Results of Competition: Smart Round 3 2015-16 - Development of Prototype

Competition Code: 1507\_SmartRnd3\_DoP

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
	Fhoss Guardian Angel, for detection and protection from workplace slips, trips and falls	£348,484	£156,817

#### Project description - provided by applicants

Slips, trips and falls (STFs) were the most common cause of major injuries to employees andmade up over 36% of all reported employee injuries last year. The cost to employers andsociety is huge, estimated at £500 million and £800 million, respectively(http://tinyurl.com/pn5hem7). Additionally, Health and Safety Executive estimate 1.5 millionworking days are lost every year due to STFs. Slips and trips are also considered the fastestgrowing fraudulent insurance claim trend (http://tinyurl.com/nlop2zo), with poor companyrecording of STFs partly to blame. Existing solutions aimed at reducing STFs have focused primarily on improving factors suchas surface grip and personal protective equipment (PPE). Automated fall detection deviceshave been implemented in the healthcare market, primarily for the elderly living alone. Thesedevices tend to be body worn and can include a help' button, however in the case of a seriousaccident it may not be possible to operate such a device. Despite the improvements made, financial and social costs of STFs remain high. To address the high cost of STFs to employers and society, and the growing concern overinsurance fraud, we have proposed an innovative solution, Fhoss Guardian Angel (FGA). FGA will automatically detect STFs, provide an accurate location of the accident andautomatically generate an official report for further review. We will offer a real-time and predictive analytic service that will be able to identify areas ofhigh risk/repeated STFs based on the data collected from FGA. Employers can then choose totake preemptive action and improve the environment at that location to avoid further STFs. By streamlining the reporting process and recording all STFs we will reduce insurance fraud. Nearly all STFs are avoidable, FGA will work seamlessly with our innovative world classPPE. FGA has the potential to revolutionise workplace safety and massively reduce the employer and societal burden of STFs.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
PixelPin Ltd	PixelPin - A Simple, Secure and User-Friendly Password Alternative	£553,903	£249,256

### Project description - provided by applicants

In today's digital age, we are becoming increasingly dependent on online services to beaccessible across multiple devices. As a result, the security of information is one of the keychallenges associated with the open- digital age, which faces commerce, governments and citizens alike. In 2014, the cost of online password breaches was around \$200Bn, demonstrating clearly that current solutions which centre predominantly on alphanumericpasswords are falling short of properly protecting personal and financial information. PixelPin aim to address the limitations of current authentication solutions through the development of a secure single sign-on solution that eliminates traditional alphanumericpasswords (can also be used as part of a multi-factor approach). The concept instead is apatented picture-based approach with users choosing a personal image (e.g. a holiday photo) and a four pass-point sequence which, based on successful PoC studies, have shown to be easier to learn, quicker to enter & less likely to be forgotten, protecting against commonhacking techniques such as dictionary attacks, social engineering, phishing & keylogging. This cloud based service allows the user to input their 4 passpoints on mobiles, tablets or the web. PixelPin is designed for today's always-on, mobile-first and multi-device generation. It replaces passwords and PINs with a secure, user friendly and private method of logging intoweb sites, providing a global solution that is language independent and perfect for mobile. Anumber of critical usability features must be developed throughout the 12 month projectwhich will advance the technology into a preproduction prototype prior to product launch in the authentication software market in Q2 2017.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
	Settlement using blockchain to Automate Foreign Exchange in a Regulated environment (SAFER)	£551,350	£248,107

