What Digitisation Means to the Delivery of Heath Care in Yorkshire.

How did they do that?

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Chief Digital & Information Officer
NHS Leeds Teaching Hospitals Trust
1. CEX: define target state customer journeys in and across channels.  
   ↑ Easiest to get wrong

2. Map to existing systems, processes and data.

3. Define gaps.

4. Resolve gaps, data, process & systems.
   ↑ Hardest to get right.

(digital transformation)
LTHT Digital Informatics Team Strategy Vision

To support the Trust’s vision for transforming the delivery of patient care and the development of new, more integrated services across the health and care community.

2023 Vision

What it will achieve for LTHT:
- Patients are at the heart of everything we do.
- A Digital infrastructure that supports patient services now and can support patient services for the future.
- Digital systems developed and delivered based on Clinical needs and priorities.
- Digital technologies developed and delivered based on Clinical needs and priorities.
- Flexible and reactive to the changing governance and legislative environment.
- Improved resilience in Digital infrastructure which reduces the risk of critical failures.
- Integration provision with all healthcare providers in the region and integration with any organisations and clinical data providers.
- Data flows into information to empower service improvement and research.
- Digital is Useable, Useful and Therefore Used.
- Visible improvement in patient outcomes.

Current state

Current state information architecture

Where we are today – End 2018

Driver: Enabling Functions

Clinical Requirements

User Experience

Business Analysis

Development

Agile Principles

Implementation

PMO Controls

Digital Governance

Infrastructure

Services

Design

SLAs

Analysis/Reporting

Patient services digital demand

ICU Strategy

People

Key Stakeholders

Priority Themes

- To use Digital technologies to support people to maintain their own health and wellbeing.
- To ensure a robust IT Infrastructure that provides support for design, development and test and 24/7 working across all health and care pathways.
- To deliver IT service and decision support technology across General Practice, Neighbourhood Teams, Hospitals and Social Care.
- To ensure a change management approach that embeds the use of any new technology into everyday working practices.

High Level Objectives

- Deliver the Trust’s strategy to transform service delivery and improve efficiency with increasing reliance on electronic records.
- Implement the Leeds Plan and West Yorkshire and Harrogate STAY & LITE services or developing more integrated service models (Supporting our Digital Transformation).
- Promote the NHS Five Year Forward View and its dependency on IT as a key element.
- Progress towards the Government’s 2020 target for ‘patients in bed’.
- Prioritise the need to improve the security and resilience of the LTHT IT services.
- Prioritise the need to replace obsolete infrastructure and extend the underlying IT facilities across all the Trust sites to facilitate the delivery of these objectives.

Where we could be in 2023

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Influences

- National Books
- LTHT Executive LTHT Clinical Workforce
- Systems
- Digital Technology
- Policy

Opportunities

- To support and improve the delivery of patient care.
- To improve the visibility and reputation of Leeds as a Healthcare hub for the region and the country.
- To use a digital strategy to develop, test and deploy new technologies to revolutionise the delivery of patient care.
- Through greater staff engagement and feedback, improve the Digital Support provided to users.
- To enable a user-centred process to ensure that what is different is focused on patient care and needs.
- To enable greater digital support to improve services and outcomes.

Key Stakeholders

- Patients
- Staff Engagement
- Other Stakeholders

Threats

- Values are not delivered in current priority cost control
- Criminals and cyber criminals are not held to account
- The need to create processes and systems that support the transition from a paper-based to an electronic environment
- The need to address the investment gap in LTHT infrastructure
- The need to have an integrated approach to the Digital landscape

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Digital, Information and Technology Elements

Data + Analysis + Output + Hardware = Information Technology
Digital, Information and Technology Elements

\[
\sqrt{\text{Analysis}} \times \text{Output} \times (\text{Data} + \text{Phosphorus} + \text{Sulfur} + \text{Sulfur}) + \text{Hardware} = \text{Digital Innovation Transformation}
\]
An Algorithm for Quality

\[ Q = A \times (O + S) / W \]

- \( Q \) = Quality
- \( A \) = Appropriateness
- \( O \) = Outcomes
- \( S \) = Service
- \( W \) = Waste
Rapidly Rising Numbers

CONNECTS: Ensure all clinical teams across the region can access key information, 18k people in LTHT and over 25k people across the system.

