Innovate UK

Results of Competition: Digital Health Technology Catalyst 2017 Round 1 - FS

Competition Code: 1707_FS_HEAL_DHC2017

Total available funding is up to £2m

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CAMBRIDGE RESPIRATORY INNOVATIONS LIMITED	Feasibility of diagnosing cardio-respiratory conditions by advanced analysis of parameters in Tidal Breathing CO2 Waveforms	£74,808	£52,365

Project description - provided by applicants

Cambridge Respiratory Innovations Limited (CRiL), of Swavesey, Cambridgeshire, has been awarded a grant by Innovate UK to complete a feasibility study into an innovative new diagnostic device for chronic respiratory conditions. Currently a clinician needs to use a range of medical devices, from peak-flow meters through spirometers and pulse oximeters to scans and x-rays, to diagnose a respiratory condition. The most commonly used devices to diagnose asthma, COPD and other chronic respiratory diseases are spirometers and peak-flow meters. Both devices are difficult for patients to use, rely on forced expiratory manoeuvres, are technique dependent and measure a respiratory proxy. Adults in respiratory distress and children cannot use these devices. CRiL has developed an innovative epitaxially-grown III-V LED-based CO_2 sensor which is faster, more accurate and more consistent than any existing incandescent or florescent CO_2 sensor. It is not affected by condensation in the breath and is a fraction of the cost. We have developed it specifically to measure the CO_2 waveform shape in normal tidal breathing to use in low-cost personal respiratory monitors. Tidal breathing CO_2 (TBCO2) waveform shape analysis is an established but under-used biomarker for respiratory conditions. Whilst medical devices that measure exhaled CO_2 (called capnometers) are commonplace in the operating theatre, devices that measure tidal breathing CO_2 are not used in any form of respiratory disease diagnosis at the moment. This feasibility study will complete research to establish the feasibility of using CRiL's platform hardware to capture the TBCO2 waveform shape in the surgery, doctors office or clinic and use the parameters in the waveform shape to diagnose specific respiratory conditions. It will include researching the needs of the clinicians and will deliver a proof of concept device to continue the development of the technology. The main areas of focus will be the users' needs, the design inputs and the potential of the technology and dataset. The primary output from this feasibility study will be the fully-costed development plan. This feasibility study will identify whether there are any technical impediments which prevent the development of a respiratory diagnostic device based on tidal breathing CO_2 measurement, whether the medical profession would support such a device, what evidence and education doctors might require to support it and whether there are any intellectual property opportunities and hurdles.

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23 LIMITED	Smoke Free - 90 Day Programme	£74,924	£52,446

Project description - provided by applicants

Approximately 500 million people alive today will die of a smoking related disease. Hundreds of millions of smokers try to quit each year but up to 95% of these attempts will be unsuccessful. We have already created a stop smoking app called 'Smoke Free' with over 3 million downloads and 3000,000 monthly active users; our vision for this project is to take app-delivered smoking cessation to the next level and drastically improve the likelihood of a successful quit attempt.

If people make it to 90 days without smoking they have a greatly improved chance of staying smoke free for good (West R, Stapleton J. Clinical and public health significance of treatments to aid smoking cessation. Eur Respir Rev. 2008;17(110):199--204). By combining highly portable, user-friendly technology with existing research we will develop the most effective smoking cessation tool available. This will take the form of a 90 Day Plan - a pocket smoking cessation counsellor who can accompany and support the smoker on the critical part of their journey to becoming 'Smoke Free'.

Our key objectives are:

* to create a digital tool with the potential to greatly improve the chances of a successful quit vs. current approaches
* to prove that an artificial intelligence smoking cessation counsellor and 90 Day Plan is a viable alternative to a course of sessions with a real life smoking cessation counsellor
* to use data from the study to enhance research in the field of app-delivered behavioural support

This project will take the latest AI chatbot technology and apply it to behavioural science for the first time. By basing the chatbot prompts and responses on the scientifically proven behavioural support scripts used by NHS stop smoking experts, and enhancing with machine learning, we aim to create an intelligent and highly personalised 90 Day Plan which can be both proactive and reactive to each individual smoker's needs .

Main area of focus:

* Assess if an AI chatbot smoking cessation counsellor can be created, i.e. a digital companion who can help a user through their quit in a more human and engaging way, successfully asking questions and gaining information to deliver a personalised approach that prompts the smoker to evaluate their behaviour, tackle challenges and manage cravings.
* Run a trial to establish the effectiveness of this approach
* Evaluate and publish our findings to contribute to research on behaviour change and smoking cessation.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SPOT SEVEN LIMITED Manchester University NHS Foundation Trust	Orthopaedic Surgical TRaining with Virtual Reality (OySTeR-VR)	£53,260 £21,731	£37,282 £21,731
Project description - provided by applicants			

Feasibility project to enable the design and evaluation of one module, containing a minimum of five complete operations, to start off the comprehensive VR content library for orthopaedic surgery training to meet the requirements of healthcare professionals within NHS, Universities and elsewhere. The project is a collaboration between Mativision Limited and the Manchester University NHS Foundation Trust (MFT).

Other key tasks include:

1. project related enhancements on Mativision's proprietary VLIPP online distribution platform architecture (user authentication, payment, analytics, instructor dashboard and trainee evaluation/assessment),
2. evaluating Mativision's proprietary VR-in-the-Classroom (VRinCR) platform as a means to deliver VR-based medical training in a classroom environment,
3. devising ways where the development and maintenance of such specialist VR platforms and VR-based material can become educationally and commercially sustainable for all involved parties.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
UFONIA LIMITED	Autonomous speech-based clinical outcome measures	£55,822	£39,075
Oxford Academic Health Science Network		£6,000	£6,000
OXFORD UNIVERSITY INNOVATION LIMITED		£13,115	£13,115

Project description - provided by applicants

Ufonia is an artificially intelligent system, that monitors health and wellness through a conversation with a medical voice 'chat-bot'.

This project builds a version of Ufonia to assess the outcome following knee surgery. Traditionally this measurement has been performed using a paper, or sometimes electronic, questionnaire called the Oxford Knee Score (OKS). Whilst this score is a well-established way of assessing the result of surgery, the questionnaires are often not completed, are costly to deliver and limit the feedback of participants to fixed responses.

We will be working with the team from Oxford University who authored the OKS to compare whether using Ufonia allows us to capture the same information using a more natural interface -- a voice conversation. This method is simple for everyone to complete without requiring posting and analysing paper questionnaires. It also does not require the use of an electronic device, download of software or any training. Additionally, Ufonia can analyse the overall sentiment of participants response language and capture extra information, beyond the limited structure of the basic questionnaire. This information likely to be important when trying to determine why particular patients improved more or less than others; and when trying to make more subtle distinctions in the outcomes from different treatments.

The project will establish the technical feasibility, user acceptance and clinical validity of the system. This will then provide a foundation for the development of similar means of monitoring other patient reported outcomes. Ultimately, we anticipate that Ufonia can be used as a tool to help monitor the health and wellness of patients, without the resource constraints facing healthcare systems throughout the world.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
OVIVA UK LIMITED	Oviva Diabetes Support: Evaluating clinical outcomes for people with type 2 diabetes following completion of a remote programme of structured education and behaviour change	£73,911	£51,737

Project description - provided by applicants

Oviva Diabetes Support is a patient-centred, digitally enabled programme of structured education and behaviour change for people with type 2 diabetes. Delivered 1-to-1 by dietitians, the programme provides individualised care over 10-12 weeks to support completion of a defined curriculum and help the participant learn to manage their condition.

