Innovate UK

Results of Competition: Emerging and Enabling Technologies Round 2 - Up to 12 Months

Competition Code: 1703_EE_R2_12M

Total available funding is up to £15M

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
Inova Design Solutions Ltd	Heat Stress Risk Prediction – A Bodytrak Feasibility Study	£99,765	£69,836
Project description - provided by applicants			
The mortality rate of outdoor workers attributed to heat illness, was found to be almost 20 times that of indoor workers, in spite of health and safety regulations and the advances made in the development of heat stress/strain models since World War 2. Clearly, more can be done. At Inova we have developed Bodytrak®, a precision in ear monitoring system used to continuously measure a suite of vital signs, many of which are highly relevant for measuring heat stress exposure. Bodytrak has access to massive data storage and computational resources through a secure wireless on-board radio. Consequently, we intend to carry out a feasibility study to understand what additional sensors and corresponding data are required for build a fit for purpose risk prediction algorithm/s for the heat stress exposure., which would help to position Inova to exploit an addressable market for Bodytrak, currently worth £11.56Bn (2017) with a serviceable market of £187m.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Green Running Limited Powervault Ltd	Tenant Electricity Exchange (TEE)	£115,608 £57,522	£80,926 £40,265
Project description - provided by applicants			
Green Running and Powervault are both fast growing SMEs at the forefront of energy sector innovation, with respective expertise in machine learning based electricity disaggregation and small scale battery storage. For both companies, key customer segments and early adopters include social landlords, community energy groups and local authorities, for whom standard B2C offerings are ill-suited with respect to issues such as tenant fairness. More broadly, despite clear and consistent public approval ratings for renewable energy technologies, only ~5% of the UK population have direct access to these carbon free sources of electricity. This 12 month feasibility study will establish the technical and commercial potential to use innovations in distributed ledger technology to facilitate increased and shared access to low carbon energy sources, and optimum business models for implementing such technologies.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Conspexit Ltd	Intelligent Assistant	£361,100	£252,770
Royal National Institute of Blind People (RNIB Group)		£158,499	£158,499
Project description - provided by applicants			
Sight loss affects 1.8 million people in the UK, with over 360 000 people officially registered blind. More than half of people living with blindness rarely or never go outside as as moving around independently in modern cities is extremely challenging. Guide dogs are an expensive and a huge commitment in terms of space and time, and the long cane gives limited information from a short distance, and many find that being immediately identifiable as blind leads to a feeling of vulnerability. In this project, a collaboration between Conspexit and RNIB, they will produce a new platform, intelligent Assistant (iA), that will empower a blind individual to have independent mobility, allowing them to move safely, fluidly and above all confidently through our modern cities. Our technological solution will allow a blind person to move seamlessly from indoor to outdoor environments, and avoid any obstacles which may occur in real time. At the end of this project, we will demonstrate iA with a user trial: guiding someone from their front door to a bus stop several streets away, having safely traversed a controlled crossing and avoided any obstacles that may occur on the journey.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Sustainable Venture Development Partners Ltd	The Internet of Bins	£99,568	£69,698
Project description - provided by applicants			
Waste is currently a 'known unknown' for many businesses and the Internet of Bins seeks to adress this systemic issue for both waste generating businesses and hauliers. Ultimately, if you can't measure it then you can't manage it. Through attaching IoT sensors to bins, data on the fullness of bins will be communicated via the cloud and used by waste hauliers for route optimisation, leading to signficant gains in collection efficiencies (>20-40%).This will in turn result in improved service levels for waste generators, as well as giving them real-time data on the amount of waste that they are generating, linked to behaviour management software that helps businesses to meet their waste management objectives (e.g. a percentage reduction in waste generated within a certain timeframe). This project seeks to develop an alpha version of the IoT device, as well as the behaviour management platform. Field trials will also run over a six month period in order to demonstrate the capability of the device, and feed learnings into its design iteration.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
BleepBleeps Limited Open Sensors Ltd	BB Cloud (smart parenting services)	£39,741 £60,150	£17,883 £27,068
Project description - provided by applicants			
BleepBleeps is a digital hardware company that design cute connected products for kids and parents. The brand is based around a suite of different products that 'help make parenting easier'. Innovate UK grant funding will enable us to develop an innovative software service, BB Cloud (smart parenting services). As a connected product company, we know the value of understanding our customers & creating products that respond to individual needs. R&D undertaken within this grant will create the foundations that will link all BleepBleeps products with a single software service that provides insight and guidance at different stress points in parent's lives, including: - bedtimes, sleep, activity, time telling, healthy teeth & good behaviours. Grant funding will provide the opportunity for BleepBleeps to collaborate with IoT data analytics company OpenSensors and online parenting community Mumsnet, to develop parenting service features that track and assess how BleepBleeps devices are used and to provide useful insights, recommendations, content downloads and notifications via the BleepBleeps app and parenting dashboard. Throught the provision of smart data analytics we can directly address parenting concerns and help parents connect more with their children.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Redacted Innovations Limited	Unifying deep learning and knowledge representation for cybersecurity applications.	£99,757	£69,830
Project description - provided by applicants			
Companies are increasingly generating more data. There's increasing value in sharing and analysing this data. However, it often contains personal and sensitive information and it's very important to protect customer privacy by not sharing this information with third parties. This leads to a catch 22 situation. Companies have data they want to share but they can't because of what's in the data. Automated tools can be used to analyse the data and redact the sensitive information. However, they can't currently be relied on because they're not accurate enough. This is because accurate classification often depends on understanding context, which is something that computer systems struggle with. This project aims to design a new type of automated classification system that fuses best in class topological, contextual data analysis and natural language processing algorithms. This system will be able to understand both the structural and contextual information that existing automated systems can't handle. This will allow personal and sensitive information to be identified much more accurately, which in turn will allow companies to share and extract value from their data.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Cambridge Graphene Ltd	Upscaling novel microfluidisation for repeatable, low-cost creation of quality graphene ink	£97,476	£68,233
Project description - provided by applicants			
Advances in printed electronics are enabling innovation & progress for the Internet of Things (smart textiles, flexible sensors). Metal ink is dominant in the conductive ink market for printed electronics but expensive & requires high temperatures for processing. Graphene inks overcome price versus performance as they are low cost, lightweight, excellent conductors. The challenge remains how to produce repeatable batches at scale. This project aims to validate a pilot scale production of graphene ink from proven novel, repeatable, microfluidisation process at lab-scale. Inks produced to date show market leading sheet resistance, can be used in commercial printing processes at up to 25 times cheaper than metal alternatives. As production chamber size increases, the physics of the system alters (longer particle residency, travel time) delivering a challenge to repeating lab-scale outputs. Further research into novel feedstocks & improved outputs (larger flakes, lower sheet resistance, tailored viscosity) is to be investigated.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Cambridge Materials Limited	Feasibility assessment of a disruptive low-cost light emitting diode technology, CamLED	£98,528	£68,970
Project description - provided by applicants			
Highly efficient Light Emitting Diodes (LEDs) are rapidly penetrating the lighting and display markets, expected to be worth >£120 billion in 2020. However, cost is the main barrier to widespread growth of LEDs, currently taking only 23% of the addressable market. In addition, today's mainstream LED technologies do not allow the build of flexible structures, which are expected to take major share in the future display market. CamLED is an ultra-low cost disruptive LED technology that utilises inexpensive materials, processed and fabricated at low temperatures (<100°C). This also enables flexible structures to be made.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Matrix Mill Ltd	Finding "Needles" in Audio/Video Haystacks	£99,439	£69,607
Project description - provided by applicants			
High-tech businesses and organisations face needle-in-a-haystack problems: they have ever growing audio and video datasets, but no effective means to find specific objects or events. Matrix Mill is a UCL spin-out that already applies cutting-edge machine learning and computer vision to massive image datasets, e.g. helping find termite mounds in satellite imagery of Africa. This project will develop the new generation of Active Learning algorithms, targeting large, but naturally messy, sound and video stores, such as those used in large scale animal welfare studies, ecological surveying for train line construction, and video surveys of model organisms for medical and pharmacological studies. Innovate UK's support is leading us to new insights and software products: our business users will have responsive interfaces that *ask* the human expert when something is confusing, and request targeted input to help the user find important but rare objects and events.			

