**Driving Innovation** 

### Results of competition: Smart – Round 5 – Proof of Market

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
Anglia Airborne Innovations Limited	Commercialisation of new applications for light unmanned aircraft	£27,500	£16,000

#### Project description - provided by applicants

Proof of market funding is sought for assessing the commercial viability of developing and offering new services with small unmanned aircraft (SUA) for civilian customers. SUA is a Civil Aviation Authority (CAA) classification covering aircraft weighing less than 7Kg and requiring minimal regulations over their operations in UK airspace. This requires research to quantify what the market wants or is likely to want in future; to assess and evaluate emerging and latent technologies that can meet these requirements; and to understand the likely regulatory and legal framework that these craft will have to operate in. All three are needed in order to for businesses to offer professional and commercial grade services.

There are good indicators that the market for SUA for civilian applications is growing globally. In the UK, current use of SUAs is mainly as platforms for video and photography for the leisure market with some use in industrial survey and public service roles such as the police. The long-term commercial viability of these is still uncertain. Industry and the user community propose more novel applications and services such as: ability to carry different payloads such as IR, radar, air quality sniffers, noise monitoring, more autonomous operations with on board intelligence to allow and 'sense-and-avoid', enable handover, evasive manoeuvre under specific conditions, wider use in disaster management, monitoring land use and other applications. However none of these are likely to see commercial operations while developments of such craft are largely uncoordinated and left to the vendors to drive forward as no one is sure what the market for this segment is likely to be. We believe there is a huge potential market both in the UK and globally for SUA services suited for the civilian professional market. But this requires sustained and coordinated marketing and R & D effort, which is the purpose of this project.

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## **Driving Innovation**

## Results of competition: Smart – Round 5 – Proof of Market¶

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
Arvia Technology Limited	Assessment of the water market for the Arvia Process	£44,285	£25,000

#### Project description - provided by applicants

Arvia Technology Ltd develops highly innovative new solutions for the destruction of aqueous organics in water and waste water treatment that are cost and energy efficient and chemical and waste-free. It is based on the multi-award winning, patented platform technology of adsorption and electrochemical regeneration. Whilst originally designed for water and wastewater treatment, Arvia were pulled into the nuclear industry to treat radioactive organic waste streams that were unable to be treated using conventional processes. Some of these orphan wastes have been stored on site for the last 30 – 40 years.

Over the last three years Arvia have worked on developing a solution for destroying radioactive oils culminating in a full scale demonstration plant at Magnox's nuclear decommissioning site at Trawsfynydd. Arvia are currently contracted by Magnox to design a plant to destroy the remaining radioactive oils at Trawsfynydd. As well as proving the system in the nuclear industry, Arvia have also proven the technology, at smaller scale, in a number of different sectors in the water and wastewater treatment industry. As well as the destruction of organics, Arvia has demonstrated that the system has the potential for microbial reduction. Developing the system as a biocide treatment system could open significant new markets, for example in the control of legionella bacteria. Arvia have already demonstrated its potential to control these bacteria populations. This could be a more significant short term market. However Arvia needs to develop a comprehensive market assessment to optimise the introduction of this technology. Hence Arvia is looking at a proof of market SMART award to develop the knowledge required to identify the most promising markets for initial introduction of the technology and to demonstrate the business case for future R&D and investment.

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**Driving Innovation** 

## Results of competition: Smart – Round 5 – Proof of Market

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
baby2body limited	Baby2body	£44,200	£25,000

### Project description - provided by applicants

Baby2body is an innovative concept to engage women in healthier behaviour at a critical time - pregnancy and post pregnancy. The product aims to educate, inform, encourage and facilitate the adoption of healthier behaviour through an innovative use of technology, unique data visualisation and relevant personal feedback.

According to the NHS, more than 2% of women giving birth in England and Wales has diabetes. Most of these have gestational diabetes, a type of diabetes that affects women during pregnancy. Encouraging healthy diet and lifestyle can avoid the need for medication and medical intervention, reducing the cost to the NHS. The NHS also states that 15%-20% of pregnant women are overweight. While losing weight during pregnancy isn't recommended, regular exercise and a good diet are important to minimise any further risks. Our concept will help prevent the risks that overweight mothers might face, and act to increase healthier lifestyle choices.

