

THE UK AND INDIA: BILATERAL INNOVATION COLLABORATIONS

APRIL 2018

FOREWORD

One of the major factors defining the key political, societal and commercial changes of the 21st century will be how technology is used over the coming years.

Much has been made of the impact of what is termed the Fourth Industrial Revolution (4IR). A dystopian future of social disruption is a common assumption. History tells us that change begets change. It also shows us that society adapts and moves forward and always to the betterment and development of the way we live.

This is the third of three reports that the UK India Business Council is publishing to coincide with the visit of Prime Minister Modi to the UK in April 2018.

The first looked at the bilateral investment relationship and the second examined visible bilateral trade flows in goods and services. Our conclusion is that India's investment in the UK and the UK's investment in India is far stronger than the headline numbers would suggest. Indeed, we believe that the relationship is far more integral to each other's bilateral economic health than is generally recognised.

This third report looks firmly to the future and the role that innovation will play to strengthen our bilateral connections.

'Innovation' has been integral to the evolution of societies since time immemorial - and its effects have always been profound. In the 18th Century, China and India were the two global economic superpowers. The UK's adoption of mechanisation in the Industrial Revolution within the 'Western World' changed the previous status quo in just a few decades. Only for India and China to reverse this situation in the last decades of the 20th century by leveraging their democratic dividends to exploit the then prevalent new technologies.

Innovation takes many forms. Of course, primarily it derives from observation, experience and application. Yet, the person in the farm field is still as capable of relative innovation as is the scientist in a university.

Occasionally we experience a seismic innovative shift - rather like the movement of the earth's tectonic plates - which causes foundational changes, altering our perceptions and consequent behaviours. It is increasingly accepted that we are now in such a period. The realisation of the possibilities through digital technologies, decentralised systems and increased data capture are causing many to question what has gone before.

This digital age is ushering in a time when almost all economies can become data-rich and the propensity of developing nations to leapfrog analogue to digital means that the competitive innovative landscape is becoming flatter. Yet, technologies still have to be discovered, developed, and exploited.

Moreover, the 'upstream' elements of the digital innovation supply chain are still not always sufficiently in place in a rapidly developing nation. As such, collaboration in development is fast becoming the new paradigm.

This report focuses on the increasingly strong emphasis of innovation in our bilateral economic relations and, with the disruptive and foundational changes in digital technology and data usage that are upon us, how the existing relationship can mature into something more profound and beneficial to both our countries.

We are already seeing the foundations of a technology bridge being set down between the private sector in India and the UK, spurred by collaborations on innovation supported, facilitated, and sometimes financed by the UK and the Indian governments.

This is laudable and there is so much more that can be done. Part of this paper will focus on key recommendations, which will make these collaborations in developing innovative protocols, networks and applications so crucial.

We call on both governments to formalise a Technology Partnership to leverage and build on what has already been achieved and to exploit the new opportunities that are beginning to emerge.

The emerging uses of Disruptive Ledger Technology (DLT) and Blockchain open-up huge opportunities. They extend far beyond supporting crypto currencies or, indeed, FinTech. At this moment, our companies and governments are merely scratching the surface of the possibilities and opportunities of decentralised platforms for value storage and transfer. Digital Decentralised Applications (Dapps), incorporating the integrated use of Artificial Intelligence (AI), Augmented Reality (AR)/ Virtual Reality (VR), the Internet of Things (IoT), and Smart-contract coding offer a startlingly positive future.

These technological developments have arrived in the mainstream at a timely moment as recent events are causing us to question existing centralised structures, platforms and business models. And their applications extend to manufacturing, logistics, infrastructure, finance, identity and ownership, learning & skilling, healthcare, pharmaceuticals, insurance, renewables, industrial processes, and social programming to name a few.

The arguments for India and the UK to work together to innovate are compelling and the timing is opportune.