#### Project description - provided by applicants

While forex is essential for businesses, SMEs are pushed out of the market due to thefinancial crisis and resulting high compliance fees. Banks now consider SMEs too risky forforex, limiting capacity for UK SMEs to trade outside the UK. SMEs with forex turnover ofless than £1m are now being refused services, forcing most SMEs to use small (Tier 2) bankswho charge as much as 10% commission on each transaction. Because forex systems in large banks require large teams of people, they are expensive tooperate, thereby often requiring min. £50K per transaction and charging as much as 10% commission on each transaction. These services are opaque about charges/costs andinefficient (often taking 1 to 5 days) due to the number of intermediaries involved. Becauseforex conversions are not simultaneous, participants are vulnerable to settlement risk(Herstatt), further increasing forex costs.Blockchain is emerging as the standard for transferring value, lead by NY introducing firstbitlicense in Aug 2015 and Nasdaq group announcing use of blockchain for share trading inMay 2015. Tramonex's blockchain system will enable highly efficient forex transactions(approx. just 10 mins) and provide SMEs with a broad range of currencies at low cost.Tramonex, an established online forex and payments platform for SMEs, has developed aproof of concept blockchain settlement system for foreign exchange. In this project,Tramonex will, establish a prototype for blockchain settlement and demonstrate to the FCA(Financial Conduct Authority) and other regulatory authorities for approval.The Tramonex platform will operate much more quickly than other systems, withsignificantly lower fees. Tramonex will be fully automated and transparent, so users willknow the exact commission charges. The platform will also perform automated identitychecks, to fulfill anti-money laundering regulation compliance.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Novarix Ltd	Novarix Vein Visualisation Device	£294,102	£132,346

#### Project description - provided by applicants

Every year more than 1bn peripheral cannulas are used globally to draw blood or to deliverintravenous therapy, making the insertion of a cannula into a vein one of the world's mostcommon medical procedures. Yet it's not always straightforward: at least 1 in 4 patients require 3 or more stick attempts, with some having to endure 10 or more, and once in place up to 50% of all cannulas failthrough inflammation of the vein (phlebitis), infection, blockage, infiltration and mostdangerously extravasation [Helm et al., 2015] and require replacement. These issues can dramatically extend treatment times, cause significant pain and seriousinjury to patients and rapidly escalate healthcare costs. In recent years the use of near-infrared (NIR) imaging has been introduced to help cliniciansfind difficult veins and to assess a patient's vascular structure to ensure that the right cannulais inserted into the best vein. In the UK the Infection Prevention Society now recommends theuse of IR vein imaging devices. However, scientific and user feedback suggests that, although useful for many patients, NIRbasedimaging needs greater consistency and clarity of visualisation across all patient types tobe fully accepted and widely adopted by the medical community. Novarix, the company behind the IV-Eye, a first generation NIR device, is one of the UK'spioneers in the field of NIR vein detection. The company is now seeking Innovate UK'ssupport to harness recently identified technological advances in order to drive forward radicalinnovation and the development of a second generation NIR vein imager. Novarix intends to combine advances in optics, electronics and software algorithms in a newdevice capable of visualisation of a patient's vascular system with industry leading clarity, accuracy and depth. This will allow the company to capitalise on a growing marketopportunity & to build a world-leading UK technology platform with a wide-range of followonapplications.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Kudos Innovations Ltd	Kudos Connect: Development of prototype service to help learned societies drive impact of research publications, and encourage cross-discipline and public engagement with research discoveries.	£298,188	£134,184

#### Project description - provided by applicants

The UK spends approximately £29 billion on research and development per annum, representing circ. 1.7% GDP. Despite this huge investment, the research community is failingto sufficiently promote and commerically apply this research, and academics are not yetmaking the best use of emerging tools and channels to assist with this. Kudos Connect will address this by tapping into the expertise, networks and infrastructureoffered by learned societies - helping them for the first time track, evaluate and amplify the collective research outputs of their member communities. Kudos Connect will also helpsocieties better support inter-disciplinary exchange, public engagement and corporateapplication of research discoveries. Learned societies are crucial organizations in the research process - holding conferences forthe presentation and discussion of new research results, publishing books and journals to disseminate research, and acting as professional bodies that regulate the activities of theirmembers in the public interest and the collective interest of the membership. Societies are alsoof key importance in assisting in the emergence and development of new disciplines and professions. Currently, societies have access to limited information to help them understand and promotethe research outputs of their members. Kudos Connect will give them information to helpsupport their member communities in the uptake and evaluation of new formats and channelsfor presenting research discoveries; identify, support and promote high performance withintheir disciplines; and connect with broader audiences in the further progression of their areasof speciality.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
	Ten gigabit Optical tRansceiver iNtegrAteD circuit for pOn applications	£553,501	£249,075

