Technology Strategy Board
Driving Innovation

Results of competition: Smart - Round 4 - Development of prototype

Total available funding for this competition was £9.4m from the Technology Strategy Board.

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
Acorn Target Systems Ltd	Acorn advanced clay target launcher	£110,857	£49,885

Project description - provided by applicants

In 1982, Acorn Target Systems Ltd, the family engineering, design and manufacturing company, specialised within the hi-tech, electro-mechanical, automated equipment industry, leading to the development of a clay target launcher (trap) to bridge the gap between the two options then available of either a simple hand trap or a large 'club' type launcher. Applying some of the principles developed in the company's industrial machines, Acorn designed a small, lightweight target launcher and since then these reliable traps have been sold in ever-increasing numbers worldwide. Customer needs continue to evolve and it has become noticeable that alternative traps are being offered; manufactured in the Far East at very low prices, undermining Acorn's competitive position.

To meet the needs of today, Acorn proposes to design and develop a cost-effective, versatile trap that is of good quality, reliable and which should last with moderate use for 10-15 years. It will be a fully working trap, adjustable to accept the three different size clay targets in use globally and supplied with safety guards, foot switch release, extension cable, and a suitable battery – all included in a competitively priced package. This unit will provide the basis for more advanced traps incorporating additional, value added features for the more experienced and demanding target shooter.

The Acorn Trap will considerably advance the technology of traps and will be a 'world first', addressing the needs of the developing market, providing a flexible, easily handled system that realises environmental, energy and economic benefits for the user. The new system will enable Acorn to widen its market penetration and generate significant sales, both in the UK and abroad. The project will safeguard the future of the company and will support the UK economy at all levels, providing additional valuable employment and revenue.

Technology Strategy Board
Driving Innovation

Results of competition: Smart - Round 4 - Development of prototype

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
Britt Technologies Ltd	Prototype of an advanced novel bicycle pedal drive system: The PowerPedal	£186,572	£83,957

Project description - provided by applicants

We are developing a smart power pedal system that can turn any bike into an electric bike in minutes. The rechargeable pedals adjust to the gradient and the motor automatically provides power assistance for the rider. No other bike propulsion system has been built into pedals and we have substantial IP including granted patents.

Each PowerPedal houses a battery, powerful motor, gearbox, sensors and control system. As the rider pedals, the force is measured and the motor is driven to do up to a third of the work of cycling for the rider. The PowerPedal solution is low cost and scalable: it can be fitted to as many bikes as required. Unlike other retrofit kits, the pedals will fit all adult bikes, as pedal threads are universal. As they are removable the pedals work well for folding bikes and they do not inhibit the fold or cause wires and cables to get trapped. The power pedal can be replaced with an ordinary pedal in seconds, so the user can make the decision as to have the option of assistance or not before setting out.

We have conducted extensive market analysis and have the support and testimonials from hundreds of people including many key bicycle and transport industry players. In addition, the product has both significant commercial potential and environmental benefits. The government has placed low-carbon vehicles at the centre of its UK economic vision - this product is an excellent fit; cycling lowers carbon emissions; it encourages more people to cycle and keep fit; and pedals can extend the useful life of any bike and stop people from destroying their old bicycles or buying a completely new electric bike (a further saving on carbon emissions over new bike production). This project will further develop the pre-prototype PowerPedals into a simple-to-recharge fully working prototype device with additional functionality. This upgraded pre-production device will enable us to better assess the public's response which so far has been highly commended.

Results of competition: Smart - Round 4 - Development of prototype

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
Buffalo Project Ltd	BuffaloGrid Ltd	£423,518	£190,583

Project description - provided by applicants

The issue: Globally, 1.2 billion people have no access to electricity - concentrated mostly in India (400 million) and Africa (550 million). The UN identifies access to mobile communication as the biggest contributor to economic growth in developing countries as they allow access to education, markets, security and banking. However, benefits of mobile phones to off-grid communities are undermined by the difficulty in accessing electricity for charging. Globally, an estimated 650 million off-grid mobile phones users have severely limited access to reliable charging. Charging stations are few in number, especially in sparsely populated rural areas. People must travel up to 20 kilometres to charge their phones and one charge costs half a day's wages.

The opportunity: India has 280 million off-grid mobile phone subscribers, who spend £2.9bn annually on phone charging. Africa has 253 million, who spend £3.1bn annually on phone charging.

The solution: The project will prototype BuffaloGrid, a robust low-cost solar-powered unit for mobile phone charging and wireless internet access in off-grid communities. Buffalo will incorporate a simple, secure payment system, via text message, and an innovative 'missed call' method to pay for charge.

Results of competition: Smart - Round 4 - Development of prototype

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
CPack Packaging Machinery Ltd	Computer controlled servo food wrapper	£356,987	£160,644

Project description - provided by applicants

CPack Packaging Machinery Ltd, based in Burnley and founded in 1988 has over 30 years' senior management experience in the packaging machine industry and the specialist design and manufacture of packaging machine systems. As a truly international business, its packaging machinery is used by major clients in numerous locations, including the US, Canada, Japan and various states in Africa. In sectors such as pharmaceutical and seasonal food retail, delays or downtime are unacceptable and CPack has established a reputation for reliable, robust products combined with responsive service and sales support.

Whilst the company is successful, the management are aware that the current machine range is becoming dated and at the end of its development life. With the trend towards increased flexibility and through-put machines, realising productivity gains for the clients, it is essential that CPack addresses its loss of competitiveness quickly if it is to ensure its longer-term viability and increase market share.