Richard Heald, Chief Executive Officer, UK India Business Council

CONTENTS

Foreword 2

Introduction 5

What the Governments are
doing to stimulate UK-India
Innovation collaborations 6

The Centrality of Academic Institutions 7

Innovation collaborations in applications
of emerging manufacturing technologies 8

Activity in Key Sectors 10

What Needs to Be Done to
improve innovation collaboration 15

Government as an Enabler 16

Conclusion 18

INTRODUCTION

Innovation is fundamental in driving sustainable growth and ensuring prosperity. Now more than ever, ground-breaking advances in radical technologies and consequent applications open new opportunities for transforming a country’s economy and the everyday lives of its people.

This is true for both a ‘developed’ economy such as the UK and a ‘developing super-power’ such as India.

Responsible development and adoption of new technologies will bring strategic benefits, and both countries are uniquely placed to collaborate to harness the gains being made in revolutionary technologies. New developments in centralised and decentralised based platforms coupled with use of Tokenisation, Artificial Intelligence (AI), the Internet of Things (IoT), Smart Contracting and Big Data Analytics are presenting new opportunities in micro-finance, robotics, nano-technology, 3D printing and data management to name a few.

India is making transformative changes to digitise the economy, through programmes such as Digital India, the widespread adoption of Aadhaar, and the introduction of Good and Sales Tax (GST). In the process, it is fast becoming a data-rich economy. At the same time, the UK Government’s Industrial Strategy aims to make the UK the world leader in AI technology, building on the pioneering AI expertise in UK universities.

Greater innovation collaboration is the true potential of the UK-India relationship and allowing both countries to explore new paths to invigorating their economies and meeting the aspirations of their peoples.

With insight gained from industry leaders, this report highlights existing innovative collaborations between the UK and India: the role already being played by both governments to catalyse collaborations; the centrality of academic institutions to innovation ecosystems; the steps already taken by both UK and Indian businesses and, importantly, identify areas where we expect to see ground-breaking collaborations in the future.

We also pinpoint what more could be done to stimulate greater joint innovation.

WHAT THE GOVERNMENTS ARE DOING TO STIMULATE UK-INDIA INNOVATION COLLABORATIONS

Governments have always played a critical facilitating role in catalysing innovations, and the UK and Indian governments are no exception. The joint UK-India flagship program is the Newton Bhabha Fund, which supports UK and Indian scientific research that provide solutions to challenges facing India's economic development and social welfare.

The scheme is the Indian focused part of the UK's £375 million Newton Fund, which supports science and innovation partnerships between the UK and emerging powers. In India, the fund is worth £50 million over five years, the second largest Newton Fund allocation by country after China¹, it is championed by both the UK and Indian governments through a ministerial agreement that has identified three priority areas:

- Sustainable cities and rapid urbanisation
- Public health and well-being
- Energy-water-food nexus

Together with the following two underpinning capabilities:

- High value manufacturing
- Big Data

The 'UK India Industrial Waste Challenge' is a competition launched in October 2017 to fund projects that use cutting-edge solutions to reduce industrial waste in India in one or more of these five sectors:

- Leather/tanning/textiles
- Municipal solid waste
- Paper and pulp
- Sewage
- Sugar cane.

ROLE OF NITI AAYOG

NITI Aayog, the Indian government's nodal policy unit, is directing India's efforts in all areas of 4IR enabling technologies, including Distributive Ledger Technology, Blockchain, AI, IoT and Robotics.

Central to their efforts are setting up a national program on AI, as well as a national Centre for Data across their universities to explore the applications of Big Data. These efforts will fall under the government's ambitious Digital India program and will be supported by the doubling of its budget, which shows the government's commitments to exploring the potential of these new technologies.

IN INDIA, NEWTON FUND WORTH

£50 MILLION

OVER FIVE YEARS

Sources

1. <http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/International/info-note-30-results-november-2014-delegation-India.pdf>

THE CENTRALITY OF ACADEMIC INSTITUTIONS

The UK has long been seen as a premier global centre for research-based learning. This has evolved into a deep and effective innovation ecosystem in its own right. UK universities are a magnet for incubators and accelerators that nurture and propel R&D intensive start-ups. And some of these grow into multinationals, for example the semiconductor and software design giant, Arm, which emerged out of Cambridge University and now has major operations across the world, including in Bangalore and Noida in India.