#### Project description - provided by applicants

Increasing demand for bandwidth-intensive applications by businesses and domesticconsumers, along with the emerging'Internet of Things', is straining our broadband networksand could lead to data demand outpacing supply. The EU Fibre to the Home (FTTH) Councilstates that 'fast broadband infrastructure is now a determining factor in ensuring the economicfortunes of cities and regions'. With Ofcom reporting that average UK speeds were 15Mbpsin 2013, the UK's current infrastructure is barely capable of servicing existing demand. It isclear that much needs to be done, when one considers that the EU, through Europe's DigitalAgenda, has set targets of universal fast broadband (30Mbps) and >50% take up of ultra-highspeedbroadband (100Mbps) by 2020.Passive Optical Networks (PON) provide the majority of the world's fibre-optic broadband. Although the fibre optic cable within PONs can provide practically unlimited bandwidth (1-4Tbps), the high cost of current technology dictates that PON's current capability is restricted to 2.5Gbps. HiLight Semiconductor Ltd has devised a Proof of Concept for a highlyinnovative approach to upgrading a critical juncture of PON in order to deliver 10Gbpsspeeds. Our approach is simple and inexpensive, outperforming all existing alternatives. Weare now ready for the next step which is to develop the concept through to a successfulprototype stage. Within 5 years of completing this project (2022) we expect our solution to generatecumulative revenue and profit of £28million and £20million respectively, in turn creating 52highly skilled world-class jobs.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
l ·	QURIS (QUicksilva eReferrals Integration System)	£512,656	£230,695

#### Project description - provided by applicants

The NHS Choose and Book system (recently renamed and re-launched as the 'e-Referral Service') provides a core electronic system for handling patient referrals to secondary healthcare providers. Whilst the service has been available since 2005 its take up has been patchy and in some ways troubled. A significant component of this has been due to the very high cost of connection to the secure NHS N3 network and NHS Spine services, around which the service is based. This has led to a situation where a dual paper/phone and electronic operation is currently required, making it extremely difficult for the e-Referral Service to achieve the significant cost savings and improvements in efficiency that were the original objective of the 'Choose and Book' project. The QURIS project creates an innovative new approach to providing low cost connectivity; particularly for small to medium sized healthcare providers, to the e-Referral Service without compromising the inherent and integral security ofthe NHS N3 network and NHS Spine services. In doing so it will achieve two very significant advances for healthcare in the UK:- it will remove any economic barriers that prevent all healthcare providers offering their appointments through the e-Referral Service; - it will establish the potential for providing both flexibility and low cost access for other NHS Spine services, greatly extending the reach and benefits available with what is a crucialstrategic area for UK healthcare. If successful QURIS will deliver a novel system that is fully accredited via the Common Assurance Process governing all NHS N3 and NHS Spine systems and which also has been approved by the Health and Social Care Information Centre (HSCIC), the body responsible for regulating NHS Spine services.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Codex Digital Ltd	Codex IViS	£551,260	£248,067

#### Project description - provided by applicants

The twenty-four month [Codex IViS] project will develop a professional camera rig forcapturing live-action immersive video for the creation of high-quality immersive experiences. The system will be lightweight, portable, and designed to produce very high quality media forentertainment, documentary and education, commercials and marketing. There is a wave of excitement about the potential for immersive video and VR to put theviewer'inside the experience. Inspired by emerging consumer-level displays (such as the Oculus Rift, Google Cardboard, Samsung Gear, Microsoft HoloLens, HTC VIVE and SonyMorpheus), film and VFX companies are experimenting with ways of making immersive experiences using 360° stereoscopic video. These developments point to the birth of anexciting new mass medium, which creates a need for a professional immersive video camerasystem capable of delivering cinematic quality from a reasonably priced compact system. Nosuch system is yet available on the market, making it difficult and labour intensive to capturehigh quality immersive experiences. The project will develop a complete immersive video capture system, comprising: A very compact camera head, integrating camera lenses, HD digital video sensors and camera electronics into a single unit; A tethered data recording and storage unit, using solid-state drives, with allelectronics not immediately associated with the camera head; Firmware to control the operation, camera synchronisation, data recording to drives in the base rack, monitoring outputs from each sensor, data copying and conversion for stitchingand postproduction using third-party software tools. Codex will market the resulting product to film and TV industry equipment rental companies, through its established sales and marketing offices in London and Los Angeles, and itsnetwork of distributors and resellers worldwide.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
	Anaxsys Technology Ltd Asthma Monitoring Device Pilot Study	£506,873	£228,092

