

# Simplifying the AI consumption process through the implementation of a standard-based AI platform

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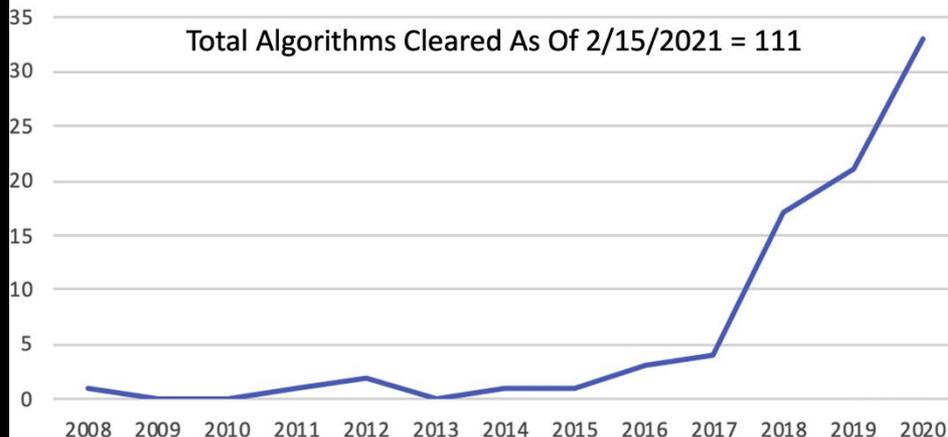
(3) FUJIFILM Healthcare Americas Corporation

# AI Trends

- There is an increased number of AI algorithms available to aid in the interpretation of medical images
  - As a consequence, it's important to standardize and simplify the AI consumption process

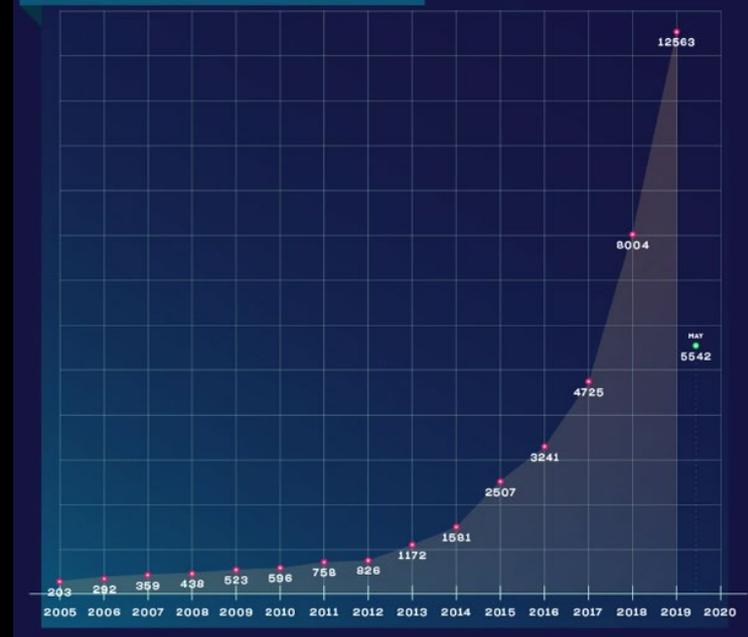
US FDA Cleared AI Algorithms In Radiology By Year

Total Algorithms Cleared As Of 2/15/2021 = 111



Evaluation and Real-World Performance Monitoring of Artificial Intelligence Models in Clinical Practice: Try It, Buy It, Check It. By Bibb Allen, MD, Keith Dreyer, MD, PhD, Robert Stibolt Jr., MD, et al. JACR, VOLUME 18, ISSUE 11, P1489-1496, NOVEMBER 01, 2021