It is highly accessible as it is fully remote (delivered via phone calls and the Oviva smartphone app) and the curriculum is delivered via a web-based Oviva Learning Platform, comprised of engaging, multi-format content, such as videos, podcasts and recipes. Participants can also use the Oviva app for self-monitoring of food intake, activity levels and weight, in addition to coaching from their personal dietitian.

Building on evidence of effective and accessible approaches to structured education provision, Oviva Diabetes Support aims to equip participants with self-management skills and help them adopt long-term healthier habits through guided behaviour change and self-directed learning.

Oviva Diabetes Support has been made available to participants in the NHS in 13 areas and has demonstrated uptake of c.90%, in comparison with the national average of 7.6%, indicating that the innovative service model is far more accessible for users than traditional models.

Real-world data also indicates that improvements in health and clinical outcomes for participants are superior and are achieved at lower cost to traditional models.

This project will enable 300 participants to access Oviva Diabetes Support. An independent evaluation of the programme's impact on clinical outcomes following completion of the programme will be carried out by King's College London, which will be used to further analyse the potential for NHS cost-savings. In addition, the findings of the evaluation will be used to inform a larger clinical trial in future, which will seek to provide further evidence of clinical effectiveness.

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PRIORITY DIGITAL HEALTH LIMITED	Priority.you Feasibility Study	£72,863	£51,004

Project description - provided by applicants
With the support of Innovate UK, Priority Digital Health will carry out a feasibility study for a digitial screening and demand-management tool, to enable GP practices to triage patients into -- or out of -- practices safely and effectively according to need.   While acting as a gatekeeper for appointment bookings, **_priority.you_** will not be designed to turn people away. For those who could be supported elsewhere, it will offer a range of targeted self-care, social prescribing and community healthcare services as alternative options.   Throughout the study, we aim to analyse and evaluate the project's potential. This will be achieved by uncovering the potential strengths, weaknesses, opportunities and threats for **priority.you**, as well as identifying resources needed and the prospects for success. We will look to collaborate with GP surgeries, CCGs and research organisations, before conducting a subsequent larger demonstration project.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
BERINGAR LTD MANDREL SYSTEMS LIMITED	Exploiting underused service capacity in the NHS Estate with IoT Sensors	£51,920 £21,276	£36,343 £14,893

Project description - provided by applicants

Vision: Greater proportion of NHS£1 spent on direct patient care by enabling the current NHS estate to be used more intensively thereby reducing the requirement for new health buildings.

Proposed Solution: LoRaWAN Edge Computing IoT sensor delivering accurate data about the use patterns, service capacity and environment of NHS buildings.

The NHS is suffering from a perceived shortage of quality health accommodation, even though it spends £30bn per annum on property and facilities-related services. The best available information from expensive consultant-led studies indicates building utilisation as low as 40%. In reality, the health system has high quality space in abundance, but it is simply undiscovered, unallocated and under-utilised. The NHS needs to spend more money on direct patient care and can no longer afford to continue to build new buildings to meet increasing demands. This means it needs to understand the capacity of its estate and ensure that new services are planned to maximise the uptake of that capacity. It is recognised that the only way to provide the data needed is through using sensors.

We have developed an innovative prototype IoT sensor that provides NHS Estate Managers and Health Service Planners with real time data on specialised health space availability, moveable assets position, building environment and service delivery. Given the sensitive nature of health buildings, we have developed an edge computing solution that looks at a space and counts people visible. To protect privacy and ensure security, all data processing is done on the sensor with the data sent via LoRaWAN backhaul. The same sensor can also track moveable assets, such as equipment and beds.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ASEPTIKA LIMITED ZENZIUM LTD	Automating prediction of exacerbation in respiratory disease using complex data-sets generated at home by patients. An unmet clinical need.	£39,781 £35,206	£27,846 £24,644

Project description - provided by applicants

Incurable respiratory diseases are characterised by frequent exacerbations (flare-ups), worsened health status, rapid lung function decline caused by infections (bacterial or viral), triggered by air pollution, cold temperatures or other environmental factors. Airway inflammation and increased mucus production result in deteriorating airflow, dynamic hyperinflation and increased workload of breathing, precipitating respiratory failure.

Human rhinovirus is the most common respiratory virus while the most common bacterial pathogens and _Pseudomonas aeruginosa_ _(PA)_ and _Haemophilus influenzae (HI)_, detectable days before an exacerbation is recognised. Recovery is usually 7-10 days, but can last 12 weeks before returning to baseline status. Only 20% of patients recover to pre-exacerbation levels 8 weeks later. Exacerbations cause disease progression. Severe exacerbations requiring hospital admission are associated with cardiovascular events. Once patients experience an exacerbation, they show increased susceptibility to subsequent exacerbation events with respect to severity and frequency.

Early treatment improves symptoms and reduces the risk of hospitalisation or developing respiratory failure. Unfortunately, in patients with moderate to severe disease who have chronic symptoms, it is difficult to detect the onset of exacerbations until well established. Treatment comprises antibiotics and oral steroids, but overuse increases bacterial colonisation and resistance. Some patients are vulnerable to steroid side effects such as muscle wasting and osteopenia.

Accurate and early prediction of exacerbations is important and is as yet, an unmet need in managing patients with Long-Term Respiratory Conditions. The long-term prognosis following an exacerbation requiring hospitalisation for COPD for example, is poor with a five-year mortality rate of 50%. Poor outcomes are associated with older age, lower body mass index, existing comorbidities (e.g. cardiovascular disease or lung cancer), a history of previous admissions for exacerbations, clinical severity, and the need for long-term oxygen therapy at discharge.

In this project two UK small companies (Aseptika Ltd and Zenzium Ltd) seek to develop new tools using the latest AI techniques to help patients and their healthcare professionals automate clinical decision-making. By detecting exacerbations automatically using the patient's own self-generated data, impending exacerbations can be detected sooner which will enable the patient to receive earlier treatment, which will in turn will reduce symptoms and lower the risk of further lung damage.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
MEDIFIT INSTRUMENTS LIMITED	A clinically-validated, integrated non-contact capacitive sensor for comprehensive cardiovascular and hypertension screening	£75,000	£52,500

Project description - provided by applicants

The core objective of this project is to develop viable solutions that will address several inter-linked challenges currently faced by the NHS. The first challenge is the unsustainable costs that cardiovascular disease places on the NHS and the UK economy.

It costs the UK economy a staggering £29 bilion in healthcare expenditure and lost productivity. The UK spends more on it's healthcare budget on cardiovascular disease than any other EU country.

This is further componded by the rising rate of obesity ensuring that cardiovascular disease continues to be a major cause of death in the future. The second challenge is that the population of the UK is ageing, and this demographic shift is set to increase exponentially, with dramatic economic, political and social implications.

There are over 15 million people in England with long term health needs and this figure is growing. The scale of the challenge is staggering; caring for people with at least one long-term condition (LTCs) accounts for 70% of the NHS £110 Billion budget and £10.9 billion of the £15.5 Billion spent on social care (Kings Fund). It is quite clear that the present care model is unsustainable and not fit for purpose in the 21st Century. The third challenge is that there is a considerable shortfall in the current cardiac physiology workforce at all levels across the NHS. Current demand cannot be met, creating significant waiting lists and regional variation of service; in addition it will be inadequate to meet future demand (British Cardiovascular Society).

A significant short-coming with the current in-hospital ECG's is that it's not integrated with continous Blood Pressure monitoring, this means that hypertension one of the most common and fatal disorders in the UK cannot be diagnosed or screened at the same time as an ECG reading, leading to fragmentation of care. It is estimated that 6 million peope in England are living with undiagnosed and untreated hypertention(Public Health England).