#### Project description - provided by applicants

Asthma attacks are caused by poor control of symptoms. Control is achieved by effectivemonitoring. Current asthma monitoring method is low technology, difficult to interpret anduncomfortable to use causing low compliance to monitoring regimes. Worldwide approximately 300 million people have asthma and approximately 30 millionpeople in Europe are currently living with this condition. The annual cost of Asthma inEurope is estimated to be EUR17.7bn, including direct cost of care, emergency admissionsand cost to the economy of working days lost. Productivity lost to asthma is estimated atEUR9.8billion per year. However, the cost to life, quality of life and the economic burden could be substantiallyimproved; severe asthma attacks are due to poor control of the condition. Indeed the drugtherapies are safe and effective and management plans for asthma would achieve sufficientcontrol to prevent asthma attacks if correctly followed. However, the peak flow meter, thestandard equipment for home monitoring to achieve that control, has various limitations. Many asthma sufferers find the forced expiration technique required to use peak flow metersdifficult and can even cause bronchospasm resulting in poor patient compliance. Childhoodasthma is also increasing and is under diagnosed; WHO estimates by 25%-40%. Childrenunder 8 cannot use peak flow meters because they are unable to achieve the forced expirationtechnique. Anaxsys Technology Ltd (Anaxsys) is a medical device company formed in 2002. Anaxsyshas developed and patented core sensor technology which is enabling us to develop andmarket a range of novel respiratory devices that challenge existing solutions and deliverimproved patient outcomes. Our overall aim is to develop and commercialise an innovativeasthma monitoring device, Breathe EasyFlow, which uses normal tidal breathing and shape ofthe breath profile to give an indicator of current asthma status.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Wikihouse Foundation	Web platform for the digital design and distributed manufacturing of homes	£460,440	£207,198

#### Project description - provided by applicants

Our cities face a huge housing challenge in the 21st century: to meet the needs of a growing,urbanising society, yet at the same time transition to low energy homes & sustainableneighbourhoods. Solutions are available, yet current housing technologies & economies fail todeploy & re-use them because our design & construction industries remain locked behindoutdated, inefficient methods & supply chains. This project aims to bring the same sort of disruptions that have transformed software mediainto the domain of housebuilding, by creating a web platform for one of the first fully digitalbuilding systems, WikiHouse: a customisable'digital lego', which can be fully parametricallydesigned/encoded, digitally fabricated locally using low cost CNC tools & rapidly selfassembledwith minimum skill (eg IKEA), resulting in beautiful, precision built, low-energyhomes at a very predictable cost. The platform will support the world's first start-to-finish process for the digital design &fabrication of buildings, along with the automation, software & data integrations necessary todesign & catalogue each project. The platform consists of:1. Sharing & versioning platform for open, collaborative sharing of design files as opensource code (a sort of Github / Wikipedia for architectural design, hence our name).2. Distributed marketplace of architects, small local manufacturers & contractors using thesystem (think Airbnb for the construction industry).3. Suite of in-browser digital tools for parametric design & digital fabrication, all integratedinto the above 2 elements. Even the basic, first version of such a platform has the potential to be very disruptive. Not justby making the production of high performance homes much simpler, faster & moreaffordable, but by breaking our 20thC dependence on centralised, one-size-fits-all, big factoryproduction models & supply chains for prefabrication, bringing the third industrial revolution' to the construction industry.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Project Provenance Ltd	Proof-of-provenance Tag "PopTag"	£531,526	£239,186

