

digitalhealth

REWIRED
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Headline Sponsors:



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Agenda

- Background
- From Regional to National
- How did NPIC build the largest digital pathology platform within the NHS?
- What has been the impact ?
- What are the future plans ?

Background

- Leeds as a City has been at the forefront of Digital Pathology for over 20 years
- Large academic centre leading across a variety of research activities
- A world renowned website <https://www.virtualpathology.leeds.ac.uk/>
- Installed one of the first Aperio scanners
- Built the first “Powerwall” as a teaching tool
- Developed the Leeds Virtual Microscope
- Written many academic papers
- Undertook studies comparing microscope use vs image viewer



Background

- Hosted many events, seminars and visits
- Talked at events across the World
- Highlighted the need for change with an evidence based approach



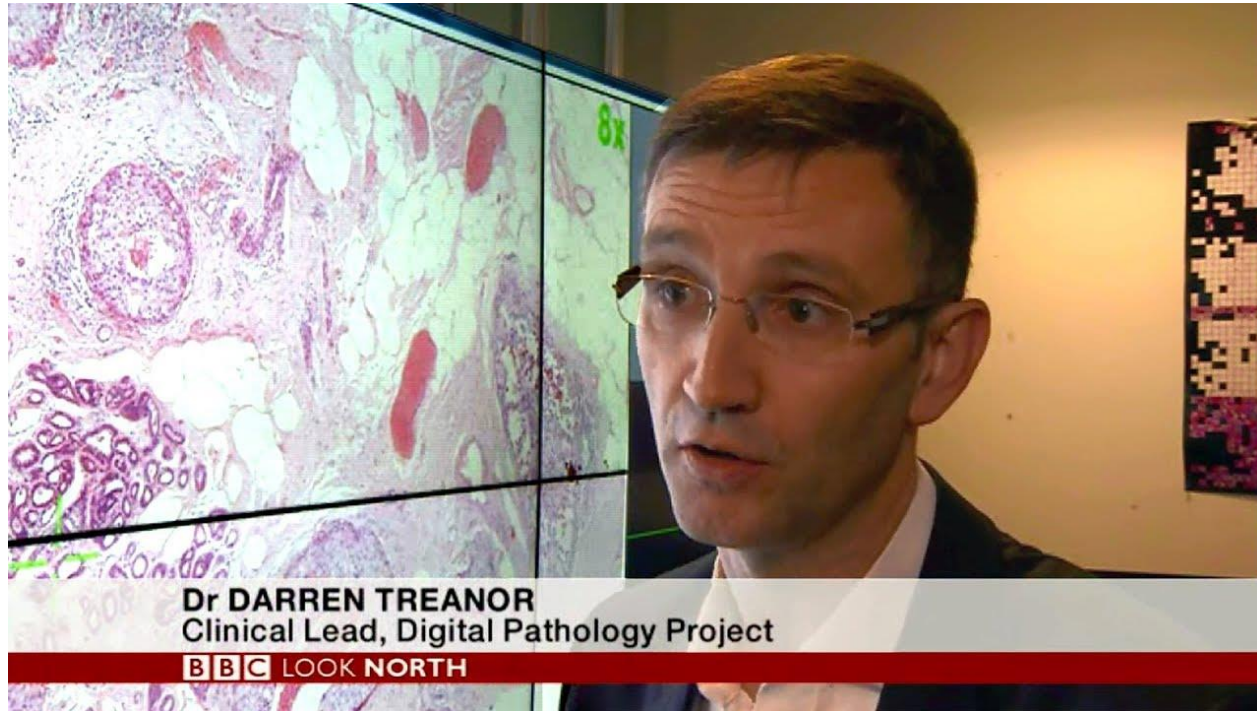
- Why just talk about Digital Pathology why don't we actually deploy the technology...how hard can it be ?