This project will aim to design a generic, 'next generation' pre-production machine for extensive trials and testing. The machine will be using a computer-based technology program to replicate movements that have previously been obtained through mechanical means and equipment. The project will be the first of its kind using new technology that is both sophisticated enough to allow this project to take place and which has only been available at an acceptable cost during the past couple of years. The key project objective is to develop a new wrapping machine designed to meet the changing and more demanding needs of the market, that will have a life span of at least 20 years and that can be manufactured at a cost that enables CPack to compete aggressively in the international marketplace. Market research has clearly identified that the creation of such a machine will attract considerable UK and overseas interest.

Results of competition: Smart - Round 4 - Development of prototype

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
Cambivac Ltd	Development of a safe and cost effective vaccine for foot and mouth disease	£221,425	£99,641

Project description - provided by applicants

This application is for a Development of Prototype grant to undertake technology optimisation, scale up, and begin clinical testing of prototype vaccines produced utillising our expression technology which highly efficiently produces improved foot and mouth (FMD) vaccines without the use of live virus.

The application builds on a Proof of Concept (PoC) project that has shown our novel approach can synthetically produce the immunogenic structural antigen component of the FMD virus with orders of magnitude greater yields than is possible with currently marketed vaccines. Unlike these vaccines which grow and inactivate live FMD virus, our synthetic antigen, lacking genetic material, carries no risk of causing outbreaks such as the 2007 one in Pirbright in Surrey. There is little or no cross-protection across the seven FMD serotypes (A, O, C, Asia 1, Sat 1, Sat 2 and Sat 3) and a large number of subtypes. This and governmental control has resulted in dominant regional producers manufacturing vaccines matched to localised circulating field strains.

Our technology opens up out licensing opportunities in countries where vaccination is routinely used as a method of controlling FMD in addition to markets such as UK, Europe and North America where culling is preferred and vaccine stocks are only held for emergencies. The cost reduction possible with our technology is attractive to vaccine manufacturers operating in an increasingly cost-competitive environment. The technology would also open up the opportunity for export to international markets from UK manufacturers, an opportunity not possible with current technology due to high containment requirement and use of live exotic strains of FMD. FMD is one of the most economically and socially devastating animal diseases globally and our technology, combined with other integrated strategies, would have major economic and social benefit to the UK, EU and many other regions of the world.

Results of competition: Smart - Round 4 - Development of prototype

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 Cmos Sensors Limited	Development of Smart NDIR CO2 gas detector based on MEMS CMOS IR Source and detector technology of capnography applications	£267,357	£120,000

Project description - provided by applicants

Cambridge CMOS Sensors (CCS) is one of the leading providers of ultra-low power, high temperature micro-hotplate devices that is readily integrated on the same silicon platform used for microprocessor chips, thereby enabling the capabilities of producing new-generation miniature sensors for medical, consumer, industrial and automotive applications. In collaboration with University of Cambridge, and large multi-national silicon foundry partners, CCS has pioneered the production of these micro-hotplates by developing and optimising a Deep Reactive Ion Etching (DRIE) process that is used for making Micro Electromechanical System (MEMS) components.

The benefit of CCS technology is that it uses standard Complementary Metal Oxide Semiconductor (CMOS) silicon wafers, which are ideal for high volume, low-cost applications. These micro-hotplate devices have many uses, which includes miniature catalytic and resistive gas sensors, broadband mid-infrared emitters for gas sensing and spectroscopy applications, flow sensors, and smart sensors with on-chip control circuits. One of the first products developed by CCS based on micro-hotplates is the broadband mid-infrared emitter. These emitters are being used for Non-Dispersive Infrared (NDIR) gas sensing applications for greenhouse gas monitoring (such as carbon dioxide, methane, nitrogen oxide) as well as human breath analysis for medical applications (such as carbon dioxide monitoring). Furthermore, using the same platform technology CCS has also developed highly innovative matching broadband IR detectors that are used with the emitter for NDIR gas sensing application. In this project we aim to take advantage of the above unique technological advantages to develop one of the most compact carbon dioxide, (CO2) gas sensors for human breath analysis that will focus on enabling low-cost capnography applications but without compromising on accuracy.

Technology Strategy Board
Driving Innovation

Results of competition: Smart - Round 4 - Development of prototype

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 Nanosystems Limited	High value graphene nanoplatalets from microwave plasma system	£541,713	£243,770
Project description - provided by applicants			
Cambridge Nanosystems aims to become the leading supplier of graphene flakes suitable for a wide range of industries. The company has developed a novel process for the continuous synthesis of graphene from microwave plasma. Unlike existing methods this process can be easily scaled up while maintaining extremely low capital and operating costs. This is because our system directly converts natural gas with extremely high yield and already runs at a kg/h scale. No chemicals or catalyst are required. Together these features give an unparalleled approached for graphene production.			

Results of competition: Smart - Round 4 - Development of prototype

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
Chiaro Technology Ltd	CHIARO: New technology for personal wellness	£550,887	£247,899

Project description - provided by applicants

There are parts of our bodies that we don't talk about much, yet are really important for our personal wellness. At Chiaro (which means to be open and candid), we aim to develop technology to enable women to take control of their personal wellness. Over one third of women in the UK will suffer at some point from the physical problems caused by damaged pelvic floor muscles. These muscles attach to the pelvis and act as a sling to hold up the reproductive organs as well as playing an important role in core stability. Although more intimate and hidden than most muscles, they are essentially the same: they need to be looked after and general fitness is important (Kegel exercises). However, they can easily become damaged through too much sport, putting on weight or pregnancy and childbirth. This can, in turn, impact on many different aspects of a woman's overall wellbeing, ranging from her confidence to physical and sexual problems.

Our project aims to develop a new product to help women learn how to exercise better (as a lot of women get it wrong) and to understand their progress in order to improve overall wellness. We believe there is an unprecedented opportunity right now to push the boundaries on this area of women's personal wellness which has received little attention but is so important to women around the world.