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## **Driving Innovation**

## Results of competition: Smart – Round 5 – Proof of Market

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
Barnard Microsystems Limited	LoRAD = Low power RADAR sensor for use in collision detection on small Remotely Piloted Aircraft	£40,000	£24,000

#### Project description - provided by applicants

We are developing Remotely Piloted Aircraft ("RPA") for use in scientific (ice thickness monitoring), commercial (oil and mineral exploration) and state (border patrol) applications. The greatest technical challenge to the use of RPA, operating Beyond Visual Line Of Sight ("BVLOS"), is the deployment of an effective, all weather, collision detection system, combined with an airborne collision avoidance capability. This is a requirement that has been raised at many RPA conferences and is top of the list of technology challenges noted by the European Defence Agency.

It has also been a requirement of our potential RPA customers, including companies engaged in oil and gas exploration and production activities. Development of a solution has been very slow due to shrinking R&D budgets. We have already demonstrated in prototype form a collision detection system based on the use of two cameras in a stereo imaging configuration. However, this solution can only be used on a clear day under Visual Flight Rules. We plan to explore the market for, and commercial viability of, a novel approach in which we use a small RADAR unit, based on an enhancement to a relatively inexpensive and lightweight maritime (yacht) scanning RADAR unit, to augment a stereo vision system, to enable the detection of airborne objects (a) at night, (b) in cloud and (c) approaching from the sun. Initially we thought the use of a yacht RADAR unit might not be permitted on an airborne platform. However, we have noticed that the US Federal Aviation Authority has authorised the use of this very type of RADAR as an "Avian RADAR" at US airports, to detect birds at up to 2 km. There is currently a rapidly growing interest in the use of RPA in civilian applications throughout the world. Apart from their application in "dull, dirty and dangerous" operations, a societal benefit will be environmental, since RPA use less fuel than their manned counterparts per kilometre travelled.

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**Driving Innovation** 

### Results of competition: Smart – Round 5 – Proof of Market

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
BC Environmental Services Limited	Development of Microbial Fuel Cells	£36,818	£22,090

### Project description - provided by applicants

Two of the key challenges facing us as a global community in the 21st century are climate change and access to clean water. Population growth and increasing usage of water has resulted in ever larger volumes of wastewater. Heightened public awareness and concerns over long term environmental and health effects have resulted in increasingly tight discharge standards. These twin drivers fuel the rise in energy required for wastewater treatment. One of the most energy intensive aspects of wastewater treatment is aeration for the aerobic oxidation of organic compounds. Typically half the energy used in wastewater treatment is used for aeration and a key by-product is a large amount of excess biomass (sludge). Treatment and disposal of this sludge is both costly and generates further environmental concerns.

The treatment of water and wastewater is currently the 4th largest sector for energy usage in the UK and global warming concerns mean that the industry is under pressure to achieve higher water quality whilst reducing its carbon footprint. The organics within the wastewater have a significant calorific value from 7.6 kJ/l (domestic waste water) to 16.8 kJ/l (mixed industrial/domestic waste) (Heidrich et al 2011). This energy concentration is too low for economic recovery using existing technologies. However significant research is being undertaken into exoelectrogenic bacteria that are able to directly transfer electrons outside of the cell by the anaerobic oxidation of organic compounds in the wastewater. Devices that convert these organic compounds direct to electricity are known as microbial fuel cells (MFCs) and combine biological and electrochemical processes. Whilst significant research has been undertaken into the potential of MFCs as a potential source of renewable energy, no large-scale plants have yet been installed and the research is still limited to the laboratory.

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## Results of competition: Smart – Round 5 – Proof of Market

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
Beautimeter	Proof of Market Research for Beautimeter	£42,591	£25,000

#### Project description - provided by applicants

Beautimeter is a pre-start up Technology Company evaluating the market potential for a digital service whereby consumers can see personalised product matches based on their unique preferences for any beauty or personal care product. The service innovatively creates an easier and user friendly way for consumers to leave personalised product ratings and reviews which other consumers can use to evaluate products.