#### Project description - provided by applicants

Our relationship with the material world around us is broken. Raw materials travel throughexploitative supply chains, premium goods are forged and and producers remain invisible. How can we stop this disconnection between people and their material items? How can weenable goods to change hands in a way that helps business with fair practices flourish? Project Provenance Ltd was founded with the goal of using technology to enable everyphysical product to come with it's provenance. Through a successful Proof of Concept grant, we have integrated blockchain technology along a supply chain to allow interoperability of provenance information. The Development of Prototype grant will enable us to build a fullprototype for supply chain traceability on the blockchain. Specifically, we intend to meets theneeds of our primary market opportunity: Regulation and voluntary standards compliance infood supply chains. We seek to empower business with a consumer facing proof for the provenance of everything we eat - starting with high value items such as organic food, fishand beverages. The end-to-end prototype will integrate our PoC work with new R&D that willdeliver an easy to use toolkit and further key operations, including: Item transformation (e.g.food processing), full verification of claims (e.g. certified organic) and item level data access(e.g. a digital marque). At the core of our system is the Proof-of-Provenance Tag (or 'PoPTag'): This is adigital/physical'product' that links a secure digital history to any respective physical item. PoPTags allows information to flow freely with goods without the need for intermediaries ordata trustees ' the weakness of current alternatives. We employ the unique features ofblockchain technology so that control and ownership can fully lie in the hand of users. For thefirst time, customers all along a chain of custody will have access to authentic data about thejourney and attributes of an item.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Kafoodle Ltd	Kafoodle Kare	£449,803	£202,411

#### Project description - provided by applicants

In light of the Staffordshire Trust Hospital scandal, the Government implemented newstrategies for providing 'maximum care' for patients. Earlier this year, the Health Secretaryintroduced 'mandatory food standards' enforced through legally binding NHS contracts withhefty fines for hospitals that 'don't provide good enough food'. Since 1992, £54m has been spent on 21 initiatives to try to raise food standards. However 3mpatients remain at risk of malnutrition whilst in hospital and at least 20% of hospitals andnursing homes are not meeting at least one basic or essential standard in nutrition andhydration. The problem for hospitals and residential homes is that as many as 50 different diets need tobe provided for, whilst typically serving ~2.8m meals a day. Therapeutic, nutritional, medicinal, recovery and post surgery, cultural, religious, allergies, intolerances - all thesespecial diets need to be catered for with many patients requiring adherence to multiple dietaryneeds. It is no wonder that 30m patient meals are wasted each year at a cost of £230m at a time whenthe NHS needs to make £22bn savings. Care plans are supposed to monitor nutrition and dietary intakes; however even electroniccare plans rely on visual cross checking to spot allergic and medical reactions. Foodintolerances are rarely catered for, meals lack nutrition and taste, and there is no qualitystandard benchmarked across healthcare providers. Our solution is Kafoodle Kare a cloud based e-nutritional care plan that maps permittedingredients in meal plans to medical condition and all possible dietary needs, hence providinga food resource management system that can be integrated into existing patient managementsystems. Kitchen staff would be able plan and resource cost effective, nutritional, appropriatewholesome foods that meet patients' dietary needs. Kafoodle Kare would enable the NHS to reduce costs and wastage, raise food standards andmeet mandatory requirements.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Select Research Ltd	Rapid Measurement of Visceral Fat	£164,876	£74,194

#### Project description - provided by applicants

The UK has higher levels of obesity/overweight people than anywhere in Western Europe; thecost to the NHS is £5.1b, and to the economy £27b each year. Excessive amounts of visceralfat (abdominal fat around important internal organs) can lead to increased risks for manyconditions including; stroke, depression, heart disease, diabetes, cancer, liver disease, andasthma. Characterising the composition of body fat, important for diagnosing and treatingobesity and excess weight, is NOT provided by measuring BMI (Body Mass Index). Currentlyquantifying visceral fat requires expensive equipment such as Magnetic Resonance Imaging(MRI), and surrogates for visceral fat (e.g. waist circumference) are subjective and unreliable. The BMI remains as the preferred measure only through convenience and low cost. Our technology is an innovative, easy to use, mHealth service to determine the percentage and distribution of visceral fat using a tablet or smart phone. This project proposes to provideclinical validation for the underpinning methodology, as well as arguments to persuadepotential customers of the benefits (social and economic) of utilising the service.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
1	Prototype Lesion Tracking Clinical Workflow and Vendor Neutral Pre- Processing Platform for Medical Imaging	£529,718	£238,373