Results of competition: Smart - Round 4 - Development of prototype

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
Chronos Technology Limited	Chronos - RETINA - Remote element timing and intra-network analysis	£249,267	£112,170

Project description - provided by applicants

The RETINA project addresses one of the most significant technological challenges resulting from the evolution to 4G mobile networks. In order for evolving 4G networks to operate efficiently and deliver a step-change in user experience, the transport of accurate time (to within 500 nanoseconds) as well as stable timing will be absolutely critical, right to the edge of the network at the macro cell sites as well as 'Small Cell' sites.

There are two technologies that are capable of delivering time and timing to the edge of a telecom network. These are Precision Time Protocol (PTP), now well standardised from within the ITU, and the Global Positioning System (GPS). Both have significant vulnerabilities. Time via PTP is degraded by variations in the network path and architecture, and GPS time is susceptible to Jamming and Spoofing. RETINA will develop a pre-production prototype small form factor pluggable (SFP) Assisted GPS (pGPS) to use in field trials to provide remote time stamps for network delay timing analysis in 4G networks. The pGPS unit will be able to provide GPS time in semi indoor locations assisted with remote Ephemeris data communicated in the PTP overhead. This in turn will provide GPS time into an SFP PTP boundary clock (pBC) at a macro base station or small cell site in a mobile network. The time stamped return PTP packets will be analysed with industry standard metrics by a software mediation application in the core of the network which must also be developed within RETINA. The overall system once developed will be run in prototype mode for six months within the project to test carrier-class reliability for possible deployment in national 4G mobile networks. Being first to market with this capability offers significant global sales potential with the knock-on benefits to UK PLC.

Technology Strategy Board
Driving Innovation

Results of competition: Smart - Round 4 - Development of prototype

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
CopyCopy Ltd	CopyCopy: Copy everything, paste anywhere, save forever. Set your data free!	£167,961	£75,582
Project description - provided by applicants			
CopyCopy will allow you to copy anything on one device and paste it on any computer or smartphone, freeing you from cables or emailing yourself information. Anything you have copied is saved in an online clipboard where it can be accessed , organised and repasted at any time on any device. Just CopyCopy any data, and it will be simple to retrieve and use anywhere.			

Technology Strategy Board
Driving Innovation

Results of competition: Smart - Round 4 - Development of prototype

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
Elderberry Post Ltd	Elderberry Platform Prototype	£479,898	£215,954
Project description - provided by applicants			
Online platform that connects the generations through play and learning.			

Results of competition: Smart - Round 4 - Development of prototype

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
Elstat Electronics Limited	Zeus	£675,987	£236,595

Project description - provided by applicants

Elstat is the leading provider of Energy Management Systems (EMS) for beverage-cooling equipment globally. Its innovative solution was developed and patented in collaboration with The Coca Cola Company. It has been embedded in various forms into over 4.5 million units over the last six years, making cumulative savings of over 14.9B kWh, worth approximately £1.6bn ($2.3bn) for its users globally.

Specific details of the project's innovations are limited due to market/IPR sensitivity. However, the project will produce a number of innovation 'firsts' that will seed several patent submissions. These are based upon truly first-to-market technologies and unique approaches to product, environment and device monitoring.

The Zeus project will deliver technology that will initially extend the current market for established products but, more importantly, will provide the foundation for an innovative, technology-driven products range that maintains Elstat as the leading innovator within its market sector(s). Each phase of the project extends the benefits of energy saving initially into existing beverage coolers and ultimately integrating into much wider systems, controls and potentially social environments. The project will produce revenue savings technology throughout the supply chain, complemented by improved device management and novel market intelligence capabilities.

Results of competition: Smart - Round 4 - Development of prototype

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
Eye Tracking Analysts Ltd	Calibration Free Eye-Tracking	£96,698	£43,514

Project description - provided by applicants

The aim of the Calibration Free Eye-Tracking project is to produce video-camera-based applications that track a user's eye-gaze as s/he interacts with a computerised display. The system involves the use of a small video camera mounted below the display. The system will then detect the user's face in the video image and track his/her eye-gaze trajectory over time. The eye-gaze trajectory is then intersected with the extents of the display screen to determine the user's point of regard on the display. Point of regard determinations allow eye-gaze to be used as an input mechanism for computer systems and gives insights into what the user is looking at and not looking at on the display.

Existing eye tracking systems suffer from serious usability problems. The main usability problem is that current commercial eye-tracking systems that offer precision eye-tracking require users to undergo a system calibration procedure. Calibration is used to map the 2D coordinates of the user's eyes within the video image to the extents of the display and allows the eye tracking system to determine the user's point of regard on the display. A typical calibration procedure lasts for 30 seconds and involves the user following a moving token with his/her eyes as it traverses the display. Once the eye-tracker is calibrated, the user must remain virtually still when using the system. Movement beyond a limited tolerance level will result in the loss of the eye-gaze-to-screen mapping and necessitate a repeat of the calibration process. Eye Tracking Analysts Ltd has developed a calibration-free eye-tracking system for precision eye tracking.

With our system, there is no need for a calibration process and users can move as freely as they like; they can even leave the computer display and return later without adversely affecting eye-tracking performance. In this way, our eye-tracking system overcomes the major usability obstacle to the adoption of eye-tracking as a natural user interface method.

Results of competition: Smart - Round 4 - Development of prototype

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
Four04 Packaging Ltd	A 'Fresh Solution' to shelf life extension	£559,654	£250,000

Project description - provided by applicants

Food waste is an issue of global significance, affecting food security and environmental sustainability with about one third of all food produced, equivalent to 1.3 billion tonnes, wasted in the food production and consumption systems. Within the UK post-production supply-chain, it is estimated that 15 million tonnes (Mt) of food and drink waste is created per annum, with 7.2Mt/year generated specifically by households. Approximately 60% of household food waste arises from products 'not used in time' with a value of nearly £6.7bn. The majority of this is made up of perishable/short shelf life products, with Tesco recently quoting that an estimated 68% of all salad grown for bagged salads ends up being wasted, with 35% of that waste occurring in the home.

