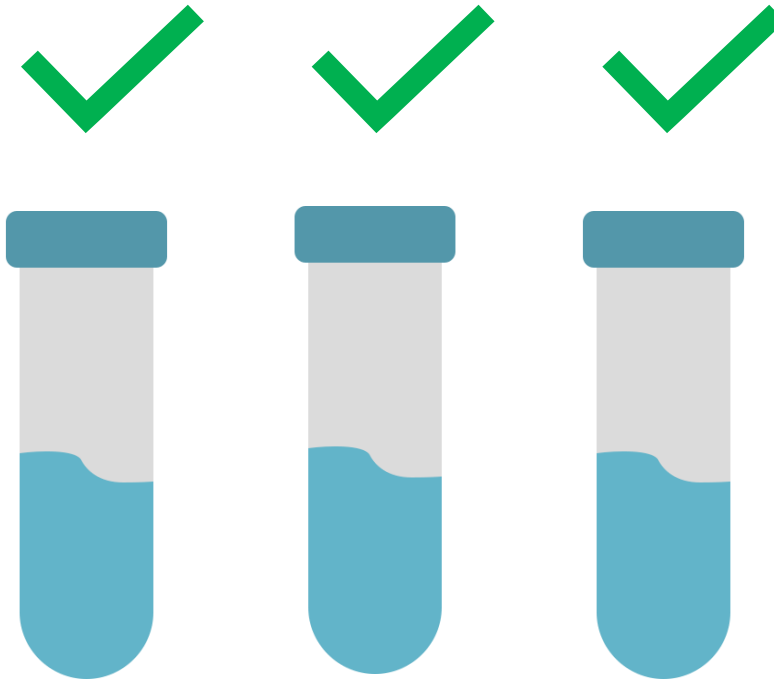
Complete

# TO BE process

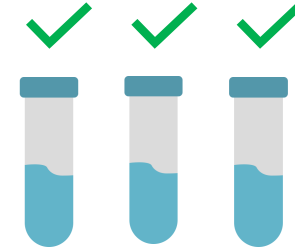
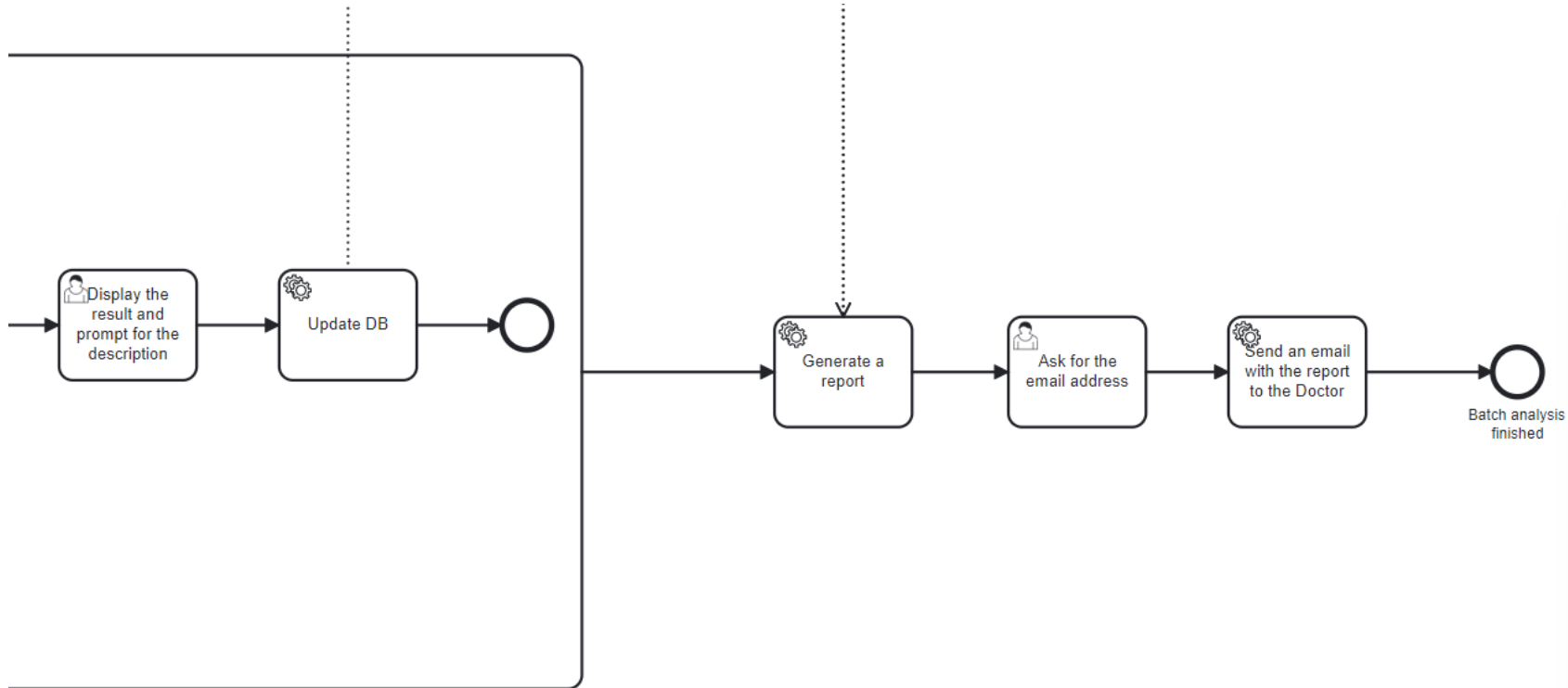