UK and Indian university-based research institutions are at the heart of the best innovation ecosystems in both countries. This report highlights a few of the many instances of collaborations involving academia, including some academia to academia and some industry to academia examples.

In the UK, the University of Manchester's Institute has world-leading materials know-how that has application across the whole range of India's manufacturing sectors. Another example is Factory 2050, within the University of Sheffield's Advanced Manufacturing Research Centre, which offers Indian businesses the opportunity to collaborate to create manufacturing excellence ahead of its global competitors.

Renowned Indian institutes such

as the Indian Space Research Organisation (ISRO), the Indian Institute of Science (IISc) and Indian Institute of Technology Kanpur (IITK) have made great strides in space exploration, developing a better understanding of climate change and designing unmanned aerial vehicles (UAVs). Located in Bangalore, the Indian Institute of Science (IISc), has produced pioneering research across a spectrum of sectors ranging from tackling HIV and climate change, to machine learning, crystal engineering and developing robust data management systems. IIT Kanpur's Aerospace Engineering department is leading the way in the design and development of visually guided autonomous quadrators (part of the UAV family) with greater manoeuvrability, agility and hovering ability for various military and civilian applications.

These highlighted institutions are just the tip of the iceberg. Much more is being done.

UK AND INDIAN UNIVERSITY-BASED RESEARCH INSTITUTIONS ARE AT THE HEART OF THE BEST INNOVATION ECOSYSTEMS IN BOTH COUNTRIES.

INNOVATION COLLABORATIONS IN APPLICATIONS OF EMERGING MANUFACTURING TECHNOLOGIES

3-D Printing



3-D printing is an area full of potential across sectors, from the ability to produce small automotive parts to entire houses and cars, which also is expected to double in global revenue in the next four years.²

The UK company, Renishaw, has built on its already strong presence in India by establishing an additive manufacturing solution centre that allows local Indian companies to access revolutionary 3-D printing equipment without high levels of capital investment. Moreover, Renishaw is adopting an open-source approach to collaborations and are in discussions with a number of Indian Institutes of Technology (IITs) to generate ideas regarding 3-D printing product development and manufacturing.³

Robotics



While the buzz surrounding the potential of industrial robots has been around for a long time, the true possibilities of what can be achieved is now becoming a reality. Collaborations are already underway. King's College London and the Indian Institute of Technology Madras (IIT-Madras) have set up a robotics laboratory developing new prosthetics technologies. Together with the Indian Institute of Science and St. John's Research Institute in Bangalore, King's and IIT-Madras will co-host robotics workshops.⁴

As noted above, there is fantastic potential, and organisations like the University of Sheffield's Factory 2050 can do tremendous work with Indian manufacturers to deploy robots to augment the work of skilled engineers.

The Internet of Things



India is one of largest players in the global IT industry, and Indian tech firms now account for almost half of the total global IoT technology services outsourcing market.

This is an area of significant potential for the UK and India to work together. And collaborations are already underway. BT has seen the opportunity to explore this newly developing industry and is collaborating with the Indian Institute of Technology Delhi (IITD) and Indraprastha Institute of Information Technology, Delhi (IIITD) to develop new uses of Quantum Key Distribution to identify security breaches in virtual networks.

What is so exciting about these innovations is that they can be applied in a range of different sectors. Making strides in these key emerging areas will ensure progress in the following sectors, and make the UK and Indian economies more competitive across the board.