We intend to overcome this technical barrier by developing a low-cost ,next generation wireless capacitive non-contact sensors integrated with ECG, Respiration and a miniaturised continous blood pressure monitoring module. Our integrated sensors will be able to accurately monitor four key physiological functions, vital for comprehensive cardiovascular and hypertension screening, simultaneously and in real-time (Cardiovascuar, Autonomic Nervous System, Respiration and Blood Pressure).

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BOLT PARTNERS LIMITED Humber NHS Foundation Trust London North West Healthcare NHS Trust	Improving patient safety and clinical productivity by developing an app for procedural checklists and patient assessments	£63,248 £4,283 £7,238	£44,273 £0 £0
Project description - provided by applicants			

Procedural checklists and assessments are used extensively in healthcare to ensure clinicians adhere to best practise and provide the safest care to patients. These checks can reduce hidden errors caused by inconsistent care by supporting decision making and clarifying appropriate best steps.

Despite the importance of and the challenges in making checklists effective, most are carried out using pen and paper, and only stored in this form (if at all). This negatively impacts patient outcomes, reduces the productivity of clinicians and provides poor assurance to healthcare providers. Our vision for this project is to improve the effectiveness, efficiency and assurance of procedural checklists and assessments by developing a smartphone application. Clinicians will be able to access any relevant checklist or assessment at the patient bedside to ensure they are conducting a procedure or assessment correctly, adaptable to the particular patient's case. An app would also allow the latest version of any checklist to be updated remotely, ensuring they work to the latest guidelines (local or even national). Providers will be able to collect, access and view hugely informative data around adherence to improve their own decision making and evidence base for CQC inspections.

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API COGNITION LIMITED	Artificial General Intelligence in support of General Practice Healthcare	£74,999	£52,499

Project description - provided by applicants

We face a crisis in the provision of primary health care. An increasing number of online technology solutions are available to help support General Practitioners (GPs). However, they have either failed to gain widespread support amongst GPs, or amongst the patients which they are intended to serve. At one end of the spectrum there are services which offer diagnostic services, employing scripted questions generated by decision tree algorithms, that fail to exhibit common sense or engage with the patient in a humanistic fashion. At the other end there are support systems that are backed by real doctors, but fail to offer patients a response in real-time.

Our approach is to employ artificial intelligence techniques with some diagnostic capacity, in a fashion that resembles the manner in which doctors usually interact with patients, something far closer to the bed-side-manner that we are used to. We are able to do this through the use of biologically inspired Artificial General Intelligence (AGI) developed over a period of more than ten years. One of the key differences is that the artificial agent that embodies these diagnostic skills, also has an awareness of the consultation process itself, and not only decides what to ask, but also decides when it should listen.

The deliverable from this project is the demonstration of virtual doctor, which enters into a consultation with a virtual patient in a stand-alone software simulation. A proof of principle in this project will allow us to demonstrate a patient-friendly real-time doctor's assistant. We are working closely with one existing service provider, and employ staff with both extensive and proven experience in primary care and in artificial intelligence development.

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APPATTIC LTD.	Improving Patient Physical Rehabilitation Outcomes Though Mental Wellbeing Using Mobile VR - Concept Validation and Scoping	£73,829	£51,680

Project description - provided by applicants

Sound mental and physical wellbeing is essential to leading a happy and fulfilling life and contributing to positive social and economic outcomes. There is a strong link between physical and mental health, whereby the status of each influences the other yet we often address each in isolation.

Through this feasibility study AppAttic will assess the concept of using mobile Virtual Reality (VR) to improve patient outcomes by uniting physical rehabilitation and mental wellbeing.

The initial area of focus is on improving the mental and psychological aspects of stroke rehabilitation. This area was chosen due to AppAttic's existing research into the home-based physical rehabilitation of stroke patients using VR and the observation during this research that the psychological wellbeing aspects of recovery are often unmet. This funding will enable us build on the existing physical stroke rehabilitation project (which will already be developed by the time this project commences) and use it as a basis for validating the concept.

The project will enable the concept of using mobile VR to improve the mental and psychological aspects of rehabilitation and ultimately improve patient outcomes to be assessed, validated and scoped for further development.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
DOCTOR FLINT LIMITED	SPOT - The Safer Prescription of Opioids Tool	£75,000	£52,500

Project description - provided by applicants
A number of strong painkillers, morphine derivatives, are used in the management of patients with cancer pain. Intolerance to these drugs or side effects involves switching to another type of drug, or route of administration. Converting from one painkiller to another requires care and is presently performed using paper tables of approximate equivalence. The Safer Prescription of Opioids Tool, (SPOT) double checks such drug conversions, reducing the potential of harm to the patient, and costs to the NHS.

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365 RESPONSE LIMITED	Digital Solution for Healthcare Facilities Management	£74,431	£52,101

Project description - provided by applicants

365 Response's ground-breaking digital solution will significantly improve clinical and non-clinical workflow while generating widespread impact across healthcare estates and support services, nationally. The company's **365 SmartPlatform** is a cloud-based solution that plans, tracks, reviews and dispatches people, goods, resources and vehicles across healthcare settings to optimise efficiencies, save time and increase productivity. The system is currently being successfully used by healthcare organisations to actively to book, plan and track non-emergency patient transport journeys. 365 Response is now extending this tried and tested system to other areas of the sector, starting with healthcare facilities management (FM) services.

The **365 SmartPlatform** removes the need for numerous poorly-integrated internal systems, simplifies the booking process and allows real-time views for all staff across hospital settings. It uses intelligent dispatch algorithms to plan, dispatch and manage resources as efficiently as possible against a set of pre-determined governance rules. The proposal involves bringing together key hospital movements including those of patients, security staff, cleaning and catering staff as well as the restocking of supplies such as drugs and clinical equipment. The award-winning cloud-based 365 SmartPlatform will plan, track and review the movement of hard and soft FM to optimise resources efficiently.

This not only reduces the amount of staff needed to undertake the booking and management of these tasks, but it also eliminates failure demand and ensures the nearest suitable resource is always dispatched. It also ensures priority activity is dealt with first and that any KPIs are fully adhered to.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
COG-NEURO SPEECH THERAPY LIMITED	A Digital Speech Therapy Solution for Stroke, Brain Injury and Progressive Neurological Disorders: The Cog-Neuro Mobile Speech Therapy Solution	£64,276	£44,993
Aneurin Bevan University Health Board		£6,868	£6,868
Cwm Taf University Health Board		£3,674	£3,674

Project description - provided by applicants

In the UK, there are more than 150,000 strokes and 162,000 brain injuries every year and a significant number of Stroke and brain injury survivors leave hospital with a disability. Aphasia is a speech and language impairment that can be caused as a result of a stroke or brain damage. Due to shrinking budgets for speech therapy services, most patients have to wait long periods of time, often six months until they can see a speech therapist. This delay can have significant impact on the patient's rehabilitation potential and encourage the onset of depression, anxiety and frustration. Cog Neuro Speech Therapy will conduct a feasibility project in collaboration with Aneurin Bevan University Health Board and Cwm Taf University Health Board to investigate the potential of a fully mobile platform which can facilitate access to early intervention speech therapies for patients suffering with aphasia. The Cog-Neuro Mobile Speech Therapy solution will support the assessment of the patients' communication skills, provide remote therapy, and capture and analyse data for reporting and designing clinical pathways. The platform will offer a complete rehabilitation program in speaking, listening, reading, writing and cognitive therapies using real life scenarios through speech recognition technology and augmented reality technology. Patients will be able to choose the scenarios depending on their interest or pressing communication need such as answering the phone, ordering a coffee or attending a GP appointment. The technology will have the capability to capture and analyse information on the patient's progress and make it accessible to the clinician. This solution will aim to maximise the chances of successful treatment through early and intensive intervention. This project will introduce a novel method of delivering speech therapy for patients with aphasia whilst admitted or outside of hospitals and lead to better care provision and improved quality of life.

