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UK Health and Social Care Case Studies: Iterative Technology Development

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Abstract. As a result of increasing demand in the face of reducing resources, technology has been implemented in many social and health care services to improve service efficiency. This paper outlines the experiences of deploying a 'Software as a Service' application in the UK social and health care sectors. The case studies demonstrate that every implementation is different, and unique to each organisation. Technology design and integration can be facilitated by ongoing engagement and collaboration with all stakeholders, flexible design, and attention to interoperability to suit services and their workflows.

Keywords. Technology, integration, health care, social care, software as a service

1. Introduction

Health and social care systems worldwide are facing increasing pressures, driven by an ageing population and increasing prevalence of long term conditions [1]. As a result, there has been a pressing need to enhance service efficiency and deliver high quality care at a lower cost [2]. As this strain increases, technology will play a greater role in the management of health and wellbeing [3].

Technology has been implemented in many services to help reduce the gap between supply and increasing demand [4], providing an opportunity to improve services and outcomes at a reduced cost [5]. Technology can provide many advantages in health and social care including improved efficiency, quality of care, health outcomes, and provision of new services [6].

With substantial advances in health technology, and increase in funding set aside for future digital projects [7], there is a growing need to better understand the development requirements of technology to integrate with existing services to improve uptake and longevity [8]. Research has identified the importance of ongoing engagement with all stakeholders [4], [9], and for organisations to be aware of the resource cost of adopting a new technology [10]. It is advantageous to have adaptable technologies to meet changing needs and requirements of an organisation [9], and interoperability is vital [11].

Whilst there is extensive research into factors surrounding technology design and implementation, there are few practical case studies that provide real world implementation guidance. This paper will discuss the implementation of a Software as a Service (SaaS) application to manage health and wellbeing in a number of different case studies.

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2. Case Study – Software as a Service

Lincus is a SaaS tool for recording and monitoring health and wellbeing information, providing both self-care and shared care capabilities. Lincus allows individuals to quantify and record subjective and objective measures of health and wellbeing using picture based surveys.

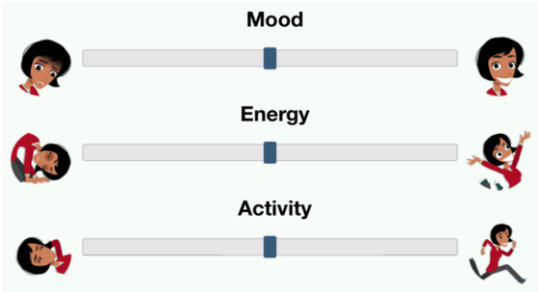

Figure 1. Lincus survey.

Events and/or interventions can be logged, enabling the impact they may have had on health and wellbeing to be identified. Nutrition, physical activity, and clinical measurements can also be recorded. Over time, this provides a history of health and wellbeing, which is communicated to stakeholders using a variety of data visualisations.

Lincus pilot trials have demonstrated usability across a range of user groups. System users have reported numerous benefits as secondary outcomes, including improved health and wellbeing, identification of previously undiagnosed conditions, and enhanced engagement and communication with service providers.

2.1. Case Study 1

Lincus was first piloted in 2013, after considerable co-development with stakeholders, as a usability trial with a service that supports those with multiple and complex needs at risk of homelessness [12]. Initial co-development identified that the system would be used in a way other than anticipated, with support workers helping the participants to complete five surveys (mental health, housing/homelessness, general health, alcohol/substance abuse, offending) to facilitate communication. Events that occurred and interventions performed by organisational staff were also recorded.

A secondary outcome from this trial was behavior change, which led to National Institute for Health and Care Excellence (NICE) recognition as an evaluation tool which facilitates behavioral change interventions [12]. Other benefits included participants feeling more listened to, and Lincus providing an auditable log of care provision.

The smooth running of this trial was facilitated by ongoing co-development and engagement. The existing culture of openness to technology and positive change played a major factor in this success. Communication also enabled co-developed adaptations to the tool to meet additional requirements.

Lessons learned include the potential for disconnect between the expectations of the technology developer and consumer [13]. Therefore, frequent engagement with stakeholders was vital throughout the technology design and implementation process.

2.2. Case Study 2

As an ongoing collaboration, Lincus was adapted and trialed with a learning disabilities charity to assess usability for individuals with learning disabilities living in supported accommodation [14]. The system was adapted through engagement with subject matter experts to develop survey questions and approach. Events and interventions were logged to enable their impact on wellbeing to be assessed. Support workers would assist end users to report information on Lincus.

