Building and deploying digital pathology infrastructure for a heterogeneous user base

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Abstract

At Brussels Free University (VUB), we wanted to build a core digital pathology infrastructure to support a range of different use cases. Various images platforms needed to be accessible through a single access point, while still supporting different user profiles. We wanted a scalable solution that would allow interaction between equipment from different research groups intra and extramuros. A combination of commercial hardware, commercial software, and open source software was used to get this accomplished. Custom coding to connect interfaces was used where needed. We built a centralized infrastructure that integrates a variety of imaging platforms (brightfield, fluorescence, zstacking), and we now have an interconnected network of heterogeneous and scalable information silos. Image analysis and data/image mining projects can remain stuck in micro-environments due to limits artificially imposed by vendor-specific solutions. We have shown this need not be the case, and have integrated five different imaging platforms onto one architecture. We are storing data from all modalities in a single storage facility, and can manage it through a single access point. We support 40+ users, working on different use cases, including education, biobanking, and telepathology.
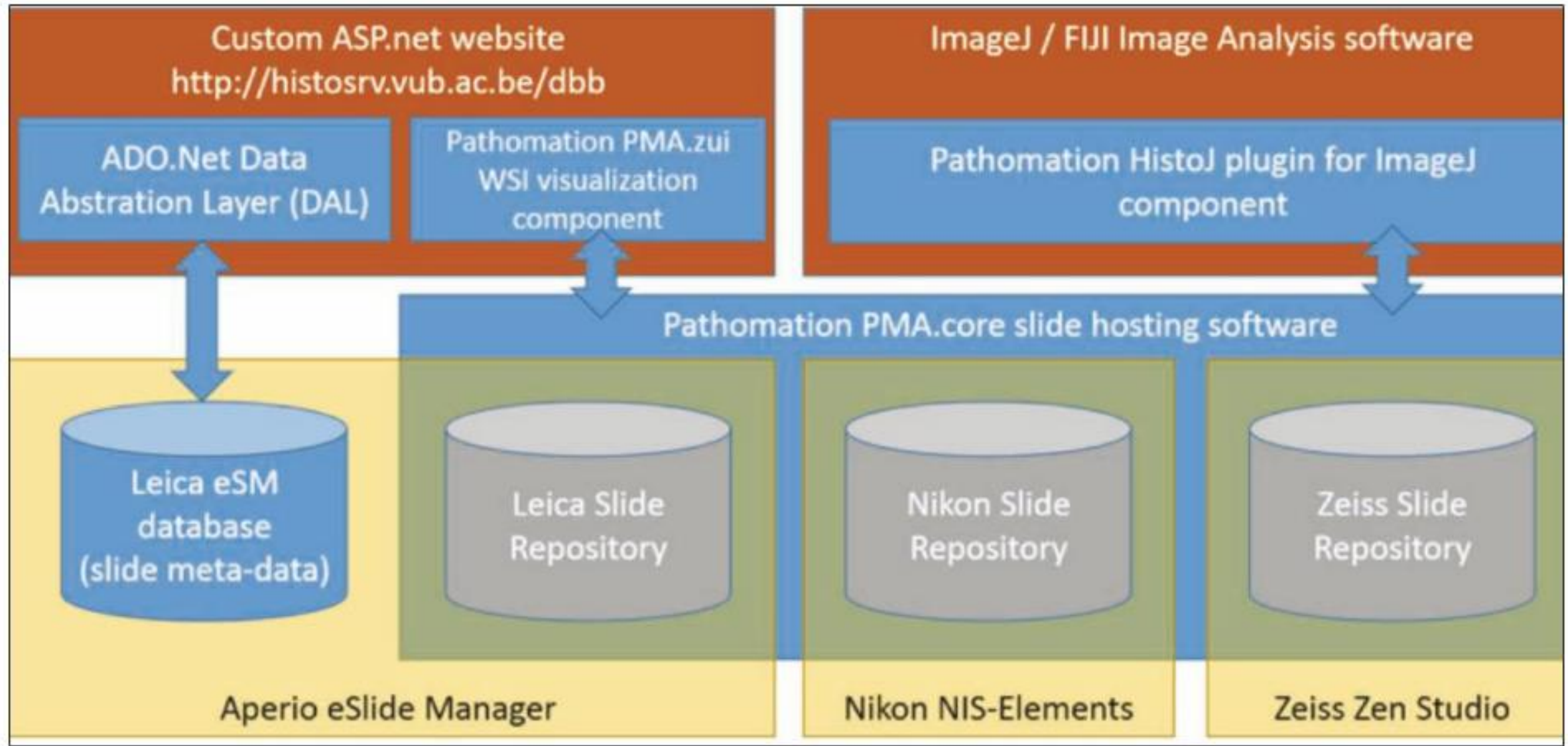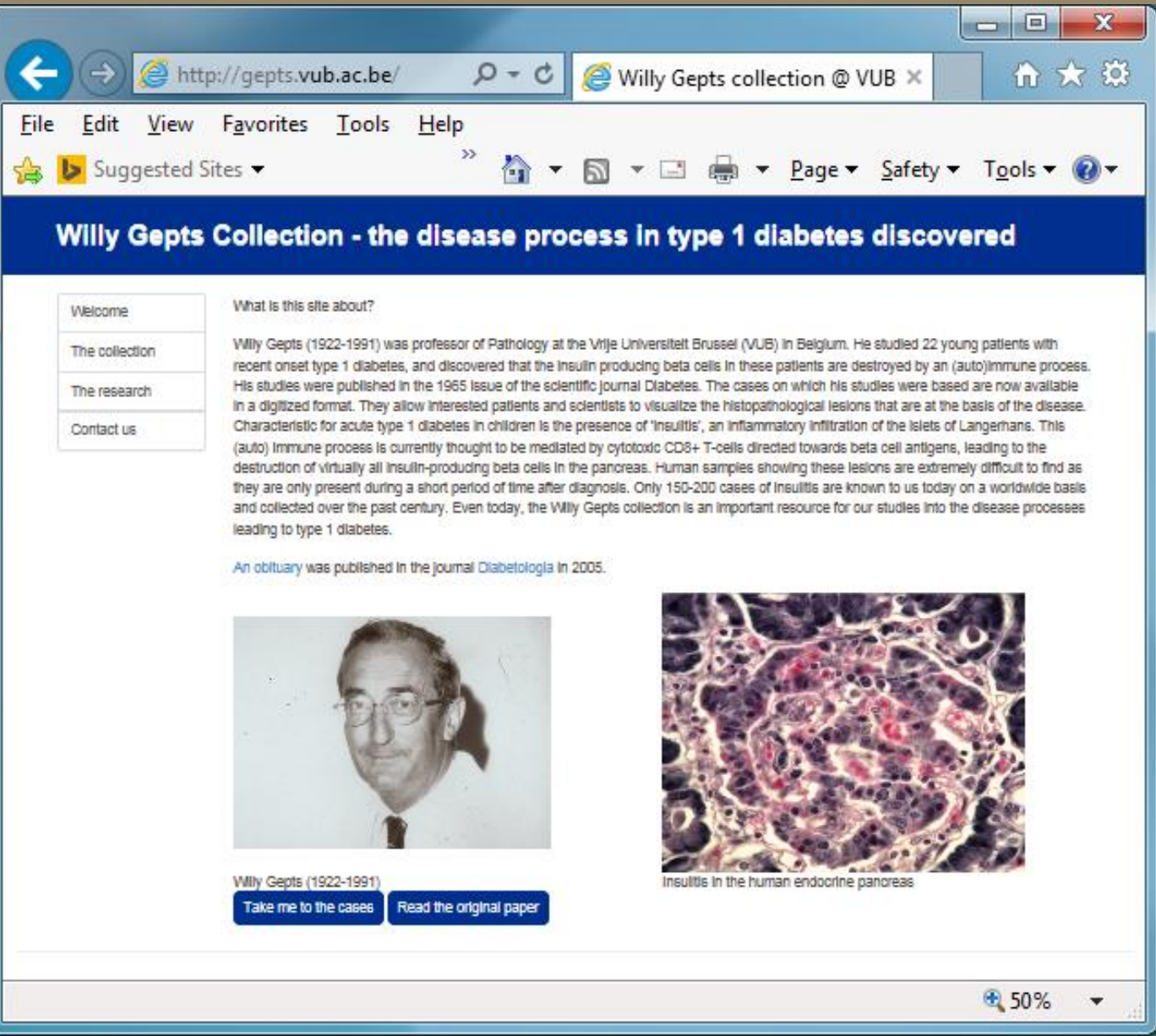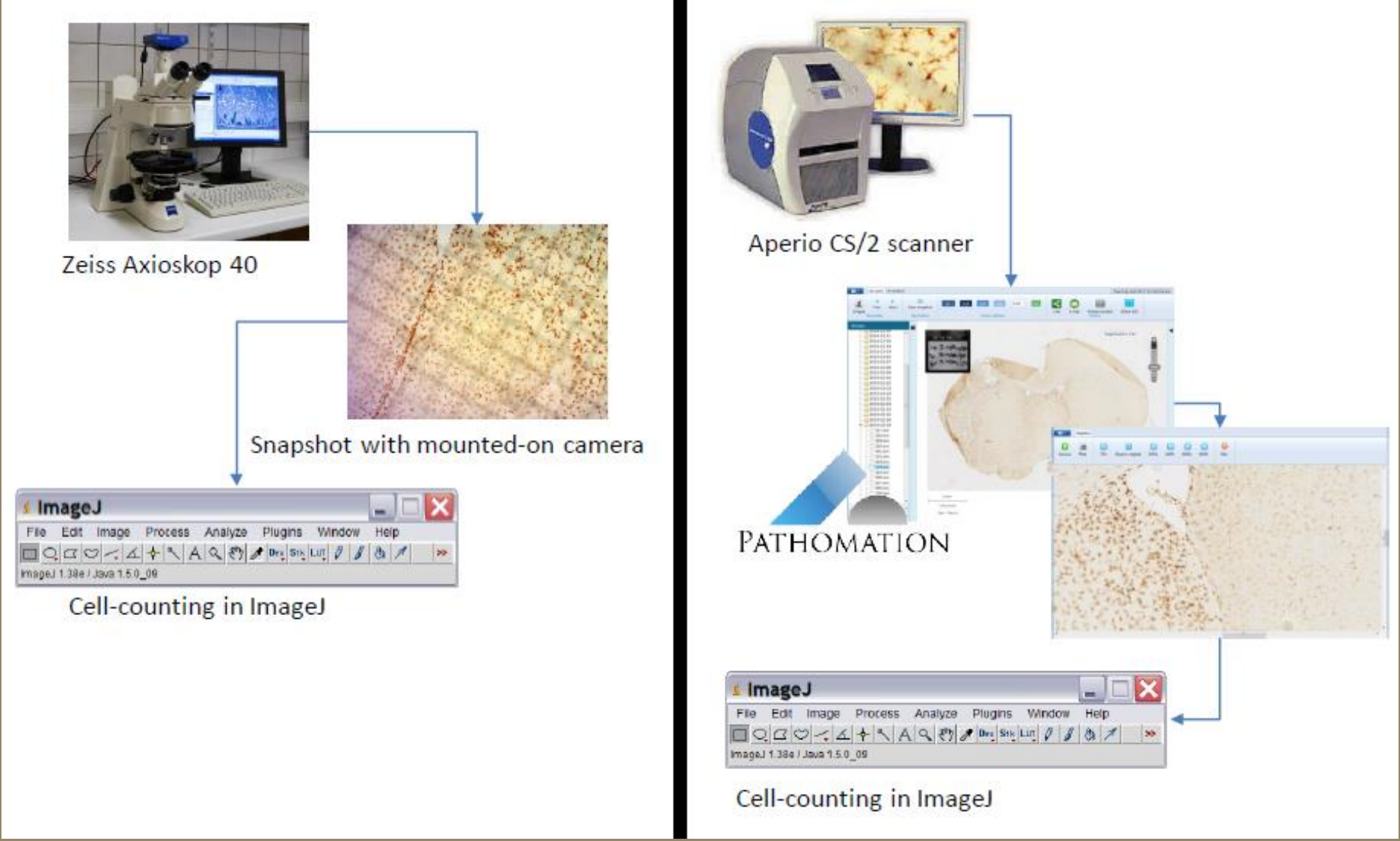
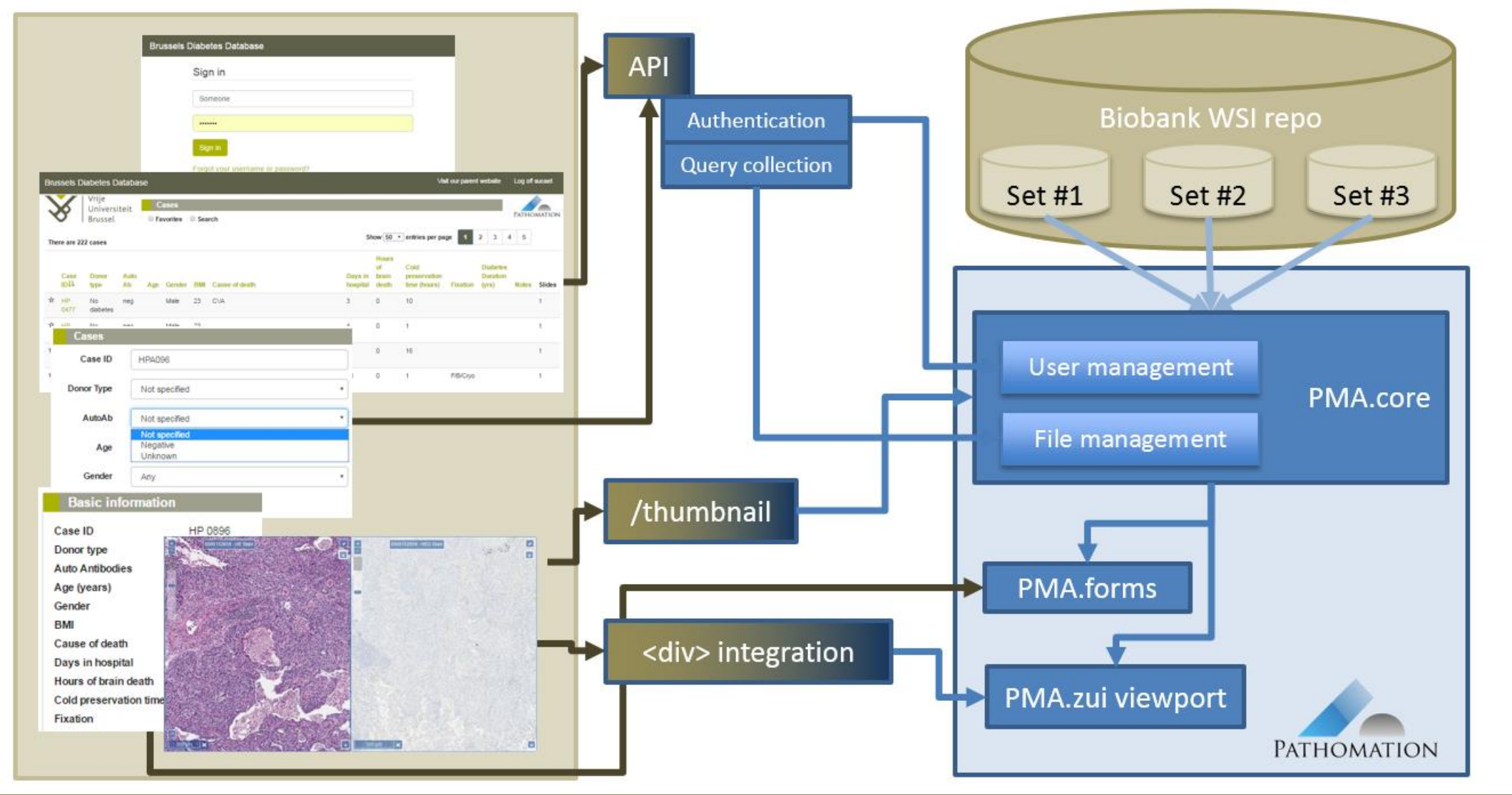## Overview of the imaging platforms and web interfaces
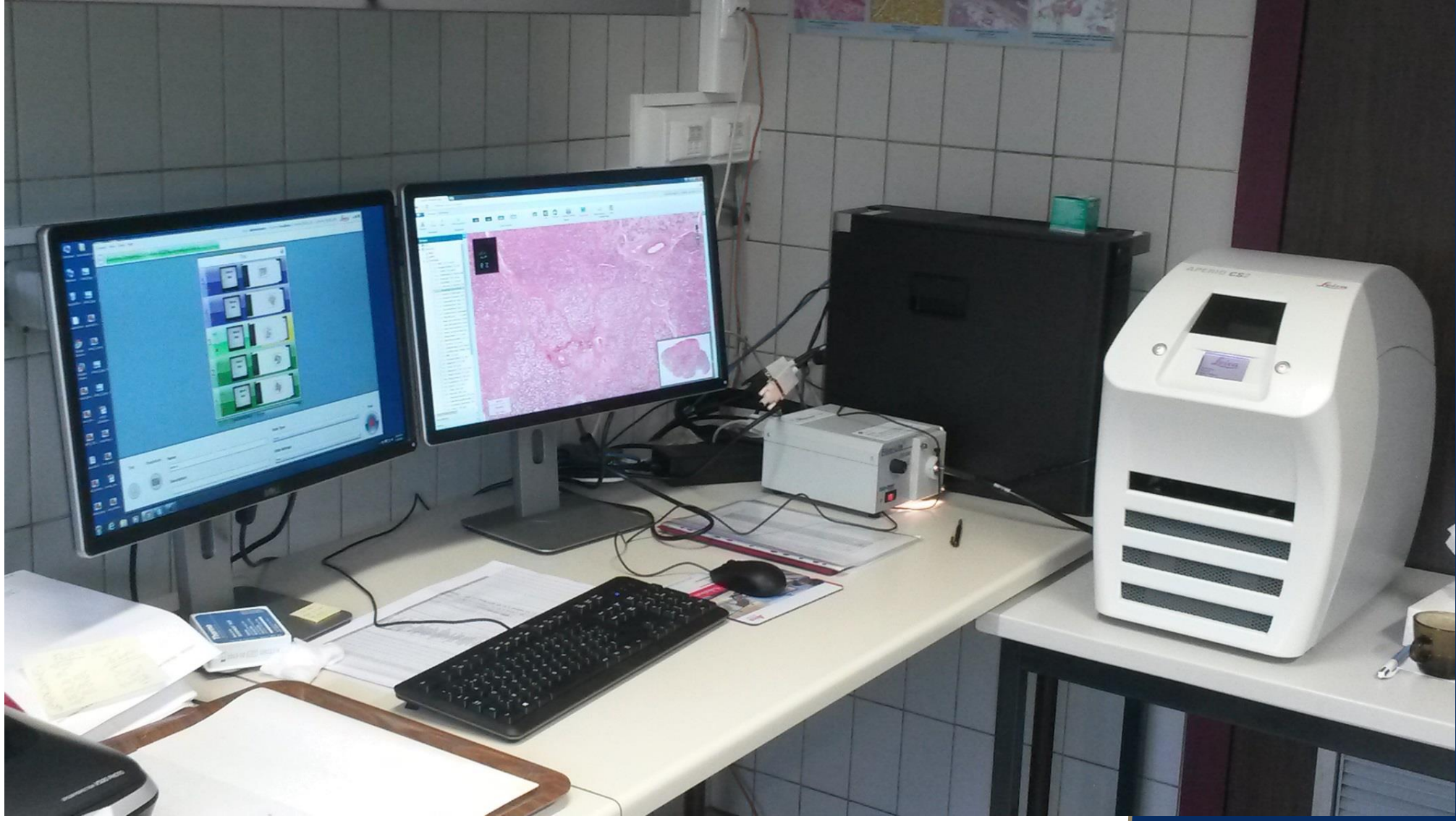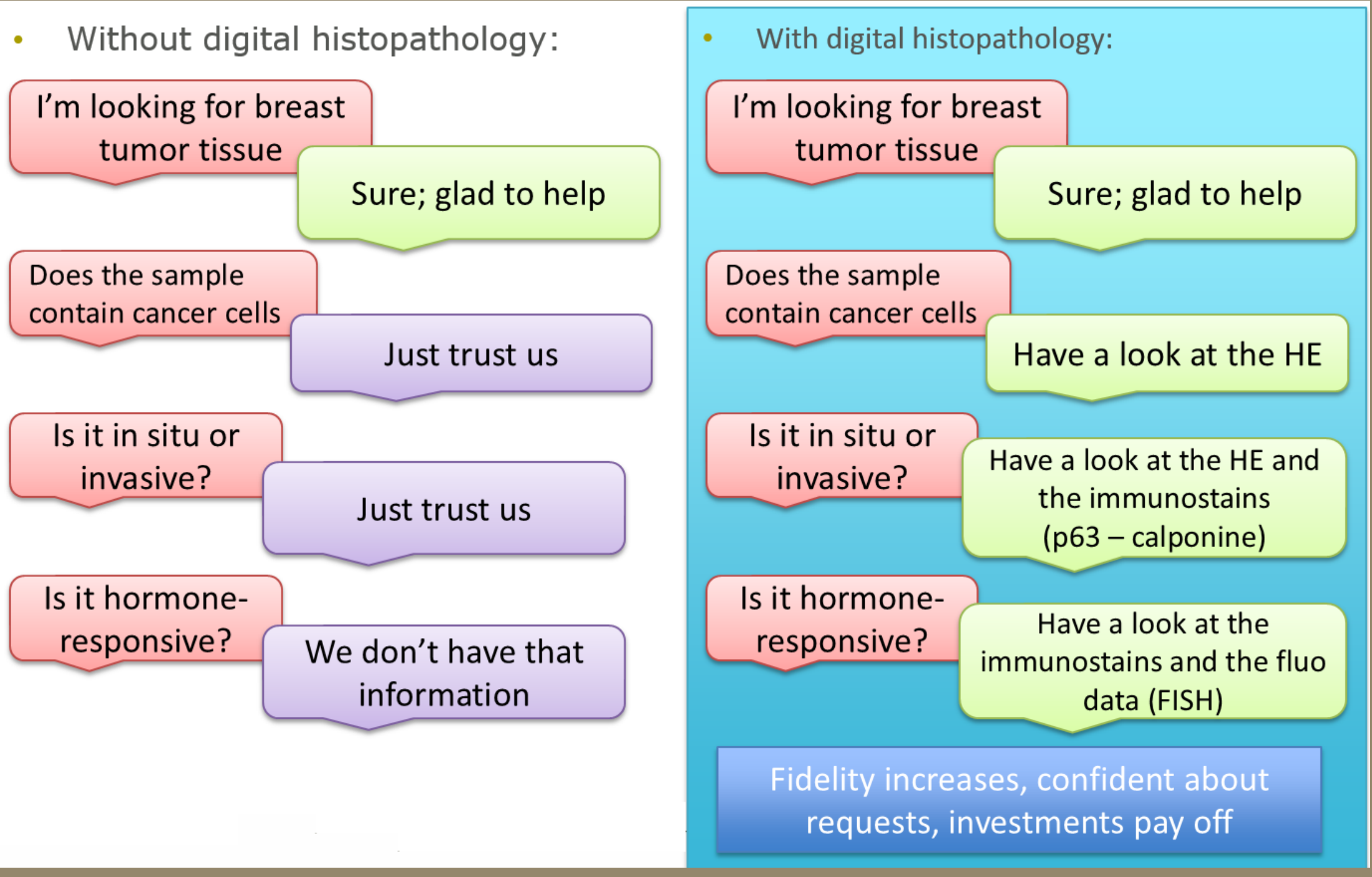