'Fresh Solutions', proposed by Four04 Packaging Ltd, offers a unique approach to the packaging of perishable food by effectively controlling the detrimental effect of condensation, thermal shock and the respiration rate of fresh produce which contribute to the build-up of moisture in the packs and mould/bacterial growth. The approach is based on the use of an innovative bio-degradable and fully compostable film which allows the moisture vapour transmission rate to be controlled and a novel, highly accurate and consistent laser perforation system which creates optimum atmospheric conditions within the packaging. The result is the potential to increase the shelf life of fresh produce by 30% - 100% over current packaging techniques.

With support from the Technology Strategy Board, Four04 aims to conduct a full-scale market evaluation of the Fresh Solutions approach across an extensive range of fresh produce including salads across each stage of the supply chain. If successful, the technique could have a significant impact on preventing product deterioration and prolonging shelf life, with the potential to address one of the most prolific challenges facing the food sector.

Results of competition: Smart - Round 4 - Development of prototype

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
Hodos Media	Fleetfoot	£410,660	£184,797

Project description - provided by applicants

Fleetfoot is a driver engagement and behaviour change tool for fleet telematics companies. We use game mechanics and real world rewards to motivate and engage the driver.

When designed correctly, gamification has proven to be very successful in engaging people and motivating them to change behaviours, develop skills or solve problems. Leveraging some of the features used in real games, gamification can turn many other types of activities into games. Gamification is currently being applied to customer engagement, employee performance, training and education, innovation management, personal development, sustainability, health and wellness. Assigning points to activities, advancing through levels, using badges as status-markers, and integrating surprise and delight are ways to achieve wanted behaviours (Mallick, Wharton School, 2013). Business (Zicherman, Gigaom, 2013) and academic research (Hamari, Sarsa et al. 2013) proves this application of technology is not a ‘fad’ and really works.

Technology Strategy Board
Driving Innovation

Results of competition: Smart - Round 4 - Development of prototype

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
HW Communications Limited	Detection, location, characterisation and tracking of faults in aircraft wiring	£322,056	£144,925

Project description - provided by applicants

Modern aircraft contain significant amounts of cabling linking flight critical components and systems all over the airframe. Current maintenance technology and techniques do not allow flight operators and maintainers to accurately locate and classify faults to decide on a rectification or a monitoring strategy. Time is spent removing panels to look for and assess logged faults, chasing intermittent faults or searching for faults that may be causing reduced performance due to damage but are not showing up as hard/permanent faults.

The aim of this project is twofold; firstly to act as a fault detection system to determine where a wiring fault is located and what type of failure has occurred. This will enable a repair team to quickly find the fault within the airframe and undertake a repair. Secondly, the system is intended to allow the aircraft operator to monitor emergent or existing faults to decide the most appropriate time for intervention, for example, at the next scheduled aircraft maintenance period - critically moving from reactive to preventative maintenance of the aircraft Electrical Wiring Interconnect System (EWIS).

Results of competition: Smart - Round 4 - Development of prototype

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
Inclusive Technology Limited	LAPS (Learning analytics for the profound and multiple learning disabilities (PMLD) Sector)	£511,670	£228,541

Project description - provided by applicants

The key aim of the LAPS (Learning Analytics for the PMLD Sector) Project is to demonstrate that it is possible to significantly improve the learning effectiveness of content that is delivered to learners with Profound and Multiple Learning Disabilities (PMLD). The use of learning analytics to improve the learner experience in standard education has increasing importance. There is no equivalent approach for people who suffer PMLD. Novel electronic delivery coupled with activity-derived analytics for each individual learner provides a first-to-market opportunity.

The innovation in the LAPS Project is based upon the creation of the new: a) Set of data analytics that will be used to interpret the raw information obtained from the learning activities. Standard analytics techniques will be used but the interpretation will be based upon detailed knowledge of low incidence accessibility learning activities and achievements; b) Intelligently sequenced learning for low incidence accessibility-oriented content, based upon insights that have been gained from the learning analytics obtained from the use of prior learning activities. There is no agreed content pedagogy to meet the needs of those suffering PMLD and there is no way to measure the learning effectiveness of that content. If learning analytics can be acquired, suitable recommendations for the design and use of such content can be established. The significant societal impacts that will accrue to users from this new approach are: a) Personalised Learning Activities where content is tailored to the specific learning objectives and needs of the individual learner. This will enable the learner to receive the best learning experience available at the point and time of delivery; and b) Personalised Learning Reports that allow teachers, guardians and content designers to create and support more focused and timely learning activities that can be tuned at the point of delivery to match the needs of each individual learner.

Results of competition: Smart - Round 4 - Development of prototype

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
IQD Frequency Products Ltd	IQD: A development of prototype high frequency oven-controlled crystal oscillator with very low phase noise	£522,463	£235,108

Project description - provided by applicants

Crystal oscillators provide stable frequency sources that the world of electronics relies upon. Oven-controlled crystal oscillators (OCXOs) are the most sophisticated and stable types of quartz oscillators. They are used in applications such as telecommunication networks, scientific measurement and space/aerospace systems. OCXOs have a market value of approximately $400m with growth predicted for the next five years.

IQD Frequency Products Limited is a leading manufacturer of quartz-based frequency devices. We have identified two innovations that will enable us to produce a high frequency OCXO with very low phase noise. We are aiming at a step change in performance over the existing products on the market. This will be a world-leading product in a highly competitive global market. Our key objectives in the project are to develop a prototype test methodology that will optimise our manufacturing process and to produce a working prototype of a new design high frequency OCXO with very low phase noise.