Centre of Excellence

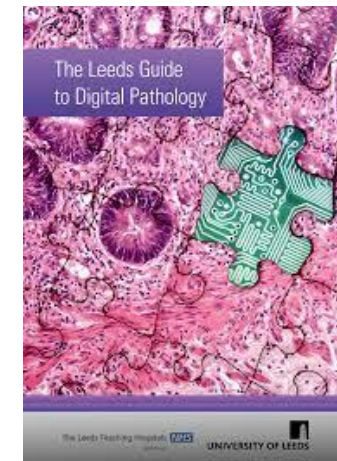


Leeds 100% slide scanning



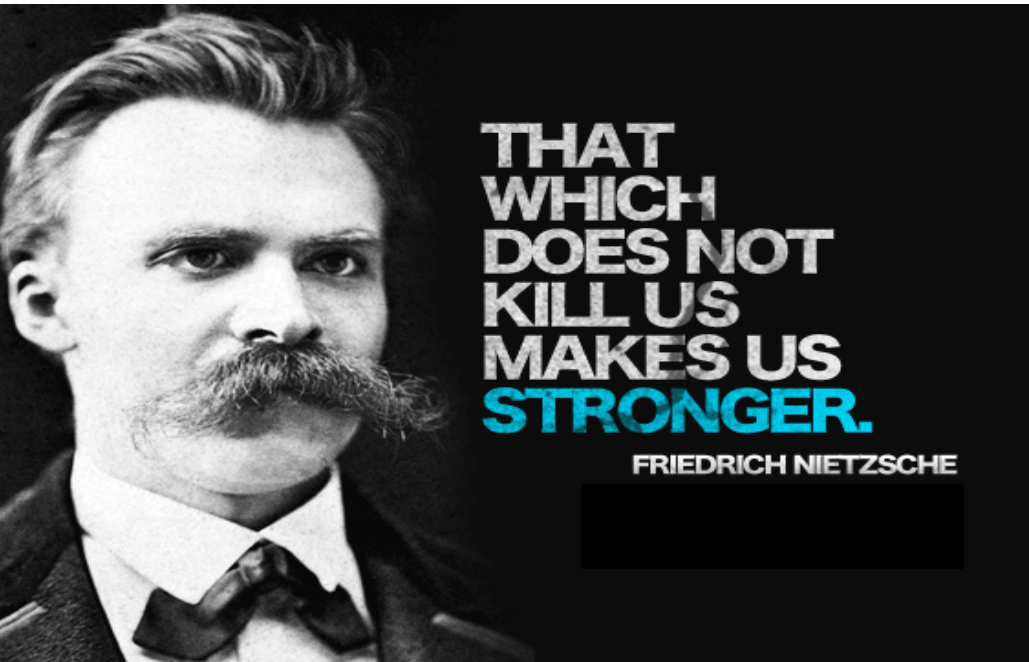
- Making News !
- Momentous achievement
- Significant learning that came from this experience

- Educational Events and Literature
- Inundated with requests
- The Leeds Guide to Digital Pathology



Period of Reflection

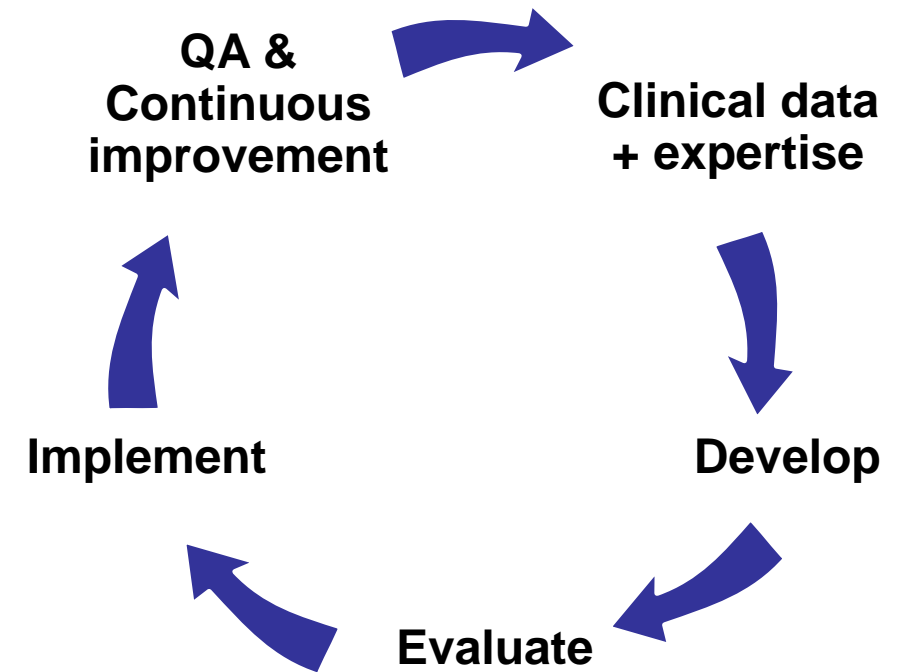
- Reflected on how tough it actually was to digitise a large busy clinical laboratory
- Challenging state of Pathology Services
- Sustainability



- We didn't want to stop here
- Lets consider our options
- How can we replicate what we've done across the West Yorkshire region?

Our Regional Plan : NPIC Aims

1. Drive clinical use of digital pathology
2. Place for AI development and evaluation over the whole AI lifecycle
3. Support *further research and innovation*



Supporting the entire digital and AI lifecycle in the NHS

Our Regional Plan

- Submitted a £10m bid to Innovate UK supported by £7m partner contributions
- Deploy Digital Pathology across 6 regional hospitals, 750k slides, 1.2PBs of data
- Centre for Training and Education



- Further support Research and Innovation
- Quality Assurance
- Patient Public Involvement
- Training and Validation of A.I.
- A.I. projects with partners



Are you a shave slave?



