

Cross Border Pathways Improvement

Introduction

Powys Teaching Health Board is an organisation which provides healthcare to the residents of the Powys County and residents across just the border in England. Powys Teaching Health board covers a geographically large part of Mid-Wales. Much of the secondary care provision for Powys patients is provided by neighbouring Welsh Health Boards or by trusts across the border in England, such as Shrewsbury and Telford Hospital Trust or Wye Valley NHS Trust. This is true for both elective and emergency patients.

The NHS Wales National Architecture is available in all NHS Wales Health Boards and includes national databases of clinical documents, results, Welsh GP records, and will soon include diagnostic images. However, these services aren't available for Welsh patients treated in England.

In Wales, there is a current feeling of frustration from residents, patients and their loved ones relating to the lack of governance of their medical records when being handled by social care providers. This has been revealed via a special report from the Public Services Ombudsman. Several sample cases have been highlighted where the misplacement or loss of health and social care records has taken place. In some of those cases, it was also highlighted that the people who raised complaints experienced additional anxiety and stress, especially at a turbulent time in their life, where a loved one passed away for example. *"Ombudsman Nick Bennett called for effective records management policies and processes, robust training and clear and detailed search and reporting procedures for use when records are misplaced or lost."* [2]

Justification

The majority of admitted care for Powys residents (around thirteen thousand) takes place in England (over fifty percent) with just over half of all admissions seen in England. Shrewsbury and Telford Hospital Trust and Wye Valley Trust are the two biggest external providers in this respect, followed closely by Aneurin Bevan Health Board in Wales. Just under half of all outpatient activity (around twenty-nine thousand) takes place in England (over fifty percent). Most of these appointments take place in Powys, but Shrewsbury and Telford Hospital, Wye Valley and Robert Jones Agnes Hunt trusts see considerably more patients than any other Welsh provider.

Most of the emergency department activity takes place within Powys. However, as there are only two minor injury units within Powys teaching Health Board, patients are reliant on major Accident and Emergency units across the border to England. Shrewsbury and Telford Hospital and Wye Valley trusts see a considerable number of Powys based patients, with over half of Powys' cross border Accident and Emergency needs (over nine thousand) covered by NHS England trusts (over fifty percent).

Therefore, given the figures presented above, and the logistics of current cross border pathways of residents of Powys whose emergency and elective care is undertaken across the border in England, there is clear justification to digitise patient data that has been lifted from digital systems in NHS England and converted to paper format for NHS Wales clinicians, to take this digital data and make it available on digital systems in NHS Wales.

There are many examples where this nature of work has been undertaken in different locations, one of them being in Portugal and Poland under the directive of the European Union. *"Within the context*

of the EU, a succession of rulings from the European Court of Justice addressed the gap of specific healthcare legislation. These rulings shook the member states assumption of health provision autonomy and led the European Commission to produce a specific directive concerning cross-border healthcare. Despite different viewpoints of member states, including Poland and Portugal, the directive was approved and expected to be implemented by October 2013. The objective of this study was to analyse stakeholders' perspective towards the directive, unveiling the factors that supported a different viewpoint, and to identify challenges and assess the expected impact associated with the directive implementation on Poland and Portugal, using the WHO health systems conceptual framework." [1]

Objectives

There are four SMART objectives:

- To improve patient treatment through the introduction of electronic and digital processes.
- To remove delays in patient access to treatment through the introduction of electronic and digital processes.
- To improve Patient Quality and Safety through the introduction of secure electronic and digital processes.
- To improve digital access to patient information and ensure successful outcome measures scalable for NHS Wales where patient pathways involve commissioned English NHS Trusts.

Aim

The aim of the project is to negate the use of medical paper-based records and allow NHS Wales patients who are treated in NHS England to have their administrative and clinical data managed and accessible through NHS Wales digital systems instead.

Project Management Approach

The approach to be applied to the final solution will be a mixture the Prince2 and Agile methodologies. The approach is to tailor the methodology to the project's needs. Utilise Agile for requirement gathering, solution Development and Assurance and maintain PRINCE2 high level governance and control. This will provide high level project governance, clear reporting and progress monitoring, iterative development. The planning is to be done in increments yielding earlier benefits realisation.

Although Prince2 can be utilised for the overall project management and relevant governance structures are in place to facilitate this, the technical delivery of the project will utilise Dynamic System Development Method (DSDM), Agile PM, to ensure an iterative delivery mechanism utilising the solution development teams. Therefore, the overall project methodology will be Prince2 Agile with DSDM.

