Innovate UK

Results of Competition: Smart Round 4 2015-16 - Proof of Market
Competition Code: 1509_SmartRnd4_POM

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Warwick Analytical Software Ltd	CARE: Customer Automated Recommendation Engine	£39,496	£23,697
Project description - provided by applicants			
The boom in big data and predictive analytics is well documented. The vast majority of dataare unstructured (at least 80%) and this is only set to grow both in volume and proportion.Text analytics is a growing market with sophisticated tools from well-established vendors.However these tools are either focused around specific, pre-defined tasks (e.g. sentimentanalysis) or they require skilled data scientists to use them to build models for specific tasksand then to interpret them for business users to action. This creates a huge gulf between theoceans of customer text data from call centres, CRM, POS, emails, social media etc. and theability of the companies to act on the insight in the data in real-time, both towards specificcustomers (e.g. to stop them leaving a telecoms provider) and segments of customers (e.g.prioritising actions which increase customer satisfaction, product improvement, or upsellopportunities). "CARE" or Customer Automated Recommendation Engine is a revolutionaryapproach to text analytics which does not pre-define patterns, but uses a proprietary techniqueto find any useful pattern in text and recommends the most useful predictive actions in realtime.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
M Squared Lasers Ltd	Wavelength Modulated Raman Spectroscopy for Applications in Healthcare	£41,584	£24,950

Project description - provided by applicants

Almost from its discovery there have been grand hopes for Raman spectroscopy to be aubiquitous tool for chemical analysis. It has the potential to identify substances easily anddistinctly from fingerprint-like spectra. This can be done with simple photonic architecture,allowing for potential portable and miniaturised form factors. Unfortunately theoverwhelming fluorescence background common to all analytes obscures the weak Ramansignal and thus makes this dream unrealised. Finally wavelength modulated Ramanspectroscopy (WMRS) represents an innovative solution that delivers fast, fluorescence-freeRaman spectra. WMRS has a wide range of potential applications in the healthcare industryfrom discriminating between cancerous and healthy tissue, to determining drug concentrationsin biological liquids and identifying the presence of inflammation and infection as well as aanalytical technique for high throughput screening. This market study will aim to clarify theoptimum development pathway for this technology in the healthcare sector.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CNR Services International Ltd	Miniature Aircraft Seat Actuator	£42,969	£25,000
Project description - provided by applicants			
CNR Services International Ltd delivers leading-edge engineering design services to a widerange of industry sectors. From concept generation and development, through the design andoptimisation of the product, to the effective integration into the manufacturing process, CNR'sdedicated team of specialist engineers, designers and scientists help customers achieve theresults they are looking for.CNR recently designed a self-contained miniature actuator for a specific aerospace customerapplication. This innovative product delighted said customer by exceeding size, mass andperformance expectations and was developed in an extremely short period of time whichmeant CNR had to compromise on a great many design ideas they had during thedevelopment.Given that experience, CNR is confident that it is now able to develop a significantly smaller,lighter and higher performing self-contained electro-hydraulic actuator given a fresh piece ofpaper from which to start. This will be done entirely without infringing any foreground IPresulting from the initial design mentioned above.During a recent discussion with another customer about the benefits of miniaturising aircraftactuators, CNR is confident that there is a significant commercial opportunity in premium(business & 1st class) passenger aircraft seat actuation. This will generate significantforeground IP for CNR, grow its business substantially and create high value UK jobs.			

