Implementing technology solutions in the NHS- a review

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market drivers

- Macroeconomics and recession - 20 billion deficit
  - Nicholson challenge- NHS reforms- Must change attitude"
  - Commissioning Care groups
  - Foundation trust applications
  - QIPP and CIP initiatives
  - Change in metrics- Outcomes vs targets
  - Increasing demand/decreasing resources-money/manpower
- New information strategy
  - Death of national program for IT
  - Shift from Data collection to information presentation
  - Patient centricity not organisation
  - Patient choice
- Accountable care
  - Patient pathways rather than departmental service
  - CQUINN and monitor being more visible- safety in care
  - Global best practice exchanges and pressures
  - Rapidly evolving technology landscape
  - Evidence based care
  - Care closer to home agenda
- Other drivers
  - Changing demographics- ageing population
  - Large scale visible fiasco's in the NHS mid staff

NHS and the US markets

NHS	US
Universal health care. Free at point of care. Minimal private participation	Insurance and commercial market forces drive delivery of majority of healthcare- (have to see impact of Patient protection and affordable care act)
Budget to spend. Profit is not a motive	Focus on Increasing revenue and profit
Predefined Fixed contracts and tariffs	Fee-for-service reimbursement- You are paid if you claim
How well you can spend (rather save-CIP/QIPP)-	Change agenda led by both savings as well as creating new markets
No financial incentives to transform- Compliance is adequate or the focus	Incentivised to transform-E.H.R Incentive program
No legislation to drive technology standards	Legislation drive adoption and standards in healthcare- Meaningful use agenda, HITECH Act,

NHS and the US markets

Similarities
Lack of transparency about the cost and quality of healthcare, compounded by limited data, to inform consumer
Fragmentation in care delivery
Population aging, rising rates of chronic disease and co-morbidities, and lifestyle factors and personal health choices
Changing trends in healthcare market consolidation and competition for providers and insurers
High unit prices of medical services

Current State Assessment
Infrastructure, Technology and Reporting

– Multiple disparate clinical systems and databases

– Minimal interfacing or integration of clinical data other than demographics/results

– Duplication of data within sub systems

– Limited customisation capability

– No point of care data capture

Current State Assessment
Process automation and workflows support in NHS

Scheduling and resources management	- Electronic/paper- CRS
Admission/transfer	- Electronic-CRS
Clinical Assessments and documentation	- Paper
Nursing assessments documentation	- Paper
Diagnostic services- Paper/Electronic	- Freenet/CRS/others
Care planning/pathways-Task lists	- paper
Medication management	- Paper
Internal Referrals	- Paper/Manual
Handovers	- Paper/Manual
Multidisciplinary assessments	- paper
Discharge/ETTA	- Electronic/Paper/ Freenet
Clinical Correspondences	- Electronic/Paper/Freenet
Patient education/communications	- Paper
Clinical audit/research	- Manual/ isolated databases
Reporting- Manual/Electronic	- Manual/Cerner- ? trust DWH

DIRECT CARE DELIVERY

Develop Clinical Best Practice | Manage Performance | Plan Service Provision

DELIVER CARE

Decide
Initiate Care | Assess Patient | Prioritise Care

Plan
Plan Care | Schedule Care

Intervene
Advise on Care | Treat Patient

Transfer
Transfer Care

SUPPORT CARE DELIVERY

Provide Support Services- Labs, Radiology, Pharmacy, Materials Management

Manage Records & Business Intelligence Systems

Manage Finances

Manage Prevention & Screening

State of automation of care processes in BLT

🟥 None or very basic automation

🟧 Simple standalone electronic solutions, no automated workflows

🟩 Robust integrated Clinical Systems with workflow automation

Current State Assessment
Clinical risk and patient safety

- Key findings from Risk management audit- top 5 correctable areas that lead to risk and litigations (….pounds value)
  - Incomplete documentation-consent, allergies, missing episodes of care
  - Missing records/case notes
  - Maternity documentation- CTG records
  - Abnormal radiology findings management
  - Theatres management- error reduction
  - Discharge process

