



## The problem with mHealth

Removing the efficacy gap in mHealth to create true integrated care

## About the author

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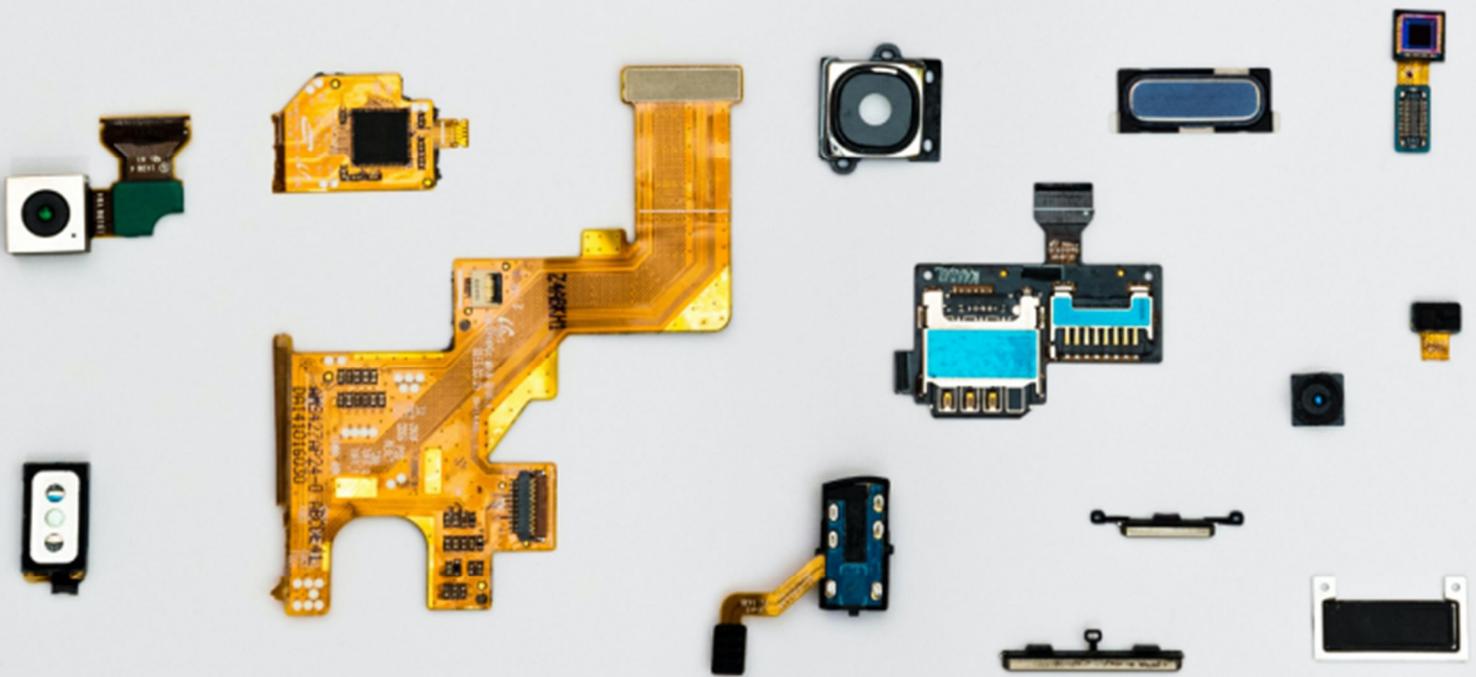
Liam Holohan is the CTO and founder of DSST, a UK company that has created the **noink platform**. **noink** allows users to generate and take control of their real world health data for themselves and their loved ones, irrespective of any particular medical condition. Liam has over 25 years of experience in technology spanning financial services, defence and healthcare.

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## About the series

This series of insight papers reflect the insights and lessons learned from working with technology in healthcare. They are based on experience of real-world delivery of technology and lessons learned. The series of papers range from broad national level problems to specific technology challenges within healthcare systems.

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## The problem with mHealth

The explosion in the number of mHealth apps available today leads us to question the long term value of this type of software in improving user health. The huge quantity of mHealth apps in existence tells us two things:

- People **care about their health** and the health of their loved ones. There is a large demand by patients to use technology to improve health
- No single mHealth app, or even an ecosystem of apps, has managed to truly benefit a patient at the point of professional care delivery, **where it really matters**

## There's an app for that

You name the medical condition; there is probably an app for that already. As there are so many apps, We believe many of them are not clinically **fit for purpose**<sup>[1]</sup> at a national or even regional level.

We are not considering the clinical, evidence based merit of these apps here, but more their ad-hoc data handling.

*"An mHealth App that just provides information to patients is not an app, it's a digital leaflet"*



Patient information and signposting aside, unfortunately mHealth apps that actually do allow patient **data entry** have become just another element in an already fragmented technological landscape, another data **silos** offering limited benefit to the goal of achieving integrated care delivery for patients.

mHealth apps created to date focus on a single condition, for a single user in a single language. Perhaps it is an app that comes with a wearable device. Clinical systems (EHR<sup>[2]</sup>) need to operate at a population level for national healthcare systems and are used by trained professionals.

This disconnect between these classes of software could be described as mHealth technology not being *clinical enough* for professionals to leverage and clinical systems not particularly usable or *available* to patients.

*“An mHealth App that is only tethered to a wearable device just fragments data further”*

In terms of data, mHealth apps provide **data depth** (lots of data on a small set of items, usually unstructured), while clinical systems also require **data breadth** (that is structured) to address the healthcare data needs for entire countries across all medical conditions. We call this deficiency the "**efficacy gap**" of mHealth apps today.