**INDIA IS ONE OF
LARGEST PLAYERS
IN THE GLOBAL IT
INDUSTRY, AND
INDIAN TECH FIRMS
NOW ACCOUNT FOR
ALMOST HALF OF THE
TOTAL GLOBAL IOT
TECHNOLOGY SERVICES
OUTSOURCING MARKET.**

Sources

2. http://www.namic.sg/sites/default/files/2017-08/Global%20Additive%20Manufacturing%20Market_1.pdf

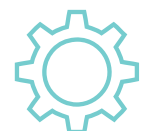
3. Interview with Rhyddan Poutney, Managing Director UK and RoW, Renishaw

4. King's College, Oliver Trumble, Partnerships Manager (Americas and India)

ACTIVITY IN KEY SECTORS

Sustainability in business necessitates anticipating change. There are already numerous examples of impressive UK-India partnerships across sectors. These, and many others, offer exciting opportunities for future innovations, which we believe will have a significant impact on the two economies.

Advanced Manufacturing: Process Innovation



Advanced manufacturing, including defence, aerospace, and automotive, is a key sector that links the two countries, not least as it is the sector that sees the most investment from the UK into India. Therefore, there is a wide range of existing collaboration, and much potential, including academic-industry partnerships.

Bharat Forge Limited, a technology-driven global leader in metal forming, with a presence across nine manufacturing locations, has partnered with the University of Sheffield's Advanced Manufacturing Research Centre to improve the manufacturing process for a wide range of automotive and aerospace parts through exploring the applications of closed-loop approaches and increased assembly line automation.⁵

In a similar partnership Tata Steel's collaboration with the University of Cambridge's Department of Materials Science and Metallurgy resulted in the invention of a form of super-strong steel called super bainite, now used for cheaper, yet stronger, armour for military vehicles built by UK defence companies.⁶

Cranfield University, which already has a 10-year relationship with Indian company, Hindustan Aeronautics, is entering a strategic partnership with Tata Power SED to explore areas of defence-related engineering and emerging technologies, including for combat military vehicles.⁷

Increasingly, there are examples of applied collaborations, where digital innovation meets manufacturing product or processing, and the UK and India have special complementarity in this area. An example is the partnership struck at the end of 2017 between Rolls Royce and Tata Consultancy Services to exploit future data innovation opportunities in IoT. Rolls-Royce is looking to shape its 'Digital First' vision and, with the help of TCS' world leading IT and business solutions consulting expertise, create solutions that incorporate 4IR technologies. This partnership is very much what we hope is the exemplar, the future direction of India-UK bilateral innovation collaboration.

Additionally, a key focus for both countries is the reduction of pollution and carbon footprint through the

lowering of vehicle emissions. India's policy to have all electric vehicles by 2030 creates both a challenge and an opportunity.

This transformation could mean India saves 64% of anticipated passenger road-based mobility-related energy demand and 37% of carbon emissions by 2030, through combined improvements in systems integration, scaled manufacturing, and shared infrastructure development. Achieving this transformed mobility future will require partnerships, and it is no surprise that there are already UK-India collaborations happening.

Tata Motors European Technical Centre (TMETC) and Jaguar Land Rover have entered a £150 million joint venture with Warwick Manufacturing Group (part of the University of Warwick) to establish the National Automotive Innovation Centre (NAIC). When it opens in summer 2018, this 33,000m² facility will be the largest automotive R&D facility in Europe. It will, no doubt, be central to the UK's and India's automotive sector, particularly with its heavy focus on developing electrified, autonomous, and connected vehicles.⁸

Banking, Insurance and FinTech



The Digital India initiative, coupled with the rollout of the Aadhaar

programme and the Goods and Sales Tax (GST), has led to a revolution in the way banking is done in India. No longer is there a traditional bricks and mortar model. The new paradigm is bricks, clicks and e-banking.⁹ This in turn has led to an upgrading of the financial infrastructure that supports e-banking. The Financial Services sectors on both countries have been investing heavily in new FinTech companies – particularly those that have been developing applications focusing on payments. This has been supported by both the UK and Indian governments, which are encouraging their FinTech communities. It is an area of largely un-tapped and enormous potential for collaboration between the UK and India. Both in terms of business-to-business and regulator-to-regulator.