Methods

The project would be resourced locally in conjunction with the national provider of systems and services for NHS Wales organisations, and the national via funding from the Welsh Government as would be set out in a business case for the solution.

The local organisation would push forward the business input (requirements and benefit expectations) from the project in collaboration with NHS England Trusts. The national Informatics

and systems providers would manage the technical delivery of the solution working with the local organisation to ensure the output meets the business need.

Although PRINCE2 can be utilised for the overall project management and relevant governance structures are in place to facilitate this, the technical delivery of the project would also utilise Dynamic System Development Method (DSDM), AgilePM, to ensure an iterative delivery mechanism utilising solution development team. Therefore, the overall project methodology would be Prince2 Agile with DSDM.

Based upon the Agile Project Framework, Agile PM allows the blending of corporate governance aspects (PRINCE2) with key Agile concepts. The breakdown of this section provides a high-level rationale as to the use of DSDM and Agile PM for solution delivery.

Enhances Product development approaches

Whereas common Agile methods such as Scrum offer product development approaches, their frameworks should not be used to manage a project as they do not address the usual up-front activities associated with launching and managing the lifecycle of the project. Agile PM goes further than Scrum by offering an agile project management approach based upon Dynamic System Development Method (DSDM) and its proven Agile project framework and can be tailored to provide rigor and structure when delivering projects in an Agile way.

Clear roles and responsibilities

AgilePM assigns clear roles and responsibilities to individuals from the business, user, technical and management areas so that effective stakeholder collaboration can occur.

Incorporates popular agile practices

AgilePM incorporates key agile practices such as MoSCoW, timeboxing and iterative development to support effective product development.

Key Roles and Responsibilities

Utilising the DSDM approach, roles can be split into Project level, Solution development team and supporting roles. One role does not necessarily mean one person, some roles can be filled by the same person or split between persons as needed.

Project Level

Senior level management of the project. Part of the project board which have authority to direct the project where necessary. All roles at the project level will need to adopt the facilitative, empowering leadership style that allows Agile teams to learn as they go, getting to an end point by their own means within an agreed framework of empowerment.

PROJECT LEVEL			
<i>Role</i>	<i>Responsibility</i>	<i>Organisation</i>	<i>Comments/Notes</i>
Business Sponsor	Business Case and project budget. Resolve Senior escalated business & financial issues	Local organisation	Most senior role in the project. Can be matched with the SRO
Business Visionary	Provides strategic direction. Ensures the solution delivered will enable the benefits expected	Local organisation	Key High level business role

Technical Coordinator	Ensures project solution/technical roles work in a consistent way. Ensures solution is technically suitable and meets desired standards	National Informatics and Systems provider	Anticipate that the Solution design architect within the National Informatics and Systems provider will fill this role
Business Analyst	Ensures business needs are met by solution development team Supports and facilitates business and solution dev engagement	Local organisation	Sits within project level and solution development team
Project Manager	Manages both business and technical aspects of project Day to day responsibility for project planning and deliverables	National Informatics and Systems provider	Can sit within project level and solution development team.

Solution Development Team

Form the engine room of the delivery of the project. They shape and build the solution and are collectively responsible for its day-to-day development, assuring its fitness for business purpose. There may be more than one.

SOLUTION DEVELOPMENT TEAM			
<i>Role</i>	<i>Responsibility</i>	<i>Organisation</i>	<i>Comments/Notes</i>
Team leader	Plan and coordinate solution delivery at low level	National Informatics and Systems provider	Expected to be held by another role within the solution development team
Solution Developer	Interpret business requirements and translate to solution increment that meets functional and non-functional needs of the business	National Informatics and Systems provider	Likely to be more than one person, dependant on timebox/increment
Solution Tester	Test solution to ensure it meets expected standards	National Informatics and Systems provider	Dedicated resource to test and assure the product
Business Analyst	Ensures business needs are met by solution development team Supports and facilitates business and solution dev engagement	Local organisation	Sits within project level and solution development team
Business Ambassador	Input into creation and prioritisation of requirements Provides day to day detail of requirements	NHS England	Key representative of the business provides day to day detail needed to develop solution

Supporting Roles

Provide assistance and guidance to the project on an ad hoc basis throughout the lifecycle. The advisor roles may be filled by one or more subject matter experts, as necessary.

