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Digital transformation in government: Lessons for digital health?

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Introduction

Globally, there is a movement for outstanding digital services in government; in many countries, this extends to healthcare. And if digital health is to be delivered at scale, there needs to be involvement from multiple stakeholders, and government often has a central role. Understanding how governments are planning digital transformation generally, and in healthcare in particular, is important for other stakeholders. First, achieving sustainable change at scale will often involve working with government. Second, how governments are approaching these challenges can provide useful lessons for others in the field. In this paper, we describe some common trends in digital transformation in government and how they apply to the health sector, using NHS England as a leading exemplar.

People expect their government transactions, like renewing a passport online or paying tax, to deliver the same calibre of service as they receive from online banking or online shopping. The processes by which successful corporations have transitioned towards digital maturity are being replicated in the public sector. The extent of governments' adoption of contemporary product development methodologies can be seen when books such as that of Eric Reis, *The lean startup*,[1] are found on the desks of senior leaders.

The goal of digital transformation for companies is clear: save money by making digital services so good that people simply prefer to use them. Amazon and Netflix did not need to train people to use their service – they created a superior service that actively responded to the needs of users in a dynamic way, with an intuitive layout. These services became the de facto way of doing business; this is digital by default.

However, digital governance and ownership is in its infancy in many organisations, both in the private and public sector. The transition to a mature digital governance model within a longstanding organisation is a complex and disruptive journey. It can be challenging when organisations conceptualise digital transformation as a clearly defined change management exercise, rather than a fundamental shift in how the organisation as a whole functions. Many organisations erroneously view digital transformation as primarily about the implementation of IT systems, rather than as a new of way working facilitated by advancements in technology, a mistake often seen in healthcare too.[2,3]

Digital transformation methodologies

Digital transformation programmes in government tend to use a set of methodologies to implement change that follow the 'alpha-beta-live' stages of a product lifecycle seen in industry. This can be seen in the USA,[4,5] UK,[6] Australia[7] and, most recently, Canada.[8] A common starting point for many of these programmes was the UK's Government Digital Service (GDS). GDS was formed in 2011 in response to a report by Martha Lane Fox,[9] previously of lastminute.com, and has since influenced approaches taken in the USA, Australia, Canada and other countries. The original GOV.UK alpha was built in 10 weeks by a team with commercial expertise, demonstrating the potential of a minimum viable product (MVP) approach to transformation.

It makes sense to use existing methodologies on government problems, and 'service standards' are the lynchpin that ties together big digital transformation initiatives. In examining the service standards within governments in Canada, the UK, the USA, Australia and New Zealand, one sees an almost identical set of principles. Indeed, in the rollout of these various initiatives worldwide, many in senior leadership roles have bounced between these countries' digital teams. The implication of this is that there is a 'first mover' disadvantage: those who can draw upon successful examples from other governments worldwide potentially have a less arduous journey in making the case for change within their government. In contrast, those pioneers who blazed their trails generally fought long and painful

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bureaucratic battles to demonstrate the need for change. This has at least given these digital evangelists high levels of credibility and future opportunities worldwide.

Governments using existing industry approaches to improve, update or fundamentally redesign services tend to share common themes: they place a high value on user-centred design, prioritise iteration over the waterfall process, and use set design principles at a macro-organisational level to create consistency and ease of use.[10] These digital transformation teams have a strong focus on end-to-end service design over stop-gap digital solutions.[11] They use a rhetoric of openness and transparency.[12]

Principles of working openly and transparently are laudable, though the output of these commitments is variable. Nonetheless, the idea of having people in government blog, tweet and share their work – in addition to making source code free for public use – is revolutionary (even if the work that is shared 'openly' has been filtered by a communications team). The long-standing ability to syndicate National Health Service (NHS) content for free continues to support a growing ecosystem of third-party applications (apps) and tools. These groups rely on open data and clinically assured content as a foundation for more customer-centric innovations, ranging from chat-bots to personal health records. The impact of this openness is greater idea diffusion among digital pioneers in government and healthcare.