Summary of current state-NHS IT

- Lack of system integration
- Fragmented experience
- Hybrid paper/electronic use
- Lack intuitiveness due to limited clinical input
    - Too much time sifting through raw data
- Partial adoption of poorly optimized tool
    - Paper paradigm remain embedded in automation
- Working to deadlines vs optimal outcome

The NHS IT current state- Level 2-3 (HIMSS)

EMR Adoption Model℠

Stage	Cumulative Capabilities	2007 Final	2008 Final
Stage 7	Medical record fully electronic; HCO able to contribute CCD as byproduct of EMR; Data warehousing in use	0.0%	0.3%
Stage 6	Physician documentation (structured templates), full CDSS (variance & compliance), full R-PACS	0.3%	0.5%
Stage 5	Closed loop medication administration	1.9%	2.5%
Stage 4	CPOE, CDSS (clinical protocols)	2.2%	2.5%
Stage 3	Clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology	25.1%	35.7%
Stage 2	Clinical Data Repository, Controlled Medical Vocabulary, Clinical Decision Support, may have Document Imaging	37.2%	31.4%
Stage 1	Ancillaries – Lab, Rad, Pharmacy – All Installed	14.0%	11.5%
Stage 0	All Three Ancillaries Not Installed	19.3%	15.6%
	Total Hospitals	n = 5073	n = 5166

Data from HIMSS Analytics   Database   N = 5073/5166 ©2009 HIMSS Analytics

Future of IT in NHS

- Information analysis and presentation services- predictive analysis, dashboards, portals- HIE/advanced data mining
- Electronic Integrated care pathways
- Mobile technology/ Point of care device strategy
- Electronic content management/ document management
- CPOE
- Voice recognition and digital dictation innovations
- Patient safety/experience related technologies- RFID/Smart wrist bands/Bedside consoles/home monitoring/device/SMS reminders/
- Smart phone health apps and capabilities
- Cloud based services and solution delivery
- Tele-health/tele-monitoring
- Innovative drug delivery/monitoring technologies- sensor centric technologies
- Population health/ disease prevention technologies
- Wireless technologies in healthcare
- Social media in healthcare

Preparing for the Not-Too-Distant Future: Clinical Care

Stage 3: Prepare for the Future

- Patient portal
- PHRs

Stage 3: Prepare for the Future

- ADE surveillance
- Medical device integration
- HIE

Stage 2: Address Current Market Requirements
- Advanced clinical applications

Stage 1: Lay the Foundation

- Electronic patient data
- Secure access
- Remote access
- Continuous computing
- Wireless
- Mobile device options
- Integrating external data
- Standards

- Antibiotic mgmt. & infection control

- Data capture & reporting

- Ambulatory data integration

Stage 3: Prepare for the Future

- Advanced data mining

Stage 3: Prepare for the Future
- Remote consultations
- Patient self mgmt
- Remote monitoring
- VoIP phones
- Biometrics

Increasing IT adoption in healthcare

- Thought leadership
- Publish evidence- communicate success
- Campaign and collaborate (CCIO, open-EHR etc)
- Demonstrate value every time
- Integrate with roles and curriculums
- Legislation and incentives
- Increasing domain input and clinical leadership

Benefits management

The steps in the process of benefits realisation are as follows:

- **Identification** – Capturing target, high level benefits in a process area
- **Clarification** – Achieving sufficient detail so that an expected benefit's measure can be defined
- **Base lining** – Identifying each benefit's current measure, expected measurements are validated
- **Monitoring and Tracking** – Benefits are placed on the [Benefits Register](#) with current information and expected measures. Future measures are included at specified dates.
- **Analysing/Optimising** – Process of review whereby the actual benefit tracked is compared to the expected benefit. If variation is discovered further analysis is required to determine the cause and put necessary activities in place.

metrics you would evaluate

- Outcomes

- Experience

- Savings

- Compliance

They should be measurable, repeatable and preferably system generated

Methods and techniques

- ADOPTS
- POLDAT- CSC Catalyst
- LEAN (fish bone, brain-storming, huddles, time and motion studies, FMEA, levelling)
- ADKAR (benefits realisation)
- Current state and future state mapping
- Value stream mapping
- Visual management-dash-boarding
- PRINCE2/MSP

- *"Tell me -I forget. Show me –I remember. Involve me –I understand" Lao Tze–500BC*

