Digital Health Engagement:

Rethinking the front door of Healthcare

Summary

Healthcare is at a turning point in most countries where there is a mismatch between supply and demand. In this paper we argue that citizen engagement is the most important opportunity for addressing this challenge. We discuss the approach that has delivered in other industries and the opportunities and practical steps to apply these lessons to healthcare.

The challenges to deliver universal care and the consequences of the pandemic have created an operational imperative to introduce a different model of delivery based on citizen engagement. This paper describes such a model, built on the principles of person-centred design and utilising digital opportunities we see in other industries such as retail and finance. These industries are already benefiting from a more personal and participative service than most healthcare systems. This type of service could provide not merely a marginal improvement to healthcare delivery, but a fundamental shift towards more sustainable, more equitable and cost-effective healthcare. It also represents an opportunity to recast the relationship between healthcare services and research. During the pandemic we saw how willing the population was to engage in research at a time when interaction with healthcare was particularly high. Now, there is an opportunity to continue that momentum by making involvement in clinical trials accessible, transparent and relevant to a participant's care and recovery.

Introduction

It is widely agreed that the most under used resources in healthcare are patients and their informal carers. In a survey conducted in 2019, 90% of providers said the patient will become the top collaborator in the healthcare ecosystem over the next 3-5 years[i]. This has not yet been fully realised, perhaps attributable to healthcare's current operational pressures as a result of the pandemic. Regardless though, this missed opportunity is baffling for two reasons; firstly, healthcare is, by its very nature personal, emotional and participatory and secondly, the mismatch between supply and demand would be eased by a more self-service model.

is better, experience is better for both staff and patients and importantly outcomes are improved.

Patients and their families generally describe a high-quality experience of receiving care itself, but a poor experience in accessing it. Uncertainty about care pathways, siloed and complex reimbursement systems, disjointed, inaccessible booking systems and a lack of transparency on what is happening often contributes to the stress of accessing healthcare at a time where people are often anxious, in distress or suffering debilitating symptoms.

We have created an artificial divide and a power imbalance between those receiving care and those charged with delivering it, which has led to (in transactional analysis terms) an "adult-child" relationship. We know that when there is a more balanced "adult-adult" dynamic, where patients are more involved in decisions, goal setting and treatment options; treatment concordance

Most commercial organisations, particularly in the retail and financial services domains, have adopted the approach of personalised services where the customer is empowered to "self-serve". These industries take the steps to understand the individual: their personality type, buying triggers and behavioural profiles to maximise marketing impact. In healthcare we often see the

opposite, where a population is engaged as a generic whole, a so call called ‘spray and pray’ model of engagement, which is both less effective and less cost efficient.

Imagine if we adopted the kinds of profiling techniques that have served retail marketeers so well, and applied it to population-based screening, immunisation or behavioural change towards healthier lifestyles. Imagine if we tailored this approach to target health inequalities, or we employed social media analysis to understand such things as population sentiment and attitudes to interventions.

Interestingly, healthcare is at risk of leaping over this humanistic approach to one which is molecular. Advances in genomics promise the opportunities to create precision medicine and precision pharmaco-genetics where drugs are matched to our genetic profile. Exciting as this is, it seems unfortunate in our rush towards this scientific silver bullet; we have overlooked the rather simpler truths for example that most teenagers want to be communicated to differently from most people in their 80s.

There are many implications of this problem that relate not only to the complex world of clinical management, but also to the simple interactions people need from a healthcare system. Questions such as “How is my father doing in hospital?”, “When is my next appointment?”, “How do I change my patient transport?”, “Who is the doctor I will be seeing?” are reasonable and common but often require monastic levels of patience and perseverance to receive an answer.

We describe this shift in thinking towards individual and empowered healthcare as citizen engagement, which seeks to (re)introduce humanity to healthcare. It can be best described as rethinking how a healthcare service sees and interacts with the individual and how the individual sees and interacts with a healthcare service and their own health.

Strategic Objectives

There are some broader objectives for any healthcare system which are arguably impossible to achieve without a user-centred approach to designing for citizens. Citizens is an all-encompassing term, representing patients, service users, carers, people, members, the population, essentially anyone on the receiving side of care. If we are to deliver good outcomes (including experience) for citizens and the workforce delivering care in a cost-efficient way, we will need to involve citizens as partners in designing and delivering healthcare services. This simple paradigm shift opens a more interactive form of healthcare that matches our human need to be conversed with rather than talked to.