Related to the use of service standards, there is also a movement towards audits of work as a condition of future funding. Regardless of whether services are provided by the in-house digital teams, digital innovation labs, or the consultancies commissioned to deliver services, many of these teams (Australia, UK, potentially Canada) will now be audited on a pass/fail basis as to whether they have met the principles outlined in service standards. If the service should not meet the standard, the team will not be able to progress on the project. Audits build the narrative of transforming the service. A 'fail' during an audit does not mean abject failure, but rather that the team have deviated from achieving the original goal; there could be a number of reasons for this, and it may not be a reflection on a team's performance. The results of the audits are often posted publicly online, meaning that the professional reputation of the service provider is more closely linked to their performance on specific projects. This approach has its roots in the managerialist reforms of the public sector in the 1980s and since, although there is little consideration of their documented failings.[13]

The NHS England experience

Are digital transformation plans for government applicable to health? While public sector organisations have many stakeholders, healthcare is more complex in terms of governance, with a different relationship to risk. Digital healthcare products – for instance, online triage, decision aids and symptom checkers – have the potential to seriously harm or even kill people. Attempting to balance safety and product design is challenging. Layers of governance sign-off are correspondingly – and rightly – complex compared to other types of digital transformation. The NHS England experience highlights the complexity of bringing contemporary digital design practices into big organisations. While the rate of change is glacial compared to Silicon Valley innovation and output, public health systems are nonetheless slowly transforming their way of working to accommodate transformative new technologies in notable ways.

Consumer behaviour related to healthcare is also incredibly diverse: the extent to which people want to 'self-serve' or be participants in their care is variable, and contingent on a range of social and structural determinants including the overlapping constructs of patient activation,[14,15] digital skills,[16] health literacy,[15–17] health confidence and self-efficacy.[18] The implication of these variables is that individuals adept at shopping online using Amazon may be disinterested in using health services online. These issues can also vary from country to country. In the UK, with the NHS largely free at the point of use, individuals may prefer face-to-face contact, while the NHS's requirement to provide national coverage adds complexity. However, an individual with a similar demographic profile in the USA may be motivated to try online health services when it saves them money on their insurance premium.

In the constituent countries of the UK, the NHS has ambitious digital plans. NHS Choices (www.nhs.uk) is a website created by the Department for Health, and later moved into NHS England. The project started in 2007, with the original objective being to provide high quality, clinically assured content to England. To this end, and against this metric, NHS Choices is a runaway success. The specific details of the performance of the website are posted online (http://www.nhs.uk/aboutNHSChoices/aboutnhschoices/how-we-perform/Pages/analytics.aspx), in addition to a blog (http://blogs.nhs.uk/choices-blog/) that covers a range of subject areas.

However, much has changed since 2007. Consumer demand for online health information and services continues to grow. While, initially, consumer needs were related primarily to online health information, such as understanding condition symptoms or treatment pathways, nowadays many consumers are interested in 'on demand' digital health products.

For this reason, in the summer of 2015, a team from the Department of Health, NHS England and the

Health and Social Care Information Centre (HSCIC; since re-branded NHS Digital), and contractors from the GDS came together to help develop the vision for NHS.UK, a future version of NHS Choices. One of us (KB) was a founding member of the team until 2016, and the other (HP) was a member of a user council set up to involve external stakeholders in activity. This work was based on policy documents, including *Personalised health and care 2020*,[19] and the roadmaps set out by the National Information Board.[20] Part of the approach was to build upon working models seen within GDS.

At its inception, the Department of Health/NHS England/HSCIC hybrid team consisted of about 25 people, informally divided into two camps. There was a cohort of technical people, for instance, user experience (UX) designers, developers, content designers and user researchers. There was also a group of team members more focused on strategy and standards; this included considering the changes to the machinery of government needed to support digital transformation, for instance, how audit, spend control and compliance levers might be used to support adoption of good digital practices. For those on the technical side, the teams adhered to a standard agile framework, working within one-week sprints. Agile working is well established as a contemporary methodology for software development, robustly documented online and through various certification bodies who offer training. Project roles included product owners and product managers. Within each sprint, there were daily stand-ups, sprint planning, sprint retrospectives, and show and tells. The work was framed around two high profile conditions, mild to moderate anxiety and depression, and type 2 diabetes. These conditions were used to help anchor work around tangible issues. The prototypes produced in the first 12 week alpha sprint are available to view online (http://nhsalpha.herokuapp.com/).