YES Bank highlights potential areas of collaboration between the scaled solutions of UK FinTech businesses and the 'coalface' experiences of Indian FinTech businesses. Together the two capabilities can combine to bring financial and micro-financial services to previously unbanked segments of Indian society. Moreover, YES Bank has set-up an accelerator with the objective of co-creating innovative solutions, particularly aimed at inviting FinTech start-ups from the UK.¹⁰

Another area of increasing collaboration is the development of new savings products. The liberalisation in the insurance sector

Sources

5. <https://www.sheffield.ac.uk/news/nr/india-theresa-may-trade-speech-1.660266>

6. Interview with David Landsman, Executive Director, Tata Limited

7. <https://www.cranfield.ac.uk/about/international-partnerships/cranfield-in-india>

Sources

8. Interview with David Landsman, Executive Director, Tata Limited

9. <http://euroasiapub.org/wp-content/uploads/2017/06/9FMMay-4971-1.pdf>

10. Interview with Priyank Tiwari, Regional Head – Corporate Strategy and Marketing, YES Bank

has led to major investments and joint ventures by leading in UK players - such as Standard Life, Prudential, BUPA and Aviva. There is an increasing demand for more sophisticated savings products. Max Bupa, Bupa's joint venture with Max India, has teamed up with several Indian firms, including Practo and 1mg, to create a new-age product, described as a disruptive and customer centric health insurance plan tailored to the Indian market. According to Bupa, this "industry first" solution is a testament to innovation collaboration.¹¹

Logistics: Supply chain



Encompassing many sectors and touching many businesses, logistics and the supply chain is a foundational area for innovation.

Again, the UK and India are already collaborating. The University of Birmingham and the National Centre for Cold Chain Development, have designed a more sustainable supply chain network for farmers, called 'clean cold', which will allow a great reduction in food waste and help cut costs for local farmers.¹² The impact of this reduction in waste is so great that it could double farmer's incomes, a goal of the current Modi administration for 2022.

Sources

11. Interview with Amy Gooden, Head of Public Affairs, Bupa

12. Interview with Wenwei Wu, International Development Manager, University of Birmingham

Innovation in the supply chain can also come from cutting-edge technologies. TVS SCS, a UK subsidiary of the Indian company TVS, is increasingly using cutting-edge digital technology, robotics, and drone technology to improve their supply chain services, exploring opportunities for collaborative efforts to expand the use of these innovations.

Retail: e-Commerce



With a potential market size of more than one billion customers and as smartphone and Internet adoption is rising rapidly, India has the potential to be one of the largest e-commerce markets in the world in the very near future.

UK-India collaborations can impact the sector in a number of ways. Improved supply chain logistics will increase efficiency, reduce costs and improve customer experience. Autonomous vehicles, including drones, have the potential to revolutionise the industry.

An existing collaboration is improving the customer experience in another way. Metail, an online clothes shop that ensures clothes are the best fit possible through asking for customer's body measurements and using an algorithm to tailor the size to

the customer, has teamed up with one of India's largest conglomerates, the Aditya Birla Group, to share data and knowledge on how a similar solution can be created for the Indian market.¹³

Infrastructure: Smart Cities



Smart cities is an area where there are strong and varied collaboration possibilities, bringing together AI, IoT, Big Data, autonomous vehicles and many other innovations.

Both the UK and India are committed to bring their cities into the 21st century, as demonstrated by London's consistent ranking as one of the top global smart cities, a range of smart city initiatives being implemented across the UK, and India's Smart Cities Mission program in motion to transform 100 cities across India.

Telecommunications businesses are key enablers of smart cities as they provide the digital services that make the use of technology possible. So 5G and other telecoms technologies will be transformative, and there is much that the UK and India can co-develop and knowledge that can be shared.