There is an international body of evidence showing that we need to realign resources to intervene earlier in the disease course of an illness – so called 'left shift'[ii]. The evidence suggests that prevention or early detection strategies will not work unless tailored to the demographics of a target cohort[iiiiv]. For health systems to be financially sustainable they need to have strategies to hold patients in the lowest cost domains of care and optimise their contact with high-cost specialised services. This may involve prevention before symptoms appear or early detection and intervention once they do, in order to limit progression for the patient and reduce cost for the system. Enabling patients to take a more proactive approach in contributing to their own healthcare is key to the early detection and prevention approach, however this is often a tricky and complex process in the way services are currently provided.

One of the cruel realities of healthcare is that even in systems with so called "universal healthcare" the outcome disparity of the richest and poorest in society is often significant. In many developed countries the reality of health inequalities means that there is 9-11 years difference in life expectancy between the most privileged and poorest. Tudor-Hart described the inverse care law where those most in need of care, are those least able to access it. This is particularly true of those with multiple conditions where the medical disease focussed model falls short. We know about 50% of those with one disease are likely to have others. In this multi-morbidity world, trying to design services one organ at a time is destined to fall short and only a human-centred approach is likely to meet the needs of an individual and therefore health system[v].

One area where this is particularly important, is the systematic planning of end-of-life care. At this stage of our lives, we need highly personalised management decisions and human-centric care. Although patient facing individual clinicians will strive to deliver individualised care, it is imperative that this also applies to the whole care journey and that we create an environment for that approach to be optimised. In many ways the model of end-of-life care can be used as a template for the rest of healthcare.

Making sense of citizen engagement

The opportunities in citizen digital health engagement can be categorised through two opposing lenses: the first being the population need or demand and secondly provision or supply i.e., organisations responsible for providing care.

For demand there are five discrete areas:

1. Health promotion - those who are well and wish to stay well

A population for whom health promotion messages and specific nudge approaches to behavioural change will be particularly important. It includes interventions designed to support those wishing to lose weight, adopt healthy patterns of alcohol consumption, stop smoking, manage stress, improving sleep quality and the promotion of activity.

2. Symptom triage – those who have new symptoms and need to know what to do

The signposting of citizens to advice and self-help will inform and empower patients to self-care if appropriate. The incorporation of a safe digital triage capability to digital health engagement channels could make a significant cost reduction on the demand for services.

3. Service transactions – those who wish to access a specific service

These experiences cover those citizens who would like to request a repeat prescription, book an appointment, cancel appointment, access to their medical records or want to know what services are available to them in their area. It involves integration across a series of fragmented legacy applications which has presented a significant access barrier to health.

4. Condition support – those who require support for an existing condition

There is an opportunity to wrap monitoring and support around those with long term conditions via a stepped down version of virtual wards which could segment cohorts and flag up those needing earlier intervention.

5. End of Life - Those who are on an end of their life care pathway

Palliative care is exemplary of the need for personalised citizen engagement. Patients and their carers need clear anticipatory care planning with a reliance on participation. The aim is to support a dignified and pain free death in a place of their choosing.

On the Supply side we can describe four key areas:

1. Organisations that need to engage the whole resident population e.g., screening, immunisation, behavioural change.
2. The need to optimise existing interfaces e.g., outpatient booking or contact centres.
3. The need to develop new models of care e.g., virtual wards or ambulatory care.
4. Those needing to engage with specific cohorts to recruit into a trial for research purposes.

What can we learn from other industries?

In most other industries the citizen receiving a service is referred to as a customer. The customer lifecycle is the 'end-to-end' lens a consumer is seen through for industries such as retail and telecommunications. Typically, a customer passes through core steps of "Marketing", "Sales" and "Service" and direct-to-consumer organisations arrange themselves around this triumvirate. There are different ways to describe this cyclical journey whose goal is to generate loyalty and therefore retain customers who will recommend and thus introduce new customers. IBM speaks about the customer lifecycle as the "Universal Experience". The Universal Experience is a shared language which aligns teams and departments across the end-to-end interactions a customer may have with an organisation. The service the organisation is providing takes the customer through the stages of: Discover, Learn, Try, Buy, Get started, Use, Get help, Expand, End use. The private sector generally strives to optimise the customer's experience to foster loyalty and ultimately increase sales and revenue. For this reason, healthcare has typically overlooked the need to improve customer experience and loyalty as revenue and sales are either not relevant or at the least, far below the most crucial healthcare success metrics of patient outcomes, clinical safety and cost optimisation.