# TO BE process



# TO BE process



## Report for batch ID: 34

The report was generated: 2023-12-05 22:15:01

### Batch overview

Batch ID: 34

Number of specimens in the batch: 2

Patient\_ID: 232134

Specimen ID: 5

Eligibility at the beginning of the process: True

Artidis Measurement Result: malignant

Eligibility after Artidis measurement: Eligible

Histopathology Image Classification Result: malignant

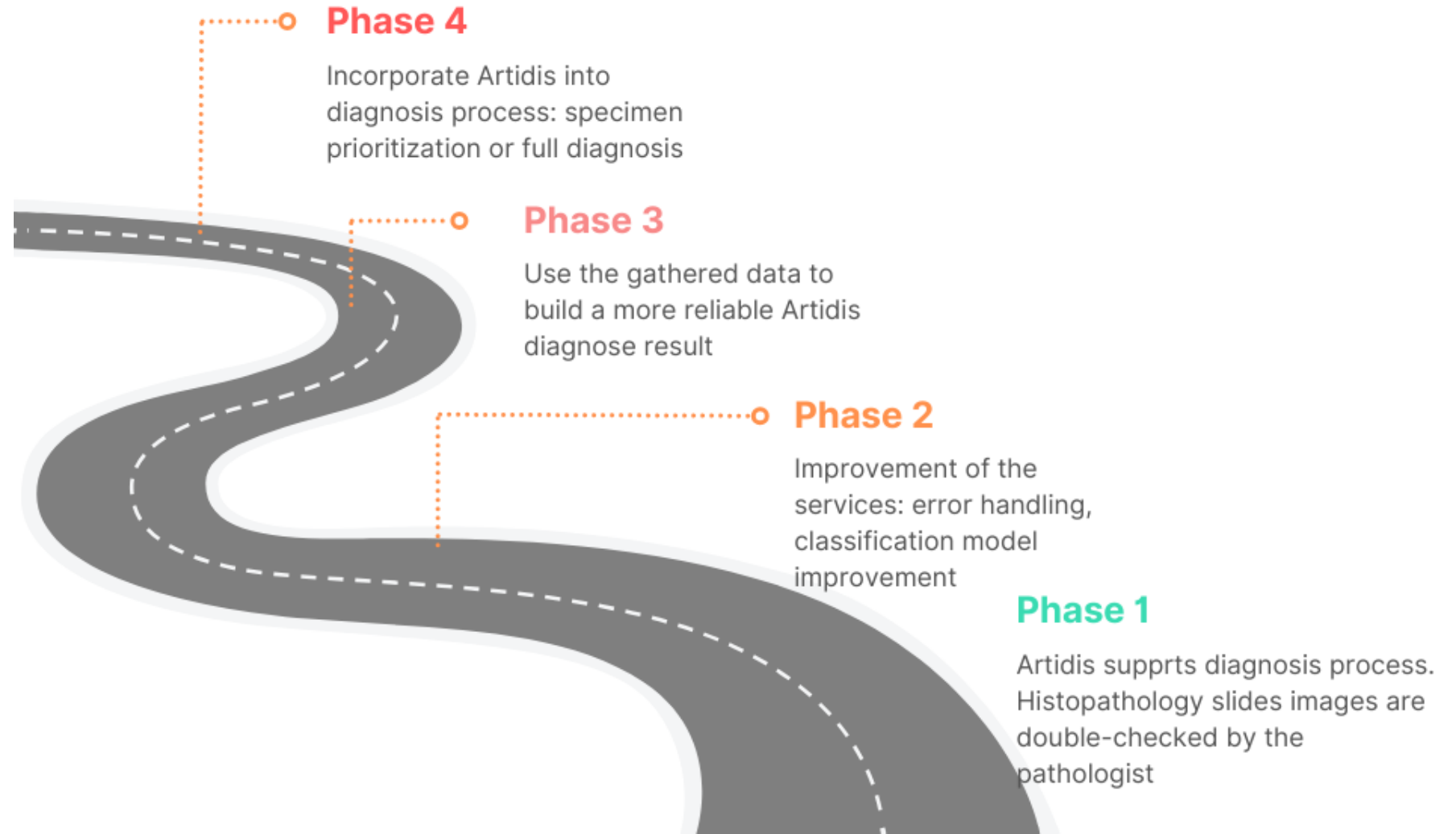
Histopathology Description:

The number of the cells is correct.

Specimen ID: 6

Eligibility at the beginning of the process: At the arrival the specimen was not eligible for the analysis.

# Vision



Thank you

Q&A

Team



Divya Sarah Abraham  
Saengrawi Gogniat  
Aleksandra Iskrzynska  
Sunita Vijay Shelke