SUPPORTING ROLES			
<i>Role</i>	<i>Responsibility</i>	<i>Organisation</i>	<i>Comments/Notes</i>
Business Advisor(s)	Provide specific, often specialised, input to solution development or testing from a business perspective.	NHS England	Likely to be End users of various backgrounds
Technical Advisor(s)	Provide specific, often specialised, input to the solution from a technical perspective	All organisations	Likely to be from various I.T depart/orgs that are integrating with the solution or from a support/change mgmt. or governance role

DSDM Coach	Help team members get most of the approach	National Informatics and Systems provider	Likely to be shared with another role
Workshop Facilitator	Planning, organising and facilitating workshops	National Informatics and Systems provider	Likely to be drawn from another role as/when needed, should be independent of outcome of workshop

Delivery phases

To facilitate Agile delivery, AgilePM breaks the project into clear phases.

1. Pre-Project Phase

Ensuring only the right projects are started and they have a clearly defined objective. This stage has been completed within this project.

2. Feasibility Phase

Ensuring that the project is feasible from a technical perspective. This stage has been completed within this project with the business case approval.

3. Foundation Phase

This stage takes the preliminary work from the Pre-project and Feasibility phases to the next level. It is needed to establish a fundamental understanding of the business rationale and requirements, the potential solution for the project and how the development and delivery of the solution will be managed.

The aim of the foundations stage is to understand the scope of the work, and in broad terms how it will be carried out, by whom, when and where. The foundation stage also confirms the project lifecycle by agreeing how the DSDM process will be applied to the specific needs of the project.

4. Evolutionary Development Phase

Building on firm foundations that have been established in the earlier stage, the purpose of the evolutionary development phase is to evolve the solution.

This stage requires the Solution Development Team(s) to apply practices such as Iterative development, Timeboxing (sprints), and MoSCoW prioritisation, together with Modelling and facilitated workshops, to converge over time on an accurate solution to meet the business needs which is also built in the right way from a technical perspective.

Working within timeboxes the Solution Development team create solution increments, iteratively exploring the low-level detail of the requirements, testing continuously to deliver solutions to meet the requirements.

5. Deployment Phase

The objective of the Deployment phase is to bring a baseline of the evolving solution into operational use. The release that is deployed may be the ultimate solution or a subset of the solution. After the last deployment, the project is formally closed.

6. Post-Project Phase

After the final deployment, the post project phase checks how well the expected business benefits have been met.

Foundation approach

The project would commence with the Foundation Phase. A solid foundation phase is key in the AgilePM approach to ensure the project solution will meet the business requirements. The foundations phase will establish the key requirements for the solution, confirm the management and development approach as well as the expected solution architecture.

The recommended approach for the foundations phase is as follows -

- Confirm and Establish the Project Level Roles
- Collate responses to the Project Approach Questionnaire
- Confirm and Establish the Business Ambassador & Business Advisor(s) Roles to help detail the requirements
- Develop and Approve the Prioritised Requirements List
- Develop and Approve the Solution Architecture Document
- Develop and Approve the Management Approach Definition
- Develop and Approve the Development Approach Definition
- Establish the Solution Development team and supporting roles
- Develop and Approve the Delivery Plan
- Develop and Approve the Foundations Summary

Foundation Phase Expected Outputs

As indicated above the foundations phase is key to provide a solid platform for solution development and delivery.

Item	Output	Purpose	Key Roles
1	Project Approach Questionnaire	Brings attention to any risk and encourages members to find appropriate risk response Helps tailor the project to best practice	Project Manager
2	Prioritised Requirements List	All High-level requirements are identified and agreed (EPICS) All requirements: Re broken down from EPICS into user stories Are Prioritised within the MoSCoW guidelines Have acceptance criteria associated Agreed by the Business Visionary Requirements for at least the first increment are granular enough and estimable in order to fit into timeboxes	Business Analyst Business Ambassador Business Advisor(s) Business Visionary
3	Solution Architecture Document	Provides a high-level design framework for the solution. Includes both the technical and business aspects of the solution.	Technical Coordinator Business Analyst Project Manager Business Visionary
4	Management Approach Definition	Confirms the management approach to the project. Confirms: How the project will be organised & planned How stakeholders will be engaged How progress will be documented and reported on	Project Manager Business Sponsor
5	Development Approach Definition	Provides a high-level definition of the tools, techniques, practices and standards that will be applied to the evolutionary development phase. Describes how quality will be assured.	Technical Coordinator Project manager Solution Dev Team
6	Delivery Plan	Provides a high-level schedule of the Project increments and the	Project Manager

		timeboxes that make up the increment (at least for the first increment)	Business Visionary Solution Dev Team
7	Foundations Summary	Provides a snapshot of the products above and confirms readiness to begin the next phase.	Project Manager Business Sponsor

Development approach

Based upon the Agile Project Framework, Dynamic System Development Method will be utilised within an AgilePM management approach to enhance product development.