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## **Driving Innovation**

### Results of competition: Smart – Round 5 – Proof of Market

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
Biovation Limited	Novel Advanced Orthopaedic	£42,498	£24,312
	Instrumentation for Synthetic		
	Cartilage Implants		

#### Project description - provided by applicants

Biovation UK Limited would like to further research and investigate the large joint (LJ) market and aims to develop the Cartiva synthetic cartilage implant (SCI) instrumentation. The Cartiva SCI currently distributed by Biovation UK Limited is used to replace warn or damaged cartilage in Hallux (toe) joints, but the current instrumentation used to perform the procedure has downfalls. There is currently limited effective treatment of focal defects in LJs. SCI could be a favoured operative technique as it has an excellent recovery rate, after 48 hours a patients joint can be weight bearing. SCI has the potential to be minimally invasive (much less invasive than total joint replacement, TJR), it is an intermediate treatment which would postpone the need for TJR "this type of treatment with the correct indications and future implant & instrumentation improvements... may guarantee a several year period of knee health and active life style." (F.V. Sciarretta 2013).

This means that in older patients SCI could potentially eradicate patients that have had TJR needing revisionary surgery. Biovation UK Limited would like to investigate a potential gap in the market and develop an easier to use, minimally invasive, single use instrumentation, with hopes to advance the current instrumentation to aid in implantation of the SCI as a remedy for chondral focal lesions in L.J's.

In England & Wales there are approx 160K total knee replacements performed annually (National Joint Registry, 2013). "As recent papers have demonstrated chondral lesions can be encountered in up to 67% of knee arthoscopies" (F.V. Sciarretta 2013). The knee joint medical market is by far the largest, most lucrative market globally. SCI is most suited to chondral focal lesions, in 993 consecutive arthroscopies; 66% of cases show incidence where a surgical approach is needed & 20% of cases show focal lesions that would benefit from SCI (Am J Sports Med 2004).

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### **Driving Innovation**

### Results of competition: Smart – Round 5 – Proof of Market

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
Bloom Agency	Mutual Data Exchange	£41,666	£24,950

### Project description - provided by applicants

Organisations such as Call Credit, Experian and Equifax have built multi-million pound businesses through selling and trading in personal data. These organisations make money out of individual's data but, until recently with the rise of websites like Quidco, the individuals themselves had seen little benefit in return. Even with the rise of organisations like Quidco, the majority of individuals in the UK see no benefit from others trading in their personal data. There is an opportunity to shift the value exchange for the benefit of individuals. We've seen this start with websites like Quidco, but we believe there is an opportunity for a bigger, more socially inclusive idea. This value exchange can be managed by a mutual, to provide benefit for whole communities rather than for individuals.

There is an opportunity and a need to create a "customer owned data mutual" to manage the value exchange individuals get for sharing for their data with third party organisations. It is our belief that a mutual business could use revenues generated from the trading of data to provide a revenue stream for individuals as well as providing cash and group buying power for community projects. The mutual would create a data exchange for this fair-trading of data. This project would look at the remit for creating such a data exchange, and whether a mutual really is the right approach, and understand which partners need to be included, how the data exchange would fit into the political, economic and social landscape and what technical requirements the exchange would need to be successful.

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**Driving Innovation** 

## Results of competition: Smart – Round 5 – Proof of Market

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
Blow My Bubble Limited	BlowMyBubble - Increasing Online Display Advertising Space by 4000%	£41,717	£25,000

#### Project description - provided by applicants

Digital advertising has simple goals - to reach users in new ways, capture behaviour, hone 'targeting' through 'cyber listening', and ultimately generate revenue through impressions, performance or acquisitions (based on cost per click, or activity completion). However, all current methods come up against the same obstacles – the viewing screen is a finite size, and all ads are 2D. Further, ads are often limited to a certain number of characters (144 in the case of Twitter). Because of this, advertisers are forced to present limited information regarding a product, rather than all the facts consumers need to make an informed decision about a product or service.

The result is 67% of online purchases are abandoned because the consumer was presented with insufficient information, or met unexpected costs when transferring to the advertiser's main site. A further 16% abandon purchases because there were no suitable accompany accessories for the advertised product. This costs the UK economy an estimated £50bn in lost revenue (Gartner). The solution – BLOWMYBUBBLE (BMB)— transforms traditional 2D ads into 3D multi-layered virtual objects with layers (like the layers in an onion), increasing marketing area by at least 4000%.

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**Driving Innovation** 

### Results of competition: Smart – Round 5 – Proof of Market

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
Carbon Analytics	Carbon Analytics	£38,420	£23,052

### Project description - provided by applicants

Carbon Analytics provides an online platform that makes it dead simple for businesses to measure their carbon footprint and find ways to reduce it throughout their supply chain. We produce a map of a company's supply chain that shows them where their carbon footprint is coming from just by analysing basic financial data.