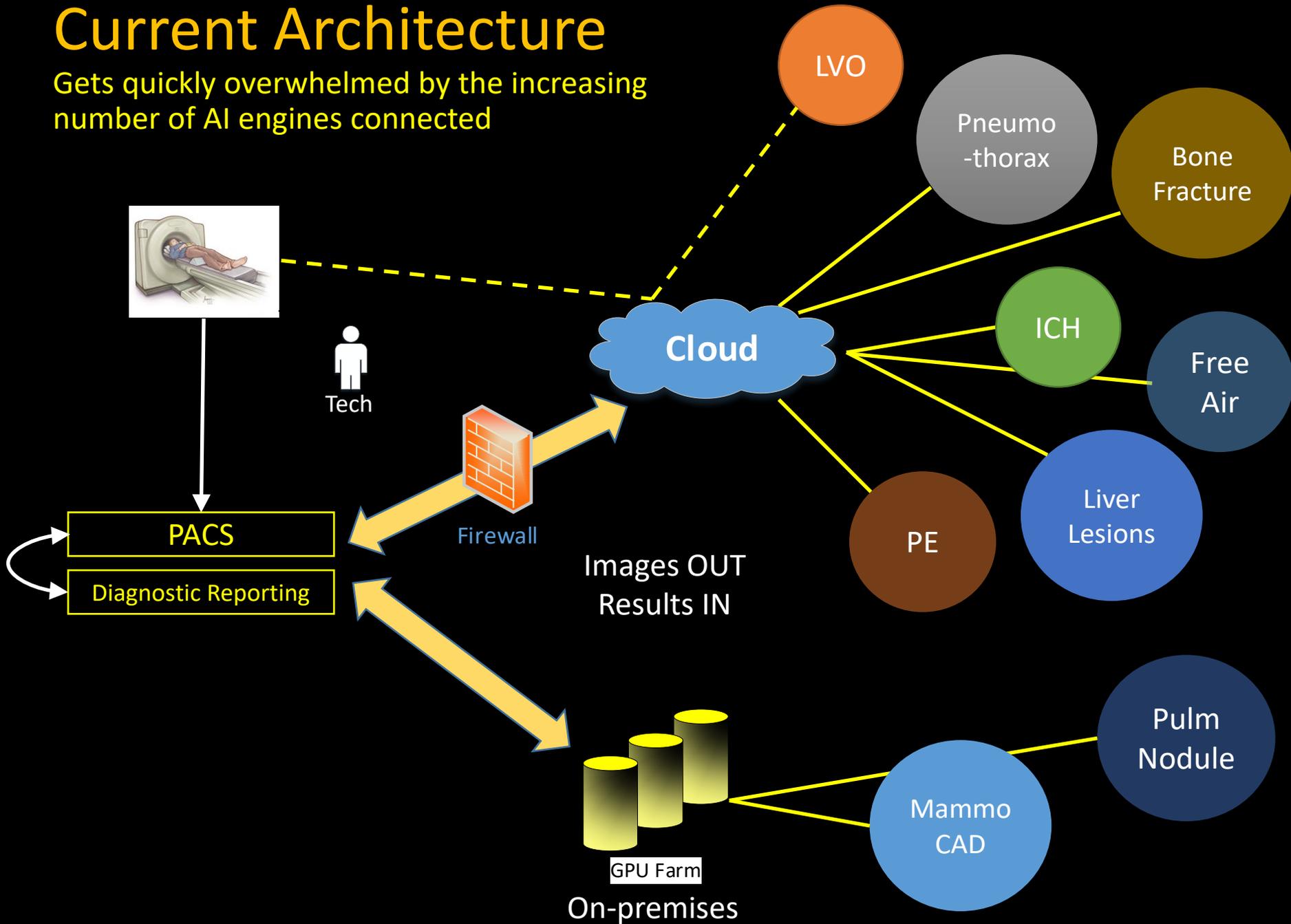
TOTAL NUMBER OF STUDIES



Number of medical A.I. studies on PubMed.com by year from 2010 to 2020. From: A short guide for medical professionals in the era of artificial intelligence. Bertalan Meskó & Marton Görög npj Digital Medicine volume 3, Article number: 126 (2020)

# Current Architecture

Gets quickly overwhelmed by the increasing number of AI engines connected



# A Lesson from Consumer Platforms

They increase efficiency by aggregating distributed data into a single consumption site

The screenshot shows the Expedia homepage. At the top, there's a navigation bar with the Expedia logo and a dropdown menu for "More travel". Below this is a search bar with "Going to Chicago (and vicinity), Illinois, United ..." and a "Check-in Nov 2" button. A map of Chicago is displayed on the left, with a "View in a map" button. To the right of the map, it says "1,422 properties" and "See how we pick our recommended properties". Below the map, there's a "Save an average of 15% on thousands of properties" offer with a "Sign in" button. A search bar for "Search by property name" contains "e.g. Marriott". A "Filter by" section lists "Popular filters" such as "Hot tub", "Free airport shuttle", "United Center", "Breakfast included", and "Spa". At the bottom, there's a "Price per night" section. The main content area features three property cards with images and heart icons.

