Taking on the Interoperability Challenge

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What can we learn?

“If a hospital bedpan is dropped in a hospital corridor in Tredegar, the reverberations should echo around Whitehall.”

Aneurin Bevan
Who, what, where, when

Over 17,000 staff

Over 1,100,000 Outpatients

Over 263,000 A&E Attendances

Over 117,000 Inpatients

Over 108,000 Day Cases

9,844 Babies born

Over 17,000 staff

Providing 120 specialist services

- 82 Adult Specialities
- 28 Paediatric Specialities
- 5 Pathology Services
- 5 Medicines Management and Pharmacy Services

Turnover £1.17 billion
Who, what, where, when

175 Buildings
Covering 574,234m² gross internal area which houses

114 wards
135 Departments & Clinical areas
And 69 Operating Theatres

Bar coding
22,017 Global Location Numbers

Integrating 8 key systems
PPM+, Bluespier, Galaxy, PAS
Order Comms (ICE)
eMedicines (Medchart)
MiCAD, PowerGate

and nearly 300 Smaller Systems/Applications
including: CAD, K2, Sauter, Salto, Trend
NHS INTEROPERABILITY 2018
The report identifies 3 core types of barriers to NHS interoperability in England (market, supplier and internal barriers):

1. **Market barriers** include insufficient technical and clinical standards, lack of patient education or willingness to share, lack of clarity on information governance, and lack of understanding of disparate care settings among care.

2. **Supplier barriers** include unwillingness to enable data sharing, lack of supplier resources and/or expertise, poor quality or missing interoperability tools (e.g., inability to share structured data), pricing model, and inability to accurately match patient records.

3. **Internal barriers** include lack of strategy or interoperability roadmap, lack of resources/expertise, internal data-sharing difficulties, clinician unwillingness to adopt tools, and unwillingness to share data.

*KLAS Interoperability* 2018: *Data-Sharing Efforts, Obstacles, and Progress in England* KLAS
Technology has transformed hotel, transport, retail, banking, communications - when will it come to health care?

Average EU eHealth Investment is 3.2% of budget. Average Financial Sector investment is 15.7% of profit.

International eHealth investment estimates

- €15.8Bn England – NPfIT Over 10 yrs
- €1.6Bn Canada, Southwest Ontario (2013-2017)
- €25Bn – USA – HITECH-Act/meaningful-use
- €1.6Bn – Australia – Predicted over 10 yrs
- €5.4Bn – NHS – Predicted in next 5 yrs

The Fourth Utility

The history of technology as it enters industries is that people say ‘this is going to transform everything in 2 years’ And then you put it in and nothing happens and people say ‘why didn’t it work the way we expected it to?… And then lo and behold after a period of 10 years, it begins working.

— Robert Wachter
UCSF

Most common patient assumption about information: the NHS is one single information system, clinicians can see my information no matter where I am.
Leeds Teaching Hospitals Trust has built its own EHR known as PPM+. This is now a platform for delivery of mobile, location based care information & the Leeds Care Record.
NUMBER OF YEARS IT TOOK FOR EACH PRODUCT TO REACH 50 MILLION USERS

- Automobile: 62 years
- Telephone: 50 years
- Electricity: 46 years
- Credit Card: 28 years
- Television: 22 years
- ATM: 18 years
- Debit Card: 12 years
- Internet: 7 years
- PayPal: 5 years
- YouTube: 4 years
- Facebook: 3 years
- Twitter: 2 years
Platform businesses are the new normal. In Leeds the PLACE is the PLATFORM!
Open Platform- Leeds City Principles

1. Citizen Centred Care
2. Open Standards Based
3. Shares Common Information Models
4. Supports Application Portability
5. ‘Federatable’
6. Vendor and Technology Neutrality
7. Supporting Open Data
8. Providing Open API
Standards, like drawing a pig...
1. Draw a letter M at the top left intersection. Bottom center of M touches the intersection.
2. Draw the letter W at the bottom left intersection. Top center of W touches the intersection.
3. Draw the letter W at the bottom right intersection. Top center of W touches the intersection.
4. Draw an arc from the letter M to the top right intersection.
5. Draw another arc from the top right intersection to the bottom right W.
6. Draw an arc between the two bottom W's.
7. Draw the letter O in the center left box.
8. Draw an arc from the letter M to the tangent of the circle.
9. Draw an arc from the left W to the tangent of the circle.
10. Draw an arc for the eye halfway between the M and the circle.
11. Draw an arc for the mouth halfway between the W and the circle. Must be a happy pig!!
12. Draw the cursive letter e near the top of the arc on the right.
13. Finally, draw two dots in the middle of the circle for the pig's nose.