Enhanced network and local cloud infrastructure
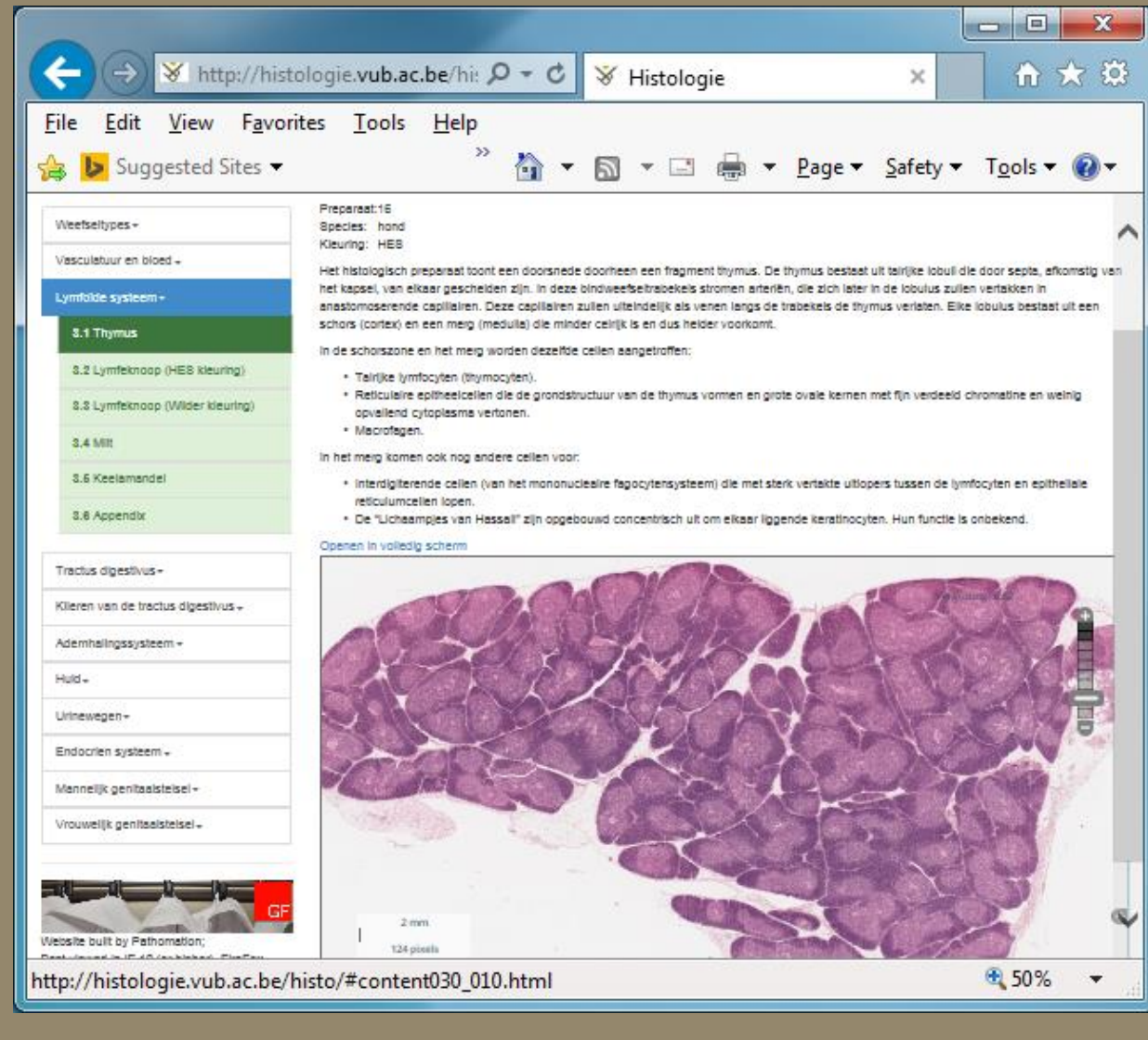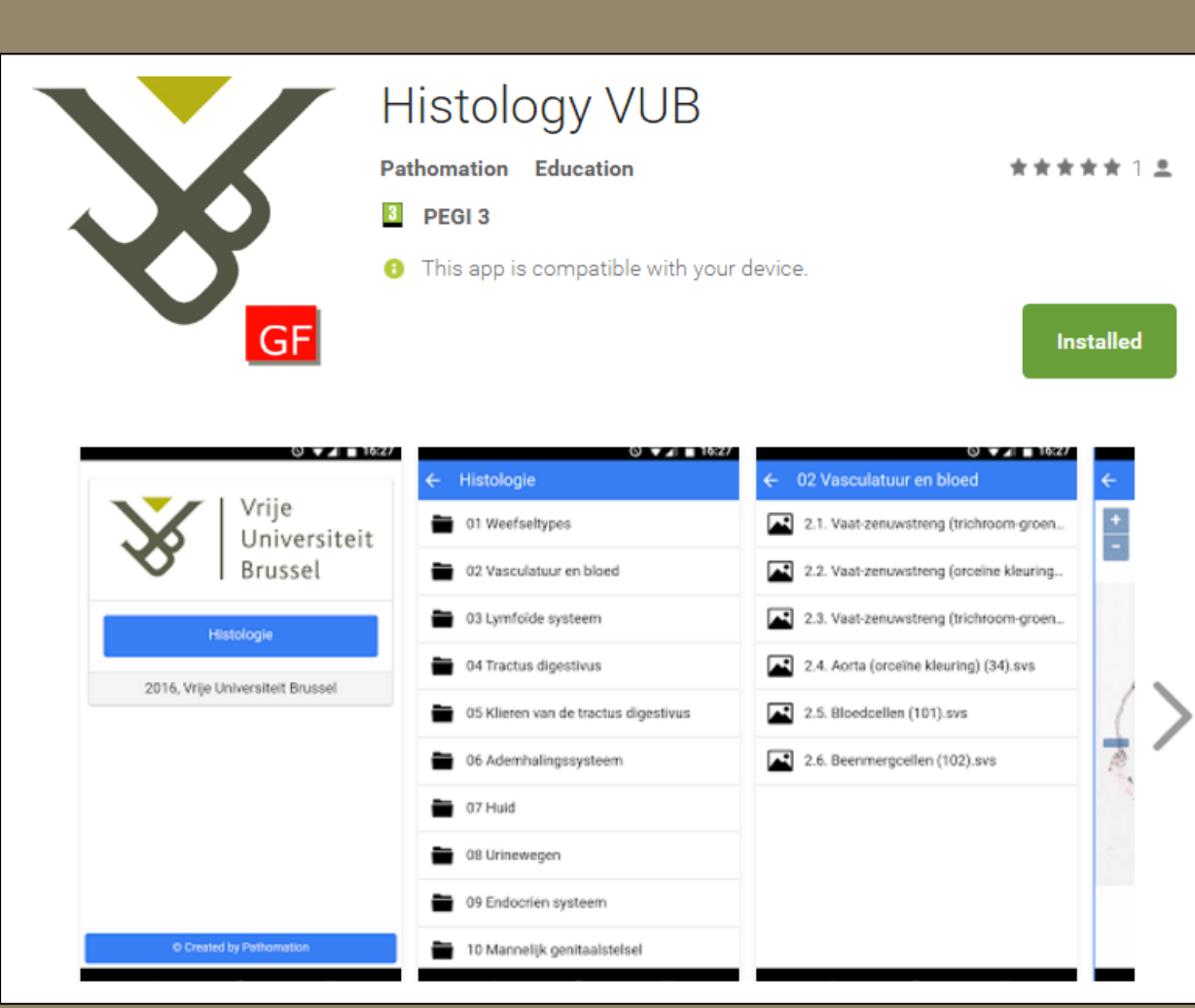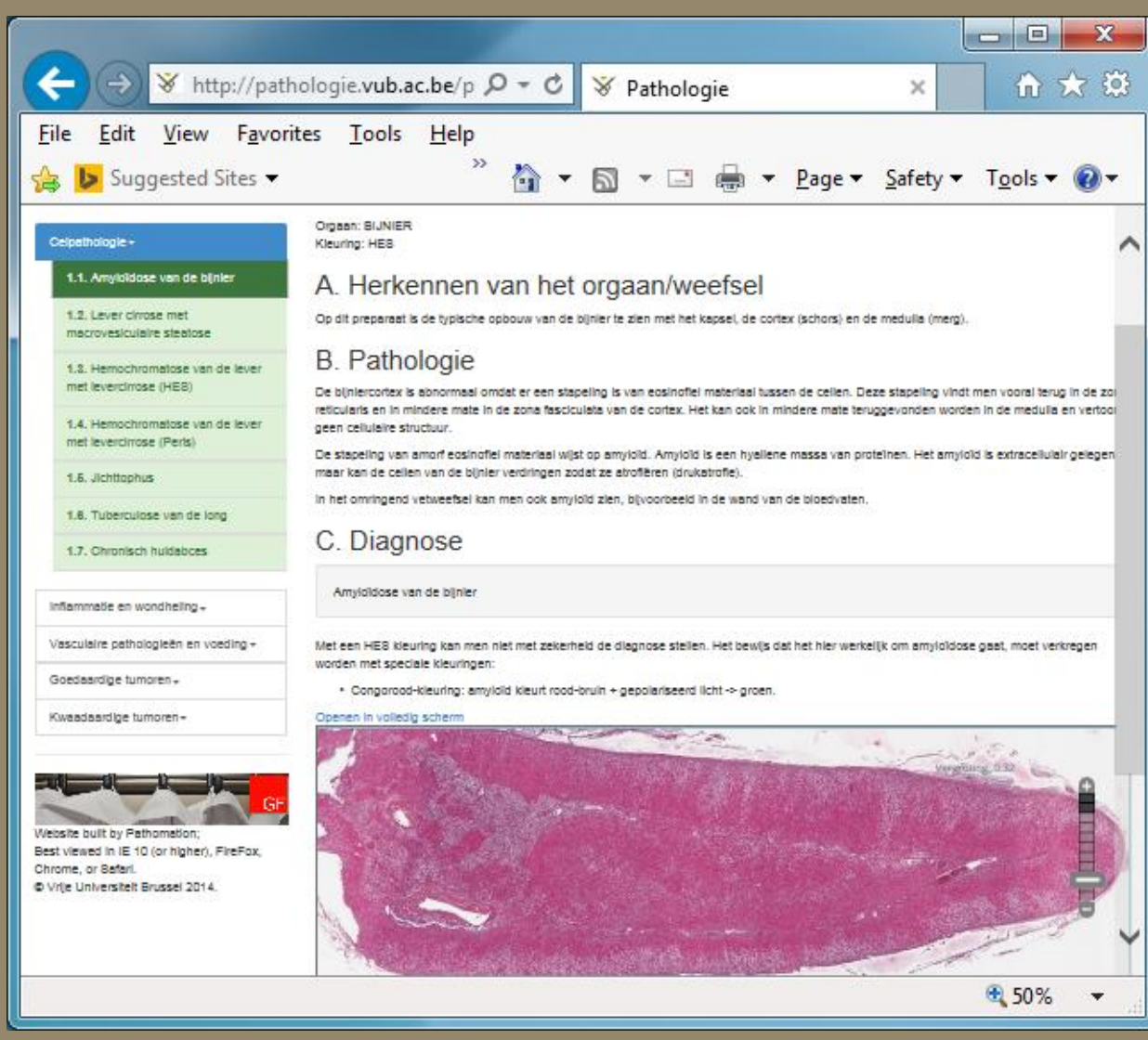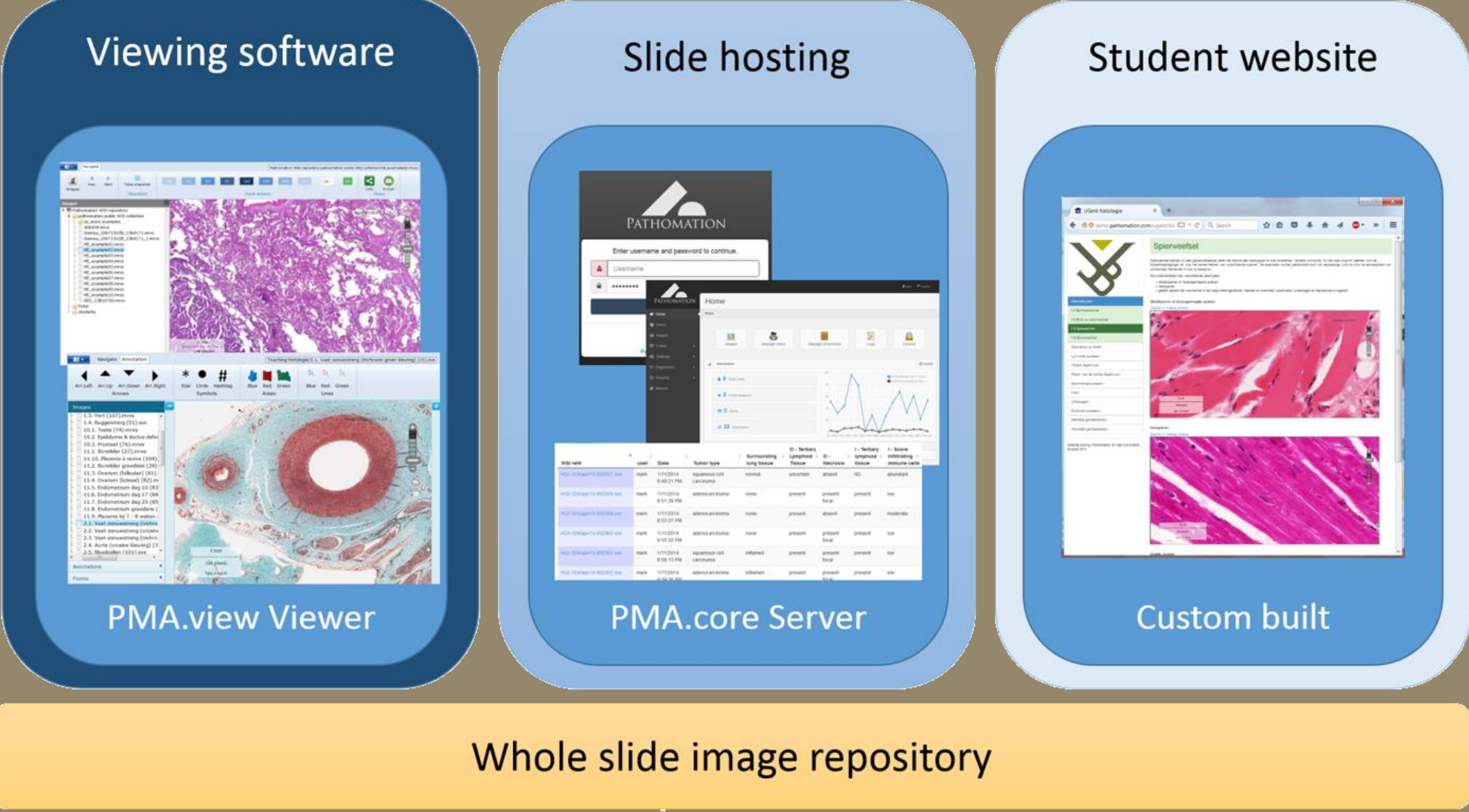
Education

Research

Biobanking

http://www.diabetesbiobank.org

Discussion & conclusion

Digital pathology involves much more than the acquisition of a slide scanner. At the VUB, we have engaged five different imaging platforms onto a single architecture. We are now storing data from all modalities in a single storage facility, and can manage it through a single access point. Furthermore, the Pathomation software platform for digital microscopy assists in rendering content to any type of display device, without the need for extra software or background information concerning the content's origin. The resulting ecosystem presents web-accessible interfaces to the right end-users at the right time. A single access portal is provided through http://www.diabetesbiobank.org.

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