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Micropropagation Services (EM) Ltd	Sphagnum Carpet	£41,800	£25,000
Project description - provided by applicants			
It is not possible currently to propagate and grow sphagnum in large quantities, which hasmeant that until now the market for sphagnum has been niche (model railways, hangingbaskets, orchids, dried flowers etc). Micropropagation Services Ltd (MPS) have researched aunique technique for the micro-propagation of sphagnum which offers the potential to growsphagnum on a commercial scale.This application is to carry out a proof of market study to determine whether there would bemarket for large commercial seed stock carpets, and understand the IP landscape. Patentprotection is crucial for this application and must be carefully considered. We have to balancegaining patent protection with maintaining trade secrets, and require professional help throughthe patent study to ensure we adopt the best strategy.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Nava Technology Ltd	Study, assessment and proof of market potentials and economics of a new hybrid solar cell technology for portable devices and building-integrated photovoltaic applications	£44,872	£25,000
Project description - provided by applicants			
The majority of photovoltaic (PV) market is currently based on crystalline silicon, which theysuffer from relatively high production cost at large scale due to tedious processing condition,which may escalates its payback time. Silicon based modules currently cost 0.65 £/Watt andhave efficiencies less than 20% which is far from industry's targets of 0.03 £/Watt. This callsfor the development of new types of PV cells, having the potential to radically diminishingmanufacturing costs, through the development of organic, inorganic or hybrid materialssystems that can be employed as thin films.Nava technology, spun out from Cambridge University's Physics Department, has developed aunique and patent-pending Nanoscale Inkjet Printing (NIP) technology for Nanostructuredhybrid organic-inorganic PSC, which promises a significant enhancement in device lifetimeby x4 and a substantial 60% cost reduction through materials engineering along withutilization of scalable and inexpensive synthesis and manufacturing techniques. Its higherefficiency, reaching 21% from 0.5 cm2 devices, combined with its lower cost of bothprecursors and processing routes as well as improved stability compare to alternative organicPV, will enable far greater applications to become economically viable, e.g. electricitygeneration from building-integrated PV; its exploitation as a result contributing towardsachieving more cost-effective PV systems.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Future Visual Ltd	Future Visual: Pedagogic and Operational Innovation using VR.	£24,207	£14,164
Project description - provided by applicants			
To prove market demand for pedagogic and operational innovation using Virtual Reality.To assess the benefit of 3rd person viewing and adaptive learning within a Virtual Realitytraining application for high-risk environments and establish market demand for certified selfdirectedtraining experiences in VR.Whilst adaptive learning (i.e the environment adapts in response to the trainee's inputs) hasexisted within the learning world for some time, developing it as a code base that can work inrealtime VR environments is a challenge that has not yet been met. 3rd person viewing withinVR would allow trainees to view their actions from a 3rd party viewpoint which enhancescognitive processing.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Noko Design Technology Manufacture Ltd	Plug+Play (performance tools for electronic musicians)	£41,680	£25,000

Project description - provided by applicants

Plug+Play is a portable toolkit that translates on-stage gestures and actions into sound andlighting effects. Using simple clip-on sensors and control software, this design enables thestatic production of digital sounds to be created with the same front-of-stage energy as liveamplified instruments. The way artists create music is changing. Inexpensive musicproduction apps and programs have given rise to the bedroom producer. Now anyone with aniPad or laptop can create complex music compositions wherever they are. However, thismethod of creating music is restrictive when playing to an audience and generally does NOTlead to an exciting live performance. By focusing on artists that cross the boundary ofproducer, DJ and live band, Plug+Play transforms a microphone stand into a dynamic musiccontroller, a maraca into a heavy bass line or a raised hand into a pulsating synth-wave. Thesensors draw upon natural interaction and gestures typically used in a live performance(Movement, Proximity, Twist, Slam, Stomp). In electronic and dance music, lights are also animportant part of the audio-visual experience and are a common way to create a sense ofdrama and performance on stage. By controlling light as well as sound, the audience get agreater sense of how actions on stage can relate to a musical performance by offering a furthervisual dynamic. The design fits within the crossing of boundaries and genres that so oftenleads to the most creative forms of musical expression. Plug+Play technology can also lead toa number of spin-off products within lighting and music performance.A proof of market grant will enable Noko-dtm to research three different aspects of the musiccontroller market - The Artist+Performer, the Venue+Hardware, and the Wider Industry(Retailers+Brands). This research will allow us to fully scope the market opportunity for thistechnology and determine ongoing development and funding needs.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
AltEnergis PLC	Piezo Charger Proof of Market	£41,675	£25,000
Project description - provided by applicants			
Piezoelectricity is a growing area of energy generation within micro-electronics, whereelectricity is generated at no cost from stress, strain, movement and vibrations. The market forpiezoelectric devices is highly diverse but traditionally, target applications have relativelyhigh power consumption, and piezoelectric devices have only been able to produce smallpower outputs which have limited their potential.However, as technology advances many applications now require far less power to operate,thus making piezoelectricity a feasible method of powering micro-scale electronics or LEDsetc. Combined with the stronger focus of industry to create energy efficient and ecosustainableproducts that consume/use less power this is resulting in a paradigm shift allowingpiezoelectric technology to become a far more valuable solution in the coming years.Traditional piezoelectric devices use a Lead zirconate titanate composite material (PZT) togenerate energy which is smooth and flat. Electricity is created when mechanical oscillations(i.e. small crystals rubbing together) occur during vibrational movement - the power of whichis dependent on its size and structure for a given application. However one of thedisadvantages of using PZT in its traditional form is that the output power is typicallyrelatively low.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Mars Space Ltd	Revolutionary, Mini Gridded Ion Engine to Transform Deployment of Cubesats in Space	£41,667	£25,000