Our system then facilitates the collection of more detailed information from their suppliers, and recommends the most cost effective initiatives for reducing their carbon footprint. This allows companies to minimise their exposure to fluctuating energy prices and increasing carbon legislation, prove their green credentials to their customers and create quick wins for the climate.

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### **Driving Innovation**

## Results of competition: Smart – Round 5 – Proof of Market

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
Dearman Engine Company Limited	Dearman Engine Company: Proof of Market in Leeds	£41,180	£24,500

#### Project description - provided by applicants

The Dearman Engine Company (DEC) is harnessing liquid air to deliver cleaner (zero emission) and cheaper transport and refrigeration globally. The Dearman engine (DE) is a novel piston engine powered by the expansion of liquid air (LA); the exhaust is clean, cold air. We are an additive enabling technology with a number of applications - refrigeration, waste heat recovery and zero emission vehicles. The DE is simple, cheap to build, requires very low maintenance and has low environmental impact; providing fuel and cost savings; meeting societal objectives and harnessing renewable energy.

Since there is surplus liquid nitrogen production capacity in many countries, a skeleton fuel supply infrastructure already exists. The UK, for example, has enough spare capacity to supply more than 15,000 refrigerated delivery trucks (approx. 10% of UK fleet). Independent economic modelling shows that the DE is cheaper to run than diesel, and can pay for itself in less than 1 year of operation. The adoption of LA technologies in heavy-duty vehicles could save Britain 1.3 billion litres of diesel and over a million tonnes of carbon by 2025. We propose to undertake a detailed market study for a single region –Leeds – to model and establish the market potential for the deployment of DE applications at city level. We will also consider the impact of multiple application from one fuelling point and the optimum mix of fleet applications and vehicle types to deliver maximum economic value (direct e.g. diesel savings and indirect e.g. NHS cost by improved air quality) and environmental / air quality impact from one fuelling depot. An LA system level view may unlock greater combined benefits in economic returns, use of capital, environmental or other terms. This study will inform the strategic plan for Leeds with clear impacts, planning and investment decisions for DEC, improve the case business case for integrated LA systems and be commercially valuable to the wider growing LA market.

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## Driving Innovation

## Results of competition: Smart – Round 5 – Proof of Market

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
D-Flex Limited	Novel sports shaft / rod design	£40,225	£24,135

#### Project description - provided by applicants

D-Flex Ltd has patented the design and manufacture of a lightweight tubular structure. Potential application areas include the fishing rod and golf club market sectors. The shaft / rod is based upon the use of a non-circular cross sectional shape to beneficially enhance flexural rigidity, producing more flexibility in one direction and more rigidity in the other.

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**Driving Innovation** 

### Results of competition: Smart – Round 5 – Proof of Market

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
Food Dudes Health Limited	Active Video Gaming for behaviour change and childhood obesity prevention	£40,986	£24,591

#### Project description - provided by applicants

Youth consume well below the recommended minimum of five fruit and vegetable (FV) servings per day (Baranowski). With nearly 3m children overweight in the UK and 1.5m of these obese (National Child Measurement Programme), finding ways to help youth consume more FV will help decrease their risk of developing adult obesity and diabetes. 92% of children consume more saturated fat than recommended, 86% too much sugar, 72% too much salt and 96% do not get enough FV (National Diet and Nutrition). Food related ill health is responsible for ~10% of morbidity and mortality in the UK, 10% lost DALYS and costs the NHS about £6 bn annually. Children and adolescent begin to gain autonomy over choosing the food they eat, yet may not have adequate information to make informed choices. Serious video games offer new opportunities for promoting health related diet change among children. Food Dudes will develop an active video game (AVG) to deliver behaviour change in diet in an engaging and accessible format.