Incorporates popular agile practices

AgilePM utilises DSDM and incorporates key agile practices such as MoSCoW, timeboxing and iterative development to support effective product development.

The eight principles of DSDM would be core to the project:

1. Focus on the business need
2. Deliver on time
3. Collaborate
4. Never compromise quality
5. Build incrementally from firm foundations
6. Develop iteratively
7. Communicate continuously and clearly
8. Demonstrate control

Iterative Development Strategy

The Solution Development team will use the Prioritised Requirements List in the planning of each increment and subsequent timebox. At the completion of each Increment planning session the team will confirm what they expect to deliver at the conclusion of the increment.

Although the responsibility for delivery will be on the solution development team, as per figure 1 (the DSDM Team Model) an essential part of the evolutionary development phase is the utilisation of business and technical advisors who help the team in the delivery of solutions that meet the business need.

Any output of the evolutionary development phase that is deemed “done” in relation to the requirements will be transferred to the Deployment Phase for implementation.

Phase Deliverables

Project Review Report – Increment
Delivery Plan update - Increment

At the end of each increment a tangible product should be delivered. As the project progresses it is expected that viable solutions will be delivered ready for implementation.

Increments and Timeboxing

The phase will be approached in an Agile iterative manner with the use of increments and timeboxes (sprints).

A timebox will last 2 weeks with each increment comprising of 4 timeboxes however, each increment will have a planning and review session at the start and end of the increment meaning an increment length will be 9 weeks (see figure 2 – Increments and timeboxes).

Planning and Reviewing

At the beginning of each increment and timebox a planning session will be undertaken. The increment planning session will confirm the expected deliverable at the end of the increment, identifying what requirements from the PRL will be worked on for delivery, it is anticipated that with this planning an indication will also be made as to the likely focus of the following increment. The end-product of the planning session will inform the high-level delivery plan. Timebox planning will focus on delivering what was agreed for the increment.

Communications and Monitoring

As each increment has a planning (at the beginning) and review stage (at the conclusion). Monitoring will be undertaken against the agreed delivery from the planning stage and confirmation of delivery at the review stage.

The use of increments and timeboxes provides a structure of nested plans to support outcome-based measurement. The review at the end of the increment and the formal acceptance, that what has been delivered is fit for purpose, provides the opportunity for outcome-based measurement.

Throughout the increment the solution development team will be tracking progress using the PRL, this will be feed into the Checkpoint reports and can be utilised for real time monitoring and bespoke updates as and when needed.

Risk and Issue Management Approach

Using a quintessential waterfall model, risks will be managed by using the Agile risk management framework. The absence of formal risk management in pertaining to work packages that are undertaken by the solution development team, can be detrimental to the outputs delivered by the project. The iterative approach that Agile uses provides comprehensive attention to risks and they can be mitigated by various practices such as continuous software testing and software validation in a solution's infancy. The drawback is that in real terms, the Agile model adds in very few risk management practices.

Risk management in Agile is the method of identifying, monitoring and mitigating risks. In the most ideal risk management strategy, a process will be undertaken where risk that may potentially yield the greatest loss are prioritised. These identified risks will be dealt with first, leaving other risks with a lower probability of occurring or becoming an issue being dealt with in descending order.

Effective risk management involves:

- Identifying the risk
- Analysing every risk to determine the severity of the impact
- Prioritising every identified risk based on how they have been exposed
- The creation and utilisation of an action plan to deal with risk in order of priority

- Continuously monitoring risk, communicating actions plans to stakeholders to ensure that they will mitigate the identified risks

Risk management in the Agile methodology is very similar to the risk management approaches that we see in PRINCE2, allowing some deviations and tailoring.

Risk Management in Agile would be undertaken at two levels, the project level and the Iteration or sprint level. The project level risk management process is undertaken on a wider scale, considering the entire project and requirements as outlined in the business case. The iteration level risk management process would be undertaken at the iteration level considering the details outlined by the iteration. Both processes appear to be separate from one another, however, they do go together during the entire lifecycle of the project.