#### Project description - provided by applicants

50% of the UK population born after 1960 will be diagnosed with some form of cancer duringtheir lifetime. Medical imaging is used for diagnosis in 60% of all patient care episodes andplays a vital role in almost all cancer diagnosis, monitoring and treatment. The use of imagingthroughout the care chain, specifically in oncology, has increased dramatically over the lastdecade. Healthcare professionals involved are being overwhelmed by the quantity and complexity of data. In addition, radiology imaging databases are moving from PictureArchiving and Communication System (PACS) to Vendor Neutral Archive (VNA) systems. Reimbursement models are shifting dramatically across major markets, e.g. the US due to theAffordable Care Act. To address these issues, Blackford will develop a Lesion Trackingprototype integrating both our existing state-of-the-art registration and new, innovativesegmentation algorithms. Lesion Tracking will be a workflow for a Vendor Neutral Pre-Processing Platform (VNP3) that will allow broader market penetration for Blackford's highlyadvanced image processing technology. It will also create a resource- and time-efficientmechanism for developing a suite of new, clinically-focused applications and allow improved collaboration with academics seeking to commercialise research. Lesion Tracking willimprove the efficiency of cancer diagnosis and monitoring which requires interplay betweenmany components, all geared towards accelerating radiologist assessment and referringclinician understanding. It will address shortfalls in current systems that are rare and/orincomplete. While some components are data management driven, some require a higherlevel of technical innovation, namely registration and semi-automatedsegmentation/measurement. We predict that the combination of these components will drive a50-70% increase in lesion tracking productivity.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
	Terrabotics - Rapid 3D Reconstruction from Satellite Video & Multiple View Imagery	£341,404	£153,631

#### Project description - provided by applicants

Terrabotics (TX) eliminates the need for manual exploration and data collection in risky andinaccessible areas across the globe, whilst enabling non-technical decision makers and technical front-end planners to leverage geospatial data to assist in planning and decisionmaking. This project's goal is to develop the key algorithms necessary to create a self-service webplatformallowing anyone to use our high resolution terrain data within their strategic decisionmaking.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Noko Design Technology Manufacture Ltd	MultiRack Production Intent Prototype	£272,749	£122,737

#### Project description - provided by applicants

This project forms phase-two in the development of a bold new automotive accessory product, the MULTIRACK'. The product will be the flagship product for a creative design andengineering business ' the first of its kind that will specialise in the application of compositematerials and other high-tech lightweight materials in new markets. The MULTIRACK takeselements of a traditional bike rack and evolves it beyond recognition into a multi-functionallifestyle product. Fitted to the rear of the vehicle it facilitates the carrying of sports and leisureequipment including bikes, skis, snowboards, cargo boxes and luggage cases. Its innovativeuse of modular design and composite materials creates an entirely new form factor and arange of functions unique to automotive accessory design. It comes as a result of 26-yearscombined experience of the founding partners in the automotive industry. The Development of Prototype grant is required to create a Production Intent Prototype thatwe will test to regulation standards. We will undertake a process of research and developmentlooking into production processes that can move the design from the labour intensive, highcostcarbon fibre lay-up process that was necessary to deliver a proof-of-concept, toward a lowcost high volume production method utilising the latest techniques developed withinautomotive manufacture. Additionally, we will address issues of usability and securitythrough the development of new quick release features with the aim of creating furtherprotectable IP. The resulting product will compete with other premium carrying systems interms of usability, security and price. We currently use a number of suppliers in the UK for prototyping and look to broaden ourrange of contacts and keep all our production UK based. All product development will feeddirectly back to the growth of our unique business proposition in the UK and reinforce thedevelopment of future product innovations.

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Results of Competition: Smart Round 3 2015-16 - Development of Prototype

Competition Code: 1507\_SmartRnd3\_DoP

Total available funding for this competition was £7.5M from Innovate UK

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
	Novel Dual Cycle Combined Aluminium Dross Stirrer and Pressing System	£628,953	£250,000