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ANB Sensors Ltd	Self-calibrating platform for all Ion Selective Electrodes facilitating in-situ smart monitoring.	£99,306	£69,514
Project description - provided by applicants			
Ion Selective Electrode (ISE) sensors are used to detect ionic concentration in aqueous solutions. Through discussions with several ISE sensor users and manufacturers, we have confirmed a fundamental issue with the ISE sensors currently on the market "electrode drift" which severely degrades the sensor's operational performance and utility as a smart sensor. In-situ ISE sensors have enormous potential across many industries (everything from environmental monitoring to medical/pharmaceutical controls), but the need for calibration to account for drift severely limits use of in-situ ISE sensors. ANB have identified an opportunity to investigate whether part of its novel electrochemical sensor platform can be used to address the issue of drift in ISE's, in-situ, enabling the vast potential of the sensors to be realised in smart solutions. To address the issue of drift, ANB will utilise a novel means of verifying the electrochemical potential/performance of the reference electrode through the introduction of an additional voltammetric electrochemical measurement. The overall objective of this project is to research, develop and produce at least 5 modified laboratory scale prototype pH sensors utilising the novel self-calibration system over prolonged periods (up to 12 months).			

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Gravity Sketch Limited	Virtual Reality Operating System for Automotive Design	£99,617	£69,732
Project description - provided by applicants			
Automotive design is being transformed through the use of Virtual Reality within the design and engineering process. Gravity Sketch is developing solutions to help build a more effective and intuitive design workflow with a foundation in virtual reality. The company is addressing some of the most challenging areas of virtual reality imaging and gestural user input to deliver an operating system for real time 3D content creation. This solution will potentially solve issues both designers and engineers face during the 18-24 month process of designing and manufacturing a consumer automobile. They aim to build the visualization and rendering algorithms that will allow this tool to grow and become a new standard for professional creative industries. This solution will break the traditional computer aided design (CAD) norms, and offer a new, more natural experience for creating and communicating 3D content and ideas in real time.			