Only 50p
Gillette

Metroline

THERE IS ONLY ONE SALE
SALE ENDS SUNDAY 17 JULY



TANCOCK

NOW YOU SEE

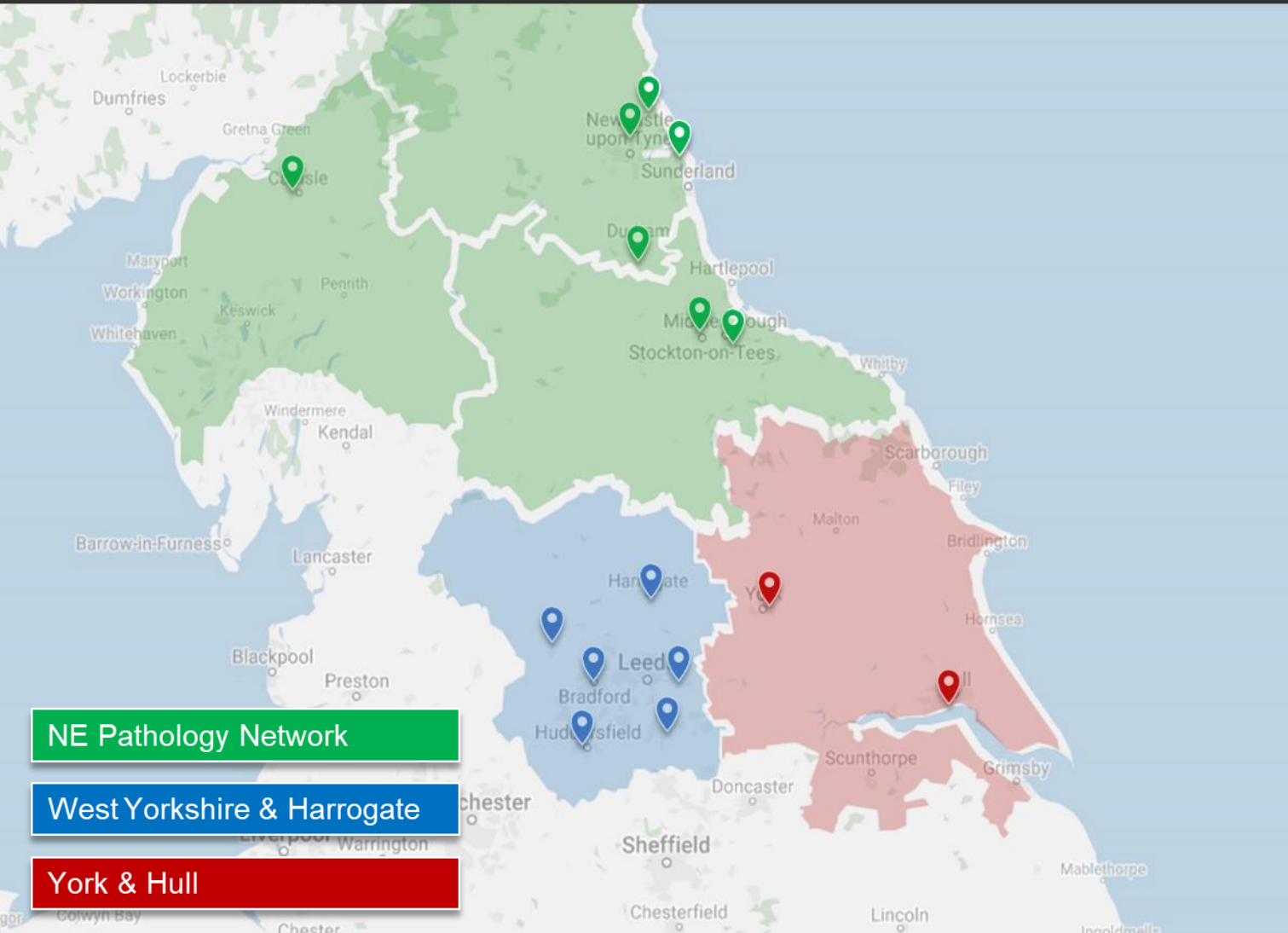
WOMEN'S
OUTFIT

From Regional to National ?

- Prepared a £20m proposal incorporating;
- Hospitals across the North East
- Hull and York Hospitals
- Great Ormond Street Hospital
- Royal National Orthopaedic Hospital
- Paediatric Hospital Network
- Soft Tissue Hospital Network



From Regional to National ?