Project description - provided by applicants

Cubesats & nanosatellites are one of the fastest growing sectors of the space business with thenumber being launched into orbit increasing almost exponentially. They are evolving frombeing just university projects & technology demonstrators to commercial realities. Thecubesat commercial market is dividing into two distinct segments. The first is 3 Unit (3U)cubesats in very low earth orbits (<300 km) for earth observation giving frequent imagerefresh & short constellation lifetimes.The second segment is for larger 6U, 12U, & 24U cubesats used in higher orbits (400 ' 600km) to perform longer lifetime, more complex missions focusing on EO, radar imaging,telecommunications & science & military applications. Most of these missions needpropulsion to perform orbit insertion, constellation control & orbit changes. At present theyuse mainly cold gas propulsion, but lately a strong interest has emerged in the use of electricpropulsion (EP) due to higher performance capabilities.MSL is developing a revolutionary, advanced, mini gridded ion engine for these larger 6-24Ucubesats that provides very high delta-v (thrust + burn time) & orbit control capabilities, usesvery low power (less than 20W), and is much cheaper than alternative technologies. This willallow 6-24U cubesats to perform orbit insertion manoeuvres, large orbit changes, and deorbitingat the end of life. This will be a disruptive factor as cubesats currently must operateon the launcher insertion orbit or very close to it. The capability to manoeuvre significantlyaway from the launcher insertion orbit will have clear economic benefits and help reduce thespace debris problem.MSL now needs to undertake a market assessment to roadmap to broader uptake of thetechnology; understand the detailed product requirements for future cubesat missions; to sizethe potential market; & to understand the compelling'value proposition' that MSL brings.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Ingenza Ltd	Point-of-care testing for nasogastric tube placement verification in neonates and children	£41,758	£25,000
Project description - provided by applicants			
Nasogastric (NG) tube feeding is common practice in hospitalised children and neonates tofacilitate nutrient intake and medication administration. However, tube misplacement is notuncommon and is a significant issue as a tube misplaced into the lungs instead of the stomachcan be fatal. This has led the NHS to recently classify NG tube misplacement as a'neverevent'. Children and neonates are at increased risk of misplacement compared with adultsbecause of their age, increased activity and non-purposeful movement of limbs or the headand neck.). To address misplacement issues, Ingenza have devised a novel, easy to use, lowcost point-of-care (PoC) test for confirmation of the safe placement of NG tubes in neonatesand children. An easy and reliable PoC test will allow ongoing verification of the location ofthe device and its tip with accuracy. It will reduce harm occurring to children and neonate inNG tube feeding. It will reduce exposure to X-ray radiation and avoid delays in initiating andadvancing enteral nutrition.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Agile Impressions Ltd	Solar Powered Electric-Bike Charge Station (SPEBCS)	£40,845	£24,500

Project description - provided by applicants

Agile Impressions (AI) is a social enterprise intent on making e-mobility accessible to all byintegrating the latest innovations in vehicle and charging technologies with alternativerevenue models to lessen the upfront costs typically associated with e-mobility.A viable alternative to cars on account of longer journey capabilities and lack of physicalexertion required, electric bikes (e-bikes) offer a promising low carbon travel option.However, as with electric cars, usage is subject to charging station access, currentlyunderdeveloped in the UK. E-bikes, generally fitted with detachable batteries, normally offer arange of 20-50km.AI has developed a prototype design for a solar powered e-bike charge station (SPEBCS) thatcan be installed at public/commercial premises to provide cyclists with a convenient means ofcharging, displacing the need for cyclists to carry their own charger with them as they travel.SPEBCS allows cyclists to receive a newly charged battery upon deposit of their'used'battery, preventing charging requirements from hampering on-the-go cyclists.The two-tiered unit holds 12 battery capsules on each tier, with charging leads on the upper.When charged, batters are released to the lower tier ready for collection. SPEBCS drawspower from photovoltaic cells on rotation to maximise radiation capture and generationpotential, ensuring e-bikes maximise their carbon savings. The unit's outer case displaysadvertising content in prime locations, offering an additional revenue stream.AI exploits maturing battery technology, public support for e-mobility and sharing economybusiness models to devise an attractive proposition for cyclists, investors and channels tomarket.Successful deployment requires coordination among stakeholders and detailed marketresearch. This study's objective is to prove our value proposition, qualify technical feasibility,and produce a technology development plan prior to securing Proof-of-Concept funding

