

Results of competition: Smart - 2014-15 - Round 1 - Proof of market

Total available funding for this competition was £9.093m 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
Bath Labs Limited	Bath Labs Ltd: A study into the commercial viability of a large-scale, distributed, rapidly deployable 'smart appliance' energy storage solution to improve the cost-effectiveness of renewable energy generation	£41,640	£24,984
Project description - provided by applicants			
This project is a study into the commercial viability of a new approach to storage of energy in a distributed manner across the UK, to enable early advantage to be taken of 'smart grid' and 'smart appliance' technology. This will enable smoothing of demand in real time to match the peaks and troughs of renewable energy generation			

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Food Dudes Health Limited	Photographic dietary assessment app for children	£41,577	£24,945
Project description - provided by applicants			
<p>Some of the physiological processes that lead to diet-related diseases such as diabetes, obesity and cardiovascular disease in adulthood have their antecedents in childhood (Livingstone). Overweight and obesity are a direct consequence of eating and drinking more calories and using too few. With over 30% of the 10-11 years old being overweight, the need to accurately measure food intake in children becomes imperative. However, assessing the diets of children is even more challenging than assessing diets of adults, mainly due to difficulties in accurate reporting. Food-related ill health is responsible for ~10% of morbidity and mortality in the UK, 10% lost DALYS and costs the NHS ~£6bn annually; 92% of children consume more saturated fat than recommended, 86% too much sugar, 72% too much salt and 96% not enough fruit and vegetables (National Diet and Nutrition).</p> <p>The UK government has set the objective to see a sustained downward trend in the level of excess weight in children by 2020. FD will develop a photographic dietary assessment app to provide a simple and practical tool for children to report their dietary intake and adjust food portions based on tailored feedback. By reducing the reliance on nutritional knowledge, FD will enable children and their parents to better tailor food portions to their requirements, track progress and identify areas to be addressed. It will help children improve their diet reduce risk of food-related ill health.</p>			

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Forensic Access	DNA sampling tool	£39,323	£23,593
Project description - provided by applicants			
<p>Forensic DNA analysis has become increasingly important in many criminal trials. The collection of DNA at crime scenes is a key stage in a process that can establish a connection between the crime scene and the suspect. Swabs are typically used to sample and recover DNA both at the crime scene and from items within the laboratory. Forensic Access has identified a gap in the market for a novel sampling tool to recover DNA from a crime scene.</p>			

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Industrial Valve Machining Services Limited	Merlin - phase 2	£40,412	£24,247
Project description - provided by applicants			
<p>We seek support for the development of an in-depth market analysis and a robust market strategy for the exploitation of highly versatile, portable equipment for machining, grinding and lapping of gas safety valves to facilitate a total in situ refurbishment solution. We have 30 years experience and a proven track record in the service and repair of gas safety valves in the UK, Europe and Asia. Through our in-house research and development we have identified a gap in the market for in-situ repairs which can significantly reduce operational down time in large scale industrial facilities.</p> <p>We are seeking support to investigate a route to development for a prototype machine that has already been proven on a bespoke basis with a selection of our industrial clients. We would like to offer the market a generic tool that can allow in-situ repairs across a range of safety-critical infrastructure platforms in the oil, gas and power industries. To achieve this we need to increase the visibility of our company and expand our client base through a programme of targeted visits and attendance at key trade shows, thus we can develop a deeper understanding of the market and the requirements of our primary clients and develop our working prototypes to meet industrial need. The development of a generic repair tool is a challenging idea for our company and would be a step change for our current business, however our strong international profile means we are expertly placed to exploit the current gap in the market.</p>			

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iProof	IdentIFRAME : Identity Industry Framework for Authentication Market Evaluation	£40,575	£24,345
Project description - provided by applicants			
<p>A market study into the opportunity for a new biometric authentication technology in the highly competitive and rapidly evolving market for enterprise IT access control. The study will provide the basis for the development of an innovative system exploiting unique British technology to address a fast growing global market.</p>			

