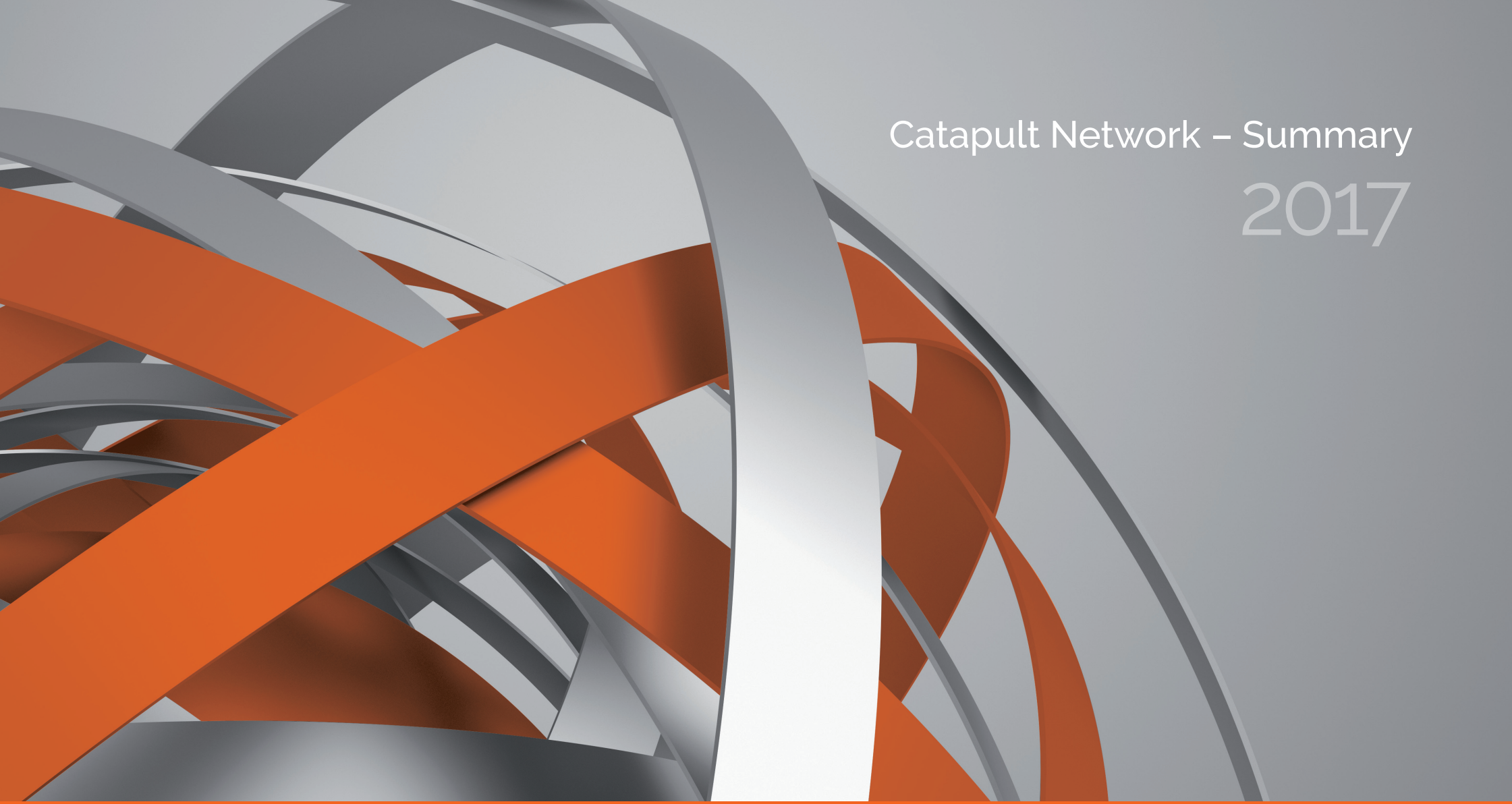




Catapult Network – Summary 2017

We work with
Innovate UK

CATAPULT
Network

TURNING RESEARCH AND INNOVATION INTO GROWTH

Economic impact through turning opportunities into real-world applications

The UK's Catapults harness world-class strengths in research and innovation, helping to grow our markets and companies, and to turn our best ideas into commercial products and services.

They help to unleash fully the potential of the UK's science and research base, and to leverage our strengths in new and emerging areas of the economy.