The screenshot shows the Booking.com homepage. The top navigation bar includes "Stays", "Flights", "Flight + Hotel", "Car rentals", and "Attractions". The main headline reads "Find deals for any season" with the subtext "From cozy bed & breakfasts to luxury hotels". Below this is a search bar with "Downtown Chicago" and a "Check-in Date" button. A checkbox for "I'm traveling for work" is visible. A COVID-19 advisory icon says "Get the advice you need. Check the latest COVID-19 restrictions before you travel." The "Offers" section features a promotion: "Save 15% with Late Escape Deals" and "Check one more destination off your wishlist", with an "Explore deals" button. The background of the offers section shows a scenic view of a building at night.

The screenshot shows the KAYAK flight search results page. The top navigation bar has the KAYAK logo. The "Recommended filters" section includes "Hide 2+ stops". The "Stops" section shows three options: "Nonstop" (\$354,306), "1 stop" (\$1,242), and "2+ stops" (\$1,000). The "Fee Assistant" section shows "Carry-on bag" and "Checked bag" with "0" items each. The "Flexible options" section has a "No change fees" checkbox. The "Times" section shows "Take-off" and "Landing" buttons, with "Take-off from PHL" set to "Fri 5:00 AM - 9:30 PM". The flight results are displayed in a list with columns for "Best", "No change fees", "Cheapest", and "No change fees". The first flight is "6:02 am - 2:43 pm" by United Airlines. The second is "4:20 pm - 9:16 am" by United Airlines, operated by Republic Airways DBA United. The third is "5:00 am - 10:29 pm" by American Airlines. The fourth is "11:55 pm - 6:23 am" by American Airlines. The fifth is "10:06 am - 6:32 pm" by American Airlines. The sixth is "7:15 am - 11:56 pm" by American Airlines.