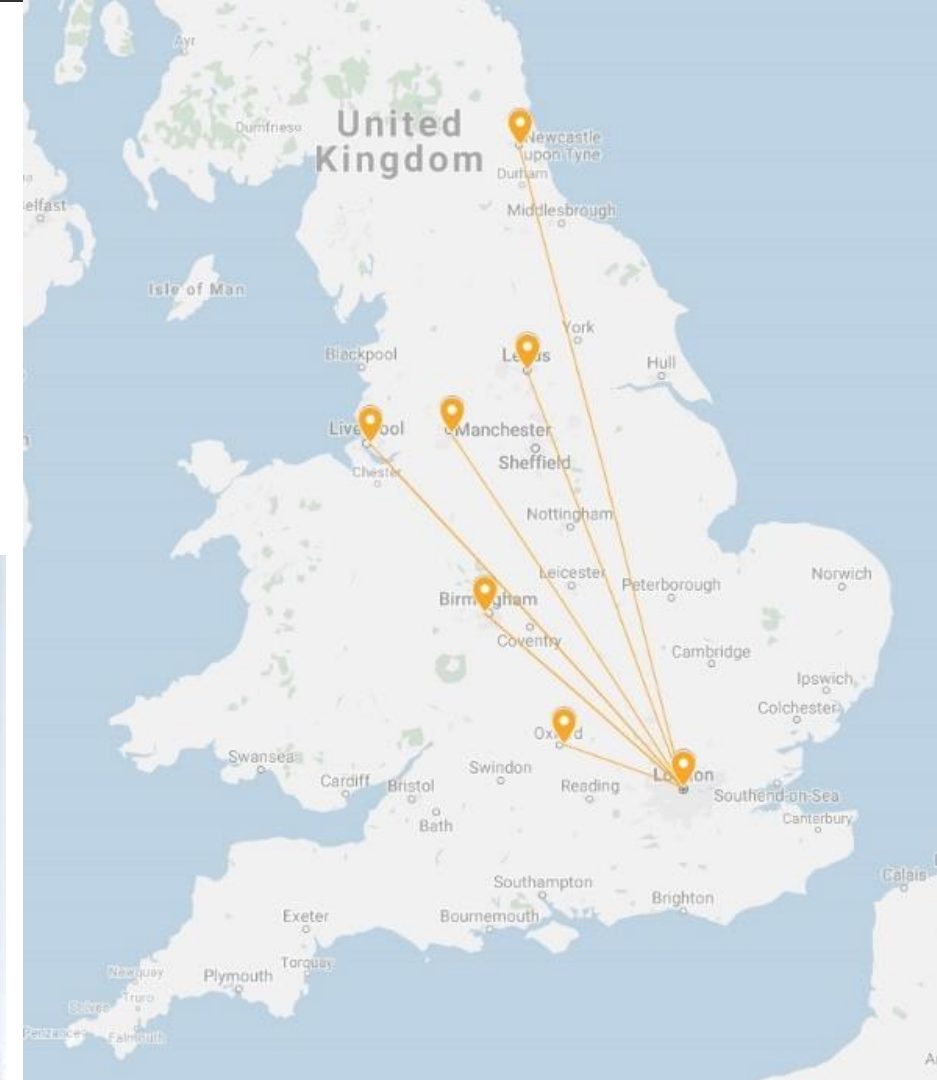


- Full digitisation of 3 NHSI pathology networks in the North of England

15 NHS Trusts
238 pathologists
6 million people
48 scanners
1 vendor neutral archive
2.4 million images per year

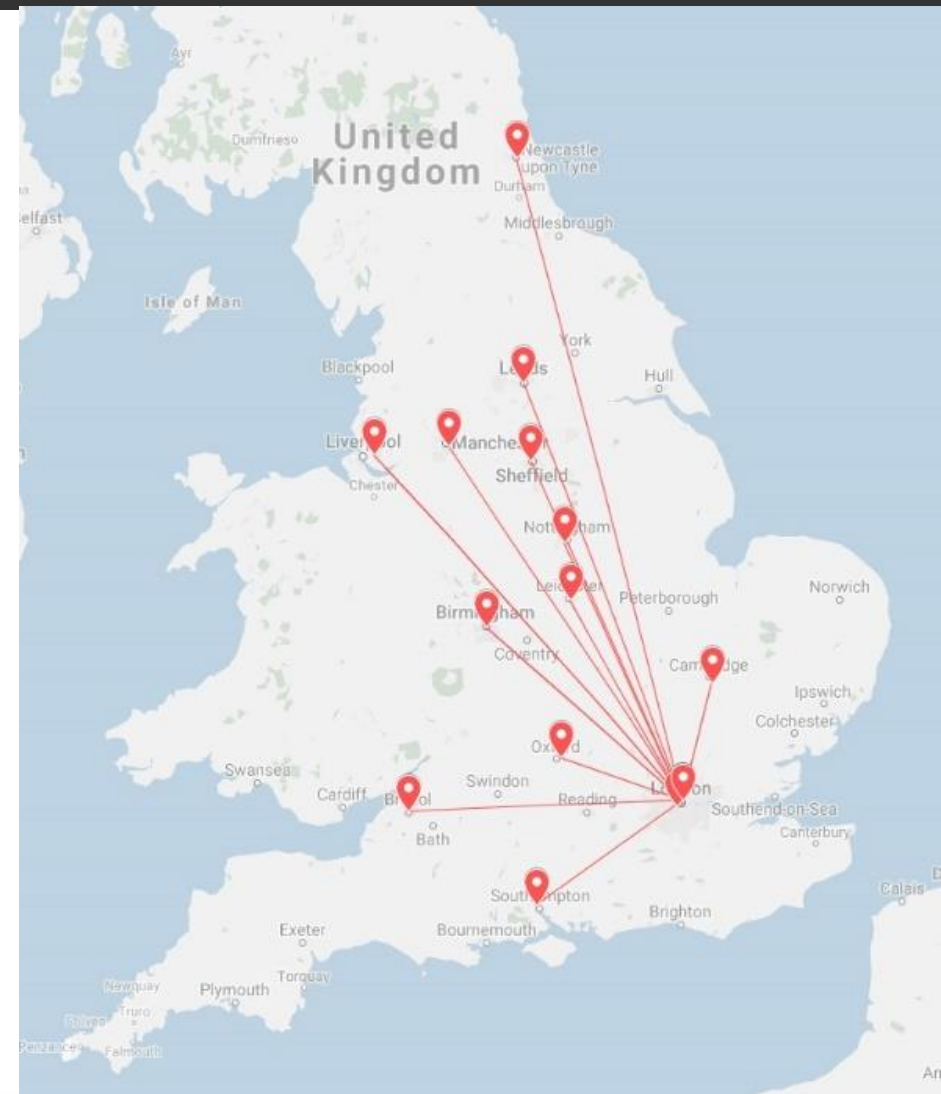
National Bone and soft tissue network

- Fully digitise RNOH
- Link 7 soft tissue sites at Genomic Laboratory Hubs
- 50 pathologists
- Links to NHSI National Bone Pathology Network



National paediatric pathology network

- Fully digitise GOSH
- Link up to 13 Principle Treatment Centres (PTCs)
- 70 pathologists
- Linked to Children's Cancer Care and Leukaemia group network (CCLG)



From Regional to National ?

- Significant change from the original scope!
- From 6 local hospitals to potentially over 30 hospitals across England
- 100 pathologist to over 300 pathologist
- 750k slides to 2.4m slides per year
- Deploying 19 scanners to over 50 scanners
- Storage demand went from 1.2PBs to 4PBs per year !
- Connectivity.. anyone ?