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### Results of competition: Smart – Round 5 – Proof of Market

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
Future Transport Systems Limited	Future Transport Systems - Site Integrated Energy Storage	£25,018	£15,000

### Project description - provided by applicants

CE-HUB is a low cost, modular, plug in and play, energy hub that incorporates a central electrical energy storage (ES) device that employs second life lithium ion (li) electric vehicle (EV) batteries. It uses an energy management system (EMS) with flexible control parameters to enable renewable generation, EV chargers, thermal storage devices and other forms of load or generation as well as the grid and the site load to be connected and managed with the aim of minimising site OPEX and CAPEX. This study will determine the viability of further developing the system to optimise its use on commercial sites. The CE-HUB system is a low cost module and its commercialisation will be further accelerated by easy integration with existing site systems. The study will help accelerate the deployment of CE-HUB within a key market segment for energy storage.

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## **Driving Innovation**

## Results of competition: Smart – Round 5 – Proof of Market

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
Harriton Beracha Limited	Market analysis & commercialisation planning for onshoring production of innovative protective body armour for use in industrial applications	£39,924	£23,954

### Project description - provided by applicants

There have been a number of reported incidents of severe injuries in the metal forging sector caused by hot flying metal from tools used within the work environment (Edencroft Consulting Ltd, 24/04/13). A number of methods for protection have been examined but none were found that could be used in this particular environment due to the heat & the restriction in movement caused to wearers by protective clothing currently available. One major problem is the weight of current garments (c6Kg each), also in this type of application the radiant heat from the parts is conducted to the wearer resulting in discomfort & therefore resistance from staff to the use of the garments.

The product which currently has the greatest market share is made from chainmail or ringmesh which exacerbates such problems. This project investigates the use of a reinforced polymer product that is processed to give 40 times the impact strength of the precursor material & is eight times lighter than metal based garments. Tests have shown the material has excellent penetration resistance & is suitable for this type of use. The existing chainmail/ringmesh garments are not manufactured in the UK but imported on premade rolls or as finished product. The reinforced polymer used in these trials has been developed and will be manufactured in the UK; this project will result in the onshoring of production of the protective clothing. The use of this product can also be extended to other sectors where the moulding techniques impart specific properties, eg: motorcycle gloves, jackets, and protective inserts for other work-wear, such as industrial boots and gloves. The food preparation industry is another facing similar problems, although in this case the issue is slashing and stabbing with knives rather than flying metal. Future work will also include investigation into the potential for use in the stab protection and ballistic armour sectors either in isolation from or in conjunction with ceramic-based products.

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## **Driving Innovation**

## Results of competition: Smart – Round 5 – Proof of Market

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
I6 Systems Ltd	To quantify the benefits and determine the market potential, through fuel related cost savings, of monitoring, in real-time, the in-to plane jet fuel properties	£42,000	£25,000

#### Project description - provided by applicants

To quantify the economic and environmental benefits and determine the market potential of monitoring, in real-time, the fuel properties, related to fuel gauging and aircraft performance, at the point of entry into the aircraft and collating this data to identify local, regional and global trends. Further development of this trend data is envisaged to make it available via a cloud-based portal to enable operators to make more informed choices regarding their route planning and refuelling operations which will provide anticipated cost savings and improved efficiencies.

The key fuel properties currently used by the refuelling industry will be established and available sensors evaluated for suitability for use in this system. Additional parameters that would add value would be identified and if sensors are not available then the technical requirements for the sensors required will be developed as part of a follow-on project. Based on the information we gain from this proof of market study the technical requirements around packaging and communicating remotely with multiple, electronic-based sensors into a fuel dispensing system will be determined. The project will consider the aviation regulatory authorities' requirements around aircraft fuelling requirements, their minor global implementation variations and how these need to be considered in developing an integrated sensor pack for monitoring fuel properties in real-time.

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## **Driving Innovation**

## Results of competition: Smart – Round 5 – Proof of Market

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
Mobius	MÖBIUS UK Supply Chain	£64,563	£25,000
	Analytics Toolkit (MUSCAT) - Proof of Market		

#### Project description - provided by applicants

Project Purpose: To assess the commercial viability of Supply Chain (SC) Analytics offered as a Service. Supply Chain Analytics helps businesses make better decisions and so optimise their supply chains, resulting in a myriad of benefits from reduced transport costs to less waste of out-of-date product. Businesses using SC analytics can also benefit from improved customer service levels leading to increased sales. In our experience having increased visibility through analytics helps reduce overall working capital employed by 8-31% and increase sales by 1-5% so leading to reduced costs and higher growth, investment and employment.