## The Bridging the gap

To bridge the gap between the desire of people to record their health data and the needs of clinicians to use this data effectively to improve care, a few minimum requirements for mHealth need to be considered. We call this an mHealth manifesto:

**1 Multi-user.** We are not all technophiles. Single user mHealth apps by definition exclude large cohorts of the population. Oftentimes it is these very people who can benefit most from mHealth and need the most provision of care.

Think the vulnerable old or very young who have only limited technical skills or exposure to technology.

A Multi-user ability with mHealth apps, while more difficult, allows these people to benefit from technology by having a loved one or carer interact with the mHealth app on their behalf. This also reflects the reality of delivery of care in a non-clinical setting.

*“Patient created data has clinical & scientific value, largely unused in professional healthcare delivery”*

**2 Multi-condition.** Perhaps the greatest challenge to large scale clinical adoption of mHealth generated data is its lack of data breath.

What clinical system would want to integrate with the thousands of mHealth apps in existence for it to be truly useful for doctors (rather than tertiary care specialists). This is also a reflection of how mHealth ignores the reality of patient co-morbidity.



**3 Multi-lingual.** While acknowledging diverse populations served by national health systems, real-time multi-lingual mHealth apps are possible if the underlying data is structured. We state multi-lingual as one of the minimum requirements as a **proxy for "structured data"**.

By Structured data we mean [standards compliant](#)<sup>[3]</sup> using common taxonomies such as [SNOMED-CT](#)<sup>[4]</sup> and [ICD-11](#)<sup>[5]</sup>. Structured data not only allows easier integration with current clinical systems and true interoperability, but also lends itself to the medicine of the future by being easier to process for emerging AI platforms.

[ETL](#)<sup>[6]</sup> pre-processing of mHealth data before transfer from one system to another should be a last resort. API [endpoints](#)<sup>[7]</sup> for real-time integration should be standard practice.

## Along comes COVID-19

After the immediate capacity needs of dealing with COVID-19 patients subsided, health services worldwide have had to adjust delivery of care for other conditions, often remotely.

This has led to the rapid adoption of technologies such as telemedicine and an increased acceptance by clinicians in the use of digital technology to assist in providing frontline care.

*"There has been a surge in patients' uptake of remote health services"*

Nuffield Trust



## Towards Patient-Centric care

Acknowledging the needs for patient to access electronic health data has caused a move in current clinical systems technology to provide this. To date, this direct digital patient interaction has fallen into the following categories:

- **“Read-only”** access of patient health records post consultation (such as test results) and other health data in compliance with data protection legislation. This is the replacement of the postal service with digital channels.
- **Interaction** with ancillary services of these systems such as appointment booking & prescription fulfilment. This is limited write access to non-clinical elements of EHRs. It is the replacement of phone booking with SMS and on-line functionality.

- Structured **workflows** to aid triage of patient contact prior to clinician intervention. This is the replacement of unnecessary face to face or phone consultation.
- **Remote** video consultations replacing the normal face to face interaction between patient and clinician during times of high clinical workload

While these have given some efficiency gains in care delivery, or were the only option available in a pandemic, **they have not fundamentally altered the flow of data into a person’s EHR**. There is still limited ability for patients to enrich their EHR with off-clinic observed data, particularly in the management of chronic conditions.



## The future

We are now at an inflection point in the inclusion of patient generated data into care pathways. Patient demand for mHealth systems to allow data entry will only increase, acceptance of the value of this data by clinicians has occurred. Now it the time to integrate patient generated data into EHRs.

If mHealth data can be produced in an EHR compliant format<sup>[3]</sup>, the benefits of this integration to care delivery will be immense. This will bring true patient-centric care, clinicians will get insights into their patients out-of-clinic lives, large efficiencies will make national universal healthcare provision sustainable and evolve current precision medicine<sup>[8,9]</sup> towards what we consider to be singular medicine<sup>[10]</sup>.

*"There's an app for that" is simply not good enough to provide integrated singular medicine in the 21 century*

DSST Limited



## Further reading:

[1] - <https://www.nature.com/articles/s41746-019-0206-x>

[2] - **EHR** (Electronic Health Record), are digital systems used by care providers to collect and store patient and population health information see [https://en.wikipedia.org/wiki/Electronic\\_health\\_record](https://en.wikipedia.org/wiki/Electronic_health_record)

[3] - [https://en.wikipedia.org/wiki/Fast\\_Healthcare\\_Interoperability\\_Resources](https://en.wikipedia.org/wiki/Fast_Healthcare_Interoperability_Resources)

[4] - [https://en.wikipedia.org/wiki/SNOMED\\_CT](https://en.wikipedia.org/wiki/SNOMED_CT)

[5] - <https://en.wikipedia.org/wiki/ICD-11>

[6] - [https://en.wikipedia.org/wiki/Extract,\\_transform,\\_load](https://en.wikipedia.org/wiki/Extract,_transform,_load)

[7] - [https://en.wikipedia.org/wiki/Web\\_API](https://en.wikipedia.org/wiki/Web_API)

[8] - <https://medlineplus.gov/genetics/understanding/precisionmedicine/definition/>

[9] - [https://en.wikipedia.org/wiki/Precision\\_medicine](https://en.wikipedia.org/wiki/Precision_medicine)

[10] - **Singular medicine**, a term coined to describe the enriching of clinical health data to include real-world data. It is the evolution of precision medicine (which is the joining of EHR data with genomic data). Precision medicine operates at a cohort population level whereas singular medicine operates at the level of an individual.