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Jaco Tooling Company Limited	Formulation and development of advanced high corrosion and wear-resistant material and manufacturing technique for tobacco shredding machine knives and wear parts	£53,838	£25,000
Project description - provided by applicants			
<p>Tobacco cutting machine knives (MK) are circular disk or conventional rectangular shape; MK & ancillaries are modular construction for ease of maintenance. The abrasiveness/corrosiveness of tobacco decreases knife sharpness, causing irregularities in quality of cut tobacco & machine blockages. MK & ancillaries have to be regularly replaced with reconditioned/new parts causing machine down times & fewer cigarettes being produced. Conventional tobacco-cutting MK & wear parts are manufactured from tool steel, stainless & mild steel. The cutting knife & ancillary parts' tool life are short, lasting from a little as 4 hrs to a maximum of 48 hrs, depending on type of tobacco.</p> <p>The study involves exploration of the tobacco-cutting machine market, investigating the manufacture of MK & ancillaries. The company hope to develop a unique powder met-based material, specifically formulated to resist corrosion/wear of cutting tobacco. This unique powder met material will be used in conjunction with a unique manufacturing method. The project aims to evaluate whether formulation of a new tobacco-resistant powder met material & new proposed method of production would provide tooling with advanced wear properties whilst enabling reduced overall manufacturing costs.</p>			

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LIG Nanowise Limited	Super-Resolution Optical Microscopes	£39,492	£23,695
Project description - provided by applicants			
<p>Optical microscopy is an important imaging technique that is used throughout scientific research. However due to the far-field diffraction limit within the visible light spectrum, existing optical microscopes are restricted to the theoretical resolution of 200 nm. This limitation therefore prevents this microscopy from being utilised in further applications, such as the study of live viruses (typically <100 nm in size) and their interactions with cells and drugs.</p> <p>Other imaging systems have been developed such as electron and fluorescence optical microscopy to overcome this theoretical resolution but they are either limited to dead viruses (electron microscopes) or relying in the interaction of fluorescent materials into viruses (thus intrusive). LIG Nanowise aims to develop the first commercially available white light microscopes at 50-100 nm resolution and confocal optical microscopes at 25-50 nm resolution, which will enable the study of living viruses and their interactions with drugs and cells. Both are unique and well beyond the current optical microscope capabilities.</p>			

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M Squared Lasers Ltd	Laser sources for real-world quantum technology applications	£41,220	£24,732
Project description - provided by applicants			
<p>Encompassing a wide range of applications, quantum technologies will be a game changer in the next decades. A variety of potential applications have been identified and are eagerly anticipated by a diverse end-user base. Given the technological potential and ground-breaking nature of the underpinning physics there will undoubtedly be many applications that have yet to be conceived, representing an exciting opportunity for the long-term growth for UK companies that can form an integrated quantum technology supply base.</p> <p>M Squared is already engaged heavily with the academic quantum technology community and is well positioned to play a key role in the establishment of such UK-based supply chains through development of novel laser sources capable of meeting the needs of the integrators and end users. The proof-of-market study will provide a formal framework for investigating and evaluating the opportunities available and generating a technology roadmap and business plan in conjunction with key collaborators and industrial partners, with whom we will actively engage.</p>			

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material communications group Ltd	Material DNA	£48,120	£25,000
Project description - provided by applicants			
Material presents a unique proposition that blends big brand thinking, bespoke data and predictive insights to provide a real time digital management platform for the talent management industry to maximise their clients' commercial value over the lifetime of their careers.			