National Digital Pathology platform

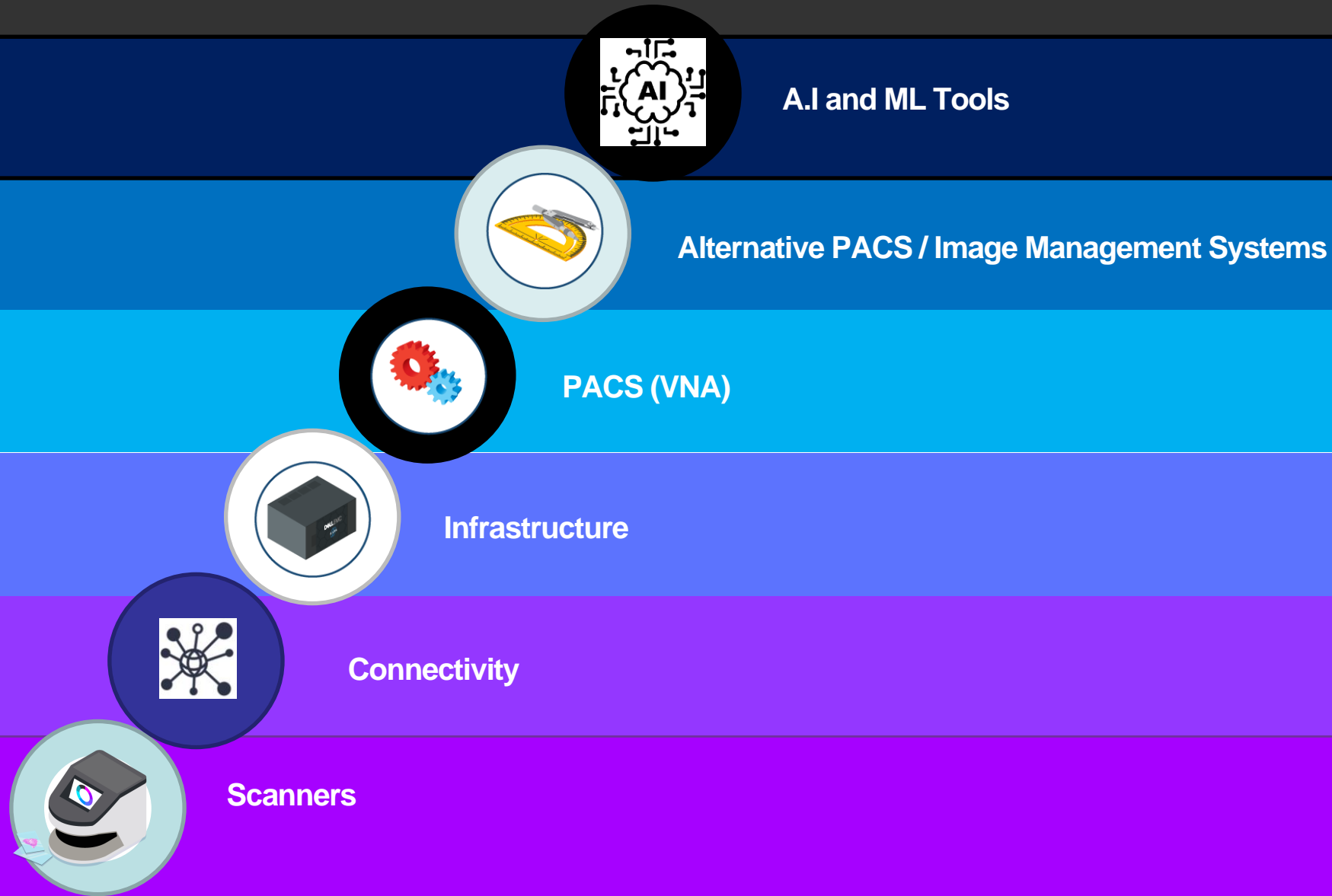
Key considerations

- How many organisations, and number of slides ?
- Scanning magnification and image retention ?
- How much storage do we need ?
- How many users will access the system ?
- How resilient does the system need to be ?
- What level of performance do we expect ?
- How is the data transferred between scanners and storage repository ?
- Do we want a single vendor for both software and hardware ?
- To Cloud, or not to cloud ?
- Which procurement route to take and contract duration ?