There is a requirement to comprehend, identify, track, monitor and mitigate project risks at all levels. The project level risk management process contributes to the Iteration project risk management process. Not every single project level risks is included in all the iterations. A few of the risks may potentially be different, including other risks being unique to a very specific iteration itself. Risk monitoring is to take place during iterations with risk review stand up meetings happening between iterations. There is a strong requirement to be aware of at what stage the project and iterations are in relation to risk management.

The Project Manager, Scrum Master and the team at large will understand the requirements outlined in the business case to identify and deal with any risks that would be manifested during the lifecycle of the project. The given approach to this risk management method is to create a checklist that aids in identifying the potential risks, mitigating them in their initial stages or the implementation of planning to mitigate the same, the approach will yield cost and time saving benefits.

Literature Review

This review is based upon the business problem defined within the introduction of this paper. The search for relevant literature on the business problem comprises of specific searches in two scholarly databases (Google Scholar and UWTSD Hwb library). The use of Boolean operators (AND/OR/-) are utilised to filter and refine the search results. Once the sources are determined, they are evaluated and selected. The abstract sections of the selected articles are read and reviewed in a bid to determine whether the articles are relevant or not. The bibliography is checked to find any other relevant sources. The citation count on Google Scholar is reviewed as the higher the citation count is, the chance that the article has more relevance to the literature review.

The first article highlights how healthcare providers have been managing the challenges of digitising medical records since 2010. The author argues that electronic medical records will improve healthcare by expanding detail and elements of the patient care process, providing preventative measures to healthcare, and reducing incidents including information governance data breaches where fines could be issued to organisations who hold personal identifiable information for example, have been lost or misplaced. Though the implementation of electronic medical records has various challenges like culture change with the people who deal with these records, the complexity of the implementation, the cost of the implementation of such systems and the cybersecurity behind keeping such data safe, the argument is that the benefits outweigh the risks. *“Data was gathered from two healthcare facilities through interviews of the leaders of the EMR implementation process at each facility. Trade journals and EMR vendor information was also*

explored. The goal was to explore the phenomenon of the EMR implementation in this short-term research project.” [3]

The second article reviewed directs an understanding of how a theoretically research model is validated, pointing researchers in the direction of further study on project methodologies, what they contain and the impact they have of implementing successful projects. The author claims *“A deductive approach was applied to validate a theoretically derived research model. In total, 19 interviews across 11 industrial sectors and four countries were used to collect data. Pattern-matching techniques were utilized in the analysis to deductively validate the research model.” [4]*

Their findings provide evidence as to why the utilisation of project methodologies when implementing solutions for business problems provide more success than the absence of such methodologies. *“There is a positive relationship between project methodology elements and the characteristics of project success; however, environmental factors, notably project governance, influence the use and effectiveness of a project methodology and its elements with a resulting impact on the characteristics of project success.” [4]*

Discussion

The implementation of electronic medical records from paper-based would influence wider system improvements in the local organisation by the evidence produced post project phase. Benefits realisation continues after the lifecycle of the project, the data gathered by the Business Intelligence team will lead to an analytic study of why such data was produced reflecting the benefits and if the business is able to start up any further projects relating to similar process changes or electronic system implementation to yield the same benefits, thus increasing the patient care experience, improved information governance of personal identifiable and sensitive data, in line with cost saving benefits and improved staff morale for the end users of such newly implemented systems.

We see a similar instance of the repeat of such projects based of research conducted within the literature review. *“To summarize all the lessons learned and the concerns of the stakeholders in the implementation of Electronic Medical Records Systems, it would come down to the eight word statement made by one of the key participants in this study: EMRs need to be implemented with common sense. Although this may sound simplistic and even blunt, this is a major conclusion of this investigation of the phenomenon of the implementation of the Electronic Medical Record System while jumping through the hoops to earn government stimulus funding. Going digital does not mean that we neglect basic common sense. This is simple yet wise advice for a very complex system that contains the private and confidential information of all people who seek healthcare by caring and ethical providers within the United States. Taking time to put in place a method and making sure that it is accurate and ethical is beneficial to all who are involved. Using common sense to implement an EMR system will conclude in success for the stakeholders of electronic medical records.” [3]*

Therefore, extensions to the implementation of electronic medical records could extend to sister organisations to the local, in NHS England and beyond. The downstream benefits of my intervention are realised through data gathered from the business intelligence team, presented to board members in the form of further business cases justifying why projects should be commenced in a bid to implement similar solutions within the organisation, maximising the benefits that are realised by the residents of and patients of Powys, healthcare professionals, clinicians, and any other end users of such systems.

References

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