A nationwide-network of innovation and technology centres, Catapults connect universities and research institutions with businesses and public bodies. By providing sector expertise and cutting-edge facilities, they speed up the commercialisation of research, grow existing markets and create new ones, and advance the technologies of tomorrow.

Vital to the UK's industrial strategy, Catapults also devise solutions to the long-term challenges that face a modern economy, like the need for sustainable energy, new therapies for a better NHS, and for joined-up services in our cities. Because Catapults are independent, they can act when the market can't due to the associated scale, complexity or risk profile of the opportunity.

All this helps to stimulate productivity, growth and jobs, and deliver economic value. Catapults are making a tangible difference to the economy. In the last four years, they have helped hundreds of UK businesses identify, develop and exploit new technologies, products and services, boosting exports and attracting inward investment.



Funded through Innovate UK, Catapults represent a step-change in how we identify, nurture and deliver market-worthy ideas.

Catapults' unique role

Catapults fulfil a unique role, bridging the gap between research and development in universities and companies, and markets hungry for product innovation, advanced solutions and new ways of doing things. Each has its own specialist sector, and together they combine to tackle issues of strategic national significance for future growth, trade and productivity.

Whole systems

Catapults are uniquely inter-connected. They can take a joined-up, 'whole systems' approach to complex, cross-cutting issues, such as reducing motorway congestion, preparing the country for the mass-uptake of electric vehicles, integrating heating and power innovations with the energy system or planning for the implications of a future 5G digital network. Catapults aggregate and interpret data to create the models that no other single entity could, and can provide open access to it, once IP and data protection are approved.

De-risking

Catapults play a vital role in de-risking innovation. They enable new and emerging businesses to road-test new technologies in real-world settings, providing equipment and expertise that businesses will need but cannot invest in until the return on investment (ROI) is clear. The Offshore Renewable Energy Catapult, for example, does this, providing the facilities and expertise necessary to test wind and marine turbine components prior to expensive commercial deployment. Digital Catapult has a cutting-edge

Immersive Lab, which organisations access to test the latest technology and content.

Overcoming barriers

Where regulation is a barrier to innovation, often because it cannot keep pace with technological developments, Catapults act. For example, the Cell & Gene Therapy Catapult works with legislators globally overseeing advanced therapies to shorten the time that new treatments take to reach the clinical trials stage. The Transport Systems Catapult is ensuring that the legal framework adapts to deal with the emerging world of 'Intelligent Mobility', while the Energy Systems Catapult is helping innovators unlock technical, commercial and societal barriers to enable customers to become active participants in the nascent smart energy system.

Brokers

Catapults act as neutral brokers of knowledge and relationships to link entrepreneurs with businesses, investors, and end-users. Using a 'demand-pull' approach, they bridge the gap between academia and industry, and research and commerce, to allow new ideas to find their way to market.

The Satellite Applications Catapult, for example, has shown supermarkets how satellite data can improve the monitoring of organic food farms; fishing authorities how illegal fishing can be tracked; and Network Rail how to spot weaknesses in rail infrastructure before faults occur.

More than 3,000 academic and industrial collaborations have been generated over the past four years.

Trade

By creating new markets for innovation, Catapults are making Britain a more attractive investment destination for leading international companies. The UK is now recognised as being one of the best places in the world to test autonomous vehicles and, as a result, Nissan and Volvo among others have brought their R&D programmes here.

In cell and gene therapy, firms from the US, Spain and Japan have chosen to locate research and development activity in Britain. The UK now has 7% of the global share of companies developing therapeutics in the sector – already outstripping the country's current share of global GDP (4%) – in a market predicted to be worth between \$14 and \$21 billion by 2025.

In automotive manufacturing, McLaren this year announced plans for a £50m investment in Sheffield, expected to produce 200 new jobs and contribute £100m or more to the local economy. Boeing too is opening its first European manufacturing facility there, investing £20m. Both were stimulated by the investment of the High Value Manufacturing Catapult in facilities and research to develop new lighter, lower-cost composite materials, for a market expected to be worth over \$10bn per year by 2020.

Regional clusters

Catapults aim to help close the regional productivity gaps that have slowed the UK's growth over the decades.

Their resources are focused on areas where the UK already has significant strengths, or where the conditions exist to grow sectors and establish multi-billion pound stakes in high-value emerging markets.

The Satellite Applications Catapult, for example, helped established Harwell as an internationally recognised 'place for space', while the Digital Catapult has established four local centres including one in Northern Ireland. The High Value Manufacturing Catapult has seven state-of-the-art research bases around the UK, helping to develop 3D printed parts for jet engines and to design more efficient car batteries, for example.