However, healthcare can learn a huge amount from B2C (business to customer) industries. Employing customer experience techniques can in fact improve delivery on the key objectives around efficiency, cost reduction and the wellness of citizens.

Five core learnings from other industries can drive improvements in these areas:

1. Reversing the concept of cross-selling or up-selling:

   In a consumer world, companies are trying to either sell us more or move us onto a higher value product. For healthcare, this might mean encouraging a patient onto a more cost-effective care plan. Perhaps they do not need to see a consultant and can see a nurse more quickly to receive treatment. Or perhaps there is a plan of exercise they can do at home to reduce pressure on a bad knee which reduces the need to operate.

2. Loyalty:

   The private sector wants you to continue to use a product or service and recommend it to your friends. In healthcare this might mean continuing with a course of care or recommending that your friend attends a breast cancer screening because you had a good experience when you went.

3. Fixing the front to optimise the back:

   Creating an easy-to-use digital experience which can improve a customer experience and service effectiveness and efficiency. In healthcare an example would be a digital prescribing information form to replace a paper service, which would reduce postage, paper, printing, paper handling and storage. It is true that many users of a health service do not feel comfortable with digital interactions and still wish to receive post and make phone calls. We do not seek to do away with these channels, but by shifting those who can use lower cost digital channels, we free up capacity on the phones for those who need it most.

4. Enabling customers to do some of the 'heavy lifting':

   In common with other industries the citizen can self-serve simple transactions such as arranging, accepting, changing an appointment time or proactively registering for a screening.

5. Creating cohorts made up of personas:

   By creating categories in the population, there is an opportunity to tailor services and messages in a way that is more targeted and efficient.

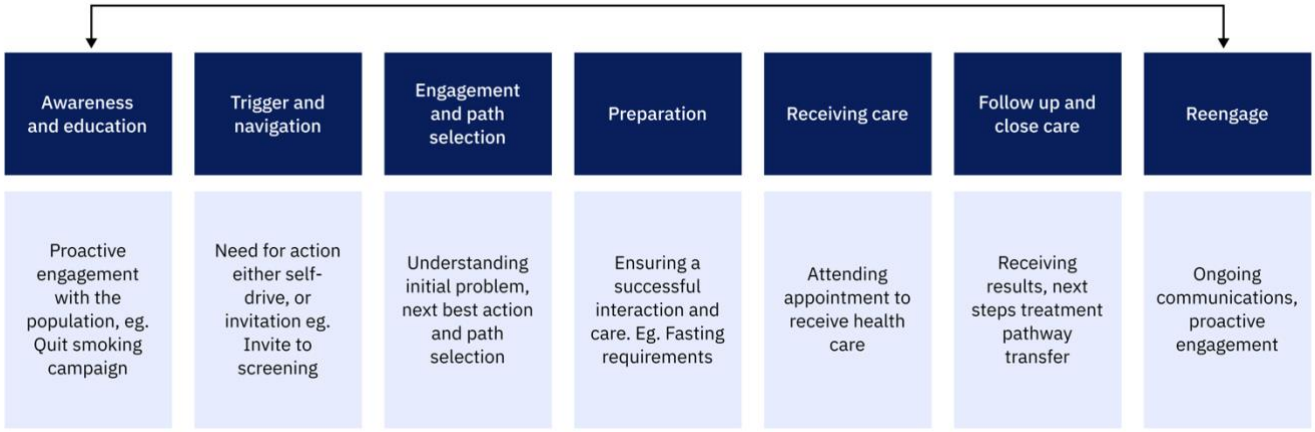


Figure 1: Citizen Engagement Cycle for Healthcare

Our model which borrows the best from consumer industries and applies it to healthcare with the goal of shifting citizens left, encouraging them to take preventative measures to manage their health, staying healthier and being served efficiently with the right care, in the right place, at the right time.

The How

How might we design a better way for individuals (be they members of the public, care givers, patients) to see and interact with their own health and health service? How might we also design a better way for a health service to see and interact with individuals? This health service might be a hospital providing outpatient care, a government offering vaccination for its population or a life sciences organisation recruiting participants for a trial.