However, there are challenges around how agile methodologies impact on and are impacted on by organisational contexts,[21] in particular the associated changes in power dynamics.[22,23] While creating a space for innovation teams within an isolated, safe and secure location can be an effective way to transform existing processes using an agile methodology, the approach to then re-integrate innovation teams' outputs into existing organisations is less well defined. At a macro level, it may be that some of these integration challenges are a result of the ways in which projects have been presented at their inception. Specifically, do stakeholders conceptualise digital transformation as a fixed project, with a clearly defined start and end date, or is digital transformation viewed as a fundamental shift in how organisations operate, with potential implications for every employee? Furthermore, many digital transformation roles are not well integrated into an existing organisational structure: this creates challenges relating to adoption, as well as product design decisions. Digital roles like 'product manager' are easily confused with 'project manager', and while there are some similarities in terms of the responsibilities, adherence to a scrum agile methodology would exclude a project manager role. A tension may develop between agile practitioners and the wider organisation over the responsibilities for roles, and who has authority to make decisions when new agile job titles and responsibilities are not understood widely. For instance, a 'product owner' has the final say on all product decisions – this means that part of their job is to consider the views of diverse stakeholders, but ultimately make the final product decision themselves. This point will often irritate executive leaders, who expect their viewpoints to directly influence product decisions. In part, these tensions emerge in a context where the executive team operate as 'unintentional digital conservatives': people who are unfamiliar with the strategic capabilities of digital, and how best to leverage digital design for strategic impact.[24] In other words, the absence of digital expertise at the most senior levels of management makes the execution of digital transformation a perilous pursuit. So, how does this impact on digital healthcare initiatives?

As highlighted above, the level of risk, and challenges associated with increasingly digital ways of working, present greater challenges in a highly regulated environment, such as healthcare. The absence of a clear top-down mechanism to adopt new ways or working, coupled with the range of stakeholders involved in changes in ways of work (patients, carers, clinicians, commissioners, Royal Colleges, NHS England, the Department of Health, Public Health England) makes developing buy-in and adoption complex. Competing incentives and political agendas muddy the water with digital healthcare. Furthermore, digital services are being delivered at a time of ever greater financial strain on health systems, meaning that there is temptation to focus on digital technologies as stop-gap measures, rather than long-term strategic investments that play a control role in future system operating models.

Currently, the NHS Alpha project has progressed into Beta, and continues to iterate, test and develop the scope of its service. The NHS Alpha was a success insofar as it demonstrated that contemporary industry methods of developing digital products can exist within (seemingly) monolithic organisations like the NHS and government. This is no small feat, as industry giants including Microsoft and Google have discovered through their various forays into the digital healthcare landscape.

Conclusion

The GDS model has become widely adopted in government digital transformation and is also being applied to healthcare. Promoting user-centred design, an iterative approach and transparency are welcome and having some method is better than having no method at all. Yet, we also note that digital transformation programmes are contingent and inescapably political.

We caution against a determinist model that methodology alone is sufficient to ensure digital transformation runs smoothly, paralleling conclusions drawn about the digital economy in general[25] or about past health IT projects.[2,26] For outsiders looking in, it can be difficult to establish whether the approach adopted by an organisation has real potential for impact. In the absence of a public-facing communication campaign outlining an organisation's digital ambitions, understanding the approach used in digital transformation may provide insights into the scale, and likelihood of success, for projects in both digital government and digital healthcare.

Successful digital transformation means bringing radically different ways of working into established organisations. While it is possible to develop and incubate innovation within 'safe spaces' such as digital labs or innovation teams, the real test is whether user-centred digital transformation can be re-integrated and adopted into massive organisations at scale. This relies on disparate parts of an organisation working together in multidisciplinary teams: difficult in contexts where silos within organisations present few incentives (and indeed often numerous disincentives) to adopting more collaborative ways of working. While government and healthcare share many of the same challenges related to creating digital-by-default services, the complexity and risk in healthcare make for unique digital transformation challenges. Although outputs may be slow to realise, the adaptations happening with public-sector digital teams are facilitating modern ways of working, and the governance approach needed to support more revolutionary innovations. Projects like NHS Alpha provide a model to illustrate that small teams of digital experts, when supported by a digitally progressively leadership team and a tightly defined scope, can eventually produce results, even within one of the world's most complex bureaucratic organisations.