#### Project description - provided by applicants

Aluminium (Al) due to its properties is the 2nd most used metal after iron (C KrammerAlHandbook 1999). Al dross represents a residue from primary & secondary Al production. Drosses are classifiedaccording to their metal contents. White dross is higher metal Al content & is produced fromprimary & secondary Al smelters. Black dross has a lower metal content & is generatedduring Al recycling (secondary industry sector). White dross may contain from 15% to 70% recoverable metallic Al & it comprises a fine powder from skimming the molten Al. Blackdross typically contains a 15% or less aluminium with a mixture of Al oxides & slag. (HwangJ Y et al 2006). Apart from Al metal, dross may also contain other chemical compounds eg Al203, AlN,Al4C3, MgF2, NaAlCl4, S102 MgO. With total global Al production at 62m tonnes (withclose to 26m tonnes from recycled) increase to around 97m tonnes (39m from recycled) (Organisation of European Al Recycling Industry 2013) by 2020. Approximately, up to 4 million tonnes of white dross & more than a million tonnes of blackdross are reported throughout the world each year, & around 95% of this material is landfilled (Journal of Minerals & Materials 2012 Vol 5). The problem for Al industry is to develop a means of recovering as much molten liquid from the dross whilst still in the hot form (830°C-900°C) on removal from the furnace. Secondary recyclers are no longer providing acceptable value in dross recovery. Only about40% of the metal recovery is passed on to the customer & is now common practice. In the FarEast & BRIC Countries, secondary recycling services are often not available. Altek haveidentified a unique dual cycle stirring/pressing process which could dramatically increase thelevel of Aluminium recovery on site.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
1	Advanced Multi-Component Gas and Vapour Sorption Analyser	£282,325	£127,046

#### Project description - provided by applicants

In our modern world, many classes of important materials such as pharmaceuticals, foods,polymers, catalysts and nanomaterials will absorb molecules such as water in the air,otherwise known as humidity. Indeed the manufacture, performance and stability of thesematerials is often dependent on this sorption behavior. Surface Measurement Systems haspioneered the development of scientific instruments for use in academic and industriallaboratories throughout the world for measuring the sorption behavior of materials based onsample mass changes: the so called gravimetric sorption method. This project will lead to the development of a new class of gravimetric sorption analyserswhich will allow experiments to be performed using either gas or vapour phase molecules forthe first time, as well as allowing for multiple gas phase species to be analysedsimultaneously. Combined with a new generation of microbalances for measuring the masschanges, these new sorption analysers will meet the more challenging and diverse needs ofacademic and industrial researchers, and will represent the new gold standard in gravimetricmaterials characterisation and are certain to be sought by leading researchers in laboratoriesthroughout the world. Key applications for the use of these instruments will include thedevelopment of new materials for carbon capture, materials for separating methane frombiogas as well as the development of the new catalysts and pharmaceuticals.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Haystack Dryers Ltd	Care Dryer	£211,417	£95,137

#### Project description - provided by applicants

Providing care to the elderly, disabled or those with limited mobility, particularly in assisting with their hygiene routine such as bathing, drying and dressing can be time consuming, labourintensive, costly and also for the clients it can be undignified, stressful and sometimes painfulespecially where they are suffering ailments. Haystack Dryers in one of the world's leaders in manufacturing body dryers and hasconceived of a solution to towel drying clients. The solution is more cost efficient, less labourintensive, less time consuming and is also more comfortable for the client. The Care dryer isdesigned to be used by people of all abilities either by themselves or aided by a carer, providing a warm relaxed hygienic experience which not only reduces the costs to the carehome/facility but it has a positive impact on the clients well-being and to the environment. The purpose of this project is to develop a concept design for evaluation and testing.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Synoptic Technologies Ltd	Synoptica: Continuous and up-to-	£456,822	£205,569
	date Business Intelligence		
	information provision for improving		
	the traditionally inefficient Demand		
	and Supply Management process		

#### Project description - provided by applicants

Many organisations suffer from a lack of quality information when it comes to identifying the most appropriate clients or suppliers. The lead generation and sourcing processes remains a laborious, manual, task that stymies innovation and often companies fail to act or act impulsively. Further, SME's that offer technologically advanced solutions find it difficult to be found by appropriate customers. This problem is magnified by the rapid advancement of global innovation, which can not be readily defined by potential buyers. The concept of Demand and Supply Management attempts to facilitate the brokerage of new technologies between buyers and suppliers. The Web contains invaluable information that could be tailored and extracted to create rich company profiles to be used as a measure of fit; this information can be continuously monitored for status changes. Due to the challenges of extracting information from the Web firms currently rely on structured data sources which are often out of date, expensive and limited in their value to guide demand and supply decisions. We have demonstrated in a previous proof of concept project that an automatic Web based lead generation process can be an effective and significantly less expensive when compared to other methodologies. This proposal expands on the previous project to create a prototype platform that identifies and defines buyer demand; integrates with innovation networks; and continuously scans the Web to profile and match the criteria of buyers with suppliers through advanced algorithms. By doing so, we effectively close the communication gap to help accelerate the adoption of innovation. The growth potential for this system has many channels through direct sales and integration and based on early traction and vast market size we are initially exploring the Smart Buildings and Smart Cities sector where we have strong letters of support from leading players in the public and private sector.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Buddi Ltd	Motivating Lifestyle Change for	£333,753	£150,188
	Type 2 Diabetes Prevention		