To date, most businesses implementing SC analytics have done so independently, investing heavily in analytics systems and tools as well as recruiting increasingly scarce analysts, which has consequently limited the widespread adoption of comprehensive SC analytics. Cloud computing and the 'as a service' model are hailed as breakthroughs which enable businesses to access capability-on-demand and innovative service offerings. Notably Analytics as a Service (AaaS) differs from a "standard" Software as a Service (SaaS) model: SaaS is the IT used to offer the same software to multiple users thus to maximising the value of IT investments. AaaS is not an IT service nor technology. It is the bespoke processing of the analysis and interpretation of the analytical output tailored to the specific characteristics of the client's business, supported by appropriate analytical software tools. Mobius UK's vision for this new service is to make supply chain analytics available to SMEs and mid-market companies by combining "off-the-shelf" software from leading vendors with our in-house expertise in supply chain management using an AaaS model. The commercially innovative aspect of this project is in moving supply chain analytics from capital expenditure to operating expenditure by developing an "as a service" model.

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## Driving Innovation

## Results of competition: Smart – Round 5 – Proof of Market

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
Nano Products Limited	Offset Lithographic Printed Electronics	£40,600	£24,360

### Project description - provided by applicants

Printed electronics represent a growing technology for fabricating electronic devices on materials such as paper and plastic using electrically functional inks in combination with standard printing processes. They can facilitate applications that are not feasible / uneconomical with conventional silicon-based electronics. Nano Products Ltd proposes a new approach to the manufacture of printed electronic circuitry.

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**Driving Innovation** 

## Results of competition: Smart – Round 5 – Proof of Market

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
Nanomedpharma Limited	Reliable measurement of metals in biological samples	£41,534	£24,920

#### Project description - provided by applicants

The measurement of trace metals in biological samples is an essential part of any medical laboratory for research and diagnostic purposes. Many metabolic disorders are accompanied by alterations in the concentration of one or more trace elements in body fluids, especially blood serum or plasma. NanoMedPharma Ltd proposes to develop a new assay kit for the accurate measurement of heavy metal ions (e.g. Cr, Co, Al, Cu, Zn and Fe). The measurement of the variation of these metal ions in blood is an important part of diagnostic tests. For instance, measurement of Cr and Co in whole blood is used to assess the viability of prosthetic implants, Fe deficiency is one of the most prevalent disorders, occurring as a result of dietary deficiency and through chronic blood loss, Al can accumulate in patients with renal disease, and severe deficiency of Zn occurs in acrodermatitis enteropathica (impairs Zn absorption from the intestine).

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**Driving Innovation** 

## Results of competition: Smart – Round 5 – Proof of Market

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
Navtech Radar Limited	Foreign object detection (FOD)	£41,477	£24,886

#### Project description - provided by applicants

Navtech's vision is to use its leading edge radar technology to save lives by improving safety and security. This project focuses on the investigation of the runway and highway debris detection market foreign objects (FO) represent a major safety risk for the aviation industry as well as a significant cost in maintenance, estimated at \$12 billion every year worldwide. Thus, airports are considering deploying systems to automatically detect the presence of small objects on runways and taxiways to prevent accidents and reduce both costs and risks. Road accidents caused by FO also cause many accidents and create costs. Navtech Radar develops commercial high resolution scanning radar and needs pertinent information before deciding whether to develop and sell a sensor for this market. The project will analyse the market conditions, in terms of existing solutions and investment trends. It will also test Navtech's available radar technology to understand its current ability to detect small objects in order to specify the improvements needed to be able to compete in the market.

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**Driving Innovation** 

### Results of competition: Smart – Round 5 – Proof of Market

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
Polygen Limited	Small scale polyethylene wave energy converter	£40,675	£24,405

#### Project description - provided by applicants

The concept of generating electricity from the movement of waves is well known. Despite this, commercialisation has not yet been achieved. New technologies are often costly to implement and must be competitive with existing provision. Devices face constant stresses and strains. They must be able to survive winter storms and function with a minimum of maintenance. PolyGen Ltd has designed a polyethylene small scale wave energy converter to address these concerns.

This small, innovative device is inherently flexible, allowing it to survive even the greatest storms. By reducing the overall power rating of the installation the product is able to stay small and use cheap materials, making for a very low cost of energy. This will be useful for many applications, such as off-grid settlements, desalination, aquaculture and other marine industries. This project is to investigate this small scale wave market, identifying the potential demand for the device and as such laying the foundation for the remaining commercialisation of this product.