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Living Map Limited	CARTO+ positioning system technology	£96,038	£67,227
Project description - provided by applicants			
Living Map is a fast growing UK digital mapping SME with R&D capability in the field of spatial orientation, data driven cartography and sensor systems. The company has developed and commercialised a proprietary world class mapping software [Cartoengine] and is now using this as a foundation platform to develop an innovative indoor positioning system. This positioning system will be used to locate and navigate humans or robotic devices in areas that are multilevel or that lack a consistent signal network eg. complex multilevel urban areas or underground transport or heavy industry environments. The platform is unique and innovative in that it a) delivers a higher level of indoor locational accuracy than positioning systems currently available on the market; b) is fully portable and independent of infrastructure, and c) is agnostic to the operating platform which means it works on both high and low end mobile devices			

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HEL Limited	Achieving better chemistry faster through thermoelectric promotion of catalysis	£143,167	£100,216
Exergy Ltd		£39,394	£27,576
Cranfield University		£74,307	£74,307

Project description - provided by applicants

This consortium combines the original technology inventor in Cranfield University, with a pre-pilot reactor developer (HEL Ltd) and a sustainable and renewable process design/assessment specialist (Exergy Ltd) to explore a novel, new and emerging technology, called thermoelectric promotion of catalysis (TEPOC). In essence, TEPOC uses thermoelectric materials to transform a temperature gradient into a Seebeck voltage, which increases the electrochemical energy of the electrons in the catalyst particles. This improves the catalytic activity by several tens to several thousands of times. The generic nature of the mechanism suggests that TEPOC can be applied to many catalytic chemical processes to: reduce the reaction temperature, increase the reaction speed, improve the desired selectivity. The use of the thermoelectric effect to boost catalyst performance has potentially wide ranging benefits for the chemical industry in terms of both efficiency savings and enabling the use of chemical syntheses which have not previously been viable.

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Avgo Biotech Ltd	Use of nano MIPS to extract valuable compounds from waste streams	£39,992	£27,994
MIP Diagnostics Limited		£40,010	£28,007
Nottingham Trent University		£19,993	£19,993

Project description - provided by applicants

Molecularly Imprinted Polymers (MIPs) have been proven for a range of applications including affinity purification. MIP Diagnostics using a revolutionary manufacturing process have developed nano-MIPs. This proprietary method enables much more refined MIPs based products including affinity chromatography media for separation of high value compounds. This proof of concept project aims to demonstrate the potential of this technology beyond the analytical scale though the isolation of glucosamine from a food processors co-product stream. The compound choice is based on a recognised customer need, the availability of a novel source (mushroom stalk) and builds on the recent success with nano-MIPs in high sensitivity glucosamine assays. The proposed project is to demonstrate the capability of nano MIPs as an emerging technology in the isolation of high value chemicals from waste food streams. The project will specifically explore the use of nano MIPs as a way to bring to market a UK sourced, vegan, sustainable, natural healthcare supplement suitable for all.

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NFC Helps Me Limited	Shoot to Skill	£99,282	£69,497
Project description - provided by applicants			
The world isn't designed for people with additional needs, and a lack of accessibility means a lack of opportunity to be independent. Shoot to Skill is a project led by NFC Helps Me Limited trading as How Do I?, a business spun out of an outstanding, statutory funded special needs school and 50% owned by Swiss Cottage School Charity, which supports learners at the school but also disseminates best practice in special needs education in the UK and internationally. It has created a user-led and commercially viable alternative to person-to-person, one-to-one support for transference of skills to differently abled children and adults, including those with learning disabilities, acquired brain injury and dementia. Smart IoT technology is used to link location to learning, which can empower individuals, increase autonomy and enhance employability. How do I? fits into the "digital" priority area for growth. The innovation is the creation of a novel platform that links self-service, instructional video content to location-based IoT technology. Content is auto-edited and formatted based on experience-driven algorithms to ensure it is accessible and intuitive. Once vetted, content is launched instantly on any device by presence of an encoded IoT object.			

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Intellegens Limited	Demonstrator for application of AI to experimental data.	£95,900	£43,155
Project description - provided by applicants			
Intellegens, a provider of specialist Artificial Intelligence (AI) algorithms to the drug discovery and material design sectors, proposes an experimental development project to enable integration of its unique algorithms with specialist software and modelling pipelines. Intellegens' algorithms are used to add insights to data, where large portions of data can be missing. Missing data is a key feature of experimental data; for example, through experiments we may know which proteins are affected by a certain drug but with millions of drugs and tens of thousands of proteins the percentage of all known activity is small. On a small scale a human may look at all this data and see that whenever proteins A and B are active for a particular drug then protein C is also active. Our algorithms can look at all this data and infer the missing values, leading to a vastly improved dataset to help inform further research and development work. This improved data quality can significantly reduce time and cost of development processes that can take many years. The innovation in this project will allow Intellegens to scale this service, currently performed on a manual, case by case basis, by combining (1) our unique AI (2) on-demand cloud-based services, and (3) modern web-based frameworks.			

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Rais Opportunities Ltd	AI-driven data cleansing and enrichment agent	£91,804	£64,263

Project description - provided by applicants

Rais Opportunities Ltd (rais.io) helps SME eCommerce businesses manage, make sense of and act on their customer data, to improve customer retention and acquisition. In this feasibility study, Rais will explore the possibility of developing state-of-the-art machine learning algorithms that automatically cleanse (auto-management of outliers) and enrich (fill in the blanks and generate new data) customer data. Improved data inputs will dramatically enhance the value of insights and actions which are automatically generated by other machine learning algorithms that Rais is developing, as part of its Virtual Personal Data Analyst software eco-system. Rais intends that these powerful software processes will use a unique combination of bespoke machine learning and computational intelligence techniques to help businesses establish a better data foundation that can enable meaningful insights to be generated. This aims to provide a vital enabling input into an automated machine learning workflow; from data collection through to the prescription of actions to take. This means that non-technical SMEs will be able to spend more resources on acting to build stronger customer relationships and less time on managing and making sense of all their data.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Compound Semiconductor Technologies Global Limited	Advanced Etching and Optical Coating for Low Cost Laser Diode Manufacturing	£295,558	£206,891
University of Glasgow		£118,095	£118,095