How we define Digital Health Engagement:

What we mean by the individual seeing services

- Knowledge – how the individual discovers a service e.g., a breast screening service
- Accessing – the first step the individual takes to begin to make use of the service
- Empowering – encouraging the individual to participate in their health care e.g., being proactive about check-ups or a screening rather than waiting to be told

What we mean by the service seeing the individual

- Seeing someone as an individual person – tailoring their services and offerings towards that individual e.g., if someone suffers from co-morbidities, they are treated together rather than as separate illnesses
- Reaching all a population – ensuring those who are underprivileged, not digitally native or member of a minority group (or all the above) are able to access care because these are generally the people who need it most
- Proactive care – engaging an individual at the optimal time to get them the best outcome in the most cost-efficient way

What we mean by the individual interacting with services:

- Engaging – self-serving for simple transactions such as appointment scheduling and management
- Managing – knowledge, tools and ability to manage their own condition
- Deciding – transparent decision making where appropriate e.g., the setting in which care is received, be it at home, in a hospital or virtually

What we mean by the service interacting with the individual

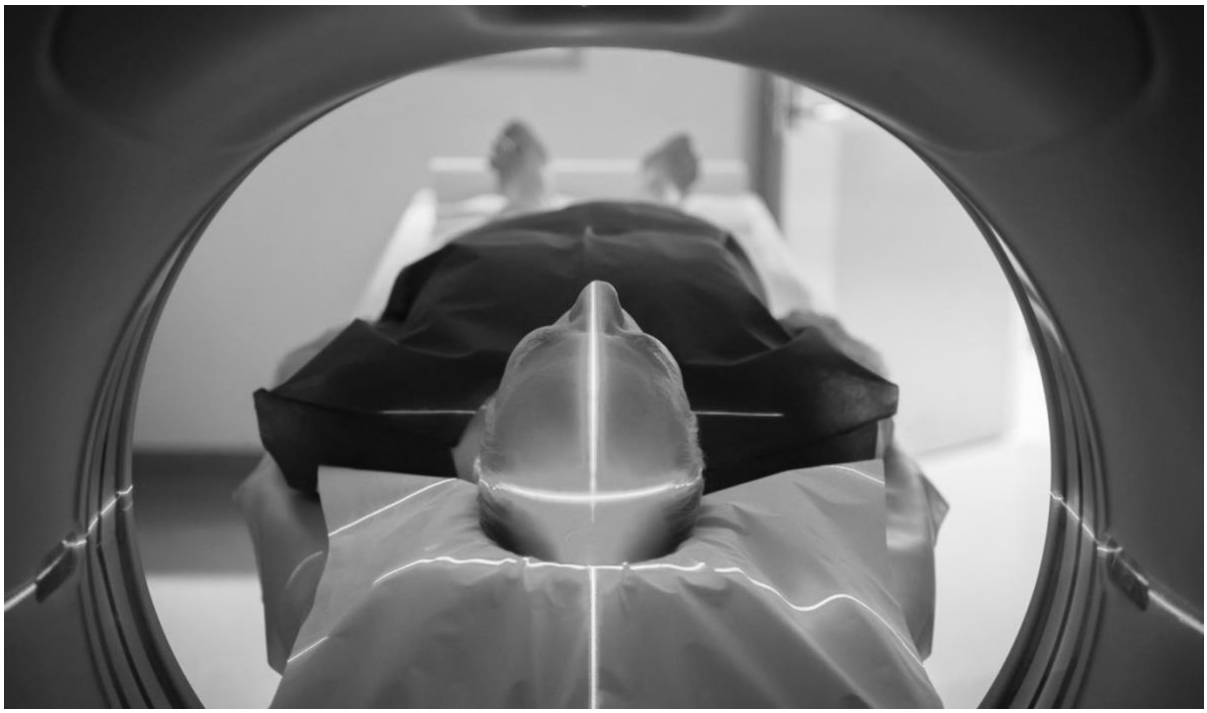
- In a chosen channel – is the citizen comfortable in digital channels or would they prefer to speak over the phone, do we have the most up to date contact information?
- Two way – interactive, personalised conversations with citizens rather than broadcasts
- Appropriate to the level of care required - e.g., automated reminders vs. human interaction to share test results

Introducing digital health engagement into a healthcare service must be approached from two angles: both from the operational service delivery perspective and the individual citizen (end user in design terms). We call this balance between serving the user and optimising operations, service design – where the operational backstage design (data, process, platforms, people) enables the frontstage customer experience (communications, applications, interactions).