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CUSH	Remote monitoring and analysis of gait and falls within an elderly population	£54,399	£38,079
Project description - provided by applicants			
We would like to carry out a 6 month feasibility study using remote patient monitoring to evaluate gait and balance in an elderly population. Out aim is to develop a machine learning tool to create a discrete healthcare wearable to prevent and protect against falls and hip fractures.			

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KYMIRA LTD.	Machine learning for adaptive non-invasive heart disease prediction via e-textile sensor platform	£74,331	£52,031

Project description - provided by applicants
KYMIRA was founded to disrupt the traditional model of medical innovation. Using a sportswear brand, KYMIRA has created a vessel through which it can commercialise and validate future medical technologies on the Health and Fitness market. Revenue from which is then invested in medical validation and further R&D. KYMIRA's current activities include the development, manufacture and sale of their internationally acclaimed infrared sportswear brand KYMIRA Sport, and developing wearable platform technologies including energy harvesting and e-textiles for primary use within the medical and domestic healthcare markets.

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JUST CHECKING LTD	Roaming Nights	£74,883	£52,418

Project description - provided by applicants
Roaming Nights will develop a digital app to run an agile, responsive night care service for adults with learning disabilities, in supported living. Activity data from sensors and devices around the home will be integrated to let carers know if and when care is needed, and to direct the closest roaming carer to call. The app will recognise patterns such as the onset of an epileptic fit, or an individual not returning to bed from the bathroom. Social services and their NHS partners are responsible for the care of adults with learning disabilities. The current model is to support individuals to live in their own flat or a shared house with care staff on hand to help. Because many individuals have complex health needs, there is a tendency to adopt a 'belt and braces' approach to care at night, with staff at the premises to provide assistance 'just in case'. It is a fine balance between providing care and stifling independence, and many individuals don't want carers around all the time. Rather than sleep-in night staff at each house, a number of service users living in proximity can be cared for by a small team of roaming carers. Individuals are more independent and care staff, who are in short supply, are used more efficiently, where they are needed.

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Competition Code: 1707_FS_HEAL_DHC2017

Total available funding is up to £2m

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SPECTRA ANALYTICS LIMITED The University of Manchester	Patient Automated Triage & Clinical Hub Scheduling (PATCHS)	£63,382 £9,397	£44,367 £9,397
Project description - provided by applicants			

Primary care is the foundation of the NHS, accounting for 90% of all NHS contacts; over 340m consultations per year. Over recent years it has come under significant strain due to increasing demand, a hiring/retention crisis, and budget constraints. Effective triage processes - efficiently and accurately directing patients to the appropriate services, be that a GP, alternative health professional or self-care -- can significantly ease pressures on GPs by reducing avoidable consultations; estimated at 27%. This could save the NHS over £700m per year* while improving patient satisfaction, due to shorter waiting times and longer appointments. Unfortunately, current triage processes are inconsistent and often ineffective, relying on non-clinically trained staff such as GP receptionists.

 This feasibility study will assess the opportunity and potential impact of applying an existing technology Artificial Intelligence (AI) triage in the primary care triage process. AI triage is well-suited to primary care due to the large amount of patient data, which allows the algorithm to identify both common more unusual ailments.

* based upon NHS England estimates of £100k annual savings per practice for telephone triage.

Note: you can see all Innovate UK-funded projects here
https://www.gov.uk/government/publications/innovate-uk-funded-projects Use the Competition Code given above to search for this competition's results

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
BERDROOT DEVELOPMENTS LIMITED	MesslyID	£74,724	£52,306

Project description - provided by applicants

The project seeks to explore the feasibility of using innovative, state of the art blockchain technology to revolutionise the ID verification process for doctors and healthcare workers. This will enable more efficient healthcare provision and directly transform service delivery.

During the process of building and selling Messly Locum, we discovered a number of critical failures in the current process of verifying the identity of new doctors who want to fill temporary vacancies in a Trust. The current process is highly inefficient, costly and unsafe and has not seen any innovation or use of digital tools in the last 10+ years.

The inefficiencies in current processes and the inability of Trusts to register new doctors quickly and safely has a number of significant impacts.

Firstly, it increases the risk of fraudulent doctors working in the NHS (identity fraud in the NHS totals almost £1bn per year).

Secondly, the inability to quickly and safely employ doctors to fill vacant shifts compromises safe staffing and therefore the ability of Trusts to deliver a safe service.

Thirdly, it causes a reliance on agencies to facilitate the filling of temporary shifts (at a cost of over £200m a year).

Fourthly, the current process requires significant manual intervention from HR departments at great expense to the NHS.

This is a long-term and growing problem as the shortage of junior doctors continues to grow as demand for healthcare increases.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CIEVERT LTD	Developing Artificial Intelligence to revolutionise how radiotherapy patients are managed whilst receiving treatment	£74,309	£52,016

Project description - provided by applicants

Cievert is a digital health SME specialising in designing and implementing innovative software in the health sector. Established in 2011 by a former NHS radiographer, Cievert software can now be found in 20% of all NHS cancer centres.

In England alone, there are 100million NHS outpatient appointments every year*. These cost an estimated £10billion, require significant clinical input and infrastructure, can often be a source of anxiety for patients, and a significant proportion (approx. 20%) of these appointments are not attended. With a growing elderly population and more people living with a long-term condition, the demand for outpatient appointments is predicted to grow. This growth will add to the demand of already-stretched, finite clinical resources.

A large number of outpatient appointments are used for routine follow-up. Clinicians would rather see patients when they need to be seen, not on the arbitrary time-based schedule currently used. Assessing patients remotely using Artificial Intelligence (AI) would free up clinicians' time and allow them to concentrate on patients that really do require face-to-face follow-up.

We aim to automate out-patient follow-up using AI, making it more efficient and effective.

This project will focus on cancer outpatient appointments, specifically patients receiving radiotherapy, of which there are approximately 140,000 per year in the UK**. We will develop software to replace the routine clinical follow-up appointment with a view to better identifying those patients in need of clinical intervention. This will result in patients with a clinical need being assessed more quickly and enable them to be seen by an appropriate clinical team member, sooner. This will free up precious clinical staff and resources, reduce costs, reduce waiting times, and radically change how routine outpatient follow-up care is delivered.

Whilst AI is rapidly developing in the field of diagnostics, there is little work being done in using this technology during a course of treatment, such as radiotherapy, post-diagnosis and follow-up.

This project will result in a commercially ready solution that will put an end to time-based routine follow-up and will be replaced by a proactive system based on clinical need.

*Source: NHS Digital Website, 'Hospital outpatients: Appointments top 100 million for first time in 2013-14' (http://www.hscic.gov.uk/article/6068/Hospital-outpatients-Appointments-top-100-million-for-first-time-in-2013-14). 26th Feb 2015\.

**Source: Cancer Research UK website (http://www.cancerresearchuk.org/health-professional/cancer-statistics-for-the-uk)

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
JOHNNIE JOHNSON HOUSING TRUST LIMITED	Monitoring physical frailty in older adult's homes with a new walking speed sensor; from prototype to proven concept	£24,982	£14,989
GSPK DESIGN LIMITED		£10,202	£7,141
University of Sheffield		£34,215	£34,215

Project description - provided by applicants

This project potentially opens up a completely new way of managing the problem of physical frailty in older people.
In our ageing society, more older people live independently in their own homes or sheltered housing. Most live healthy and active lives, but a substantial number will become physically frail. 10% of older adults are frail and another 40% pre-frail, having a serious risk of becoming frail.

Physical frailty is associated with a high fall risk and is a predictor of negative health outcomes. Unfortunately, frailty appears to be a persistent problem and it is very hard to reverse the negative effects.