Project description - provided by applicants

The objective of the project is to reduce the cost of manufacturing compound semiconductor laser diodes. In the key markets for laser diodes such as Fibre To The Home (FTTH) and in DataCentre (DC) networks, laser diode cost is a critical factor . Compound Semiconductor Technologies Global Ltd is currently serving these markets however in order to remain competitive against laser diode suppliers globally, it is necessary to develop manufacturing processes and technology that will maintain the company's competitiveness. Project therefore addresses the competition scope by developing an innovative enabling capability in compound semiconductors to improve productivity. This will be achieved through the development of an advanced etch and passivation process that will be applied to the laser diode wafers and will allow the facets of the laser diodes to be coated while still in wafer format. A typical 3 inch diameter laser diode wafer contains over 1000 bars and therefore the benefit of this approach is that it removes the labour intensive approach of cleaving the wafer into bars and mounting the individual bars in jigs to perform the dielectric coating process. The development of the process will lead to substantial savings in the manufacturing cost of laser diodes.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Sensum Technologies Limited	Feasibility study of a connected medical device with novel electrodes	£100,000	£70,000
Project description - provided by applicants			
Sensum Technologies is developing a combined hardware and software solution for the detection of electrical activity from the body, using a novel electrode.			

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IQE PLC	Telecoms-wavelength GaAs-based VCSELs with GaSb quantum rings (QRVCSELs)	£129,578	£64,789
Lancaster University		£111,146	£111,146
Compound Semiconductor Technologies Global		£122,334	£85,634
The Centre for Integrated Photonics Limited		£20,883	£12,530

Project description - provided by applicants

Vertical-cavity surface-emitting lasers (VCSELs) are small, fast, cheap lasers with a low-divergence circular-beam profile. They are ideally suited for sending signals down the optical fibres that are used to carry the vast amounts of information that we take for granted every day. VCSELs are already widely available for generating light in 600 to 1100 nm range for datacoms applications, e.g. relaying information around a datacentre, but, because of the distributed Bragg reflector (DBR) technology that is the key to their operation, they are invariably GaAs-based. This has limited their use in telecoms applications, which requires longer wavelengths (1260 nm to 1675 nm): it has proven difficult to generate a GaAs-based active region that emits at telecoms wavelengths. In this feasibility study we will assess the potential for commercially-viable, GaAs-based VCSELs, that can operate cooler-free at high-speed and at telecoms wavelengths, by exploiting the novel self-assembled GaSb quantum ring technology developed in Lancaster in the active region of the device.

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Racketware Limited	Automated Intelligent Coaching for Racket Sports	£99,514	£69,660
Project description - provided by applicants			
Racketware have created a small lightweight electronic sensor that attaches to a racket and records the motion of that racket during an entire match. It is targeted initially at squash but is applicable to all racket sports and beyond. Racketware have developed breakthrough racket tracking technology using this data that allows the player's racket to be tracked accurately in terms of its position and orientation on the court hundreds of times a second, without needing beacons to be installed, or other court modifications. This Innovate UK grant-funded project has allowed Racketware to build on this tracking data a powerful set of Artificial Intelligence algorithms developed in conjunction with world class England Squash coaches and leading academic researchers. These algorithms can automatically analyse player's movement patterns, tactics, and technique when striking the ball, so as to provide valuable intelligent automated coaching feedback and performance statistics for every match played. The Racketware system makes quality coaching accessible to a large number of players under actual match conditions, at a fraction of the cost of coaching today.			

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Innovate UK

Results of Competition: Emerging and Enabling Technologies Round 2 - Up to 12 Months

Competition Code: 1703_EE_R2_12M

Total available funding is up to £15M

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
Isotropic Systems Ltd Avanti Communications Group PLC	Transformation Optics Antenna for Satellite Broadband Markets	£623,000 £103,849	£436,100 £51,925
Project description - provided by applicants			
Isotropic Systems Ltd the UK satellite terminal pioneer has partnered with Avanti Communications the leading UK satellite operator to develop an ultra low-cost, self install, high performance, high throughput antenna to enable the massive distribution of satellite broadband by high throughput satellites to connect the unconnected and open up a new high growth opportunity for satellite broadband providing new growth and jobs for Avanti and Isotropic who will develop this project from the UK and the growth of broadband in emerging markets.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Integrated Environmental Solutions Limited	Community Energy Dynamic Solution with Blockchain (CEDISON)	£256,283	£153,770
Chaddenwych Services Limited		£211,138	£147,795
London Business School		£159,125	£159,125
Our Power Energy Supply Limited		£141,510	£83,000