Lincus demonstrated usability as a tool for communicating perceived overall health and wellbeing in this user group. As a result of the outcomes from this trial, Lincus was widely deployed by the charity.

During the trial many adaptations were made, and continue to be made, to improve usability. For example, no events or interventions were recorded during the first deployment. As a consequence, the system was developed to automatically prompt users after completing a survey to ask if they wished to add an event, which improved logging.

Following discussion with staff, many did not have the time to log in to monitor Lincus. Consequently, a new feature was developed to send reports from the system to the individual's email with desired information at a frequency that suited them. Considerable effort was made to improve end user engagement, including customisable interfaces, accessibility view, regular updates, tablet optimisation and new functionality.

Strong collaboration and flexibility in the design of the tool has resulted in long term commissioning of the technology, expanding use from a person centered recording platform to a total care management system.

2.3. Case Study 3

Lincus was further developed for individuals with long term conditions for use as part of a person centered coaching programme. Multiple changes were made to the system including interface redesign to make it more appealing to the wider population, and the integration of an activity tracker. The technology developers continued to adapt and modify the technology in line with feedback relating to user experience.

At completion of a limited 12 person trial, 100% of the participants said they would recommend the programme, stating that they had benefited from the intervention, and would continue to make improvements to their lifestyle based on what they had learnt. Integration of the activity tracker also led to self-reported behavioural change.

Though the whole coaching model has not been directly commissioned UK, the technology developments have been adopted by new and existing customers and partners.

2.4. Case Study 4

Lincus was tailored for a 12-month project with a City Council to support 300 individuals across a range of services, including supported living, care homes and young people during transition.

The project was commissioned by senior management without early inclusion of service providers who would be using the technology. This led to a lack of engagement at the start of the project due to service provider resource constraints. With further engagements, providers gained a better understanding of the system and how it could benefit them. It also changed the way the platform would be used for the project, with an increased focus on utilising the shared care capabilities, rather than self-care alone.

The authority also found it difficult to identify service providers, therefore the technology providers supported commissioners in identifying potential service providers where use could be beneficial.

After a revised project start date, multiple staff and service users have reported positive feedback when using the tool. However, outcomes of this project are yet to be identified.

Lessons learned include the need to involve those that will work with the system early on in the commissioning process to increase engagement during implementation. Organisations must also see the value in the tool, and must be willing to commit the required resource to adopt a new technology.

2.5. Case Study 5

Lincus has also been used as the underlying technology to deliver a Clinical Commissioning Group (CCG) sponsored programme to identify high blood pressure, and educate people on the importance of blood pressure in collaboration with an existing health service provider. Blood pressure screening clinics were set up around the city over a six-month period by the provider, and each person screened was given the opportunity to use Lincus. A tailored website was also developed with close consultation with the CCG and service provider to provide interactive information on blood pressure.

The programme was highly successful, with more than 1,000 people screened. Many individuals with high blood pressure were identified as a result of the screening. A key learning point from this programme is to work with a provider partner early on, and leverage existing services to co-develop a solution.

3. Discussion

There have been many lessons learned throughout the case studies outlined in this paper, which have informed development. The case studies highlight that each implementation is unique, therefore it is beneficial for the technology to be developed in a way that can be adapted to suit different services.

In order to achieve this, long term collaboration and engagement strategies must be utilised to develop technology that is designed to meet the needs of an organisation [9]. It is beneficial to engage with all stakeholders in this process, with the support of senior staff [4]. This can also help to overcome any concerns or issues, and identify more effective ways of using technology or integrating services early on in the implementation process [9]. Ongoing engagement has been a key reason for the success of a number of Lincus trials which have led to long term collaborations [12], [14].

Technology must also be adaptable to changing needs [9]. This can also lead to extended use of the technology within an organisation, as evidenced in Case Study 2.

Organisations need to be aware of the resource required to adopt a new technology, and be willing to dedicate internal resources to the implementation process [10]. Failure to do so can heavily impact implementation, especially in the early stages of adoption.

Finally, interoperability and integration with current systems, infrastructures, and ways of working are paramount for implementing new technologies in social and health care services [11]. It is vital adapt technology to fit workflows as closely as possible to ensure adoption, ongoing use, and benefit to organisations [13].

4. Conclusion

The case studies demonstrate that each implementation is different and unique. Collaborating closely with organisations and stakeholders on an ongoing basis is key to successful adoption. A shared learning process, and flexible system design allows adaptability for changing organisational needs. It is essential to design technologies to suit services and the complexity of their workflows and cultures to maximise success.

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