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References

1. Ries E. *The lean startup*. New York: Crown Publishing Group, 2011.
2. Greenhalgh T, Potts HWW, Wong G, et al. Tensions and paradoxes in electronic patient record research: A systematic literature review using the meta-narrative method. *Milbank Q* 2009; 87: 729–788.
3. Wachter RM. *Making IT work: Harnessing the power of health information technology to improve care in England*. London: National Advisory Group on Health Information Technology in England, 2016.
4. The US Digital Service. Digital services playbook, https://playbook.cio.gov/ (accessed 27 July 2017).
5. United States Government. 18F: Digital service delivery, https://18f.gsa.gov/what-we-deliver/ (2017, accessed 27 July 2017).
6. Government Digital Service. GOV.UK. Service manual, https://www.gov.uk/service-manual (accessed 27 July 2017).
7. Digital Transformation Agency. Digital service standard, https://www.dta.gov.au/standard/ (2017, accessed 27 July 2017).
8. Government of Canada. Canadian Digital Service, http://digital.canada.ca/ (2017, accessed 27 July 2017).
9. Fox ML. *Directgov 2010 and beyond: Revolution not evolution*, https://www.gov.uk/government/publications/direct-gov-2010-and-beyond-revolution-not-evolution-a-report-by-martha-lane-fox (2010, accessed 16 November 2016).
10. Andrews E, Thornton D, Owen J, et al. *Making a success of digital government*. London: Institute of Government, 2016.
11. Margetts H and Dunleavy P. The second wave of digital-era governance: A quasi-paradigm for government on the Web. *Phil Trans R Soc A* 2013; 371: 20120382.
12. Bannister F and Connolly R. ICT, public values and transformative government: A framework and programme for research. *Government Information Q* 2014; 31: 119–128.
13. Hood C and Dixon R. *A government that worked better and cost less?* Oxford: Oxford University Press, 2015.
14. Barello S, Triberti S, Graffigna G, et al. eHealth for patient engagement: A systematic review. *Front Psychol* 2015; 6: 2013.

15. Ledford CJW, Cafferty KA and Russell TC. The influence of health literacy and patient activation on patient information seeking and sharing. *J Health Communication* 2015; 20: 77–82.
16. Goldzweig CL, Orshansky G, Paige NM, et al. Electronic patient portals: Evidence on health outcomes, satisfaction, efficiency, and attitudes: A systematic review. *Ann Intern Med* 2013; 159: 677–687.
17. Diviani N, van den Putte B, Giani S, et al. Low health literacy and evaluation of online health information: A systematic review of the literature. *J Med Internet Res* 2015; 17: e112.
18. McKinley CJ and Ruppel EK. Exploring how perceived threat and self-efficacy contribute to college students' use and perceptions of online mental health resources. *Comp Health Behav* 2014; 34: 101–109.
19. National Information Board. *Personalised health and care 2020*, https://www.gov.uk/government/publications/personalised-health-and-care-2020 (2014, accessed 5 June 2017).
20. National Information Board. National Information Board's workstreams, https://www.gov.uk/government/publications/national-information-boards-workstreams (2015, accessed 5 June 2017).
21. Vijayasarathy L and Turk D. Agile software development: A survey of early adopters. *J Inform Technol Manage* 2008; 19: 1–8.
22. Gandomani TJ, Zulzali H, Ghani AAA, et al. Obstacles to moving to agile software development; at a glance. *J Comput Sci* 2013; 9: 620–625.
23. Gandomani TJ, Zulzali H, Ghani AAA, et al. How human aspects impress agile software development transition and adoption. *Int J Softw Eng Appl* 2014; 8: 129–148.
24. Welchman L. *Managing chaos*. New York: Rosenfeld Media, 2015.
25. Orlikowski WJ and Iacono CS. The truth is not out there: An enacted view of the 'digital economy'. In: Brynjolfsson E and Kahin B (eds) *Understanding the digital economy: Data, tools, and research*. Cambridge, Massachusetts: The MIT Press, 2000, pp. 352–380.
26. Greenhalgh T, Stramer K, Bratan T, et al. Adoption and non-adoption of a shared electronic summary record in England: A mixed-method case study. *BMJ* 2010; 340: c3111.