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## **Driving Innovation**

## Results of competition: Smart – Round 5 – Proof of Market

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
Reliawind Limited	Reliawind Limited – Study, assessment and proof of market potentials and economics of a new condition monitoring technology for wind turbine applications	£42,533	£25,000

#### Project description - provided by applicants

Reliability and cost reduction are vital to the growth of the wind industry, especially offshore, and to realise the UK's targets for 2020 and beyond. A recent study by Electric Power Research Institute (EPRI) shows that a reduction of 67% can be achieved in the maintenance costs of offshore wind turbines (WTs) if preventive maintenance is adopted, enabled by condition monitoring systems (CMSs). Reliawind, spun out from Cambridge University Engineering Department, has developed a novel and patent-pending CMS technology for WT drivetrains, which is 60% cheaper and substantially easier to install than its rival products in the market, and has greater fault detection precision and diagnosis.

The unique feature of ReliaWind is the use of electrical measurements, already available in WTs, to detect and diagnose mechanical and electrical faults in WT drivetrains. Hence, the hardware and its installation are significantly simpler than existing CMS products. In addition, Reliawind algorithms are based on the analysis of complex electro-magnetic (EM) fields in the generator, derived from the voltage and current measurements, which have shown to give enhanced precision in fault detection. The technology is proven on laboratory-scale prototypes and is being developed for site testing in real wind turbines. This project aims to study, assess and prove the commercial feasibility of Reliawind for on- and offshore wind applications and set the foundation for commercialisation operation to move to the next phase.

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# Technology Strategy Board Driving Innovation

### Results of competition: Smart – Round 5 – Proof of Market

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
Rescon Limited	Rapid Glutathione Detection	£42,234	£25,000

#### Project description - provided by applicants

Rescon's glutathione sensor Proof of Market project is an investigation into the commercial feasibility of our anti-oxidant sensor technology. This follows on from the early development of our anti-oxidant sensor technology that can measure oxidative stress and ability to combat it. Measuring anti-oxidants is important as they are a key indicator of health status and diseases such as Alzheimer's, diabetes and cancer. The end result of this project is to assess the feasibility of developing this technology for use in laboratory, clinical settings and for self management at home.

Traditional tests are expensive, time-consuming, and require blood to be drawn. Rescon's technology is portable and can be used by a patient, saving the healthcare system time and money. This technology also might be applied to animal health, the food industry, and crop production markets. In collaboration with Milner consultants, Rescon will profile the market including key diseases, future trends in diseases, long-term sector trends, and any other important areas that emerge. We will interview key stakeholders to investigate the best format our technology should be in to solve their problems and for optimal market uptake. We will profile international markets, looking at demographics and barriers to uptake. We will also profile our competitors, with a comparative summary of functionality, pricing for similar products, and strategy. To build upon this profile Rescon will complete IP searches to clarify market position and potential for submission of additional patents, as well as forecasting costs for project stages including manufacturing and taking the technology to market. Milner will consolidate this research to develop a market model for Rescon. A final proof of market report will be written summarising the market opportunity over the next 20 years. This will be used to develop strategy and recommendations covering suggested routes to market and brand positioning.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Simitive Limited	Simitive - iWAMS - Proof of Market	£45,807	£25,000

#### Project description - provided by applicants

Simitive provides innovative, online performance management systems and performance consultancy to the university, education, professional services, public and private sectors. The Company is the leading provider to the UK university sector, working with over 40 UK and international universities, and is the technology provider for the International University Performance Initiative called Performance for All (PFA). Simitive proposes to perform a Proof of Market research exercise to establish the size, appetite and readiness for a ground breaking new product called Intelligent Workload.

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Stripe 21 VN Limited	Stripe 21 - Proof of Market Proposal	£41,675	£25,000

#### Project description - provided by applicants

There is a growing global trend towards mobility, working outside the office and away from the standard desktop PC on smart phones, laptops and tablet devices such as iPads. In a corporate environment, this trend of Bringing Your Own Device (BYOD) is challenging the traditional approaches to IT deployment. BYOD security relates strongly to the end node problem, wherein a device is used to access both sensitive and risky consumer networks and services as well as business applications and data. Management and security of company data on personally owned devices in an SME (from 20 - 500 users) is especially problematic. Many outsource the entire function to an IT support specialist or company, and although a reduction in hardware costs is welcomed by many SMEs, catering for so many devices presents time-consuming and disparate challenges, particularly around support and security.