An existing collaboration of note is an initiative between the University of London and the Indian Institute of Technology Roorkee, (with the assistance of AECOM) to create a

solution for monitoring the state of infrastructure.¹⁴

Renewables: Clean Energy



Finding sustainable substitutes for fossil fuels is a global challenge, which both governments are pushing to solve. For India, there is also the challenge of getting electricity to remote areas. In this regard, a collection of universities, five from the UK and three from India (Sheffield, Exeter, Nottingham, Leeds, Heriot-Watt, Visva Bharati, IIT Bombay and IIT Madras), have come together to help find a solution. They have created an alternative to fossil fuels for those who live in rural areas, which uses waste biomass and solar technology that is both more reliable, sustainable, and environmentally friendly.¹⁵

Healthcare, Life Sciences and Pharmaceutical



We have yet to see UK-India healthcare collaborations reach their potential. Nevertheless, UK and Indian pharmaceutical companies are doing great things in both countries, including R&D. The next stage should be med-tech innovations, and e-health solutions.

Sources

13. <https://metail.com/wp-content/uploads/2016/03/ABOF-PRESS-RELEASE.pdf>

14. <https://www.city.ac.uk/news/2018/january/citys-collaboration-with-india-selected-among-top-20-projects-at-house-of-lords-event>

15. http://www.cbi.org.uk/index.cfm/_api/render/file/?method=inline&fileID=A5E40C30-3C49-498D-A93DFB69305C365D

Networked Electronic Health Record (EHR) systems, AI, real-time data from wearable devices and improved analytics are driving a profound shift in India's healthcare sector. India's National Health Policy 2017 unveiled the Government of India's plans to build a national IT backbone that will help in integrating EHRs and making them portable. There is also an enhanced penetration of health insurance due to technology.

Access to affordable, high-speed data connectivity – both as a result of the government's Digital India initiative and private sector competition – make it possible for both doctors and patients from smaller towns to access some of the benefits of the changing healthcare sector.

UK technology businesses, such as BT have much to offer in delivering e-health to remote areas. There is clear un-tapped potential for med-tech collaborations as the UK has a series of world-leading clusters – Cambridge, Oxford, London and Sheffield, where Sheffield Hallam University is opening an Advanced Wellness Research Centre.

Education



We can see from the many examples in this report that university researchers are central to the UK-

India innovation relationship. But the delivery of education, including higher education, is being transformed by technology. This presents much scope for the UK and India to work together.

India will be home to the world's next technology revolution in education. Indian culture prizes learning and scholarship, and the country's excellence in all things digital will translate into education platforms and apps proving products and services that people (at every income level) will pay for.

India's young population (one in every 3 people below the age of 14) will drive huge demand for post-secondary education opportunities, and the traditional campus-based model will never meet the demand.

India will therefore jump to online learning, catalysed by mobile phone adoption, and universities and businesses in the UK should be engaging in this transformation.

INDIA WILL BE HOME TO THE WORLD'S NEXT TECHNOLOGY REVOLUTION IN EDUCATION.

WHAT NEEDS TO BE DONE TO IMPROVE INNOVATION COLLABORATION

While there are clearly excellent partnerships in place, our consultation identified a number of barriers preventing the UK-India innovation partnership achieving its full potential. These include:

- A lack of skills in both countries. Up-skilling the workforce in both countries is one of the biggest challenges and one of the most critical factors for collaborative innovation. Industry, universities and governments should partner to facilitate the creation of programmes that generate skilled graduates that are immediately employable.
- The operating environment, including tariff and non-tariff barriers (such as quotas and administrative entry procedures), and other legal conditions that limit or discourage the entry of foreign firms may affect FDI, trade and therefore collaborations.
- The need to develop more effective IP protection systems, policies and best practices, which are critical for technology collaborations.
- Start-ups and SMEs face substantial transaction costs in identifying the right partners and negotiating collaboration deals. These costs and risks act as deterrents.
- Lack of knowledge impacts collaboration – firms, particularly start-ups and SMEs, may not be aware of overseas opportunities or may be too inward-looking to

search for knowledge sources abroad.

- Insufficient financing can also be a barrier if firms cannot make the investments necessary for collaboration.

A collaborative UK-India approach to addressing the issues above is more likely to succeed than working separately. This collaboration will generate new commercial opportunities.

Our respondents felt that government intervention could contribute and create an ever-more enabling environment for collaborative UK-India innovation partnerships.