Tools and Templates Provide a Proven Foundation for Successful Implementations

Domain	Assess	Design	Optimize	Prepare	Transform	Sustain
Governance & Leadership	• Develop governance structure • Develop communication strategy	• Validate governance structure • Execute communication strategy	• Address HR and organizational impacts • Address policy and procedure gaps	• Change agent training • Review unanticipated consequences from lessons learned	• Support the go-live • Pre-change support communication	• Hand off to client • Lessons learned
Workflow Redesign	• Map Current State processes • Review areas for improvement	• Develop "ideal" future state and gap • Identify transformation priorities	• Simulation modeling • Create "realistic" future state understanding technology limitations	• Validate future state and incorporate into training materials • Training for staff on changes to workflow	• Workflow training • Identify barriers w/go-live	• Identify barriers w/go-live • Optimize process after go-live
Change Management	• Review organization readiness • Review organization history of change	• Initiate change management plan • Identify change agents	• Develop "day in the life of…" scenarios • Initiate change management education	• Change agent training • Change agent feedback	• Support during go-live • Feedback sessions	• Ongoing training • Change management Support
Clinician Adoption	• Environmental analysis • Assess solution • Cultural readiness review	• Value management • Develop clinical knowledge-based content	• Technical readiness • Validate clinical knowledge-based content	• Core competency training • Pre go-live support • Solution training	• Go-live support • Post-go-live support	• Value management support • Change management support
Benefits Realization	• Create and communicate the vision • Assess current benefits programs	• Establish criteria/indicators • Deploy the indicator selection/design process	• Establish targets/ thresholds	• Develop data collection strategy • Implement training program	• Implement revised workflows to achieve results • Launch collection tracking process	• Develop/conduct ongoing program management • Integrate quality and benefits programs
Technology	• Infrastructure capacity planning • Site walkthrough and technology review • Project Workplan	• Infrastructure, physical plant, facilities, data conversion, interface requirements • Detail system requirements and specifications • Acquire hardware/ software upgrades	• System build • Interface development • Conversion programming • End-user device walk-throughs	• Test approach; test plans, test scripts developed • Unit, system, integrated, performance, stress tests • Training plans, materials, curriculum, schedules • Competency testing; security setup	• Go-live planning • Command center • Data conversions • Build in production • Move all interface pointers • End-user devices deployed and tested	• Go-live issues resolution • Transition to support • Lessons learned • System monitoring

SCORE Benefits Realization Program Provides Accountability for Improved Outcomes

Benefits Realization

Safety/Quality	Clinical Adoption	Operational Efficiency	Return on Investment	Evidence-based Decision-making
• Medication errors by type • Adverse drug event rate • CMS compliance score • The Joint Commission/National Patient Safety Goals compliance scores (e.g., Falls, SSI, med reconciliation rate) • Reduced mortality and morbidity • Completion of screening assessments (e.g., vaccinations) • Patient education/discharge teaching compliance	• User satisfaction • End-user login percent by discipline • Remote access utilization to patient related information • Help desk calls by reason for call • CPOE utilization rate • Ordering provider electronic signature timeliness • Clinical documentation completion rate	• Emergency Department Left Without Being Seen (LWBS) • Throughput Emergency Department (time from door to admit/discharge) • Missed transfers (bed availability) • Coding compliance (CMI appropriateness) • Worked hours per unit of service by department • Duplicate tests (Lab/Rad) by cancellation reason • Medical records deficiency rate • Time to process (tests/specimens/procedures) • Time to results (Lab/Rad order to final results)	• Denials • Discharged Not Final Billed (DNFB) • LOS and cost for top 25 DRGs by payer source • Overall pharmacy cost per case mix adjusted discharged • Operating expense/adjusted discharge • Recruitment cost avoidance • Adverse drug events/1,000 patient days • Reproduction, document storage costs	• Use of evidence-based order sets • Use of alert overrides • Use of acceptance reminders • Use of knowledge resource links • Use of clinical pathways • Use of patient risk assessment tools