- What levels of integration ?



How did NPIC build the largest digital pathology platform for the NHS ?





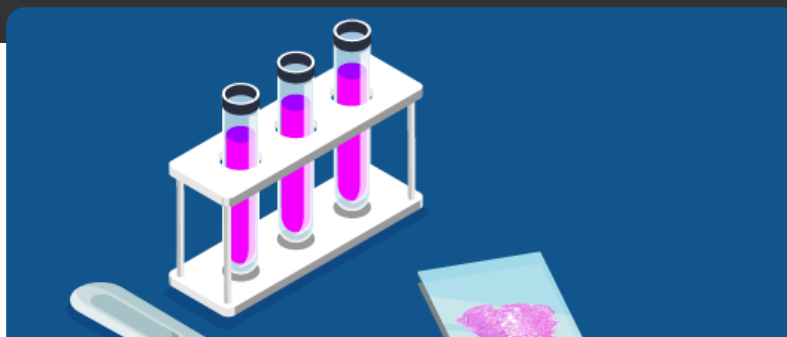
Storyboard



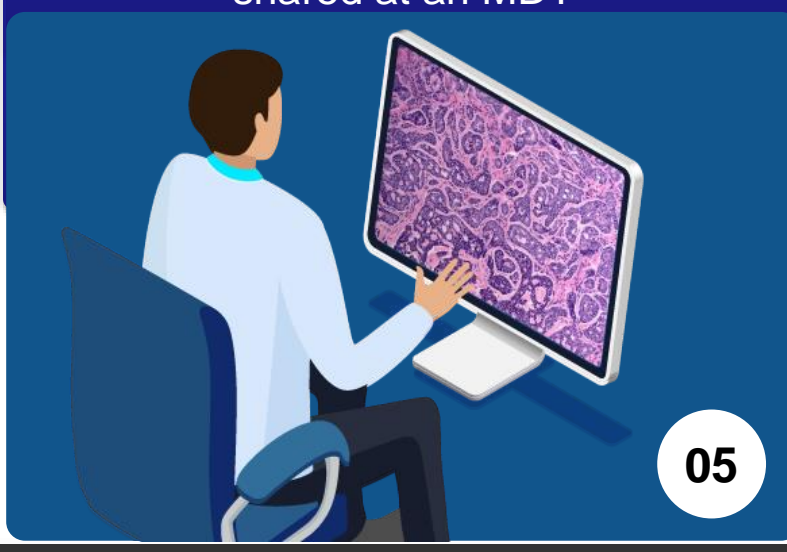
The high resolution image is ingested into the PACS platform and replicated between geo-diverse data centres.



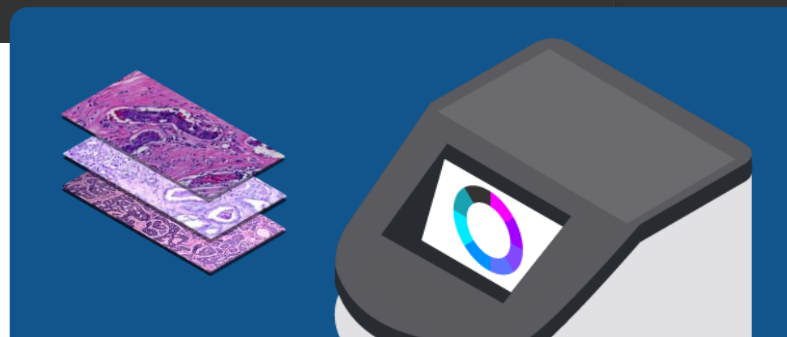
04



Pathologist can access the digital image via the PACS platform for diagnosis. Second opinions can be sought immediately. Images can be shared at an MDT