Project description - provided by applicants

Within the UK grid infrastructure environment, renewable potential is curtailed, preventing large penetration of Renewable Energy Sources and injection of all available power into the grid. This leads to an opportunity for micro-grids at the community level to be optimised, enabling local balancing and providing extra revenue schemes, i.e. electric transportation charging, or electric heating. In addition, Distributed Ledger Technologies (DLTs) such as blockchain can be used to stipulate and store smart contracts that enforce proportional fairness among participants in low-carbon microgrids. CEDISON will examine the synergy between DLTs, intelligent building monitoring and control at community level, including forecasting based on weather and electricity price and Peer-to-Peer trading to smart energy systems. CEDISON is the first of its kind to define a way to capture the benefits of local balancing markets, at building and district level, enhancing consumer digitalisation, and being able to measure the impact in rural and city district microgrids. CEDISON is disruptive, in a way that allows evaluation of interactions of data trading providing insights to consumers, planners, markets, business and governmental bodies.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Think Cyber Security Ltd	Feasibility of a disruptive and cost-effective anti-phishing and security awareness solution	£80,528	£56,370
Project description - provided by applicants			
The proposed project, and corresponding innovation, is concerned with the development of a novel and disruptive product which fuses technology- and human-centric methods to cost-effectively mitigate the cybersecurity risk of phishing. The overall objective of the project is to empirically prove the effectiveness of PhishWizard in addressing a customer pain and gain traction in exploiting a $1-2bn global market. The project aligns with the competition scope because it examines an exciting and unique product in the area of Digital-Cybersecurity and is applicable to both consumers and businesses in almost all industries, sectors and geographies. The project will 'œfast forward' engagement with human-computer interaction experts and accelerate growth by maximising the effectiveness and attractiveness of the product, delivering empirical proof of its superiority and validating the main go-to-market channels.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Luggage Logistics Ltd University of Surrey	Low cost baggage tracking, through machine learning and image processing.	£273,006 £111,387	£191,100 £111,387
Project description - provided by applicants			
The development of an innovative bag tag recognition system that uses the improved capabilities of low cost cameras and advances in image analysis and machine learning to individually identify bags as they are handled on their journey from check-in through to delivery to the passenger at their final destination. Mishandled baggage cost the air transport industry $2.3billion per annum, while fraudulent and exaggerated claims are becoming a growing problem. In an attempt to reduce mishandling and fraud, IATA, the trade association representing 265 airlines, has passed a resolution (753) that requires, by June 2018, that their members track checked-in baggage at key exchange points in the baggage handling process (check-in, loading, transfer and delivery). However, as of today, very few airlines and airports worldwide have the necessary infrastructure to meet these tracking obligations, primarily due to cost, lack of accuracy and the physical constraints of a typical baggage hall. A bag tag recognition system, built around compact, low cost cameras, advanced image analysis and machine learning should be able to address these legacy restrictions and provide airlines and airports with a credible and affordable option for more extensive baggage tracking.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Applegate Marketplace Ltd	Machine Learning for eProcurement Quote Request Matching	£96,948	£67,863
Project description - provided by applicants			
A project to evaluate the use of Machine Learning to extend eProcurement in the management of tail end spend. Applegate operates a software-as-a-service eProcurement service called 'œApplegate PRO'. This allows buyers to submit quote requests for any b2b product or service. This project will investigate the applicability of Machine Learning to identify the most relevant suppliers to match against each quote request.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Satavia Ltd	Digital environmental awareness for aviation	£99,828	£69,880
Project description - provided by applicants			
Satavia is a SME that provides digital environmental awareness solutions. Aircraft exposure to environmental factors, including ice, dust, sulphur and volcanic ash, accelerates wear of engine and airframe components, and may pose a threat to flight safety. Unscheduled maintenance is costly and causes disruption to airline operator flight schedules. Satavia's mission is to enable aircraft original equipment manufacturers (OEM) and operators to minimise unscheduled aircraft maintenance caused by the environment. The solution is a patent-pending cloud-based Big Data platform that combines technology from numerical weather prediction, Earth Observation, and live aircraft tracking, to provide environmental factor exposure products for individual aircraft. Environmental exposure analytics will allow OEM maintenance schedules to be proactively adjusted, or operator planned flight trajectories to be optimised against predicted exposure. Satavia is working with Innovate UK to to develop an enabling platform across several technologies in order to demonstrate capability and build lead customer revenue.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Fergusson's Advanced Composite Technology Limited	Thermally conductive foams	£98,197	£68,738
Project description - provided by applicants			
The recent uptake of hybrid and electric vehicles has led to the development of higher and higher capacity batteries. These batteries generate a lot of heat during use. Thermal management is a major challenge. Furthermore, batteries also undergo strucural changes during use, they get larger or smaller based on the amount of charge in the battery, while also getting incrementally larger over time. Our project makes use of advanced nanomaterials combined with novel materials processing technology to manufacture a lightweight, highly thermally conductive adhesive to fasten the battery in place in an automotive vehicle. The improvement in thermal properties prevents the battery from overheating, thus lenghtening the lifetime of the battery. The designed material will also be able to withstand the change in size of the battery cell over a lifetime of use.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ALP Technologies Ltd	Re-Purposed Smartphone Based Automation Control System	£99,013	£69,309
Project description - provided by applicants			
PLC is a computer with input/output connections (I/O) which has been adapted for the control of manufacturing processes, such as assembly lines, or robotic devices, or any activity that requires high reliability control and ease of programming and process fault diagnosis. At Alp, we have implemented an automation control system for our hybrid micro biomass power plant prototype without PLCs. Instead, it relies on a smartphone compatible system to perform mechanical processes at the industrial level. There are 2.1B smartphone users in the world and over 1 billion functional smartphones are replaced every year. UN Environment Programme says e-waste such as smartphones will top 50m tonnes per year. Smartphones have the right balance of hardware and software for computational processing and communication functions typically performed by Programmable Logic Controller (PLC). More and more, they have the reliabilty and ruggedness required for industrial applications such tolerance of high dust, moitsure, temperature and even impact. Their data communication capabilities are often superior to even high-end PLCs. Moreover, a parallel system can be formed by linking multiple units for industrial redundancy in backup and safety functions.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