Human-Centred design of Digital Health Engagement

In order to consider the “front stage” citizen experience, we must build empathy with the people we are serving to design and deliver a human-centred service. To do this we put ourselves into the shoes of our users. We begin by creating personas through user research, mapping the challenges and pain-points of these cohorts with the current service. These pain points are prioritised based on frequency and severity and then extrapolated into needs statements which represent opportunities for change[vi]. This “as-is” analysis informs the design and delivery of the service, centred on satisfying the most pressing needs for our users.

Once we understand the needs of our users, we can begin generating ideas on the solution. We might be approaching these needs with more blue sky thinking and using design thinking techniques to come up with innovative ideas which are not bound by existing legacy technology or an already chosen out of the box scheme. Or we might be coming up with ideas for new features or functionality for an existing product or service. An often-asked question is why human-centred design is needed for an off the shelf piece of technology? To which we would answer it is vital when considering is this the right piece of technology for the purpose, how a platform might be configured, how its front-end interface might be build or the people and process change management which must happen to implement that piece of technology.



	Referral	Arrange	Prepare	Pre-Attend	Follow up
	Awareness and education	Trigger and navigation	Engagement and path selection	Preparation	Receiving care
As-Is Citizen	I have been referred by my doctor to have a colonoscopy. The appointment was overwhelming, and I can't remember when or where they said I should or would be able to book. Is there an action on me?	I received a letter through the post, with my appointment, the date doesn't work for me and its in 5 months. I don't feel the pressure to rearrange yet. Enclosed there was a lots of pamphlets and information overload.	I need to rearrange my appointment, but I can't find the letter and I didn't write it down. I know there is some things I need to do before hand to prepare so I have put that information somewhere safe.	I keep getting calls to fill in a questionnaire with a nurse but they always ring at bad times. I need to dig out the prep information and medicine I got. I am nervous and have never been to this hospital.	I was groggy after my procedure and can't remember what the next steps were going to be. I don't know if there is an action I am required to do.
As-Is Staff	Department receives a referral through the system, we may need to ring the doctor to get some additional information and to confirm the patients needs.	Hospital administrator sends a letter to patient with a date for their procedure. They might ring the patient to confirm they have received the letter and receive phone calls to rearrange appointment.	Nurse rings the patient to do a prep questionnaire to make sure they are ok to do the procedure. Have to ring a few times as don't know when is best for them. There are a few cancelations so our team is not always productive.	Prep the procedure with all of the professionals, not always sure if they will turn up or not. The patient needs to have fasted and taken medication beforehand.	Give the patient lots of pieces of paper with follow up steps including reviewing the team and staff.
Pain Points	• I don't know when I will receive my appointment • I don't know if they have forgotten about me, don't know who I have been referred too	• I received a letter with an appointment that doesn't work for me. • My appointment is in 5 months time	• I don't have time to talk to someone on the phone to do the pre-op questionnaire • I am in pain and have to wait for months for my appointment	• I have misplaced the leaflet that had my preparation instructions • I don't know where to go	• I want to know the outcome of my appointment and what happens next • I forgot to ask about follow up when I was in my appointment
Opportunity	• Waitlist cohorts • Smart prioritisation • PIFU	• Appointment change or cancel • Choose preselected appointment time • Communication channel preference	• Appointment change or cancel • Personalised comms based on cohort characteristics • Smart re-prioritisation	• PIFU - do you need your appointment still • Reminders • Way-pointer • Digital sharing of prep info	• Communication channel preference
To-Be Citizen	I have been referred by my doctor to have a colonoscopy. I got sent a text as I walked out of my appointment letting me know I will be contacted to book my appointment shortly.	I received a text with 3 options of appointments they are all in about 5 months, I have a holiday booked for 2 of them so I request the third. I get sent a link to how to cut food types out of my diet to try and identify my symptom cause. I watched some videos and am able to read about which would be the most likely for my lifestyle. I decide to spend the next few months consciously not eating this food group to see if there is any change.	1 month out I get send a link to some information on what to expect in my procedure. I received a message with a different appointment that I could take that was a bit earlier, but I wasn't available so attend. I feel like I know what will be coming and what I should expect.	I get a text to confirm I still need the appointment which I confirm. Then I get a text with 3 options to have a call from a nurse. I reply with one of the options because I was busy at work for the others. I got sent a link to a digital copy of my appointment details and how to get to the hospital department and what I need to bring with me. I feel confident I am prepared for the appointment and not worrying about anything I have forgotten.	I was groggy after my procedure and can't remember what the next steps were going to be. But as I got home, I received a text with the next steps, and someone will arrange an appointment to communicate my results. I feel less anxious and focus on recovering.
To-Be Staff	I can send batch text messages to patients referred automatically to patients that are added to our back log.	I can group patients into cohorts depending on characteristics. I can prioritise those cohorts and then send automatic options to patients. I can see where patients may be cancelling and the system aims to fill them first.	I have a few cancelations and can auto fill it based on previous cohort prioritisation. This will cycle through patients until someone will be able to have their appointment earlier.	I have a timetable or when and who to ring to talk through the pre-procedure questionnaire. This fills me with confidence I wont waste my time ringing aimlessly through a list.	I can send out a text message with all the information patients need to know after their procedure. I can save time printing at the end of an appointment.
Value	• Waitlist prioritisation	• Waitlist reduction	• User satisfaction • Appointment times used	• Reduce DNA • Increase successful first appointments	• Reduce time from procedure to results