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
New Finance Ltd	Nickle proof of market	£33,135	£19,881
Project description - provided by applicants			
Globally, 2 billion adults, half the world's adult population, lack access to formal financialservices. Moreover, the financial products available are inadequate and deficient in addressingthe needs of lower income segments.Therefore, millions of people have to recur to informal ways of saving and borrowing, themost common being Lending Circles used by 1.5 billion people according to the World Bank.Lending Circles today operate with several inefficiencies: No data collection (lack of credithistory), Cash handling (insecurity), Geographical limitations, Cost of travel, (closingbusiness) Ardous bookkeeping.We addressed all these inefficiencies by modernising lending circles in the form of an appand, therefore, also addressed the need for a financial product specifically designed formicrolending/microsaving. To put it simply, we developed the 'Whatsapp' for savings.A trial version of the app was developed, the objectives of our Proof-of-Market project are to:Research and identify communities and ethnic groups in the UK most likely to use the app;Further develop our relationship with the FCA. Nickle was accepted and aided by theInnovation Hub in its early stages and we will participate in the upcoming regulatory sandboxinitiative.Bring this tool to end users to test the application and give us feedback so that we can thenincorporate any amendments and additional features until we find market fit (i.e. we haveadequately addressed the need).This market assessment study will help us to optimise Nickle and define the requirements ofits back-end systems to meet the needs of micro-lenders/savers in the UK (where 9 millionpeople are currently underbanked) and developing countries primarily Mexico and Indiawhere smartphone penetration is high. If successful this will open a potential global massmarket of 700m unbanked people only in those 2 countries and the possibility to roll out theconcept in Latin American countries, USA Philippines and Africa.			

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GWMV Ltd	Proof of Market for an innovative medical device	£41,988	£25,000
Project description - provided by applicants			
A development of a new physician platform			

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Wind Technologies Ltd	Wind Technologies Limited – Study, assessment and proof of market potentials and economics of a new electricity harvesting technology for powering rotor instrumentation in variable speed drives	£44,982	£25,000

Project description - provided by applicants

The UK's electricity consumption could be reduced by 1.6 TWh annually, equivalent to £160million, if the average efficiency of industrial inverter-fed motors, also known as variablespeed drives (VSDs), is increased by 1%. One way of achieving this, and also several otherbenefits such as extended lifetime, lower maintenance cost and higher reliability, is throughreal-time measurement and monitoring of rotor performance.However, powering the instrumentation and wireless data transmission system installed on therotating shaft by batteries is not practical in most applications where the motor is required torun continuously for long intervals. In addition, batteries are expensive and bulky, and cancause significant reliability issues. These have prevented the adoption of rotor measurementsin industrial VSDs where it can bring substantial efficiency and cost benefits.Wind Technologies has developed a patented energy harvesting technique, MAGtronics thatextracts DC electricity from the leakage magnetic flux of rotor end-windings. MAGtronics,demonstrated on laboratory prototypes, can supply sufficient power for the instrumentationelectronics on the rotor.This project aims to study, assess and quantify the economics and market potential ofMAGtronics technology for industrial VSD applications.

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TISICS Ltd	Fibre Reinforced Metal Matrix Composites for Automotive Applications	£40,836	£24,501
Project description - provided by applicants			
The automotive industry is being subjected to increasingly strict fuel economy restraints,alongside a growing customer demand for improved interiors, advanced safety systems andstate-of-the-art entertainment facilities, all of which result in unnecessary additional weight.Tisics Ltd have designed a novel process which will use silicon carbide monofilamentreinforcement to create light-weight automotive components.			

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