Results of competition: Smart - Round 4 - Development of prototype

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
Landfill Systems Maintenance Ltd	Enhanced energy generation from landfill gas and leachate ammonia using new Stirling technology	£276,242	£124,308
Project description - provided by applicants			
This 22-month project will demonstrate the effective use of landfill ammonia and landfill methane in the production of small-scale power generation.			

Results of competition: Smart - Round 4 - Development of prototype

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
MDF Recovery Limited	Closed-loop recycling of MDF - prototype development.	£527,401	£237,330

Project description - provided by applicants

MDF Recovery (MDFR) has developed a novel technology that allows for the recycling of waste medium density fibreboard (MDF). Around one million tons of MDF are used every year in the UK and yet none is recycled. At best, waste MDF is shredded with other wood types and burnt for energy recovery. This causes operational issues within the wood recycling sector as MDF generates a disproportionately high level of dust when processed. Much is still sent to landfill.

MDFR's innovative approach is timely with a move towards a circular economy gathering pace. MDFR, together with its supply chain partners, will introduce systems for the collection, segregation and re-processing of a costly and problematic waste stream for the UK economy. Closed loop recycling will be introduced for UK retailers that wish to recycle their waste furniture and shop fittings into recycled content MDF board and thermal insulation products. These materials/products will then be re-integrated into stores, closing the loop. This project will involve the construction of a small-scale prototype fibre recovery plant, the successful demonstration of which will complete the technology validation phase of MDFR's commercialisation process.

Results of competition: Smart - Round 4 - Development of prototype

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
Micro Nav Limited	Micro Nav Ltd - Pilot training: Simulated air traffic control environment for flight simulation training devices	£811,184	£250,000

Project description - provided by applicants

What is the need? The lack of realistic simulated other aircraft and air traffic control (ATC) communications in flight simulators has been called 'the missing link' in pilot training. As a result, the most advanced training devices simulating today's most sophisticated aircraft still lack fundamental realism in environment and communications. This project will develop a fundamentally new major sub-system within flight simulation training devices (FSTDs), helping to keep the UK at the forefront of simulator technical development and more widely, the flight training market.

Leap in flight simulator performance
This technology will create a step-change in flight simulator fidelity and application, providing pilots, at all levels of training, with a more realistic busy airspace environment outside the cockpit and more representative pilot communication workloads.

Regulatory backing
This system will meet guidance first introduced by the International Civil Aviation Organisation (ICAO), and over time will become a regulatory requirement in flight simulation training devices, thus generating industry-wide global commercial demand. An enhanced ATC environment is already mandated by the European Aviation Safety Agency (EASA) for flight simulators used for the Multi-Crew Pilot Licence.

Enhancing worldwide aviation safety
Human factors, and in particular, communications, are recognised as areas having contributed to many aircraft incidents and accidents. This project will further enhance both civil and military pilot training, delivering enhanced aviation safety worldwide.

Micro Nav Ltd.
Micro Nav Ltd, based in Bournemouth UK, is a highly specialised developer and supplier of Simulated Air Traffic Control (ATC) Systems. The company is the proud recipient of the Queen's Award for Enterprise (2010) for its performance in international trade and has been ranked in the Sunday Times HSBC Tech Track 100 (2010) and International Track (2011) league tables.

Technology Strategy Board
Driving Innovation

Results of competition: Smart - Round 4 - Development of prototype

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
Neutrino concepts Limited	Search	£350,465	£157,700
Project description - provided by applicants			
Businesses hold valuable data but are unable to access it as their business intelligence systems aren't sophisticated enough to find, recognise and compile the data into something meaningful for users. In particular, there is a difficulty with languages of different data sources. Our project 'Search' will create a new user experience by significantly improving NeutrinoBI's natural language search to provide better results by developing 'semantic processing'. In effect this means synonym interpretation or the relating of various word forms to their core concepts, which bridges the gap between text and meaning. Our product will also include spelling correction capability, identifying closest logical alternatives to misspelt words. We are seeking a 'Development of prototype' grant to accelerate our product development for 'Search', which will enable businesses to gain greater information about their business faster.			

Results of competition: Smart - Round 4 - Development of prototype

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
Ostara Biomedical Limited	"Red-NLAM" - reducing numbers in laboratory animal models (through improved artificial reproduction rates)	£719,738	£250,000

Project description - provided by applicants

In the UK alone, 1.8 million mice were used in breeding programmes for production of transgenic mice in 2012, according to Home Office figures (about 48% of all animals used in research). The creation of genetically modified animals, primarily mice and rats, has revolutionised our understanding of disease processes in animal models. Transgenic biotechnologies utilise large numbers of animals: females and males to generate embryos for genetic manipulation, females to provide a host uterus to support the development of embryos, and infertile males to induce 'pseudopregnancy' in recipient females. Pseudopregnancy is necessary for the uterus to become receptive to transplanted embryos and is achieved by mating foster females with a vasectomised (infertile) male, whose seminal fluid contains an active array of proteins and other factors.

Whilst we can't replace females for superovulation and pregnancy, we have demonstrated in a previous 'Proof of concept' study that vasectomised males can be replaced altogether. The objective of this project is the development of a prototype vaginal pessary system that supersedes the use of vasectomised males in the induction of pseudopregnancy and enhances transgenic embryo implantation rates in the host mothers. These novel pessaries contain substances that have been identified in mouse seminal fluid that mimic the beneficial effects of semen without the need for vasectomised males or the large numbers of female mice needed to produce enough pseudopregnant mice.