Figure 2: Example As-Is and To-Be Outpatient User Experience

This is an example of a high-level typical Service Design artefact which brings together the front-end citizen experience with the backstage actions of the employee delivering the service. It highlights the experience as it is today and the opportunities for future improvements. This demonstrates the clear link between operational efficiency gains and an improved citizen experience. Moreover, in IBM's 2021 CEO study, 60% of CEOs who lead the most financially successful organizations cite "delivering better customer experiences" among their highest priorities in the next 2 to 3 years. Therefore, those organisations who deliver cost efficiency also focus on experience, the two are not mutually exclusive, they are in fact mutually beneficial.

Value-based decision Making

Once we have a wish list of ideas or solutions which can solve our users' greatest challenges, we translate these into requirements (in the language of Agile methodology: epics, features and user stories) and prioritise them. We rank these based on feasibility (complexity and cost), viability (business value, clinical risk, strategic alignment) and desirability (scale of user problem solved). This method of prioritisation is called Speed-to-Value where we deliver the most valuable both to the organisation (e.g., cash releasing) and to the customer (e.g., allows someone to complete a task more easily) and the simplest to implement first. In healthcare, this three-way value approach is particularly crucial. In a world where the greatest worries are reducing cancer wait times, optimising capacity in clinics and theatres rather than delivering a seemingly shiny new app for a citizen, our greatest design principle must be that by introducing a better citizen experience we are fixing an operational inefficiency. For example, to reduce no shows for a cardio-vascular outpatient clinic we utilise the patient as part of the workforce through a self-service experience where they can choose, cancel and request assistance for their appointment.

The speed-to-value prioritisation method should not be confused with tactical "quick wins" or "low hanging fruit", these initial value-adding features will amount to a minimum valuable product, rather than minimum viable product (MVP) i.e., the minimum set of functionalities that will enable a user to complete a task end-to-end and will be delightful to use. It is therefore not an attempt at minimum initial delivery but something more profound for the user.

The MVP is not the final solution, value-based decision making delivers the most valuable BUT feasible functionality first, however it also sets a strategic roadmap of change which becomes easier to deliver once the value has been proven and some return on investment has been recognised. We must remember that the largest value will often lie in the most complex. These might be technically complex to build, but more importantly they are organisationally complex to embed and adopt. This latter challenge becomes easier when value in the product or service can already be demonstrated in a launched MVP because this makes it easier to get buy in from across the organisation and the change is more readily accepted. Eventually, if value-based decision making is a success, rather than having to push new technology and services within the organisation, they will be asking to get their hands on it sooner.

Once a service is live it is important to continually manage its use and experience. This is called Experience Management.

There are three core areas of value we measure:

1. Outcomes:

   Clinical outcomes and patient safety, typically measured through quality management systems within healthcare services

2. Experience:

   This may include technical usage data such as features and functionality most used, or the part of a process a user typically gets stuck at. We should look at employee experience as well as citizen experience through techniques such as surveying, web feedback forms and NPS (Net Promotor Score) “Would you recommend this service to a friend?”.

3. Efficiency:

   We might look at operational data such as cost to serve, complains and service support data.

Many organisations measure one or two of these areas, but they are rarely brought together. The key to maximising this data is to create a feedback loop where opportunities to improve a service are fed by experience management insights.

Digital technology response

Platform solutions are well established in most other service industries with the objective of providing a more personalised and efficient service to the end user. Leveraging enterprise platforms such as Customer Relationship Management (CRM) or Enterprise Resource Planning (ERP) with pre-configured components and building incrementally provides the opportunity to deliver faster, increase adoption and reduce technical complexity and cost by using their 'no code/low code' approach.