RNF Digital Innovation Ltd	BEAM+	£99,913	£69,939
Project description - provided by applicants			
Although the leisure industry pioneered the use of Location Based Services, retail has the fastest growth. Beacons through their unique location identification code, trigger the relevant location based information previously downloaded on to a Smart Phone carrying an App. RNF Digital's BEAM platform manages the fleets of beacons and their push notifications as well as receiving uploaded Smart Phone data that provides a location and time based insight into consumer behaviour in store; However, large volumes of data are currently being generated at a rate of 5m items/month. This creates an opportunity if the BEAM data sets can be combined with the appropriate publicly available data sets covering the economy, weather, society and social media and analysed using Big Data statistical techniques it should be possible to gain previously unobtainable detailed insights to in-store customer behaviour. Furthermore offers can be personalised both in terms of content and timing so they arrive on the consumer's smart phone at the optimal time. Our solution is BEAM+ a Big Data analytical model that is easy to program and can be offered to clients to also work alongside their current databases. Our proj-ections are that over 5 years BEAM+ could generate £3.66m additional sales and 15 new jobs.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
BakePlan Software Limited	In-store Manufacturing Planner (IMP) to reduce retail food waste	£96,896	£43,603
Project description - provided by applicants			
Our project's aim is to eliminate the data inputting needed by food retailers to cut in-store production waste and meet strict environmental sustainability targets. It will do this by exploiting emerging technologies, mixing machine learning, autonomous imaging, speech recognition and mobile/cloud internet data delivery to create a system that can see food products, count them and record data about them autonomously. This new system will be used to enhance our current food retail waste management software which cuts in-store production waste by 20% using autonomous production forecasting. This solution is used in all 600 in-store bakeries of a large British grocery chain. Our goal is to gain market penetration across the supermarket, food-to-go and convenience store sectors in the UK and to export to European and global markets. As well as boosting our export opportunities, the result will be to rapidly grow our company, our staff and our skillset.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Inclusive Designs Ltd	DeHeat Solid-State Cooling Using 3D Printed, Graphene-Doped, Fractal-Like Metamaterials	£99,508	£69,656
Project description - provided by applicants			
Inclusive Designs Ltd DeHeat technology is a fractal-based, solid-state sustainable cooling solution. Our patent-pending metamaterial structures are self-similar to the 'Menger Sponge' '“ a complex fractal construct that while mathematically defined, has previously proved impossible to fabricate at the required resolution. However, the rapid maturation of 3D printing (or additive manufacturing) and selective laser sintering (SLS) now allows for such architectures to be fabricated. The manufacturing process will be via state-of-the-art 3D printing capabilities, in particular, selective laser sintering (SLS). When infrared radiation is incident upon the material it is captured by the complex structure and cannot re-radiate back into the environment, resulting in a net cooling effect. Graphene-coated polymer beads will be used to enhance the material performance due to the very high thermal conductivity. The principle is completely scalable '“ from thermal management of computer chips, large data centre cooling and electric vehicle batteries - it is an enabling technology with multiple potential applications. The benefits of such a system are many-fold '“making energy savings, protecting our environment and reducing carbon footprint (no HFCs required).			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
RedWave Labs Ltd	Laser module for material processing and sensing applications ALIGN	£100,000	£70,000
Project description - provided by applicants			
Diode lasers are enabling technology in a wide range of fields including sensing, healthcare and material processing. In this project, we will develop a laser module combining a diode laser, an analog laser driver and a digital power supply. Combining the three functions in a designed module allows the laser to perform at its best, increasing the efficiency and lifetime, and reducing noise.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Brightday Engineering Ltd Victor Systems Ltd	Satellite broadband throughput optimiser	£50,238 £7,536	£35,167 £0
Project description - provided by applicants			
Optimisation of Satellite broadband terminals using RF processing.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Silson Limited	Graphene microphone innovation and micro fabrication process	£99,742	£69,819
Project description - provided by applicants			
The project is the development of microphones made from graphene for consumer electronics applications such as mobile phones, portable media players, laptops, hands free systems, IoT devices and many more. With the emergence of an internet connected electronic environment, many devices have requirements for multiple microphones, providing features such as 'œalways on' and noise reduction. These developments require low power, high sensitivity and affordable small form-factor microphone devices. Voice capture and recognition is another feature that requires high quality hardware. Graphene has a number of desirable properties such as high strength, high flexibility and high conductivity. Previous research has indicated that using graphene in microphones can result in performance reaching far into the ultrasonic part of the spectrum, achieving microphone sensitivity and quality while improving the manufacturing process and lowering the cost of manufacture.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Correvate Limited	Vercator	£99,990	£69,993
Project description - provided by applicants			
Operations in many geospatial sectors, such as that of Building Information Modelling (BIM), have a requirement to align or register 3D point clouds that are recorded using conventional scanning technology. This is a labour-intensive process where shortcuts may be used to reduce time and effort but at a cost of accuracy. There is a need for improvement. A technical advance now promises to enables automated alignment with high accuracy and subsequent processing. The project is designed to gain a better understanding of the capabilities and limitations of the technical advance to deliver economic benefits, to subsequently inform on how these aspects may be incorporated in a commercial product. These results will enable the applicant to capitalise on Britain's leadership in the processing of 3D point cloud data in multiple sectors.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Horse Logic Ltd	Define equine behaviour monitor	£96,700	£67,690
Project description - provided by applicants			
Define is a patent-pending equine technology product that uses data from a sensor at the poll to indentify equine-specific behaviour. Using a related website, owners can choose which behaviours they are specifically interested in monitoring and be told about, according to their priorities for the horse. It will save undue expense and provide peace of mind. This industrial research will build on the prototyping already undertaken, such that it would then be possible to launch an initial batch of units aimed at the racing industry.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Respira Ltd	Breathing and speech monitoring wearable device to help people who stammer gain fluency	£100,000	£70,000