Results of competition: Smart - Round 4 - Development of prototype

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
Oval Medical Technologies	Oval Medical - Primary drug container foil feed, seal and finish process for aseptic enviroment.	£507,236	£228,256

Project description - provided by applicants

Oval Medical Technologies Ltd design, develop and aim to manufacture auto injectors to support patients self administer injection of drug for various therapy treatments. Multiple drugs are already available to patients for the treatment of various conditions such as rheumatoid arthritis, multiple sclerosis, and cancer. Auto injectors have been available since the 1980s, predominantly as reusable devices, and since 2006 more single-use disposable applications have emerged. However, today's technology of auto injectors is based around the standard 1ml glass syringe which was developed in the 1950s and certainly not developed for use in auto injectors. This leads to unreliability of function, provides limitation for drug stability and constrains auto injector design for ease of use and compliance by the patient.

Oval Medical has developed a novel drug container specifically designed for use in an auto injector with optimal performance for patient use, reliability and improved drug stability. The novel container has been design in plastic, allowing the moulding of specific shapes and form to optimise the auto injector design and all drug contact materials are manufactured from inert plastics allowing optimal drug stability. Oval has shown in four user studies that devices based on this novel patented technology are better for patients with significantly fewer use errors than marketed devices and are preferred by patients. The novel drug container closure system consists of a polyethylene cup seal and welded aluminium foil. Whilst the process of foiling plastic containers is widely used, it is novel in an aseptic parenteral drug filling environment. This project seeks to resolve mechanical and environmental condition and control issues to bring a commercially viable process to market through the realisation of a prototype foiling process capable of installation in an aseptic environment.

Results of competition: Smart - Round 4 - Development of prototype

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
Paperback Collection and Recycling Ltd	WAFER- Waste (and technology) agnostic fuel for energy recovery	£683,523	£250,000

Project description - provided by applicants

Solid recovered fuels (SRF) are an alternative fuel derived mainly from C&I wastes. They are an effective solution to reducing landfilled waste and generating energy, two major UK government priorities. The UK currently sends ~60% of its waste to landfill but due to new EU regulations more must be done to increase reuse, recycling and recovery or the UK could face annual fines of £182m per annum. The UK is facing numerous challenges in developing secure and sustainable energy with volatile gas and oil prices, aging nuclear capacity and rising demand, at a time when the UK must reduce CO2 emissions and adopt renewable energy.

Energy from waste (EfW) can overcome these challenges and deliver up to 20% of the UK's Energy needs. Current SRFs are low value (>20MJ/kg), inconsistent (fluctuating emissions and energy output) and low density. The EfW infrastructure in the UK requires better SRFs to remain profitable, reduce operational costs of emissions and plant shutdowns and exploit the benefits of producing EfW such as a large supply (~26Mtonnes of potential SRF available UK) and contribution to renewable energy targets (20% by 2020).

Paperback Collection and Recycling (PCR) aims to develop a novel, high value, consistent and energy dense SRF that will deliver a valuable fuel to the EfW market. PCR will develop both a suite of novel, market desired prototype SRFs and a licensable processing methodology for the target market which consists of mid-level EfW facilities and materials recovery facilities. The results will enable the target market to provide stable, renewable energy which can contribute to lower emissions and decentralisation. PCR's novel SRFs and process methodology will be developed over an 18-month development of prototype project and will enter the waste treatment market (worth ~£1.68bn) in February 2016. The project will contribute to revolutionising SRFs from a waste treatment method to a commoditised fuel comparable to coal (calorific value >20MJ/kg with 1/3 less CO2 emissions).

Technology Strategy Board
Driving Innovation

Results of competition: Smart - Round 4 - Development of prototype

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
Paraytec Limited	Novel UV-Vis imaging system for flowthrough dissolution of pharmaceutical tablet formulations	£217,452	£97,853

Project description - provided by applicants

The driver for this project is the need for technical innovation, as identified by users in the pharmaceutical industry, for imaging dissolution of complex tablet formulations.

This project will develop the prototype of a new analytical instrument to allow rapid measurement and characterisation of how complex formulations release their active components in biological media.

Results of competition: Smart - Round 4 - Development of prototype

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
Power Gems Ltd	High efficiency silicon carbide power supply	£224,837	£101,176

Project description - provided by applicants

Power Gems is an established developer and supplier of high power lamp ballasts used in entertainment and event Lighting. Its global reputation for delivering high quality, innovative solutions extends to end customers including the major film and TV studios in Hollywood. Following the successful conclusion of a proof of concept project, Power Gems now intends to deliver a development of prototype project. This will produce a market prototype demonstrating a radical new approach to the design of the switch mode power supplies used in driving very high output DC discharge lamps (> 1kW).

Power Gems has invented a novel design concept which should result in a saving of at least 40% in both weight and volume over conventional solutions and is also expected to provide up to a 30% increase in energy efficiency. The design is very demanding of high power switch devices and it is only the recent release of components based on silicon carbide technology that has enabled the company to consider a practical implementation of the concept. Whilst the design makes particular demands of the MOSFET devices it enables magnetic components to be used that are a fraction of the size and cost of those currently required. Since common applications for high power lighting are either high on gantries or in location filming, the resulting quantum leap in portability will be of significant commercial advantage. Powering DC discharge lamps is a very specialist area. Any supply must be capable of typically providing, and controlling, a 160 Amp drive current coupled with a 40,000 Volt ‘ignition’ pulse to strike the discharge. Unfortunately, as well as offering unique characteristics, Silicon Carbide also has some serious design drawbacks, and this represents a technically very challenging project.

The eventual deliverable will be a modular prototype design, bridging three distinct markets, that establishes significant reductions in size, weight and cost over current market products.