There is evidence that pre-frailty can be reversed. Many clinical experts think that monitoring frailty in early stages of its development is a potentially powerful approach to managing it. Scientific literature demonstrates the importance of certain indicators of frailty as predictors of the condition and its negative consequences.

One of the principal indicators is walking speed in everyday life. When people start walking more slowly than usual this gives an indicator of the risk of developing frailty.

GSPK Design (GSPK), a product design company, has, with the Centre for Assistive Technology and Connected Healthcare (CATCH) at the University of Sheffield, developed a prototype walking speed sensor that can be placed in someone's home. It measures walking speed every time the person passes the sensor.

In CATCH laboratory tests, it has accurately and reproducibly (over a short time) measured walking speed. We will test the sensor in real-life with 20 older persons living independently in a sheltered housing scheme and study how the sensor behaves over a longer period. We will then refine the algorithms and improve the robustness of the sensor. We will explore whether the data produced by the sensor have an added value for improving care and support for the people using it.

Johnnie Johnson Housing (JJH), a housing organisation specialised in housing and support for older people, is interested in ways to improve the services to their residents. This sensor has the potential to do this. JJH believe its synergy with Astraline, its national monitoring centre, will add real value and insight to the project to deliver something truly market making.

The project should result in a validated walking speed sensor that can be further developed into a market-ready product to be used by organisations like JJH and other organisations in housing, health and social care.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
PROMOTE MEDICAL LIMITED	PROMOTE (Patient Records of Medical or Trauma Event) App	£74,772	£52,340

Project description - provided by applicants

Promote Medical's project vision is to offer a complete service transformation in the way that sports and event medicine patient care is delivered.

Events and sports medicine is a developing pre-hospital speciality recognised worldwide as requiring further scrutiny and planning as the frequency and nature of sports and events evolve. Overall, guidance in this area for medical cover is noted as being limited.

The need for documentation from a medical and legal perspective, in addition to providing patients information and to facilitate ongoing care, is complicated by often remote location of initial care, multiple care givers and the requirement for follow-up with specialists.

By developing a digital way to record sports and events medicine consultations we will be able to improve patient outcomes in their initial treatment and future advice and follow-up. Current documentation on paper based systems is no longer fit for purpose. There is a need to retain documentation for the practitioner and also to enable communication of ongoing care requirements to both primary and secondary care. Vitally, the patient becomes an empowered stakeholder in this process.

Within general healthcare and specifically within professional sports and events this is particularly important when details of initial injury such as mechanism and initial treatment are crucial to ongoing management. The need for high quality documentation that can be shared amongst care givers and shared with the patient is an area of unmet need within sports and events medicine.

Our proposed digital technology will allow quick diagnosis, efficient recording and secure sharing of the care required should the patient need to receive ongoing treatment or be admitted into hospital. It will also reduce the demand on the healthcare system as it will allow a more integrated approach to patient transfer from a pre-hospital to hospital setting, as well as communication to the GP thus enhancing pre and post hospital inter-connectivity. Practitioners will also benefit from an advanced reporting and diagnosis system that will allow them to immediately treat and monitor the patient on each part of the treatment and recovery process.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
FUTUREPHARM HC LTD	Future Pharmacy - Clinical Decision Support	£73,164	£51,214

Project description - provided by applicants

The level of technology required to create a smart, effective and reliable clinical decision support system has reached a pivotal moment; becoming affordable.

Technology in medicine is not a new trend, applications have been purpose-built for the NHS, enhancing care for many years. However, many systems have been constrained in their usability, required on-site maintenance and come with a costly fee.

Future Pharmacy proposes a Smart Clinical Decision Support System that is safe, effective and scalable. A constantly updated database comprised of trusted resources provides the basis of our tool which is combined with a user-friendly interface and journey. The tool captures key patient characteristics which then serve as the databases filters. Only dosing recommendations, prescribing pathways and interaction checks that have passed all patient filters are returned.

Issues such as lack of access to resources and essential hardware create a barrier to safe and effective care in many healthcare institutions. The likely knock-on effects of these barriers such as wasted nursing time, procurement costs and liability mean that medication errors waste over £2.5 billion of NHS funding each year.

Technological maturity in the cloud and personal computing sectors allows for day to day barriers to be removed while still allowing for the same day to day tasks to be completed with increased efficiency.

Our plan is to use both technologies to create a system that drives best practice throughout trusts in an affordable and considered manner. Our innovation derives from our plan to:

* Increase the system's accessibility (app and desktop based).
* Increase its commonality (use the same resources and structures for multiple functions) to drive affordability and reliability.
* Utilise cloud computing (processing and analytic power, as well as, user control abilities such as auto-updates to security and databases) to enhance functionality, improve adoption and increase its effectiveness and efficiency.

By encompassing the above our plan is to clearly demonstrate the value of a patient-specific, accurate and considered clinical decision support system.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
GRAKNIT LTD.	Pactster: Improving adherence to specialist exercise for better physical and emotional health in adults with Cystic Fibrosis	£74,345	£52,041

Project description - provided by applicants

Pactster is a community-based exercise platform for people with specific health conditions. We offer condition-specific exercise videos and community support, including online group exercise, to encourage people to exercise more for better physical and emotional health.

As an initial target market we have chosen cystic fibrosis (CF), a disease affecting over 10,000 people in the UK, with annual costs of at least £24,000/patient. We chose CF due to profound impact regular exercise can have on the management of the disease and the unique barrier they face in not being able to meet in person for fear of cross-infection (meaning group exercise classes are out of the question). In the 12 months since launching our product to the CF market we have had extremely encouraging response from people with the disease (have acquired 3% of the UK market), their carers, clinicians and the wider community both in the UK and beyond.

It's a great start, however one of the key challenges we face is improving exercise adherence and motivating users to do more exercise. To speed up the pace at which we can overcome this challenge and start significantly improving the lives of people with CF we propose a 12 month project to research, design, implement, test and evaluate three technology interventions with the primary aim of increasing the amount of exercise people with CF are doing.

With a team of technology, health and marketing experts, specifically in the field of cystic fibrosis, and backed by advisors and strategic partnerships who will provide support during the project, we are perfectly positioned to conduct a successful and meaningful feasibility study into how technological innovations can be used to increase exercise adherence.

The outcome of this project has the potential to have a powerful impact on the lives of people with CF and as a result reduce costs to the NHS in treating the disease. Moreover, the impact will continue to be felt by people with other health conditions (breast and prostate cancer, HIV and diabetes to name but a few) as we roll out Pactster out across the health sector in the UK and worldwide.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
MIRADA MEDICAL LIMITED	Improving quality assurance in radiotherapy	£49,688	£34,781
The University of Manchester		£22,986	£22,986

Project description - provided by applicants

Radiotherapy is a key method for treating cancer in which high energy radiation is directed at a tumour to destroy it by disrupting DNA replication. However, it is inevitable that surrounding healthy tissue is also irradiated during the process. It is therefore necessary to plan any therapy so as to maximise the tumour's received dose while minimising the dose to the healthy tissue. In this process, known as RT **p**lanning, teams of clinical experts spend a great deal of time developing treatment plans prior to their administration. This process is very time-consuming and can typically take some tens of hours, leading to high costs and limited throughput for the clinic.

A major step in the planning process is the delineation of the tumour and surrounding healthy organs in a medical image scan of the patient, a task known as contouring. **The resultant delineations, called RT s**tructures, are subsequently used to estimate the delivered dose and optimise the treatment plan. Typically, tumour and organ delineation is a laborious manual process.

Manual delineation has inherent variability because the boundaries between organs and tissues may not be clear on the image, and a degree of judgement must be applied by the clinician in deciding where to draw boundaries.