Project description - provided by applicants			
About 1% of the population stutters. This is a condition that deeply affects people who stutter (PWS) at all social, personal and professional levels. Even if it is currently not possible to cure stuttering, there exists a series of practices that, when mastered, help PWS to gain fluency and reach an articulation level similar to that of a non-stutterer. Several companies such as the Starfish Project, Del Ferro Institute or McGuire Program, currently run courses worldwide to help people to overcome their stutter via these learned techniques. The largest challenge to a PWS is turning these practices into habits, as this requires patience and dedication. We have developed a prototype wearable device that tracks speech and breathing patterns, providing real-time feedback to help turn those techniques that improve the fluency of PWS into habits. We have patented the technology behind this prototype as it is the first of its kind, and last December our idea was awarded the Terence Barry Grant Award from the Stammer Trust. Through this project we will commercially and scientifically validate our concept (with potential customers and speech therapists) and finish prototype development. From this process we hope to understand how our device can best help PWS to gain fluency.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Circadian Capital Limited	Development of a networked behavioural-biometric authentication model	£97,209	£68,046
Project description - provided by applicants			
For anonymous, online transactions today, we typically use authentication in the form of knowledge 'œsomething you know'. This knowledge doesn't need trust, because it's binary: you know the secret passphrase (or possess second factor) or you do not. The authentication model is struggling, and, as a result, our identity is under attack: 1.5bn user records were stolen last year alone. Our authentication credentials have value to hackers and the data loss also has a substantial cost to business (a situation likely to worsen for various reasons). In contrast, recognition, like trust, is, instead, variable, and can be used to detect fraudsters. The project takes the existing log-in protocol we are all familiar with, and 'without inconvenience' adds behavioural biometric (taps, swipes, keystrokes etc.), plus other more traditional, features to data capture. Those features draw a picture of the customer to generate a trust score, in real-time, for business to use in its online fraud detection efforts.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
True AI Ltd	Neural networks with memory for automatic customer service conversations	£98,187	£68,730
Project description - provided by applicants			
True AI is developing TRACS - an Artificial Intelligence, Text Response Automation Customer Service system. TRACS significantly reduces the need for human customer service interaction, improves operational efficiency and enhances the overall level of customer experience and consequently, consumer satisfaction. It works by making response suggestions to a text based customer service representative, ensuring quality and relevance of the answer provided to the consumer. This project is an industrial research effort focused effort to develop a new artificial intelligence algorithm. Our goal throughout its duration is to implement conversation memory capabilities within our existing TRACS technology, allowing the system to generate more intelligent and context-aware responses.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
True 212 Limited	Machine learning and NLP for journalists and bloggers in a simple Wordpress plug-in wrapper	£99,645	£69,752
Project description - provided by applicants			
TRUE 212 Limited is a content marketing and content solutions provider. In this project we are researching a new approach, using semantic analysis and machine learning to analyse a website's content, and provide concept and asset recommendations to site editors, bloggers and journalists. Although Google Analytics can tell 'œthe what' about a website's performance, our solution will explain 'œthe why', by providing novel 'œprediction' and 'œrelevance' insights, leveraged by our in-depth understanding of the publishing and media world. This means that the user will effectively have at their disposal their own data and insights team, accessible through an easy-to-use data insights plugin for use within the most commonly used content management system - WordPress. This novel Real-time Editorial Resource will enable writers to gain faster access to insights on what to write about, and alert them to the most relevant breaking news stories, based on their audience's preferences, plus easy access to relevant social media content as they write articles.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Proximie Limited	Augmented reality & maching learning to enhance surgical productivity and collaboration	£99,892	£69,924
Project description - provided by applicants			
Proximie believes there are substantial opportunities to improve the productivity and workflows associated with the delivery of surgery and surgical consultation. Our highly centralised healthcare system has created a problem/inefficiencies, surgical delivery in district locations is often inefficient due to the lack of access to surgical expertise at specific time and locations. Patients are often held up within the NHS on wards or being transferred to specialists centres often simply due to the lack of meaningful five minute consultation between two colleagues. Skype and Facetime have enhanced general communication, Proximie believe that ICT technologies (augmented reality & cloud computing) can provide an unprecedented level of collaboration in the theatre to remove logistical and scheduling bottlenecks associated with critical clinical staff. Proximie is driven by a number of innovative surgeons and IT professionals that wish to implement a novel combination of AR and mixed reality smartglasses (e.g. Microsoft's HoloLens) to provide fully immersive remote collaboration between to users to drastically enhance surgical delivery, consultation and teaching. The enclosed application provides Proximie with a vital opportunity to resolve their AR related development challenges.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Ngistic Limited	Neuromorphic machine learning for fast object recognition using dynamic vision sensors	£98,110	£68,677
Project description - provided by applicants			
If you step out inadvertently in front of an autonomous, driverless vehicle, you will want to be sure that that it will be capable of making an emergency stop before hitting you. To do so, its reaction times will need to be of the order of a few milliseconds. Relying on conventional, frame-based cameras mounted on the vehicle to respond in this time scale is unrealistic, given the 20 milliseconds or so between each frame. Even more problematic is their poor performance in poor lighting, in heavy rain or snow, or in high contrast sun/shade conditions. Dynamic Vision Sensors (DVS) offer a new camera technology which operates like the human retina, sending out signals from each image pixel as soon as it detects a change in activity, within a few microseconds, in poor light and under high contrast. Using these sensors in applications such as autonomous vehicles requires the development of new Artificial Intelligence, in particular Machine Learning technology. This project aims at developing neuromorphic technology, inspired by how the brain processes information from the retina, which will recognise and respond to visual events as quickly as the DVS detects them, and provide fast object detection and recognition necessary for the most demanding applications.			