TRANSFORMS: Through integration and connectivity; over 95m API connections a months transforms patient experience.

IMPROVES: 100,000 data items per person, over ½ a million forms a month.
What if our culture could be our advantage for digital?
Frictionless Structures give us frictionless delivery!
Lily Pad numbers
2 billion people aged 60 and over in 2050 (World Health Organization)

$475 billion USD WW cost of patients not taking their medications (Prescriber)

$4 trillion USD WW healthcare spend on the three leading causes of death in 2020 — half of the total (World Health Organization)

10.5% WW healthcare spending as a percentage of GDP in 2020 (The Economist Intelligence Unit)

14 million projected WW shortage of healthcare workers in 2030 (World Health Organization)

$1.2 trillion USD projected global spending on medicine in 2017 (IMS Institutes for Healthcare Informatics)

15% security breaches WW in 2017 involving healthcare organizations (Verizon Data)
The earth is 4.6 Billion years old

Scale that to 46 years

Humans have been here for 4 hours
Our first industrial revolution began only a minute a go!

The third revolution began when I turned onto this slide...

Digital healthcare is happening...
Derek Wanless (2002) ‘...rise from around 1.5% of total NHS spending to over 3%’

Average digital spend – 15.6% of budget in ‘other’ businesses.

Statistics form NHS England & the Office of Budget Responsibility
The NHS ‘answer’ to the need.

NHS

Digital

NHS

Improvement

NHS

England

“I think you should be more explicit here in step two.”
**Quadruple Aim**

1. **Digital Transformation**
   - **Quadruple Aim**
   - **Triple Aim**

2. **Trusted Technology**
   - **EMPLOY** your Care Teams to Improve clinician experience and productivity
   - **ENGAGE** your Patients to Improve the patient experience
   - **TRANSFORM** the Care Continuum to Improve the population health
   - **OPTIMIZE** Clinical & Operational Effectiveness to Improve the population health
   - **EMPOWER** your Care Teams to Improve clinician experience and productivity
   - **CONSOLIDATE** data sources
   - **Mobilise**
   - **Augmentation & Transformation**
   - **Substitution**
   - **Analytic & Modification**
   - **Universal**
   - **System**
   - **Technology**
   - **Modernisation**

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*1 Berwick, D. “The Triple Aim” Care, Health, Cost”. Health Aff, May 2008 vol. 27 no. 3 759-769
**Substitution**
Tech acts as a direct tool, substitute, with **no** functional change.

cup of coffee

**Augmentation**
Tech acts as a direct tool, substitute, with **functional improvement**.

latte

**Modification**
Tech allows for significant task **redesign**.

caramel macchiato

**Redefinition**
Tech allows for the creation of new tasks, previously inconceivable.
pumpkin spice
We are witnessing the collapse of expertise and rise of collaborative sensemaking!

David Holzmer
A new CIO compass

CEO

DoF

CIO

Director for Strategy

CEO
The most complex customer

Human & tech trade off: It’s about the people first. However we have to assist in the use of digital to create a joined up human system.

Revenue & Capital: Plan for the future together, but with limitations of tomorrow being the only future with some assurance.

EHR plus ONE: How to go beyond the attitude of ‘special system need.’

A Dr of What: Build respect for digital, professionals create an equal standing.
Let's make magical thinking happen!

"What I’ve come to understand is that computers and medicine are awkward companions. Not to diminish the miracles that are Amazon.com, Google Maps, or the cockpit of an Airbus, but computerizing the healthcare system turns out to be a problem of a wholly different magnitude. The simple narrative of our age—that computers improve the performance of every industry they touch—turns out to have been magical thinking when it comes to healthcare. In our sliver of the world, we’re learning, computers make some things better, some things worse, and they change everything.