Various commercial automatic contouring (autocontouring) solutions are available to assist in the task of contouring standard anatomy. Typically, these are based on using anatomical mapping to transfer boundaries drawn on a previous image to the current patient image. Such autocontouring systems have been shown to reduce the time required, but more importantly to improve consistency between clinical staff.

Tumours are not standard anatomy and can occur anywhere in the patient. Therefore, the target contour cannot be drawn automatically using typical approaches. However, clinicians still wish to reduce the variability of their contours and ensure high quality treatment.

In this project, we will investigate the commercial and technical feasibility of an approach to address the problem of improving target contouring consistency.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
DIETARY ASSESSMENT LTD University of Leeds	Development of a nutrition monitoring and diagnostic tool for clinical and non-clinical use to	£55,861 £17,913	£39,102 £17,913
Project description - provided by applicants			

Project to assess the feasibility of developing a new nutrition monitoring and diagnostic tool for clinical and non-clinical use to reduce diet-related disease.

According to the BMA, poor diet has the highest impact on the NHS budget, costing around £6 billion per year, greater than alcohol consumption, smoking and physical inactivity.

The majority of children, young people and adults in the UK are not eating a healthy diet. One in five children start school overweight or obese, and a third of children leave primary school overweight or obese. Nearly two thirds of adults in the UK are overweight or obese.

Dietary Assessment's vision, and the main motivation behind this project, is to help health practitioners to better track, monitor and improve diets and to reduce the incidence of diet related disease across the globe.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
VITRUE LTD	Vitrue Autonomous Functional Assessment Feasibility Study	£75,000	£52,500

Project description - provided by applicants

In modern healthcare, not only must we focus on prolonging a person's life, but also on maintaining the quality of that life. The opportunity this project addresses is the radical improvement of functional assessment, a key step in measuring and managing a range of conditions such as frailty, stroke, risk of falls and musculoskeletal disorders affecting millions.

Functional health information is a powerful resource enabling clinicians to maintain patient quality of life, however it is let down by imperfect assessment tools that are subjective, have poor repeatability and are insensitive to incremental change. If clinical staff had access to longitudinal, scientific and accurate data it would give them full insight into the patient's daily health and would naturally lead to improved patient outcomes.

Additionally, there is a large economic incentive to revolutionise this type of assessment. For example, due to shortcomings of current assessment tools and the huge pressures on clinical staff the NHS spends an estimated £700 million annually on patients awaiting assessment prior to being discharged from hospital or who then require emergency readmission within 30 days.

The aim of this project is to create a huge leap in functional assessment accuracy and efficiency. Vitrue will develop a new, motion capture based system to accurately monitor and report on a patient's functional ability. Our system will enable occupational and physical therapists to treat more patients, more effectively by providing them with far more advanced and modern assessment tools. This directly leads to both improved patient outcomes and a reduction in the number of people kept needlessly in hospital. More importantly it breaks the cycle of elderly patients physically deteriorating while waiting for discharge leading to further loss of functional health, loss of independence and ultimately readmission.

The data provided by Vitrue's system will lead to substantially lower NHS costs and more importantly enable the clinician or therapist to focus on optimal care and treatment for those in need and speedier discharge for those kept waiting. This will ultimately benefit patients in all aspects of their lives.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
HEARING DIAGNOSTICS LIMITED	Audimetroid, a new hearing screening technology	£55,900	£39,130

Project description - provided by applicants
Hearing loss affects 360 million people worldwide and 11 million people within the UK, with most of those affected being 65 years of age, or older. Un-managed hearing loss in the elderly commonly leads to social isolation and depression, and may cause or accelerate the progression of cognitive decline and dementia. Management is thus crucial, and is most effective if started early after the initial progression of the hearing loss. Routine screening is necessary in order to ensure early management, as without screening, patients often go un-diagnosed for a prolonged period of time after first experiencing the symptoms of hearing loss. However, current technology is inappropriate for widespread screening due to poor accuracy and high sensitivity to background noise. To address this, we are developing a new hearing screening product, Audimetroid, that will make innovative use of advanced algorithms in order to make screening for hearing loss more accurate and less sensitive to background noise. This will make widespread hearing screening programmes more cost efficient by reducing the number of normal-hearing patients who are erroneously referred to audiology services, and will allow hearing assessments to take place at primary care providers, including GP surgeries and pharmacies, where existing technology would be unreliable due to the presence of background noise. During the proposed feasibility study, we will validate the technological and scientific approaches underpinning the concept, and ensure Audimetroid's applicability as a tool for use in widespread hearing screening programmes.

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DIRECTED SYSTEMS LIMITED	BP Assist: Digital Control to Prevent Low Blood Pressure Complications During Surgery	£74,545	£52,181

Project description - provided by applicants

Directed Systems is developing BP Assist, a digital product that will reduce the complications of low blood pressure during surgery in the operating room (OR).

Low blood pressure during major surgery is common and results in post-operative complications, which are bad for patient outcomes and very costly to the hospital. It is estimated that they cost the NHS £1b per year.

BP Assist is a product to support anaesthetists. It connects to the existing bedside monitors and drug and fluid infusion systems. Under the direction of the clinician, BP Assist is able to detect impending low blood pressure, and prevent this happening by automatically infusing blood pressure drugs. Once proven in the OR, this technology will be applicable to patients in the intensive care unit (ICU), where a doctor is not always present by the bedside.

BP Assist is a highly innovative concept that will take anaesthetic care into the 21st century, applying state of the art digital technology to automate key tasks, yet under close clinician supervision. It has the potential to substantially improve outcomes for many patients, reduce hospital costs, improve efficiency and release funds for other use in the NHS and other healthcare systems.

The business opportunity is global, which will allow us to create a major player in the international medical technology market, employing talented staff in the UK and in other countries.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
DESQ LIMITED	Signs of life	£72,018	£50,412

Project description - provided by applicants
Signs of life' is a training game for nurses and doctors to learn the procedure and routine for medical observations. In a busy hospital, taking patient observations (pulse, blood pressure, etc.) is crucial to patient care. Despite robust and standardised procedures (NEWS), mistakes still occur. Observation cycles are missed and vital signs not acted upon, which can lead to conditions going unnoticed or worse, conditions becoming critical. A simulation game with repeat play is the ideal platform for trainee healthcare professions to learn routine procedures.

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ANIDIUM LIMITED	Automated detection of cardio-vascular abnormalities in self-captured ECG recordings	£73,557	£51,489

Project description - provided by applicants
The project aims to access the feasiblity of automated detection of cardio-vascular abnormalities with the use of the low-cost personal health monitoring system.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SPOONFUL OF SUGAR LIMITED	Antimicrobial resistance (AMR) digital intervention	£74,794	£52,355

Project description - provided by applicants

Antimicrobials -- any medication which targets microbes such as antibiotics -- and resistance to this (antimicrobial resistance or AMR) is a growing public health problem. The World Health Organisation estimates about 700,000 people die each year from infections caused by multidrug-resistant bacteria. In the EU alone, associated costs of AMR amount to about 1.5 billion euros per year. Although there have been many efforts to address this, most have focused on trying to improve behaviour of health workers -- such as changing prescribing or supply practices. The patient is an important part of the health pathway and there is a need to develop a tool that can better support patients with their adherence to antimicrobials.

Lack of public awareness of AMR, how it comes about, and what can be done about it are factors that can drive AMR. Resistance can occur when antimicrobials are stopped too early, started when there is no need for an antimicrobial, taken incorrectly, or when the wrong antimicrobial is chosen as treatment. An important step to addressing this AMR is to educate the public and patients, and address any barriers they may face to using antimicrobials correctly.