Skills

Catapults contribute to developing hi-tech skills in the UK. The High Value Manufacturing Catapult has two skills centres where 900 apprentices have been trained in the last year.

21st century challenges

The UK faces complex, long-term, national-scale challenges that only a joined-up Catapult network can address.

To deliver affordable energy and clean growth, we need more sustainable methods of making energy, more efficient ways to transport and store it and 'smart grids' to model demand and reduce waste. The Energy Systems, Offshore Renewable Energy, High Value Manufacturing, Future Cities and Satellite Applications Catapults are already working on this challenge, both individually and together.

Catapults are also collaborating across sectors to tackle some of the other big challenges of the modern era:

- ◆ Batteries for electric vehicles and to store energy produced by renewables – High Value Manufacturing, Future Cities, Transport Systems and Satellite Applications Catapults
- ◆ Intelligent production systems to ensure the supply of new therapies – Cell & Gene Therapy and High Value Manufacturing Catapults
- ◆ The Internet of Things – Digital, Future Cities and Satellite Applications Catapults

The bottom line

The High Value Manufacturing Catapult was established in 2011, followed by six more in 2013. These include:

- ◆ Cell & Gene Therapy
- ◆ Digital
- ◆ Future Cities
- ◆ Offshore Renewable Energy
- ◆ Satellite Applications
- ◆ Transport Systems

Additions since then have been:

- ◆ Energy Systems in 2015
- ◆ Medicines Discovery in 2016
- ◆ Compound Semiconductor Applications in 2017

As independent, non-profit making corporations, the Catapults gain their funds from three sources:

- ◆ core public funding for investment in the infrastructure, expertise and skills to place the UK industries they support at the forefront of the markets of the future

- ◆ competitively won collaborative applied R&D projects, funded jointly by the public and private sectors, to accelerate the capability and growth of the industries they support
- ◆ competitively business-funded R&D contracts, where the Catapult can provide valuable services to the sector.

Catapults have achieved notable results already, but they will deliver even greater value in the years to come, when long-term strategic plays, such as making the UK the best testing ground for autonomous vehicles, building a better battery or proving the potential of the Internet of Things, bear fruit.

Meanwhile, the Catapults are making a significant contribution to fulfil many of the 'pillars' of the Government's Industrial Strategy, in particular the first: Investing in science, research and innovation. These include:

- ◆ Commercialising the UK's world-leading research and innovation
- ◆ Boosting productivity
- ◆ Driving growth.

Catapults are the essential connection for our business if the UK's modern industrial strategy is to succeed.

APPENDIX: CATAPULTS – A SNAPSHOT

Catapults...

- ◆ Bridge the gap between research and industry
- ◆ Foster collaboration between organisations and sectors
- ◆ Get new ideas and technologies to market quicker
- ◆ Break down barriers to success
- ◆ Help SMEs get concepts to market
- ◆ Anchor innovation and jobs in the UK

They are...

- ◆ Expert
- ◆ Trusted
- ◆ Open access
- ◆ Independent
- ◆ Led by industry professionals

Vital for the UK's Industrial Strategy (alongside Innovate UK)...

- ◆ Investing in science, research and innovation
- ◆ Upgrading infrastructure
- ◆ Driving growth across the country
- ◆ Supporting business to start and grow
- ◆ Encouraging trade and inward investment
- ◆ Cultivating world leading sectors

Address big issues...

- ◆ Systemic failures and complex, cross-sector challenges
- ◆ Short-term investment cycles
- ◆ Slow growth in productivity and competitiveness
- ◆ Wider adoption of enabling technologies such as artificial intelligence, biotechnology and robotics

Stimulate demand by...

- ◆ De-risking innovation
- ◆ Testing new ideas and technology in real-world scenarios
- ◆ Pump-priming new markets
- ◆ Sharing ideas across sectors
- ◆ Bringing large and small businesses together
- ◆ Making regulation fit for purpose

Work in key sectors and industries of the future...

- ◆ Cell & Gene Therapy
- ◆ Compound Semiconductor Applications
- ◆ Digital
- ◆ Energy Systems
- ◆ Future Cities
- ◆ High Value Manufacturing
- ◆ Offshore Renewable Energy
- ◆ Medicines Discovery
- ◆ Satellite Applications
- ◆ Transport Systems



Catapults are a network of world-leading centres designed to transform the UK's capability for innovation in specific areas and help drive future economic growth.

catapult.org.uk