Clinical Engagement Cycle
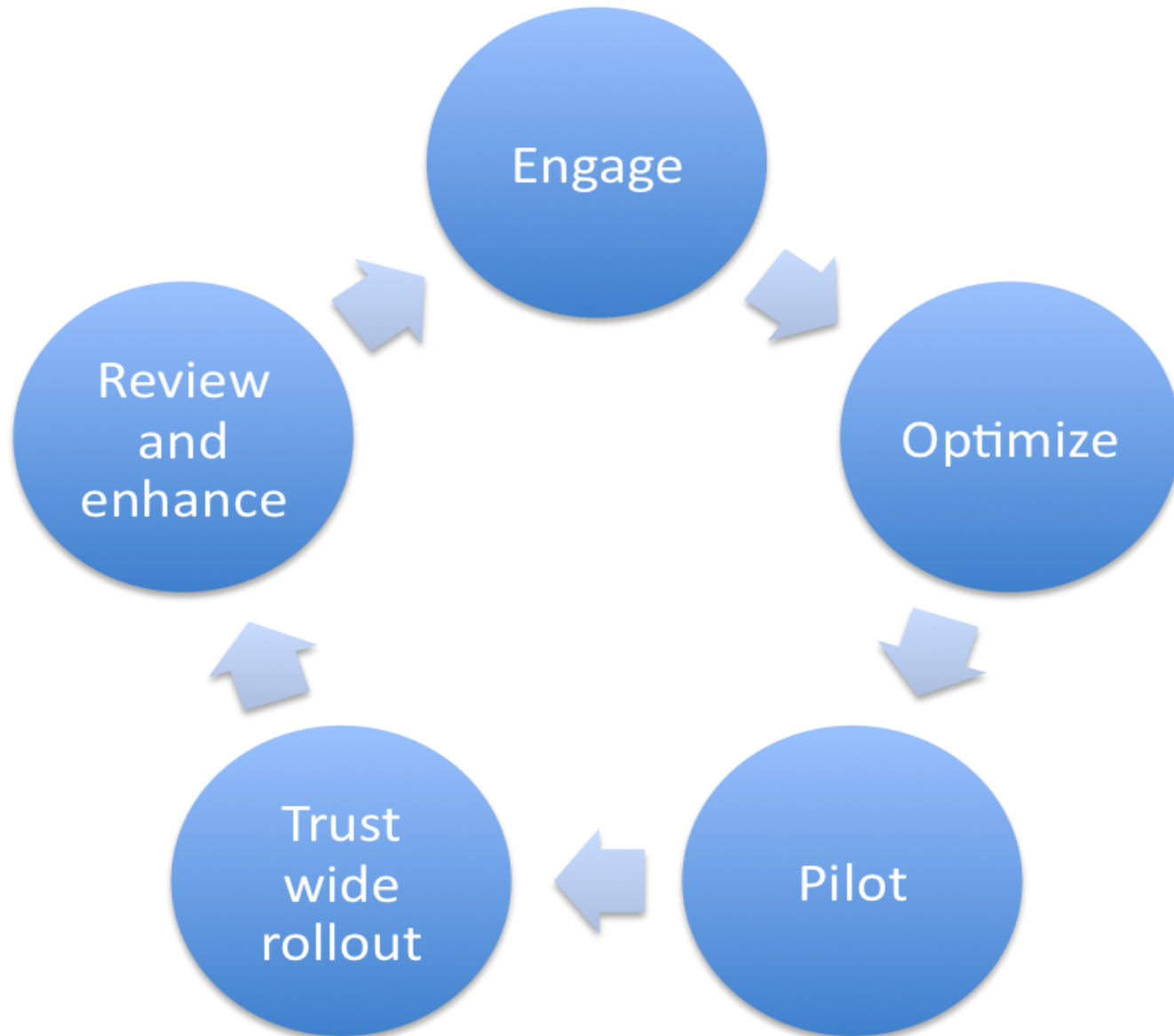
Approach to engagement with clinicians- what I have learnt

- Set up a consistent resourced engagement program from the beginning
- Make them the owners of the decisions while you drive the plan
- Involve them at all stages
- Usability-Usability-Usability- Customisation. Localisation personalisation
- Champion the champions. Actively manage and convert the critics (worst mistake is to ignore them) Being pro-active and responsive helps.
- They don't always know what they want and definitely don't know what you can give. When this gap is bridged you find the best of friends.
- Have robust Clinical Governance and consensus process- CAG
- Disengage to engage with Quick wins and proof of concepts
- Start small and scale up if possible.
- Communicate. Keep it simple and clinical. Avoid technical jargon at all cost.
- They are interested in the front end more than the back end
- Don't give false hopes. Dates. Functionality. Reporting capability etc
- Have a Point of care focus.