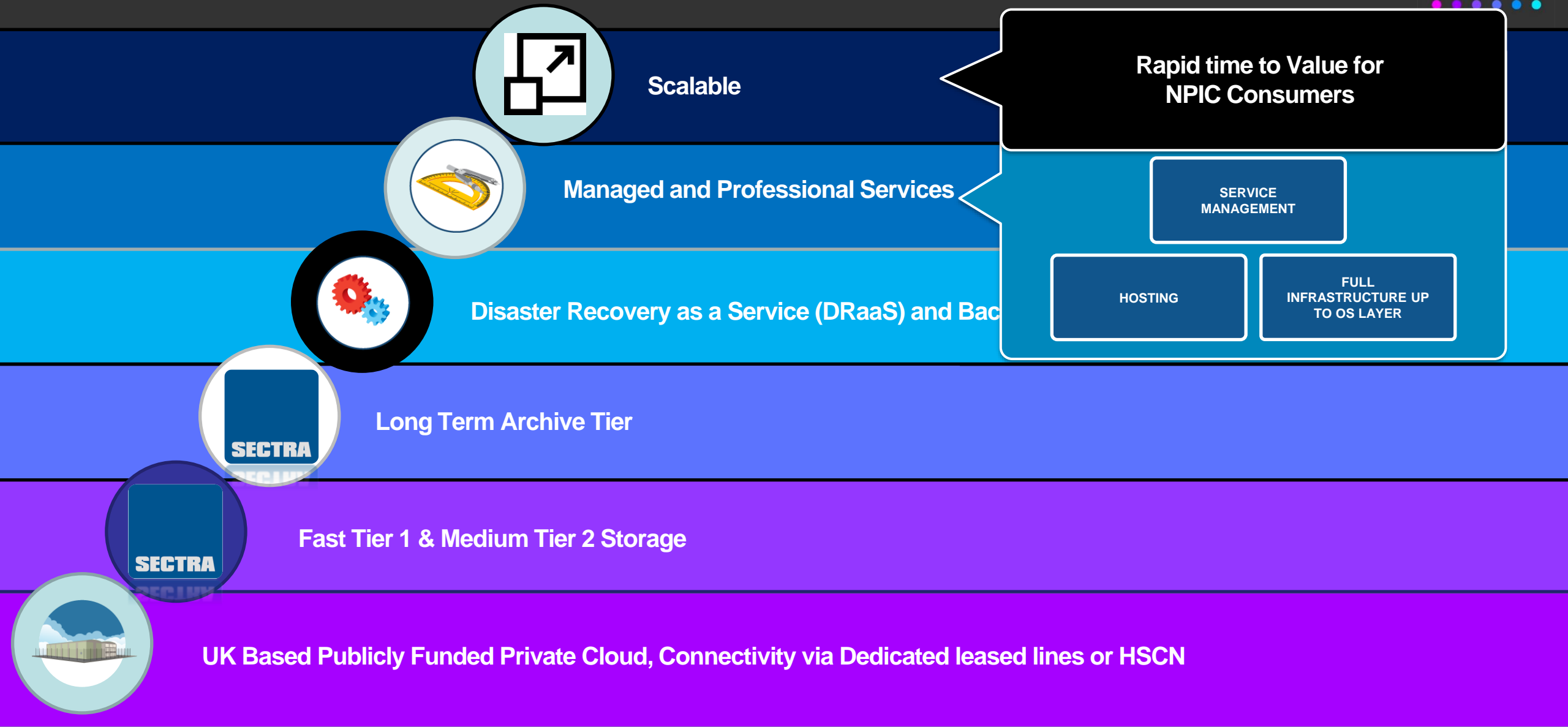
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A consultant can meet the patient to discuss results and even show the digital images to support their treatment plan



06



Scaling the Solution

Scale out and Scale up capabilities allow for growth of the platform as more Trusts and Organisations are onboarded.



West Yorkshire Association of Acute Trusts

- Leeds Teaching Hospitals NHS Trust
- Airedale District Hospital NHS Foundation Trust
- Bradford Teaching Hospitals NHS Foundation Trust
- Calderdale & Huddersfield NHS Foundation Trust
- Harrogate & District NHS Foundation Trust
- Mid Yorkshire Hospitals NHS Trust

North East & North Cumbria

- County Durham & Darlington NHS FT
- Gateshead Health NHS FT
- The Newcastle Upon Tyne Hospitals NHS FT
- North Cumbria University Hospitals NHS Trust
- North Tees & Hartlepool NHS FT
- Northumbria Healthcare NHS FT
- South Tees Hospitals NHS FT