Utilisation of these platforms supports the surfacing of data from their traditional silos into a consumable and actionable format by citizens, enabling the self-service decision making that is prevalent in our modern society.

However, these platform solutions need to be surrounded by several other technology capabilities that are core to providing healthcare services in a secure, robust and efficient manner. IBM's healthcare technology reference model provides a blueprint of the technology capabilities healthcare providers need to possess as they move towards providing more personalised healthcare services to citizens and demonstrates how citizen interaction and collaboration components are central to a holistic, digitally enabled healthcare provision.

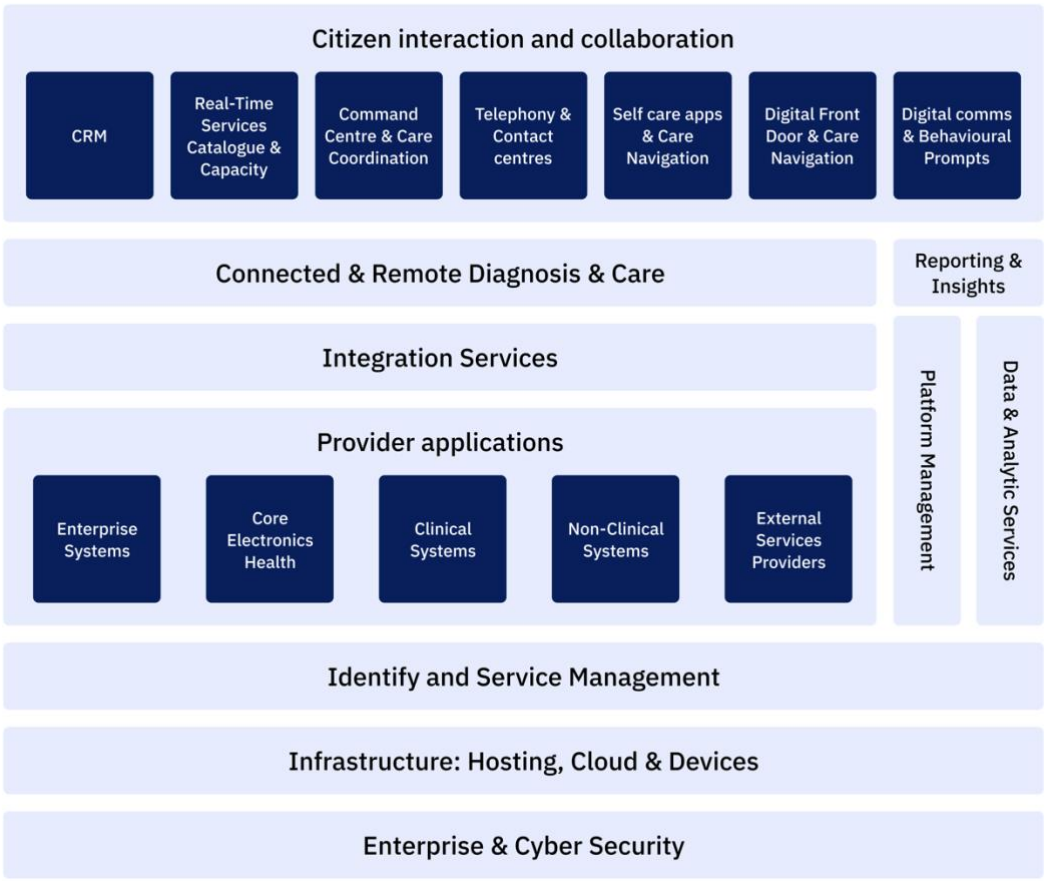


Figure 3: IBM Smarter Healthcare Reference Mode

Approach

Once we have engaged our users for the first time and prioritised our solution based on value, we must continue to approach the delivery of the product or service iteratively. We hear talk of agility and agile, but how do we make sure this is a method with rigour, not just going through the motions? Working in an agile, iterative manner is much more about principles than tools. Agile can be done well with post it notes and face-to-face meetings.

The key principles we need to bring to agile delivery are:

People (generally referred to as squads)

- An empowered team of people who can build and implement the solution with very little outside help. These teams usually consist of service, user experience and interface designers who design how a user will interact with the product, developers who will make those designs real, architects who will ensure the surrounding applications and infrastructure can speak to what we are building, testers to make sure we are building a robust solution.
- Subject matter experts (SMEs) we can bring in as and when needed e.g., cyber security engineers, data scientists, clinical safety officers.