Approach to engagement with clinicians- what I have learnt

- Time is their biggest constraint
- They are not dumb or technophobic. They just need to see "value"
- Rigour and rhythm is critical to a successful engagement program. Consistency in dates, meetings, messages
- "What's in it for me"- if you don't address it you don't have ears to listen
- Nothing works like peer pressure Publish. Present. Audit what u do. They like that
- Show the long-term vision and how your proposed projects fit with it
- Position technology as front end enabler, not just back end support
- Show you can get the data out in the format they need
- They respect evidence. Often demand it. So have it ready if possible
- Top down approach does not work very often.
- They can always find an excuse not to engage/use so don't land there.
- Their best escape- " it will impact patient safety" or " we are already overworked"
- Go to them. Don't expect them to come to you. Onsite meetings will be better attended and have participation
- Be ready for bizarre timings
- Being open and frank will help
- A clinician respects and believes another clinician.
- You need the right level of gravitas, knowledge and competency to challenge them when things are difficult.

Clinical Adoption Themes

Improve user experience
- Quick access to patient record
- Develop personal favorites
- Personalized lists and content

Promote Best Practice
- Reduce dependency on memory and human errors
- Provide Evidence based care sets for specific conditions
- Rule based alerts and flags to support decisions

Automate Workflows
- Replace paper and manual processes
- Combine clinical workflows with documentation
- Task lists and message centre- reminders and notifications

Benefits Delivered- Examples

- Improved user experience
  - Access to all Referral letters, Clinic letters, MDT documentation, in single electronic patient record
  - Quick ordering of multiple investigations
  - Alerting on abnormal and new results availability
  - Personalized patient lists to support audit
  - Ability to capture telephonic consultations in patient record
  - Electronic handover process integrated with patient records- remove multiple diaries

Benefits Delivered-Examples

- Promote best practice
  - Evidence based and Protocol driven electronic care pathway for Upper GI bleed
  - Standardized Order sets for investigating Antenatal mothers
  - Algorithm based investigation of Renal and Vasculitis patients

Benefits Delivered-Examples

- Automate workflows
  - Electronic Referral process and triage online-replace telephone calls and postal delay
  - Preoperative assessment - one stop shop for patient booking for surgery
  - Discharge planning workflow- starts and flows through with patient journey
  - Message centre- reminders and notifications to clinicians of abnormal results

Cerner- Example Clinical engagement plan

Resolve issues/Complete current projects	Optimize /adopt current functionality	Design/prepare for Upgrade - Clinical	Deploy /Adopt new functionality
Nov-Dec 2010	Nov 2010-March 2011	Jan-May2011	May-Dec 2011
•A& E- M Page and Power note- Revise Quick Reg process •Neurosurgery procedures •Outpatient Blood Cards •VTE and CRS •IV IG and CRS •Reporting options review •Doctors training- new/refresher courses •Clinicians communications •BLT clinical collaboration	•A&E CAS Card replacement- additional power note templates •Message Centre •Patient lists / PALS •Paper Clip •Problems, Diagnosis, Procedures, Allergies •Clinical notes •Certified CRS champions course/Refresher training •New BMJ care sets	•Set up clinical design group •eMM •Clinical documentation and forms design •Clinical databases - Audit and Strategy •Benefits realization- Base lining metrics •Non Cerner diagnostics •Pathology OEFs-order sets •Care pathways •M-Pages- new	•Clinician training •Nursing and AHP workflows- review/pilots •Reports development •Clinical Pilots –Go-live •Benefits realization- Measures and Audit loop •Trust wide roll out •LCARD catalogue training •PIEDW Clinical reports
Code Freeze	**Code freeze/Play Domain**	**Technical upgrade**	**Upgrade functionality roll out**