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Matrix Magnets Limited	Developing and marketing a novel analytic instrument	£25,000	£15,000
Project description - provided by applicants			
<p>Matrix Magnets are developing a novel instrument for chemical analysis based on proprietary technology. The objective of the project is to analyze the potential markets for the new instrument in the healthcare, pharmaceutical and petrochemical sectors and to define its desirable attributes in terms of performance and operational details. The results of this market survey will help inform the design process such that an instrument is developed that appeals to prospective end-users.</p> <p>The project will involve visiting end-users in countries in Europe and the USA, including luminary scientists in world-class laboratories in industry and academia. After defining the user requirements, the new instrument will be designed, with an industrial designer employed to improve ergonomic features.</p>			

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Nano Products Limited	ZAP2TAP: solar sterilisation technology for clean safe water	£40,450	£24,270
Project description - provided by applicants			
<p>Water purification is the process of removing contaminants, suspended solids and disease-causing pathogens to produce water fit for a specific purpose. Nano Products Ltd (NANO) proposes a new approach to water purification, ZAP2TAP, a solar sterilisation technology for clean safe water. Applications include sterilisation of source water, stored harvested rainwater and greywater for drinking and food preparation (particularly in humanitarian situations / developing countries). ZAP2TAP panels will be both portable and suitable for fixed installation.</p>			

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Nebulair Technologies Limited	Research into the possibility of effective sanitisation in situ.	£41,700	£25,000
Project description - provided by applicants			
Research into the effective decontamination of spaces without the need for evacuation.			

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Orphidia Limited	PuMPED - Proving the Market of Point-ofcarE Diagnostics	£36,130	£21,678

Project description - provided by applicants

Protein biomarkers offer accurate diagnosis of a wide range of conditions but are currently only available through centralised laboratories. This makes them expensive to the healthcare system and slow to provide results, delaying the start of treatment and causing unneeded hardship for patients. Orphidia's technology replicates the process of the laboratory in one device, bringing laboratory-accuracy measurement of biomarkers to the point of care. This will improve the speed of diagnosis and provide earlier treatment to patients, increasing their rate of recovery.

We expect that Orphidia will also provide significant savings to the healthcare system itself. In this project we will improve our understanding of the market for Orphidia and the specification of a successful product. This will take the form of three activities: first we will prioritise market sectors for entry, based on the companies that are currently active in it and on emerging technologies from academia. Having identified our primary market we will invite doctors and biomarker companies to focus groups, in which we will explore how Orphidia can best accommodate their needs. Finally we will build a health economic model to calculate the benefit that our customers will derive from Orphidia. The outcomes of this project will be essential to inform further development of Orphidia's technology. They will help us to identify the markets that we should approach first and to finalise the business case of Orphidia to biomarker companies and clinicians. Based on this project we will set target specifications for our first product, to show clearly how it addresses the needs of our customers.

Successful delivery of this project will help us to unlock investment of £200k to support prototype development and a follow-up of £2m for production of the first Orphidia product.

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pECM Systems Ltd	Modularised platform technology of twin-axis PECM machine tool	£45,023	£25,000
Project description - provided by applicants			
<p>Pulsed Electrochemical Machining (pECM) uses the principles of ECM but pulsed voltage/current, providing: lower current, improving energy usage; lower material removal rate & better surface finish vastly improved dimensional accuracy machining hard/high strength, temperature-resistant materials; smaller machining gaps between cathode & workpiece to produce finer detail; follows geometry of the cathode reducing cathode reshaping/regeneration; has less metal Hydroxide waste (hard to dispose of).</p> <p>The problem facing the conventional ECM market is components must have 2-3mm additional material prior to machining to enable removal of defects achieve final geometry, wasting expensive materials. Components can be nearer net shape if manufactured using pECM. Typically, compressor/turbine blades are forged to oversized dimensions, machined by conventional methods (milling/turning) or, one side at a time using single cathode (axis) ECM leaving a “pip” which needs removing via tumbling /hand grinding/polishing with no control over accuracy of final geometry/dimensions. A twin-cathode (axis) ECM would machine both sides of the blade simultaneously, leaving no pip. There is no known production of twin-axis ECM machine tools in the world nor any twin-axis pECM. A twin-axis pECM would be the ideal machining method to complete manufacture of compressor/turbine blades to final tolerances/geometries & surface finish. If twin-axis pECM could be developed, it would have a huge impact on the global aerospace/turbine market.</p> <p>The proposed study involves exploration of the ECM market in aerospace (civil & military) for the manufacture of compressor/turbine blades & to see if development of a modularised platform technology of pECM machines, capable of dual-sided machining (twin axis/multi axis) can be adapted to meet industrial applications at a competitive price & be viable, research & investigate the use of metal-dipped plastic as cathodes to provide cheaper tooling/manufacturing costs</p>			