Processes (often referred to as ceremonies)

- Impediments management (removing blockers)
- Effort estimations for tasks (sprint planning)
- Timeboxed chunks of work (sprints)
- Continuous user engagement to make sure that what we are building truly solves a user problem while delivering on the operational efficiency agenda
- Continuous prioritisation of the team's tasks (backlog grooming)

Platforms

- Key to our approach is that the service requirements and the processes drive the selection of specific technologies, thereby enabling transparency of decision making and the ability to trace the value technology components provide.

Iterative design is incredibly powerful, lots of up-front design is good, but without continuous user engagement "Big Bang" go-lives can deliver a solution which doesn't solve the problem a project set out to deliver. To maximise clinical and staff time, prioritise prototyping solutions in low-fidelity wireframes and then higher fidelity clickable prototypes to get real user feedback from tangible technology in people's hands which ultimately leads to better user adoption and higher user satisfaction. The days of design by output-based specifications are long gone.

For design to deliver enduring change, it needs to be scalable across an organisation. Without a design-for-scale mentality we are destined to repeatedly get stuck in the 'pilot phase'. It is

important to harness platforms, technology accelerators and methods such as DevOps (an accelerated software development processes) to maximise scalability of a solution.

Conclusion

There is much to learn about citizen engagement from industries outside healthcare that can help us address some of our own industry challenges. There are practical steps as described in this paper that can be taken to demonstrate early value and build confidence in a setting where leaders often don't have the head room to think creatively. The link between operational efficiency and citizen experience has been demonstrated repeatedly outside healthcare and research. The key is to demonstrate fast benefits by applying human centred design and a repeatable 'component model' of technology deployment. The pressures currently on healthcare are so extreme that rather than being a laudable aim, citizen engagement strategies are now an operational imperative.

Case Studies

Pivoting to a self-service model for national insurance applications

The COVID pandemic was the catalyst for the redesign of the Apply for National Insurance number service for the UK. IBM partnered with **DWP** in the summer of 2020 to rapidly redesign the service that had been paused due to the restrictions. A team was stood up and the launch of the first iteration was within 8 weeks. The criticality of the pain points and circumstance required true agile way of working to completely redefine the service for both the citizen and the staff experience. The programme replaced what was once a heavily clerical face-to-face process with a new digital service. Taking a user-centred approach allowed the team to keep the fact that 98% of applicants are non-UK nationals where English isn't their primary language, in the heart of their solutioning. This kept the final solution accessible and easy to use. At every stage there was rigorous user testing done to ensure that digital service was fit for purpose. Once the initial service was launched, the team focused on the technical landscape supporting the system and took the new service as the blueprint to bring the back-end technology up to date. The programme redistributed the labour efforts of the service to a citizen self-serve which consequently resulted in a

57% reduction in time

taken to **complete the application**. It reduced the residual face-to-face ID check appointment length by 42% to-date. Finally, DWP is on track to achieve **significant operational savings** of

£108 million over **10 years.**

This is a good case study of how digitising public sector services can have huge efficiency benefits, redefine how a long-standing service is viewed and empowers the citizen/customer to be part of the future solution.

Modernising a digital front-door to accommodate dramatically increased demand

In 2019 **Boots** were seeing an increase in website traffic which was stress testing the limits of its technical capabilities, when the pandemic struck in in early 2020 it left many retail businesses with nowhere to hide when it came to their digital infrastructure, with Boots.com amongst them. Almost overnight they had an increase from 7000 customers a minute to 19,000 on the website. The decision was to move the technical infrastructure to cloud while keeping the website fully live; “the work can be described as akin to a heart and lung transplant at the same time”. There was zero outage, and zero customers were impacted through the transition. With the new infrastructure having its first real test on black Friday 2020 by hosting 27,000 customers, it went by without a hitch. This new cloud-based environment enabled a great starting point for an agile approach to improving customer experience. It was the springboard to launch new customer engagement initiatives, such as enabling new and more accurate search capabilities, bringing personalisation to the next level and a more streamlined checkout experience. The programme saw an

increase in revenue of **54%**

annually, the **customer base grew by**

more than 45%

and the average order value increased by more than 8% annually. This case study is a great example of understanding the front-end customer needs ensures you support those ambitions and growth with an appropriate backend technical solution. Boots are now not scared to consciously increase customer traffic and push the limits of a successful customer experience as they are well prepared.

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