This is the standard work for drawing a pig.
Set the standards?
Local Health & Care Record Exemplar
Innovation & the future

CHAT BOT: AI supporting search capability within the EHR and the possibility of AI support for patient interaction.

MOBILE FIRST: Ensure all clinical teams have responsive kit that can be used to adapt to the changing needs effectively. Deliver choice.

VIRTUAL CONSULT: Enable clinical contact with patient virtually but within a secure and contextualised environment.

CLINICALLY IMPACTFUL GENOMICS: Enable a MDT view of geneticists opinion in rare disease and cancer.

CLINICIAN PROXIMITY: Enable technology to prompt clinical time based on location in the hospital.

CLOUD FIRST: Remove reliance on LTHT infrastructure and move to an agile, secure and waste resistant model.
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
Integrated Care

Investment to date to be realised...
1. No need to be **FAST**, time elapsed already
2. **CHEAP** = Investment internally, Our staff skills, our Eco-System
3. **GOOD** we define what good is!

The future can be digital:

**GOOD** – Leeds has a clinically driven EHR in place.

**BETTER** – The city has a solution that allows patients to interact with their digital information.

**BEST** – Continuous Service Improvement Plan can be invested in locally.
Rate of interoperability

Usage Stats

Form submission count per month

Form submissions
May 2018
Rate of interoperability

All eForms submissions for 2017: 2,193,225
NEWS total submission for 2017: 782,802
Handover total submissions for 2017: 502,214

All eForm submissions for Jan-Apr 2018: 1,618,614
NEWS submissions for Jan-Apr 2018: 74,383
Handover submissions for Jan-Apr 2018: 221,648

At peak times 1 form completion every 2.6 seconds
Rate of interoperability

User Growth

<table>
<thead>
<tr>
<th>Year</th>
<th>Growth</th>
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<tbody>
<tr>
<td>2014</td>
<td>1,953</td>
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<tr>
<td>2015</td>
<td>5,020</td>
</tr>
<tr>
<td>2016</td>
<td>7,828</td>
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<td>2017</td>
<td>11,374</td>
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11th May 2018
Clinical coding are now able to code the activity of L15 from PPM+. No more high towers of paper notes.

"The Teams have been amazing. It has been a really cathartic process to have that time to step back and review what team members are documenting on paper and see the repetition and duplication, it’s been a real eye opener."

Sarah Miller Head of Neurosciences

#LeedsDigitalWay
CONNETS • TRANSFORMS • IMPROVES

The Neurosciences Physiotherapy Team are writing all clinical notes on PPM as of 21/5/18.

First 10 days have saw 1,953 forms generated on iPad, laptops and desktops.
Functions of Interoperability

**eObs - J96 ward metrics**
- Improvement in correct score calculation in metrics – 59% correct annually prior to eObs was improved to **97% with eObs**.
- An improvement in ward metrics for prescribing of observations, from 93% annually to **100% with eObs**.
- Minimum x2 daily observations recorded rose from 80% before eObs, to **100%**.
Functions of Interoperability
Functions of Interoperability
<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>eWhiteboard</td>
<td>Biggest deployment in country (110 wards, 2602 staff trained)</td>
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<tr>
<td>PPM</td>
<td>16,000 active users across PPM platform with 350 new users added every month</td>
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<td>302,000 forms completed (Nov 17) - Peak time, one form every 3.8 seconds</td>
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<tr>
<td>eCorrespondence</td>
<td>77k per month</td>
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<tr>
<td>Patients</td>
<td>2.8 mil known to PPM/LCR of which 2.2 mil associated with LTHT</td>
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<tr>
<td>Interoperability</td>
<td>51 million interactions with PPM per month – 64 million messages per year through the integration engine</td>
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<tr>
<td>eMeds</td>
<td>2245 nurses and 1148 prescribers trained in 85 area. 741,096 prescriptions</td>
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Bob often feels that he’s seen by public services as a collection of bits and illnesses.

Leeds Care Record enables digital solutions to support the delivery of integrated care to patients throughout the city for health and social care.
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<th>Action</th>
<th>Patient</th>
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<th>GP Practice</th>
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<th>Speciality</th>
<th>LOS</th>
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**System Interoperability**
Up to 7 care setting for a complex case – newest is hospice – Children’s Social Care this month.

Massive thanks to @martinjwaugh @LeedsCareRecord in enabling the Leeds hospices and their community services to be part of this amazing electronic patient record. Has revolutionised how we work and serve patients.

#Integration @stgemmashospice @SRWheatfields
Thank you so much for developing the St Gemmas virtual ward view. It is amazing to have this. Really excited about the full utility. I’m confident it will make a significant difference to patients and how we operate. You’re a great team.

Dr Mike Stockton