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Ponds4fish Limited	Modular containerised aquaponics system	£44,000	£25,000
Project description - provided by applicants			
<p>Aquaponics is the farming of freshwater fish with the production of salad crops, to supply local communities with truly organic and Eco-friendly produce. Only 10% of the water required to grow salad crops. The system is powered by Solar PV systems, with excess power either sold back to the grid or used locally. The company wishes to establish if there is a market for a containerised modular aquaponics system that can be used in the UK or anywhere in the world. It can be exported easily and positioned anywhere on a vacant plot.</p> <p>A full proof-of-market study is required to study the viability of a step-change Aquaponics system that could be sited in a series of 40ft containers.</p>			

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Shift Thought Limited	Shift Thought Ltd- Digital money agent graph	£13,997	£8,397
Project description - provided by applicants			
<p>A digital money agent network serves as the bridge for people to transfer money as payment or to other people. Any transaction traces a path through a giant and extremely complex network of global agents – the ‘agent graph’. We propose to create a shared compliance service to dramatically bring down the cost of compliance, enable far more specific and dynamic targeting of rules, improve compliance monitoring, reduce risk of non-compliance, increase competition by creating a more level playing field for free agents, and improve access to digital services for a much larger part of the disenfranchised population by enabling a dramatic growth in the agent graph while still keeping it manageable.</p>			

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switchee	switchee - a home management and energy saving solution	£48,325	£25,000
Project description - provided by applicants			
<p>switchee is an all-in-one home automation system targeted at the B2B managed housing market. It integrates multiple novel technologies into a single unit which turns an existing light switch or thermostat into a smart, connected device. It provides property management functionality in addition to standard home automation features.</p>			

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Talar-Made Limited	Research and Development of Pressure Care Support Surface and Suspension Device Technologies for the Treatment and Prevention of Pressure Ulcers	£70,091	£25,000
Project description - provided by applicants			
<p>Talar Made Ltd (TML) would like to undertake research & development in pressure-relieving devices for the treatment & prevention of pressure ulcers. The need to use & develop improved clinically effective & economically sustainable support surfaces is beyond dispute in the ongoing fight against pressure ulcer damage (Wounds UK 2006 vol 2 No3). The development of hospital-acquired pressure ulcers on the heel has been an increasingly acknowledged problem (Donnelly 2001). Patients with limited mobility due to sensory or motor impairment, lower limb fractures, heavy sedation & other intrinsic problems are particularly at risk. Pressure ulceration is a conspicuous blight on the health & wellbeing of both the patient & carer/care systems, affecting 10% of all patients in acute hospital setting (NHS Research 2005).</p> <p>The situation in the community & primary care home settings may be much worse, with exact numbers impossible to measure (Cullum et al 2001). Some studies suggest that in-hospital settings pressure ulcer prevalence ranges from 5% to 32% (Kaltenhaler et al 2011). Also noted is the high prevalence rate occurring in elderly patients with limited mobility. In the UK in 2011 23.6% of population (12.5m people) were over age 65 & largest % growth in any group was in 85+ age group. With diabetes also rapidly increasing with 2.9M sufferers in UK & sufferers not diagnosed at an estimated 800,000, people the high-risk pressure ulcer groups are increasing in size. TML proposal for a modular, cost-effective & clinically effective treatment, prevention & monitoring technology has significant potential benefits for patient & healthcare services alike.</p>			