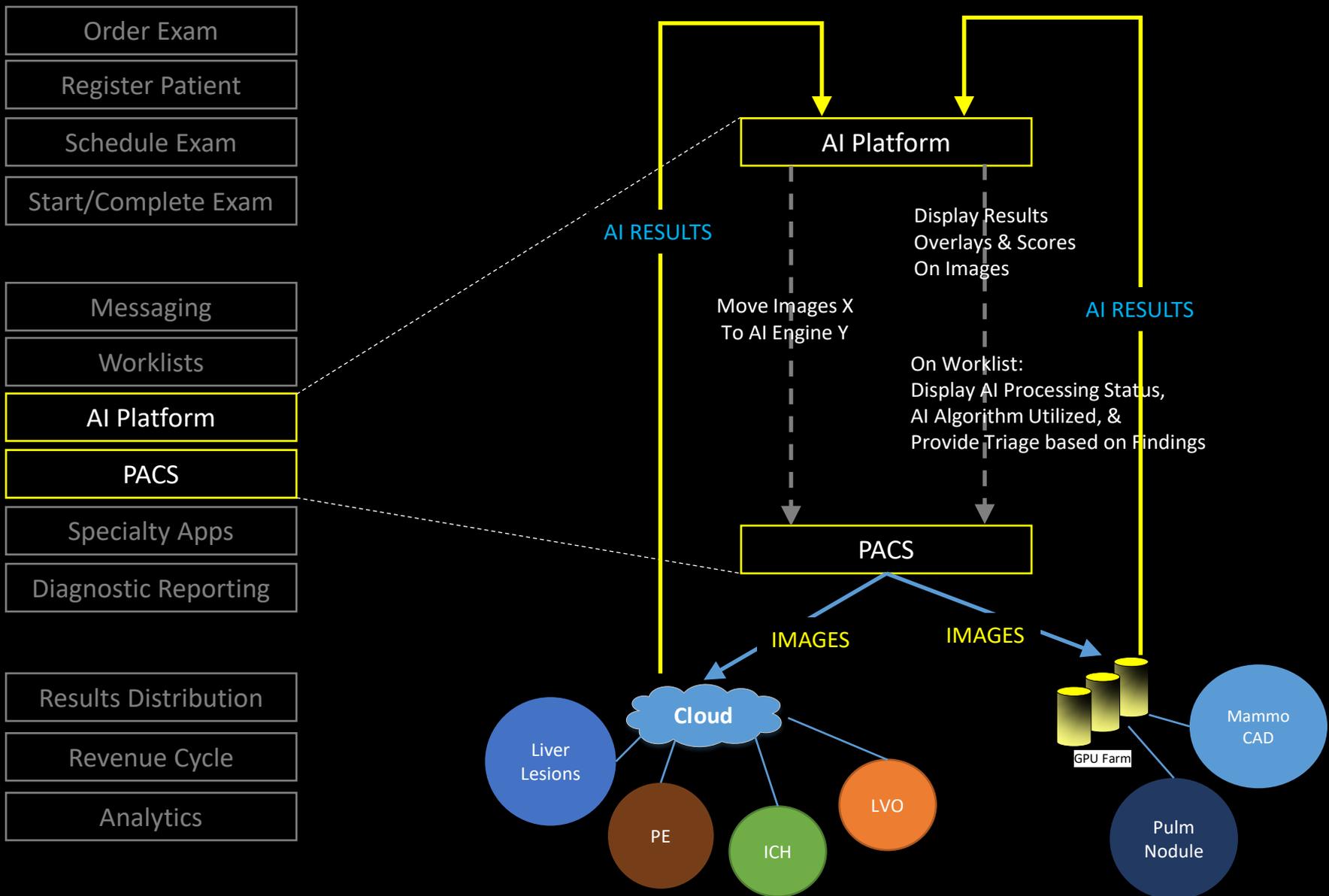
# New Architecture

- A standard-based AI platform to deliver a common user experience regardless of the AI solutions adopted
  - Streamline data out of PACS & results into PACS and Reporting System
    - Minimize the impact on Technologists' workload – no manual pulling & pushing of data
  - Single point of integration with on-premises & cloud-based AI engines
    - Automates the export of cases & intake of results, creates queues based on study priority and improves hardware scalability through load balancing
  - Leverages on industry-wide, vendor-agnostic standards such as DICOM & HL7
  - Greater control can be achieved through a published Open API which is publically available and shared freely

# AI Platform Features & Functionality

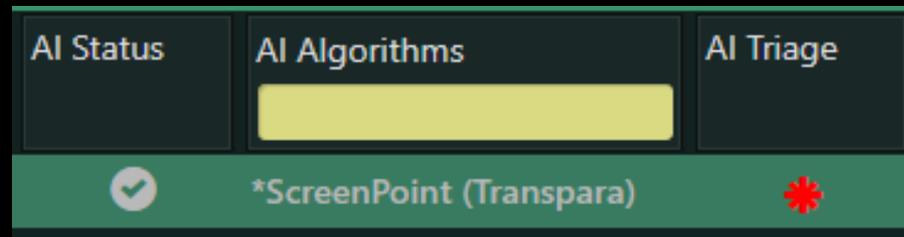
- Automates the data flows in-and-out of PACS
  - Extraction: Easily select datasets to be routed to external engines
  - Transformation: Anonymize PHI
  - Load: Encrypt for transmission
- Orchestrates the sending of imaging data to the appropriate AI engine
  - No need for the Tech to double-pitch data
  - Provides hardware load balancing
  - Scheduling and Prioritization of cases
- Streamline the display of AI results into the Radiologist workspace, ie, PACS viewer, worklist and/or reporting system
  - Triage cases
  - View CAD results (marks, annotations, measurements, ...)