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Innovate UK

Results of Competition: Emerging and Enabling Technologies Round 2 - Up to 12 Months

Competition Code: 1703_EE_R2_12M

Total available funding is up to £15M

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
Hobs Studio Limited	Interactive Virtual Reality (VR) safety training for Tunnel Boring Machines (TBM)	£59,833	£29,900
Leslie Technical Services Ltd		£10,000	£7,000
University of Strathclyde - AFRC		£14,921	£14,921
University of Sheffield - AMRC		£15,015	£15,015

Project description - provided by applicants

This project is to enable construction companies to use immersive Virtual Reality (VR) training modules in a safe environment, avoiding the need to train in hazardous underground environments. This improves health and safety for trainees, productivity by reducing machinery down time no longer required for 'live' training and reduces project cost. The project will develop a cost effective, interactive Pop-up VR prototype for remote site orientation, health and safety briefing and training before entering hazardous construction environments.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Relative Health Limited	ACE-WP - Automatic Classification Extraction of Waveform Photoplethysmyography	£98,088	£68,662

Project description - provided by applicants

ACE-WP is an industrial research project aiming to use a new approach of multi-stage Machine Learning Algorithms to extrapolate biomarker information from combined ECG and Photoplethysmographic sensor. The primary aim of this research is to build on approach to the estimation of Blood Pressure when measured from the hands with the secondary aim of being able to produce Biometric security using the same technology. In such a manner we are aiming to create a system that gives us go-to-market IP that can be used in multiple industries. We already hold the background Patent for these works and so we are seeking to take the level of automatic calculation of Blood Pressure to the next level with these works. By calculating the Blood Pressure from the two sensor sets mounted on hand operated devices, such as Smartphones we are in effect enabling consumer healthcare to operate autonomously at a new level. The Cardiovascular system is perhaps the body's most significant indicator of performance and up until now, systems have only existed that look at the Cardio side of the equation. ACE-WP brings together both the Cardio and Vascular aspects through waveform analysis enabling Smartphones and Medical Devices alike to benefit.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
OMA Media Ltd	OMA	£25,059	£17,000
Squint/Opera Limited		£74,721	£44,832
Project description - provided by applicants			
Anyone who has tried to hold a video call with a squirmy two year old and a faraway relative will know - keeping a young child engaged and a grandparent involved is a difficult task. Yet many families already rely heavily on digital services like video chat and messaging to keep in touch with family, or when parents themselves have to be away from home. Research shows that when caregivers and children read together, children learn more and relationships are supported. With families more dispersed than ever, sometimes you can't curl up with a book face-to-face. OMA is an innovative child- and grandparent-friendly platform that helps families keep in touch through stories, learning, and play. It offers high-quality, diverse, curated content, in a beautiful and easy-to-access design, based on the most up-to-date research on children's literacy. Our platform enables families who cannot physically be together to nonetheless maintain closeness through digital interactions that are more sustained, meaningful and fun. OMA works by combining eReaders with video chat services, adding in light-touch interactivity designed to enhance family relationships and help children learn.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Volo Commerce Limited	Cross Channel Listing Engine (CCLE)	£97,279	£58,367
Project description - provided by applicants			
Listing products on online marketplaces (e.g. Amazon, eBay etc.) is a complex and time consuming task and the lack of an efficient method of undertaking this process also leads to errors in the listings and dissatisfaction amongst buyers. This can directly affect the reputation of sellers and is a barrier to increasing sales/profits for sellers. This project will use a unified product data model, to automate the process around product listing data specific to relevant online marketplaces. The innovation is clearly aimed at the competition scope, namely the use of artificial intelligence (AI) and machine learning (ML). Research indicates that currently only 15% of product data can be automatically sourced/listed. The project's intention and initial target is to increase this to over 50%. Its impact to both companies and customers will be: 1) Faster, more extensive, more accurate listing of products resulting in more sales, less returns and increased profitability; and 2) The development of an AI/ML engine/database that will increase accuracy and improve listing quality over time and delivering a significant competitive advantage for Volo and its users through increasing future market penetration within the ecommerce sector.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Synseer Limited	Smart agent for problem solving and decision making	£98,914	£69,000
Project description - provided by applicants			
Listing products on online marketplaces (e.g. Amazon, eBay etc.) is a complex and time consuming task and the lack of an efficient method of undertaking this process also leads to errors in the listings and dissatisfaction amongst buyers. This can directly affect the reputation of sellers and is a barrier to increasing sales/profits for sellers. This project will use a unified product data model, to automate the process around product listing data specific to relevant online marketplaces. The innovation is clearly aimed at the competition scope, namely the use of artificial intelligence (AI) and machine learning (ML). Research indicates that currently only 15% of product data can be automatically sourced/listed. The project's intention and initial target is to increase this to over 50%. Its impact to both companies and customers will be: 1) Faster, more extensive, more accurate listing of products resulting in more sales, less returns and increased profitability; and 2) The development of an AI/ML engine/database that will increase accuracy and improve listing quality over time and delivering a significant competitive advantage for Volo and its users through increasing future market penetration within the ecommerce sector.			

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