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The Sustainable home Survey Company C.I.C	Solar Bikes - community transport	£42,063	£24,500

Project description - provided by applicants

The Sustainable Home Survey Company (SHS) is the UK's leading community-focused energy assessment company and social incubator. SHS's management team has delivered over 15 low-carbon ventures to market, and actively supports team members in identifying and growing spin-out businesses. SHS proposes the creation of the UK's first solar-powered electric Solar Bikes (e-SBs) and its supporting pay-per-use infrastructure to provide urban communities with an alternative low-carbon, low-cost, and commuter friendly transport mode for long journeys. UK has made a commitment to reduce greenhouse gas emissions by at least 80% below base year levels by 2050. Meeting this target will require substantial energy efficiency improvements in the transport sector. Increasing public transport costs and congested roads are significantly impacting on commuters in urban communities.

This has created a compelling social/economic imperative for a low-cost and low-carbon commuter transport mode. e-SB takes advantage of reductions in telematics costs and newly developed holographic solar technology to create a prototype design for the UK's first solar powered electric cycles. The e-SB infrastructure consists of five components: a low-cost solar powered electric bike; a telematics-integrated bike locking system; a recharging station; a smart phone app with booking and scheduling functionality; and an embedded digital advertising screen. Successful deployment of the e-SB solution requires co-ordination among many different stakeholders, including solar bike manufacturers, telematics service providers, wireless carriers, software developers and local councils. Before this can be achieved the addressable market requires: further segmentation and appraisal; customer proposition validated; supply chain readiness verification; and development and establishment of an infrastructure roadmap

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Ullrich Designs Limited	Ullrich Designs Ltd – high-performance climbing shoes with health benefits	£15,000	£9,000
Project description - provided by applicants			
<p>Ullrich Designs Ltd. Are investigating whether there is a market in the UK and worldwide for innovative rock-climbing shoes. Through special design and materials, we will be looking at whether there is an opportunity for a rock-climbing shoe that provides superior performance, comfort, and health-related benefits, whilst staying competitive in price with other rock-climbing shoe manufacturers.</p>			

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Undo Software	Assessing the commercial viability of the Undo Flight Recorder: a new technology that assists in the diagnosis and fixing of Linux and Android software failures in the field.	£42,952	£25,000
Project description - provided by applicants			
<p>According to Cambridge University research, developers spend 50% of their development time debugging, representing significant cost to the industry and to the economy as a whole. Undo Software, leading supplier of software quality tools for Linux and Android, is currently developing a new technology to assist in the diagnosis and fixing of Linux software failures: the Undo Flight Recorder (UFR). Software is written by developers working for a software vendor, and consumed by an end-user. Buggy software creates significant costs to the software vendor and represents even greater costs to the end user. To analyse an end user-reported software failure, developers must either reproduce the error on their computer or, if that fails, travel to the end-user site to reproduce the issue there. Both options are time consuming and expensive, and there is always the risk that the issue cannot be reproduced. The UFR is an error-reporting system that resolves this issue by removing the need to reproduce bugs. Once embedded into the software vendor's program, UFR enables the program to record itself.</p> <p>The resulting recording contains an instruction-level recording of the defective code's execution, i.e. everything the buggy program did. Developers can then load the UFR recording onto their own machine to find and fix the bug; saving time and money, and preserving company reputation. Undo believes the UFR has huge market potential, as any vertical which writes C/C++ on Linux and Android could use the UFR. These include: embedded, automotive, telecommunications, web and enterprise, amongst others. However, Undo only has visibility into one market: electronic design automation (EDA), as its current product is being sold into this vertical. The PoM grant will be used to understand the product and market requirements of different markets, to rank the markets in order of attractiveness and to understand the compelling 'value proposition' the UFR brings to each vertical.</p>			