Results of competition: Smart - Round 4 - Development of prototype

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
Rosslyn Analytics Limited	Karachi	£474,940	£213,723

Project description - provided by applicants

The key aim of the ASTERI project is to demonstrate the automated creation of a Star Schema relational data warehouse representation of the database for an On-line Transaction Processing (OLTP) system. Database structures for OLTP systems are optimised for data storage and so are poorly structured for obtaining analytics-oriented information. Star Schema-based solutions are optimised for data retrieval i.e. the creation of analytics. Ease of access to analytics by a wide range of users is of increasing commercial importance.

The innovation in the ASTERI project is based upon the application of: a) machine learning techniques to produce the transformation from the original OLTP database format to the relational database form used in the data warehouse. The data engineer is then used to confirm a transformation as opposed to its creation; b) event-driven visualisation using HTML5 based data presentation. This includes addressing efficient and responsive visualization of hundreds of thousands of data points. The associated reports will then reflect the latest data available. While the significance of Star Schema to data warehouse representation has been well known for the past 20 years, it is only in the past five years that research into the use of 'machine learning' to create a Star Schema representation has shown the potential of the approach.

With these new capabilities Rosslyn Analytics Limited (RAL) can substantially reduce the effort and cost to engage new customers and can rapidly create new sector database schemas enabling it to expand into new markets and gain market share with smaller organisations. RAL also intends to leverage the new tools to expand its emerging OEM sales to major global data analysis service providers such as Xerox, Pitney Bowes and Qlikview to be used as their data analysis service engine. In addition, the automated tools will permit increased sales by development partners who use the RAL RAPid toolset to deliver value for their own clients.

Results of competition: Smart - Round 4 - Development of prototype

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
Samos Analytics	Handpick for fashion - Implementing narrative search with an Attribute-Value ONtology (AVON) to enable sequential, natural language product navigation on any device	£553,583	£249,112

Project description - provided by applicants

When it comes to shopping online for nuanced products, such as fashion, shoppers are often unable to articulate and discover what they seek - especially on mobile, where browsing many products at once is tedious or impossible. Most major fashion retailers' mobile websites are simply shrunken desktop sites. However, desktop search-and-filter tools frustrate shoppers when applied on mobile - as small screens curtail shoppers' ability to quickly browse. Total online UK fashion sales are £7.1bn, growing at 16% YoY (Mintel 2013). Although Mobile accounts for 23% of this total spend, the visit-to-purchase conversion rate on mobile is half that compared to Desktop (IMRG 2013). Low conversion rates on mobile cost UK fashion retailers £1.6bn last year in missed sales (Verdict, 2013).

To close this conversion rate gap, we are developing Handpick - a mobile sales platform with sequential, natural language search to enable low-latency, non-historical personalisation in real-time. We call the approach Narrative Search: whenever shoppers notice something they like, they can find more items like it, but better, in one or more specific ways (e.g. more casual, more appropriate for work). Narrative Search relies on AVON (Attribute-Value ONtology), our learning engine that links discrete product attributes with scalar 'shopper values' e.g. casual, work-appropriate, elegant, smart.

Sponsored in part by a Technologu Strategy Board proof of concept grant, we have already shown that Narrative Search, as compared to conventional search-and-filter tools, significantly increases shopper satisfaction and decreases product exchanges on a major retailer's site. Handpick mobile will complete the automation of AVON for all fashion categories and enable rapid deployment for any retailer. The

Handpick/AVON infrastructure is extensible and can be used in the future to support mobile retail in other complex categories such as real estate, wine and furniture.

Results of competition: Smart - Round 4 - Development of prototype

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
Ship & Duck Limited	Advanced Technological Platform solving distribution in the licensing industry	£583,952	£250,000

Project description - provided by applicants

Ship & Duck wishes to develop an extension to its licensing marketplace, currently facilitating product development through the connection of brand owners, designers and licensees (manufacturers) to encompass distribution, thus providing a comprehensive solution from partner discovery, to crowdsourcing of novel product concepts, product development and ultimately access to and exposure to retailers ('buyers'). The licensing industry is widely considered as a fragmented market (many potential partners for each product category, and for each territory) dominated by a few massive actors (Disney, Hollywood Studios…). As a result, this industry is hard to navigate for most brand owners, products often lack innovation (with widespread 'brand slapping') and access to consumers via retail is extremely complex.

Ship & Duck's mission is to solve the pain points of this industry by connecting all licensing professionals (brand owners, designers, licensees) through a unique digital marketplace, which has been developed. We wish to extend this marketplace to retailers to cover the whole value chain ('buyers showroom'), providing tremendous value to licensing professionals (more distribution options, assessment of market opportunity of new products even before launch) and buyers (access to exclusive products, no intermediaries, etc). The buyers showroom will allow for intelligent matchmaking and dynamic pricing from real-time telemetry and analytics-driven, predictive and stochastic algorithm to optimize value for the partners.

The development of the buyers showroom will lower the barriers to entry to this industry, allowing new companies, currently not able or not even considering licensing options because of the inefficiencies of this market, to start implementing brand extension strategies with new licensing partners, creating more choice for the end user, increasing manufacturing, creating jobs and generating business.

Results of competition: Smart - Round 4 - Development of prototype

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
Supply Design Limited	Supply Design high efficiency, high density DC power demonstrator	£373,645	£168,140

Project description - provided by applicants

This project aims to deliver the highest efficiency electric vehicle (EV) charging platform in the market. Providing the most efficient solution to maximise electricity utilisation and miles per kW/h consumed. By 2025 it is expected worldwide EV will add an additional 5000GW of demand on the grid; 130GW in the UK. Supply Design (SD) is focused on ultra-efficiency DC fast charging technology, using our innovation in three-phase AC to DC power to offer the customer a clear competitive advantage. EV rapid charging is one of the key performance enablers for wide-spread adoption of battery electric vehicles (BEV).