This project will explore the technical feasibility and market opportunity of providing a low cost, vendor-neutral, managed IT "desktop" service in the cloud (i.e. hosted on the internet) for SME sector businesses, using applications such as Microsoft Office, Google Mail and many other hosted applications (termed Software as a Service or SaaS). Stripe 21 is an established Internet Service Provider (ISP) registered with RIPE NCC number AS8838 and also an Internet Telephony Service Provider (ITSP) and Secure Wide Area Network (WAN) provider. Specialising in the delivery of managed voice, data and Internet services, our primary client base is the voice and data reseller community in the UK. We provide many UK telecommunications companies with white-label managed services that they resell, and as a result we have many blue chip companies utilising our network on a daily basis.

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Useful Biology Ltd	Mycoplasma in the dairy industry	£32,193	£19,315

### Project description - provided by applicants

Mycoplasma are a type of bacteria and are the smallest free living organisms known; they are commonly found in the oral cavity and as symbiotic gut flora. In man, mycoplasma have been implicated in a variety of diseases including chronic fatigue syndrome, pneumonia and arthritis. Mycoplasma infection has long been recognised as a problem for the US dairy industry with 5-6 million tests annually on dairy cattle.

Mycoplasma infections lead to pneumonia, mastitis and arthritis in dairy cattle, they are extremely difficult to treat, and the impact on milk production can be devastating. Testing is slow, taking 14 to 28 days by culture methods and typically culling is the only effective treatment to stop the spread of an infection throughout the herd. Until recently, the effect of mycoplasma in the UK and EU dairy herds has been considered insignificant and therefore overlooked, but in just the last few years farmers and vets have started to become aware of increasing numbers of mycoplasma infections as the implementation of US-like intensive farming methods has become more widespread. We have a simple, sensitive and rapid test for mycoplasma which requires minimal training and only simple equipment. This project will discover the market potential for our test in the dairy industry in UK and Europe, and will generate a business case and "game plan" for entry into the market.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
WallJAM Limited	WallJAM Proof of Market	£40,800	£24,400

### Project description - provided by applicants

WallJAM is a uniquely shaped, interactive rebound wall and sports activity zone, designed to get people of all age groups and ability levels active, in a fun and intuitive way. WallJAM will significantly drive sports participation levels across the UK through repackaging the way sport is delivered at grass roots level. WallJAM is a game-changer. Firstly its shape and graphics encourage repetition for all ball sports with scope to deliver a 'predictably unpredictable' ball return for individual or multiuser play. The inclusion of (patent pending) interactive impact sensors allow users to benefit from technology and innovation previously only the privilege of the elite athlete. Individual, and peer to peer, competition using data and real time feedback on speed, power and accuracy of any ball strike, against the clock, will revolutionise the way sport is taken up and played. It is tailored for inner city areas where space is at a premium and budget remains an issue. It can be sited indoor or outdoor.

WallJAM can be hung, mobile or free-standing. It is modular and therefore scalable from individual units of 1 square metre up to a two way facing 10m wide x 3m high free-standing wall.. Our "intelligent" vertical play surface interfaces with a zoned ball court allowing difficulty levels to be set. Scores can be collected and uploaded via the WallJAM app, allowing a universal performance benchmarking platform and On-line profiling by sport and discipline. On-line leagues for all ability levels can therefore be set and exploited. Additional accessories can be used on and around the wall to increase functionality and user appeal at limited additional cost. For instance customers can opt to install our digital dance & movement zone (which we are piloting with The Exercise Dance & Movement Partnership) to have remote qualified instructor livestream sessions to multiple users. WallJAM is the perfect antidote for the sedentary X-Box generation!

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Zilico Limited	Electrical Impedance Spectroscopy to Detect Oral Cancer	£30,270	£18,162

### Project description - provided by applicants

When found at early stages of development, oral cancers have an 80 - 90 % survival rate. Unfortunately, the majority are found as late stage cancers. This accounts for the very high death rate of ~43% at five years from diagnosis, for all stages combined at time of diagnosis. Zilico Ltd is developing the next generation of cancer diagnostics and proposes to use electrical impedance spectroscopy as a tool to diagnose the presence of oral cancer.

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