Robert Wachter, MD
The Digital Doctor

“This is a business, Harris, no place for magical thinking.”
“There is a magic in standing under a huge juggling pattern and feeling it stabilize”

Matan Presberg Chief Juggler of the USA
Understand our behaviours

**Implementation Behaviour:** *One ball up and catch*
Wake Up, Patch Up, Catch Up - Run to the fire and put it out, then run to the next fire whilst considering what the others are doing.

**Systems Replacement Behaviour:** *Two balls up and keep catching*
Organisations that can act as one - Leadership through recognition of expertise or length of service, grade is king!

**Consumer Engagement Behaviour:** *Juggling*
The eco Systems can act as one - Cohesive experience across sectors - Consumers access and control data - Unaffiliated organisations can access and gain value form others work.
Future Proofed Organisations
Consider all three paradigms

1-12 Months
Operational Excellence

1-3 Years
Search for Growth

10+ Years
Understand Future Drivers

Build Mindset, Talent, Agility & Innovation Culture
Innovation & the future

**AI:** Several AI projects linked to algorithm learning and live open data being able to offer live insights within the Leeds EHR and Y&H Care Record.

**MACHINE LEARNING:** Use of live environmental data linked to historical healthcare data allows predictions for MFFD and DNA.

**AUGMENTED REALITY:** Delivering digital pathology images via HoloLens to enable the sharing of quality pathology images across Leeds and to deliver an immersive pathology training experience.
Ward level – patient tracking

Patient flow and winter ready
Simple & exponentially impactful solutions require simple and exponential organisations, don’t they!
A new type of leadership? Influence & guide, be an exemplar. Star Wars culture or Star Trek culture?
Average vs. Variation

- **Allscripts** (n = 6), Median = 18, Spread = 85.5
- **Athenahealth** (n = 6), Median = 13, Spread = 62
- **Cerner** (n = 19), Median = -2, Spread = 88.4
- **eClinicalWorks** (n = 5), Median = -10.7, Spread = 45.8
- **Epic** (n = 65), Median = 37, Spread = 74.1
- **MEDITECH** (n = 7), Median = -18, Spread = 62.3
- **Other**
Clinical Perceptions
KLAS Arch Collaborative.

All Clinicians (42,794)

- All Organizations (n=118)
  - 72nd Percentile
  - 0th Percentile

All Nurses (14,447)

- All Organizations (n=52)
  - 63rd Percentile
  - 0th Percentile

AHPs (4,898)

- All Organizations (n=51)
  - 59th Percentile
  - 100th Percentile

Leeds
Net EMR Experience: 41%
Collaborative
40th Percentile for Providers
49th Percentile for Nursing
55th Percentile for Ancillary Care

The Net EMR Experience score is a snapshot of your clinicians’ overall satisfaction with the EMR environment(s) at your organization. The survey asks respondents to rate factors such as the EMR’s efficiency, functionality, impact on care, and so on. The Net EMR Experience score is calculated by subtracting the percent of negative user feedback from the percent of positive user feedback. Net EMR Experience scores can range from -100% (all negative feedback) to +100% (all positive feedback).
Santa Barbara, California, is closer to Hollywood than it is to the con Valley. Its casual, beach-front college campus just north of Tinseltown is the unlikely center of quantum computing development, the very future of our industry. Its proximity to Hollywood is fitting, since a film script may be a better guide to quantum physics and mechanics than a textbook. Rod Serling's The Twilight Zone likely put it best: “You’re traveling through another dimension, a dimension not only of sight and sound but of mind. A journey into a wondrous land whose boundaries are that of imagination. That’s the signpost up ahead—your next stop, the Twilight Zone.”

Defining quantum computing is no simple feat. Origin...
“You’re traveling through an other dimension, a dimension not only of sight and sound but of mind. A journey into a wondrous land whose boundaries are that of imagination. That’s the signpost up ahead – your next stop... Digital Health Care”

The Twilight Zone by Rod Serling quoted in Hit Refresh by Satya Nadella