SD is offering suppliers the opportunity to create the most efficient and smallest EV charger in the market. We have identified opportunities in applications like EV charging, where our invention can save energy, cut CO2 emissions and cut costs. We are on target to produce the most efficient DC EV rapid charger in the world. By the end of this project we should be able to demonstrate DC rapid charging that reduces charging losses by >50%. This in turn decreases energy consumption over the next leading competitor by about 10%. The product size, weight and cost advantage in our low component count design will also add to our appeal.

The target of this project is to get SD into a new market and build our reputation within the supply chain with demonstration hardware that will create partnerships to take our technology to market.

Results of competition: Smart - Round 4 - Development of prototype

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
Sustainable Marine Energy Limited	Tidal energy converter enabling technology: Removable subsea rock anchor and subsea drill rig	£552,907	£248,808

Project description - provided by applicants

The UK has legally binding targets for the reduction in CO2 by 2020. A key way of achieving this is through the deployment of renewable energy. A promising technology is Tidal Energy Converters (TEC) that use fast moving tidal streams to generate electricity using subsea turbines. Deployment of these is expensive as they are typically pinned or held to the sea bed through gravity anchors. Sustainable Marine Energy Limited (SME) is developing a buoyant TEC platform that allows TECs to be operating in the fastest part of the stream. A key enabling technology for this concept is the use of removable ground anchors to which the buoyant device is tethered.

This project aims to develop and prove a new removable rock anchor technology and accompanying innovative drilling rig that is capable of fast deployment, using small work boats at a fraction of the cost of traditional technologies. Innovation lies within two key areas - the design of the removable anchor and the way in which loads are distributed into the host rock formations and where the deployment time is kept to a minimum and the development of a subsea drilling rig capable of deploying the new anchor quickly and effectively in fast stream conditions.

The overall project cost is just over £550k and a grant of just under £250k is requested from the Technology Strategy Board. The key objectives are to design and manufacture a new rock anchor based on patented technology, prove the anchor and drilling capabilities on dry land, controlled subsurface conditions and a sea trial. Finally, the aim is to have the anchor solution certified by DNV, the international accreditation body. The enabling anchor technology can be applied across many offshore renewable technologies (tidal, wave, buoyant offshore wind platforms, etc) and is also applicable in the oil and gas industry and other offshore industries.

Results of competition: Smart - Round 4 - Development of prototype

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
The Salford Valve Company Ltd	Development of next generation eco-valve for aerosols	£498,548	£224,346

Project description - provided by applicants

Liquefied petroleum gas (LPG) is the most popular aerosol propellant c.84% of global market, however, it is unsustainable as it is extracted from depleting, non-renewable resources (natural gas and oil); contributes substantially to VOC emissions; and it is highly explosive and flammable and thus surrounded by H&S regulations which drive up the cost of all associated activities. Compressed inert gas (air or nitrogen) is an alternative aerosol propellant offering major advantages over LPGs: renewable resource,non-explosive/flammable, H&S regulations no longer apply, therefore lower life cycle cost. However, its use is limited when used in conjunction with a standard aerosol valve: the pressure in the can drops as the product is used and thus spray characteristics deteriorate (unacceptable variations in particle size and discharge flow rates).

To address this issue, The Salford Valve Company has developed and patented, at lab scale, a unique suite of aerosol valves - 'Eco-valve' - which enable a standard aerosol to function effectively using a compressed gas propellant without the need for specialist technology. Advantages include: excellent spray characteristics over lifecycle of the can; step change in performance compared to current technology; standard filling technique and components and can be fitted to a standard can; suitable for all applications and industry sectors including metered and continuous flow. The company now seek to advance three 'Eco-valve' types from bench top to pre-production prototype (applicable to c.90% of aerosol applications): super single casket, metered and low-loss. Scale up will involve further design and development of the valves and pre-production moulds to ensure the valves can be mass produced at levels demanded by the global market.

With the global aerosol valve market already a $617m industry and with significant policy drivers for environmentally friendly and safe consumer products, the development of the Eco-valve represents a major business opportunity, with market entry expected in Q4 2015.

Technology Strategy Board
Driving Innovation

Results of competition: Smart - Round 4 - Development of prototype

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
Vivo Smart Medical Devices Limited	Limb Glider - intelligent rehabilitation device	£532,690	£239,709

Project description - provided by applicants

Rehabilitation describes a physio-therapeutic treatment patients undertake following orthopaedic surgery (for example, total knee replacement), stroke, musculoskeletal disorders and trauma. These age-related disabilities increase expenditure on health and social care; treating a significant growing, ageing population with chronic conditions. The requirement for rehabilitation is dramatically increasing; in the UK there are over three million rehabilitation consultations annually. However, effective rehabilitation in hospitals is costly for the NHS and inconsistent/inconvenient for the patient due to the current rehabilitation pathway, leading to poor health outcomes.

This project will develop 'Limb Glider' an intelligent rehabilitation device with patented Assisted Controlled Active Motion, an advanced way to deliver home rehabilitation for lower and upper limbs that critically improves outcomes for patients, enabling them to remain active and independent, whilst reducing the cost and resource burden on the NHS. The device provides remote monitoring/management capability through a cloud-based data sharing system to complement current rehabilitation pathways.

The project will develop the design to incorporate Active-Passive Bilateral therapy to help regain motor function and neurological connections in the brain, helping prevent limb paralysis and pain. Clinical trials will test the prototype and integrate the technology and clinical scientific research in biomechanical, stroke and neurology to combine musculoskeletal therapy regimes into the Limb Glider technology algorithms and special sensors. This enables clinicians to pre-set and remotely monitor m-Health therapy tailored to individuals and patients to engage with their rehabilitation at home, improving outcomes. Clinical utility and efficacy will be tested with users in knee and stroke rehabilitation. Output of the project will be a device/system to deliver more consistent, complete, cost effective rehabilitation to patients globally.