Effective face-to-face interventions are often time- and resource-intensive, and may be difficult for most people to access, limiting their relevance and applicability to the real world. On the other hand, digital health strategies (tools and services using information and communication technologies) may help make such healthcare interventions more accessible, given that most people now use electronic devices in their daily lives. They can be highly scalable to address AMR at a patient level and have the potential to provide consistency in the delivery of interventions at low cost.

This project aims to evaluate the feasibility and use of a digital app with the objectives of influencing patient perceptions about antimicrobials, and supporting patients' responsible antibiotic use. The project will use behaviour change methods that are grounded in evidence to increase the effectiveness of the app in changing patient attitudes and perceptions, and ultimately social norms. Many types of digital interventions available have poor uptake -- by creating the digital app based on the science of people's behaviour, the intervention can be 'behaviourally smart', thus increasing both its effectiveness and engagement.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
HEALTH PATHWAYS LIMITED	Blockchain Technology for a Patient-Centred Clinical Pathway Feasibility Study	£71,121	£49,784

Project description - provided by applicants

The NHS trails behind other industries in use of new and emerging technologies to transform business practice. It is agreed that digital technology holds the potential to transform the way patients engage with services and improve the efficiency and co-ordination of care and to assist people in managing their own health.

The speed of adoption of digital technologies to transform care has been the focus of recent policy and discussion. The NHS England five year forward describes a digital vision to close gaps in care and quality, funding and efficiency and health and wellbeing. Lessons learned from NPfIT resulted in caution around centrally mandated solutions. The National Information Board PHC2020 describes practical steps in development of local digital roadmaps and the 2016 Wachter report calls for greater clinical leadership and interoperability as core goals of a digitised NHS.

With a unique clinical-technical collaborative model we have developed and deployed integrated care pathways for specific populations that have been diffused nationally due to an approach of clinically driven solutions across networks, on a central platform that hosts the core clinical process without interfering with well-established local service delivery models. We believe this approach to digitised whole-care pathways across organisations supports social and clinical networks and provides opportunity for transformational change. This feasibility study will test whether a parallel system built using emerging blockchain technology, with a distributed ledger rather than centrally hosted information, could deliver greater cost efficiencies across the system, specifically around commissioning through capture of transactions at patient level and the ability to pull large volumes of data from populations for advanced analytics that are currently not available due to current practice of data warehousing within organisations. We plan to test the feasibility of blockchain technology by modelling patient flow and transactions on two systems in parallel; one using open source technology hosted on a shared central platform, and the same clinical process developed using blockchain, within a defined and well understood population. Cost-benefits can be analysed against current status, where patient level data is entered locally into a national database that informs commissioning through retrospective annual analysis of activity based on simple stratification of risk across the population linked to a tariff. Comparison will be modelled across two systems, one where real time data can be extracted from a web-based dynamic clinical process versus the potential for transactional analysis using distributed blockchain approach for the same clinical process.?

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NATIONAL ELF SERVICE LIMITED	Team gamification of health CPD: closing the gap between research and practice.	£55,400	£33,240

Project description - provided by applicants

The National Elf Service website was launched in 2015 to help practitioners in health and social care keep up to date with the latest evidence based research relevant to practice: [www.nationalelfservice.net][0]

The website provides a digital platform where expert-written, clinically relevant blogs can be freely accessed. This platform is well established and has a significant reputation in the field and a huge following on social media. Website subscribers who pay a fee have the benefit of a range of CPD (continuing professional development) features such as alerts, reflective practice notes, private discussions and gamified incentives to increase engagement.

The challenge that this project will address is to use team gamification to help participants achieve their goals of keeping up to date with the latest evidence-based research in their fields in a timely, efficient, effective, and enjoyable manner; and, in particular, to engage more fully in the online CPD and community features that are available as part of the functionality.

A basic level of individual gamification is already in place (in the form of points, badges, leader-boards and CPD certificates) but this needs to be expanded with team gamification techniques not currently seen at scale anywhere in the digital health sector.

The outcome will be an innovative gamification system that is appropriate to the context and that will encourage practitioners to engage more fully with evidence-based research, to the mutual benefit of patients, carers, clinicians, researchers, policy makers and society at large.

[0]: http://www.nationalelfservice.net/

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
DATA SCIENTISTS LIMITED	Adlace - an open-source analytics platform for the NHS	£62,337	£43,635
WHOLE SYSTEMS PARTNERSHIP LIMITED		£12,316	£8,621
Project description - provided by applicants			
Adlace is a digital platform that enables users within the NHS and their partners to have a greater degree of control over: * The data they analyse to inform decision making * The predictive and simulation models they use to generate intelligence from that data * The data visualisations they create and dashboards they build to interpret that intelligence Adlace facilitates repeat analytics for NHS organisations with similar data and will be the first open-source healthcare intelligence platform available to the NHS. Users will benefit from this development paradigm that has been shown to be both transparent and cost-effective. Adlace is future-proofed as new models, analytical methods and data visualizations can be added with ease.			

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Innovate UK

Results of Competition: Digital Health Technology Catalyst 2017 Round 1 - FS

Competition Code: 1707_FS_HEAL_DHC2017

Total available funding is up to £2m

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
MEDCIRCUIT LIMITED	Medcircuit, the algorithmic software reducing waiting times in emergency department and general practice waiting rooms.	£74,748	£52,323

Project description - provided by applicants

MedCircuit is a pre-triage risk stratification software product designed by doctors to assist doctors and nurses in the triage assessment of patients initially in A&E departments and subsequently in GP practices throughout the UK. MedCircuit collects full and relevant medical history from patients in the waiting room in the idle time they spend waiting to be called in to see a doctor. The medical history is then made available to nurses and doctors prior to seeing the patient for triage. MedCircuit is a SaaS product that operates through a complex proprietary algorithm and question tree written by UK doctors using UK national clinical guidelines.

MedCircuit reduces patient waiting time, improves quality of patient care and enhances efficiency of doctors' time. A&E departments and GP practices will be able to significantly reduce costs and avoid fines for slow patient processing.

With the NHS stretched to breaking point and A&E departments and GP practices experiencing an intensifying crisis, the NHS is turning to technology and innovation to help relieve the strain on its stretched services. In A&E, over two million patients exceeded the four hour cap last year, resulting in over £220 million of fines across A&E departments for missed targets.

Doctors and nurses are under extreme pressure for rapid patient turnover whilst patients are experiencing excessively long waiting times to see doctors, particularly in A&E departments (median time of 2.26 hours in A&E in 2016) as well as rushed consultation and poorer quality of care.

By enhancing the efficiency of consultations, patients, doctors, A&E departments and GP practices will all benefit significantly from the implementation of MedCircuit in A&E departments and GP Practices. Patients will see a reduction in waiting times as well as improved accuracy of diagnosis. Triage doctors and nurses will spend less time with patients and doctors will spend less time writing up notes and documentations after consultations. A&E departments will be able to significantly enhance their abilities to meet the four-hour patient time limit, and will therefore be able to drastically reduce the amount they spend in fines for slow patient processing. They will also be able to gain better access to funding opportunities due their greater levels of efficiency. Both A&E departments and GP practices will see a significant reduction in labour costs, in particular in terms of triage nurses and doctors.

Innovate UK

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Talking Mats Ltd	TALKING TECHNOLOGY ENABLED CARE - A personalised, visual, digital platform to transform health, social care and housing services	£36,099	£25,269
AGE SCOTLAND		£2,125	£2,125
Edinburgh Napier University		£11,598	£11,598
University of Stirling		£19,692	£19,692

Project description - provided by applicants

The vision of the _Talking Technology Enabled Care_ project is to conduct a feasibility study to co-design, implement, evaluate and deliver a **novel, visual, digital care management application for those who find communicating their health needs challenging.**

The Talking Technology Enabled Care project will assess the feasibility of co-designing and evaluating a more visually advanced, personalised version of a digital health tool (Talking Mats) for people with communication difficulties.