#### Project description - provided by applicants

Globally diabetes poses a major challenge, both at a national and an individual level. Theeconomic impact and the effects on quality of life are very significant and growing. Nearly,400 million people suffer from diabetes across the world. In the UK 3.2 million people havebeen diagnosed and it is estimated that there may be almost another 0.8 million undiagnosed. For the UK the cost of treatment is estimated to be approaching £1B annually, with the widercost of complications estimated to be £9B. Buddi proposes to develop an IT/e health system/platform which gathers patient data onactivity, eating behaviours and patterns and thoughts and feelings about their diabetes selfmanagement. The system will then analyse and make supportive and motivationalinterventions and feedback to the patient to prompt, encourage and facilitate him/her tobecome more confident and willing to change their behaviours. For example, changing thehabit of eating 'late' to one of eating earlier in the evening or at a more appropriate time, eating nutrionally balanced meals, managing cravings, comfort eating in response to lowmood or stress and perceptions of low blood sugar. The purpose of this project is todetermine if targeted motivational information/prompts as feedback on biological datacollected via wearable technology can reduce weight and increase physical activity; the twomain risk factors for type-2 diabetes.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
	Prototype Development of a Hybrid Gas and Ultrasonic Powder Delivery System	£350,181	£157,581

#### Project description - provided by applicants

Additive manufacturing (AM) using laser cladding has the potential to replace manyconventional manufacturing processes. Engineering parts are created by repeatedly adding fusing thin layers of materials to a surface. Complex 3D shapes can be achieved with lowcomponent distortion and minimum heat input. However major drawbacks include a highwastage of the expensive powder and the erosion of the powder head. This is a key barrier to the wider adoption of AM to a broader range of applications particularly for large components. Advanced Laser Technology (ALT) have noted these limitations and willaddress them by developing a novel hybrid gas and ultrasonic powder delivery system.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
	Development of an integrated Mobile Workspace Platform – hardware and software to turn empty and underutilised office space into mobile working destinations.	£242,880	£109,296

#### Project description - provided by applicants

2 billion+ square feet of new office space has been built worldwide in the past 30 years,however 49% of this work space currently lies under-occupied at any one time (ManhattanAnalytics:2014). Fuelled by changing work patterns & a rapid advance in technology, workhas become agile, distributed & flexible with an increasingly mobile workforce. Additionally,rigid leasing structure, inflexible rental agreements, strict covenants & a one-size-fits-allapproach have trapped companies into corporate footprints incompatible with modern workpatterns. The traditional office is increasingly becoming commercially obsolete & technologically illequipped to meet the demands of the mobile workforce. To address, we intend to develop anintegrated Mobile Work space Platform that will enable any business centre, empty work spaceor under utilised office to instantly become an accessible, integrated mobile work space -tapping into the huge demand for flexible, collaborative work environments. Utilising beacon hardware & location-based connection algorithms, the platform will consistof the key three elements;1. Access 'a work space management system incorporating'plug and play' beacon hardware& software to allow mobile workers to discover, access & use facilities near wherever theyare;2. Connection 'an integrated suite of embedded desktop, project management & productivitytools on a single platform3. Collaboration 'a proximity-based social & skills network to facilitate interaction betweenpeople, projects & workplaces. This low cost, impact solution to the problem of unde rutilised existing office space has thepotential to change the way space is let to worker and companies 'opening up a potential£200m secondary market for under-used work space (DTZ:2015). Our ambition is to move far beyond simple ecommerce sites that list work space and design atechnology platform to turn any empty work space into an instantly accessible, integrated on demandworkplace.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
PowerPhotonic Ltd	Fully automated fulfilment for micro- optic products - LightForge 2	£534,494	£240,522

#### Project description - provided by applicants

The development of a fully automated system enabling the direct ordering of micro-opticsonline and automating the design and fabrication process to a fully "man out of the loop"process.

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