# Radiology IT Technology Stack w/ AI Platform



# Integration Profiles

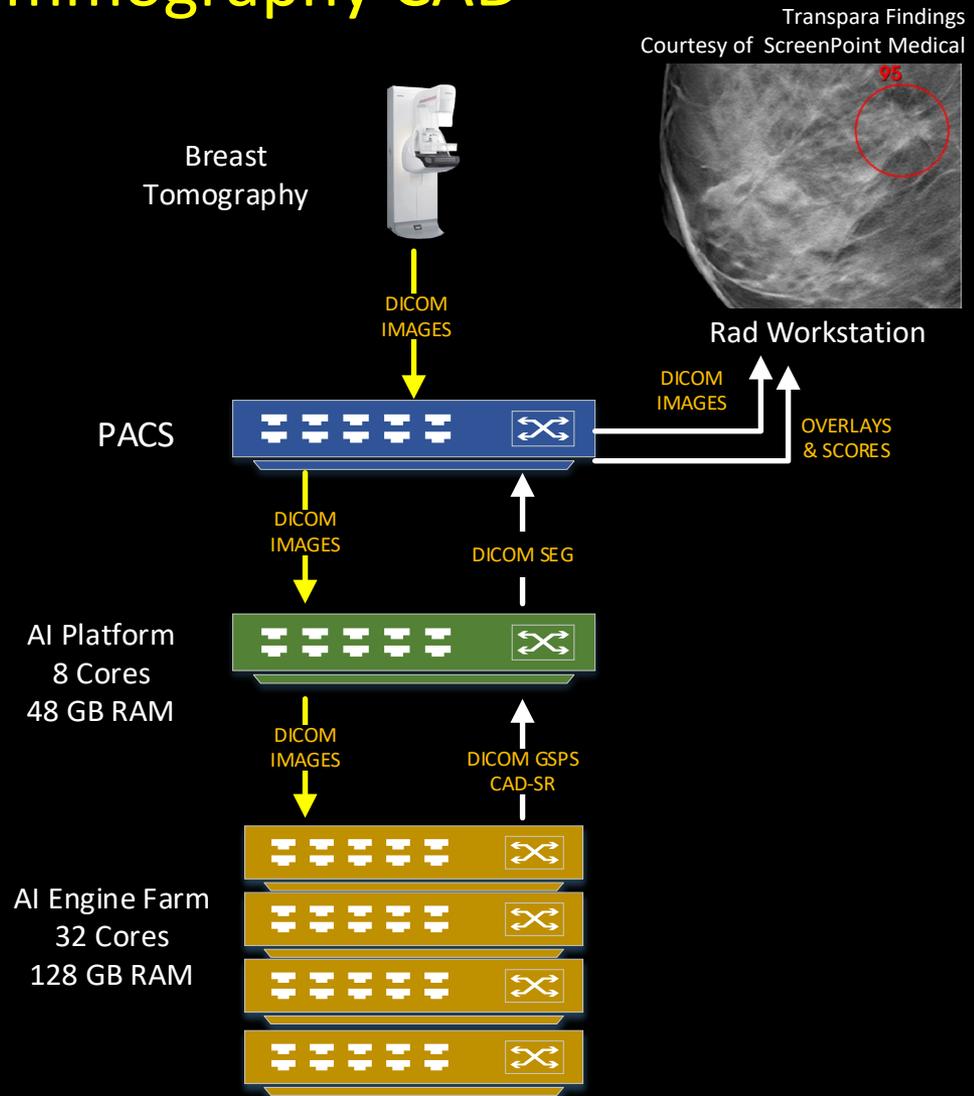
- Integrate AI results directly into PACS viewer
  - GSPS, DICOM SC, DICOM SEG, CAD SR
  - Overlays can be toggle on/off
  - DICOM SC provides minimum level of integration
- Notifications of Results
  - AI processing status
  - AI algorithm utilized
  - Triage assignment based on AI findings



# Case Study

## AI Platform & AI-based Mammography CAD

- For diagnostic breast exams where the interpretation occurs in near real-time, the **AI TAT** needs to be **< 3 min** (illustrated on the right)
- This is critical in order to provide the AI results **prior** to the radiologist's start of interpretation



# AI Platform Benefits

- Orchestrates the secure exchange of imaging data and intake of AI results in a standardized and simplified manner
- Aggregates the output of multiple AI algorithms under a single platform delivering a consistent end-user experience
- Platform provides AI-vendor independence facilitating the consumption of best-of-breed AI solutions
- Platform automates the data distribution between PACS and AI engines eliminating manual workload by Technologists

Thank you

Questions & Feedback:

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