A need exists for people with communication difficulties to express all their health (physical and mental), social care and housing needs in an effective way with groups of informal and professional care providers. The current state-of-the-art digital care planning tools focus mainly on the health needs of patients/citizens and do not adopt a holistic approach, missing out the social care and housing needs of vulnerable groups. In addition, most digital care applications do not provide personalised visualisations that aid communication but only offer generic, largely text-based solutions that require higher levels of digital skills to use, limiting their applicability in different contexts and reducing their market potential, consumer reach, and social and economic impact.

By creating a more targeted, holistic, visual, digital care management tool that establishes clear and nuanced lines of communication via mobile technology, and testing this with patients/citizens and health, social care and housing professionals, we can assess if Talking Mats can enhance health (physical and mental) and social care outcomes of many vulnerable groups.

The _Talking Technology Enabled Care_ project will enhance the existing **Talking Mats** ([http://www.talkingmats.com/][0]) solution by **co-designing new personalised, visual dashboards of health, social care and housing information** with patients/citizens with communication difficulties who live in social housing and their informal and professional carer network. This will ensure people with communication difficulties receive support for their care needs and individual lifestyle. The technological solution will make the delivery of healthcare more efficient reducing the need for repeated sharing of a client's physical, emotional and social care information with each public agency and numerous professionals. This streamlined and targeted communication will transform healthcare delivery for people with communication difficulties and improve the efficiency and effectiveness of three key public services: Health, social care and housing.

[0]: http://www.talkingmats.com/

Innovate UK

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SOTER ANALYTICS LTD University of Derby	Behavioral change of UK industrial workers to avoid musculoskeletal injuries	£52,500 £22,436	£36,750 £22,436

Project description - provided by applicants
Soter Analytics and the University of Derby aim to identify and prevent 'dangerous' movement patterns, through the capture and analysis of ground breaking data with an innovative new device. Through innovative new methods we will educate workers to prevent these patterns, reducing the high volume of musculoskeletal injuries experienced within UK Industry, impacting on the National Health Service and UK companies in lost time and money.

Innovate UK

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ARETE MEDICAL TECHNOLOGIES LTD	Algorithm Development for Respiratory Diagnostic Device	£74,693	£52,285

Project description - provided by applicants
This feasibility study project is to develop and evaluate concepts for software-based methods that improve respiratory diagnostic devices. Improvements are expected to the overall cost, usability, and access for the device. With a software-driven approach, personalised medicine approaches to diseases like asthma and COPD become possible. By helping to personalise treatment decisions, quality of life, patient outcomes, and overall costs to the health system will be improved.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SYNERGATION LIMITED	A Case-Based Reasoning Digital Tool for Decision Support in Diagnosing Dyslexia (CD4)	£75,000	£52,500

Project description - provided by applicants
Developmental Dyslexia is a learning difficulty and a disability, as defined by the Equality Act 2010\. Dyslexia is characterised by difficulties in language processing (reading, spelling and writing) which do not correspond with an individual's general intellectual abilities. In addition, dyslexia occurs across a wide spectrum, which makes it difficult to identify the suitable customised interventions. This project intends to apply case-based reasoning (CBR), an artificial intelligence technique that solves newly encountered problems by applying the solutions learned from solving similar problems encountered in the past. The product retrieves stored previous cases with similar presentations to the current individual, and then formulates a dyslexia intervention regime based on the success of these previous experiences. The outputs of the CD4 tool will make a critical contribution to deciding the best course of action. When combined with human subject-matter expertise, it will lead to step function improvements in decision-making. The project brings together an innovative UK micro-company, and respected academic and dyslexia experts to develop an automated digital solution that vastly improves the outcomes for our users.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
FITNESSGENES LTD	Feasibility analysis for the integration of the FitnessGenes digital self-care fitness and nutrition platform into the health system.	£70,138	£49,096

Project description - provided by applicants

Obesity is a growing public health problem. According to National Statistics for 2015, 58% of women and 68% of men in the UK were overweight or obese. Figures also suggest that, worldwide, 2 billion adults will be overweight or obese by the year 2030\. Being overweight or obese increases the risk of many illnesses, including diabetes, stroke, depression and certain cancers. Left unchecked, this trend will culminate in an unhealthy, unhappy population that places a large strain on the NHS.

While many people have tried to lose weight and keep fit using various diet and exercise programs, it's estimated that over 95% of these programs fail. One major reason for this is the inadequate tailoring of diet and exercise programs to an individual. We all differ with respect to our genetic make-up, the way our bodies function, and the lifestyles we live. Consequently, health and fitness recommendations that work for one person, may not work for another person.

FitnessGenes is a company that analyses an individual's genetic, personal and lifestyle data to create individually-tailored dietary and exercise plans based on proprietary modelling. Already deployed commercially in a product aimed at fitness enthusiasts, the next phase of development is to test and further develop this model in a healthcare setting. This presents new challenges, including users who may lack the enthusiasm, opportunity and/or education required for making healthy lifestyle choices.

By allowing us to identify the different technological and prototyping requirements for various patient cohorts, this feasibility study will enable us to prepare our current platform for use in the healthcare system. By gathering data, as well as feedback from patients and clinicians, the aim is to to adapt the model so that it can make accurate and reliable diet and exercise recommendations that are delivered to the patient in an effective manner. This will allow us to cater for individuals who require customised nutrition and fitness programs for health reasons, such as patients with diabetes or metabolic syndrome, or those are at risk of developing these conditions.

The information presented to customers will be positive, educational and most critically, actionable. Ultimately, the most significant and high impact outcome of this project will be the creation of a novel prototype applicable to a healthcare setting, that contributes towards the prevention of obesity and chronic disease improving compliance with government and scientific advice, thus improving overall public health outcomes.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CARDIOCITY LTD	BESTOW - Blood prEssure STOWmarket	£74,484	£52,138

Project description - provided by applicants

High blood pressure is defined as a systolic blood pressure (SBP) above 140 mmHg and/or a diastolic blood pressure (DBP) above 90 mmHg. In most countries, up to 30% of adults suffer from high blood pressure and a further 50% to 60% would be in better health if they reduced their blood pressure, by increasing physical activity, maintaining an ideal body weight and eating more fruits and vegetables. In people aged up to 50 years, both DBP and SBP are associated with cardiovascular risk; above this age, SBP is a far more important predictor. Blood pressure usually rises with age, except where salt intake is low, physical activity high, and obesity largely absent. Home Blood Pressure Monitoring (HBPM) is being increasingly used in many health systems worldwide and is well accepted by patients. A recent survey undertaken in the UK found that around 30% of patients with hypertension monitor their own blood pressure at home. In other countries, this figure stands at over 70%. To realise the full value of HBPM, however, it is important that HBPM is carried out in a way that is consistent with the current evidence base and therefore in line with the British Hypertensive Society's protocols. BESTOW is a digital health technology project that connects a cohort of patients in the community via smartphone technology with Stowhealth, the local Polyclinic in Stowmarket, with the aim of automating the home monitoring of suspected Hypertension patients. Data is collected by the patient from a free issued Blood Pressure monitor that links to a smartphone. An app on the smartphone provides reminders to use the device and stores and forwards the BP data to the Polyclinic and into the Electronic Health record. The key area for the BESTOW project is to provide a management of the data in the cloud before insertion into the Electronic Patient Record such that the data is trended and automatically reviewed prior to being inserted into the record. Working with the Polyclinic triage staff who monitor the state of the remote hypertension management patients, we aim to provide the ultimate optimisation of Blood Pressure management for both patient and practice alike. This is digital health data optimisation for increased patient empowerment and successful patient/clinician partnerships.