Hull & York

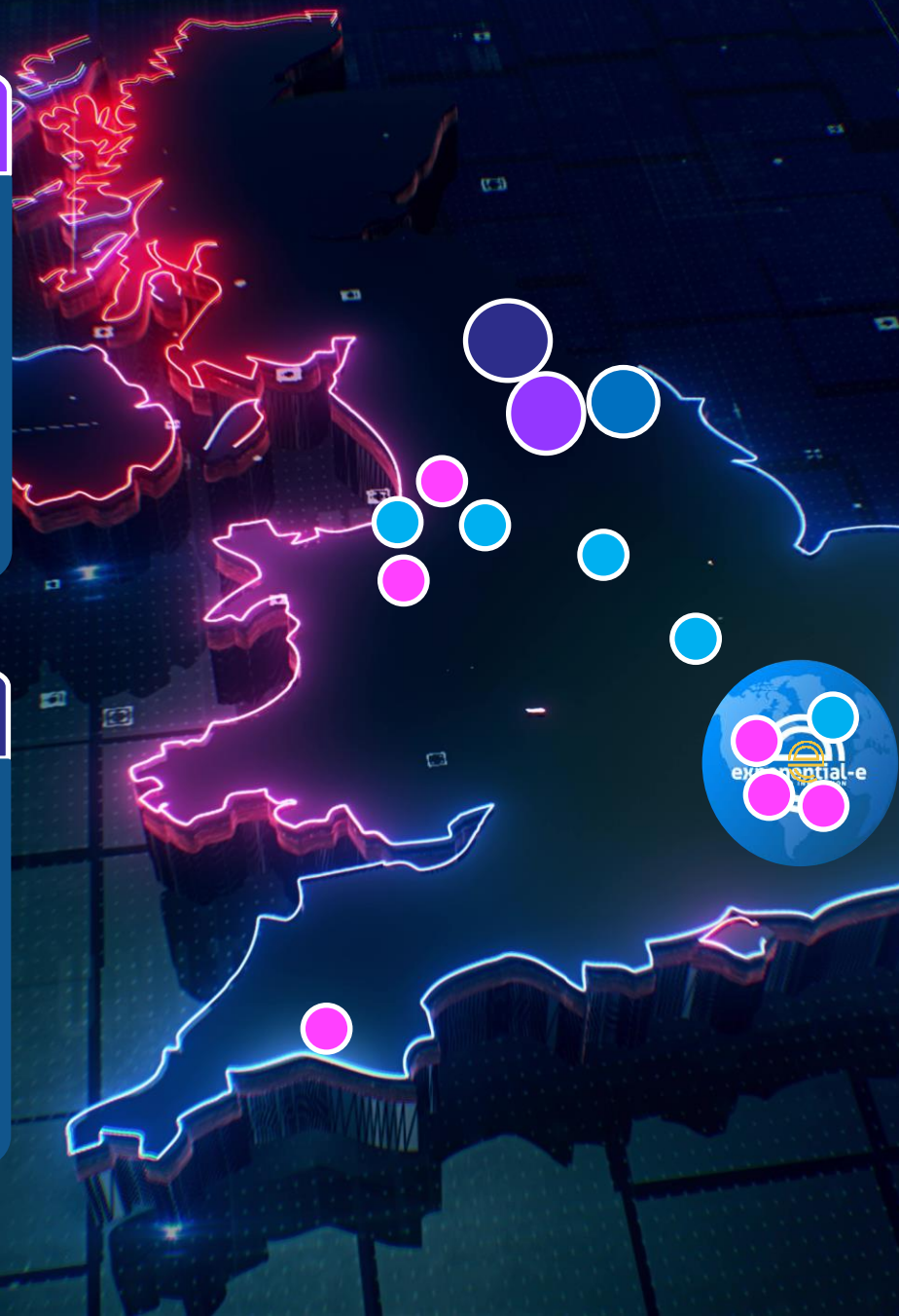
- Hull University Teaching Hospitals NHS Trust
- York Teaching Hospitals NHS FT

Paediatric Network

- Great Ormond Street Hospital for Children
- Alder Hey Children's NHS FT
- Manchester University NHS FT
- Sheffield Children's NHS FT
- Birmingham Women's & Children's NHS FT

Soft Tissue Network

- Royal National Orthopaedic Hospitals NHS FT
- University College London Hospitals NHS FT
- The Robert Jones & Agnes Hunt Orthopaedic Hospital NHS FT
- University Hospitals Plymouth NHS Trust
- The Christie NHS FT
- The Royal Marsden NHS FT



So what does this mean ?

- Dual data centres – providing real time replication of data, instant fail-over
- Over 50 Petabytes (PB) of storage across 2 data centres
- Currently we can store over 12M Whole Slide Images and keep x2 copies
- Scalable storage to multiple Exabyte (EB) (1000s petabytes)
- Have the potential to capture and store ALL Whole Slide Images across UK for 30+ years
- Seamless site to site image sharing instantly across hospitals
- Potential to improve turnaround times for cancer diagnosis
- Faster deployment of A.I capabilities to ALL the NHS
- Vast research capabilities and ability to support clinical trials



So what does this mean ?



Potential to save the NHS a minimum of £100million*



Future Plans

- Deliver on the promise to our NHS partners onboarded by the end of 2023
- Provide workshops, academic papers, webinars on a range of topics
- Continue to invest in the IT infrastructure
- Work on Interoperability between Image Management Systems
- Support further NPICs Research ambitions
- Consider the approach in deploying A.I.
- Continue to engage at a National level



Future Plans - Consider NPIC ?

Consider NPIC ?

- 100% digitisation capability
- Archiving capabilities
- Point to Point image sharing