GOVERNMENT AS AN ENABLER

There are many things governments can do to help the overall business environment, such as removing red tape or establishing the appropriate policy framework for innovation. Specific steps can be taken to promote innovation collaborations between the two countries.

India is making strides towards improving the ease of doing business – rising from 130 to 100 in the World Bank's ease of doing business rankings in 2017. And through its Industrial Strategy the UK is supporting innovations in AI, transport/mobility, healthcare, and clean growth.

But what can additionally be done to encourage innovation collaboration?

Our consultations with business and universities identified a range of interventions, covering transparency, bureaucratic efficiency, incentives, cutting red tape, and protecting intellectual property.

A particular issue raised was facilitating the movement of talent between both countries. These included entrepreneurs, technicians, academics and students.

An enabling tax environment was also encouraged, including R&D incentives, tax holidays for start-ups, and providing a clear and fair tax regime that encouraged investment and innovation.

REGULATOR-TO-REGULATOR COLLABORATION

We noted the value in regulator-to-regulator collaborations in the FinTech space. However, there are far more areas in which government bodies can learn from one another, including most things digital, such as payments, online entertainment, or telecommunications.

In particular, given the way digital technology is advancing rapidly, we recommend that the UK's telecommunications regulator, OFCOM, and its Indian counterpart, TRAI work more closely together.

We encourage the continued engagement between the UK and Indian governments on improving the ease of doing business. This knowledge share is a win-win.

Critically, it is important that alongside the regulator-to-regulator dialogue, there is a business-to-regulator partnership. This will enable both parties to adapt innovations, technologies and regulations in tandem. This enables another win-win.

FUNDING

Existing funds, for example the Newton Bhabha Fund, already provide an important stimulus to the UK-India innovation ecosystem. However, more funding and greater visibility of existing funding and R&D incentives would make it easier for

businesses and research bodies to access opportunities and undertake joint projects.

CROSS-FERTILISATION OF INNOVATIONS

As equal partners, both governments should work together to share successes achieved in their respective countries. Technology developed should not be restricted for use only in the country where it originated.

The Joint Economic and Trade Committee Working Group on Advanced Manufacturing and Technological Collaboration has a role to play in cross-fertilisation of innovations by championing and showcasing the opportunities and successes, as well as making recommendations to the governments on how to stimulate more collaboration.

Greater support from government bodies to start-ups - funding, favourable policies, facilitation of international collaborations - will act as a catalyst for more innovation.

In addition, both governments should create a bridge and support system to enable UK and Indian academic institutes, start-ups, SMEs and other innovators to come together to co-innovate.

A key part of this bridge should be a pilot programme that provides hands-on guidance and support to tech-rich

SMEs in both countries to help them find partners. The Government of India's Access India Programme is one such programme, which helps UK manufacturing SMEs to enter India. A similar initiative for digitally driven tech companies would generate awareness of the opportunities and catalyse more UK-India technology collaborations.

GREATER SUPPORT FOR RESEARCH INSTITUTIONS

Higher Education research institutions – including India's 100 named centres of excellence – would achieve even greater success if they could supplement their government funding with private sector funded research through tax incentives to the private funders.

This tighter academia-industry collaboration would generate win-win outcomes – more and better research, which can be deployed to the benefit of the people of India.

Further, allowing overseas universities to set up campuses in India would naturally encourage even further collaboration between the UK and India, simply by being in closer proximity.¹⁶ As universities are such a vital aspect of the innovation collaboration eco-system, it is vital to continue strengthening the links between UK and Indian academia.

Sources

16. Interview with Wenwei Wu, International Development Manager, University of Birmingham

CONCLUSION

Extensive innovation partnerships across and between the UK and Indian public, private and academic sectors already exist. These have produced successful scientific, commercial and social outcomes, and provide a strong foundation for deeper collaboration.

But we are at the cusp of something much greater. Industry 4.0 creates even more opportunities for the UK and India to collaborate. The accelerating rate of adoption of AI, robotics, the Internet of Things, blockchain, data analytics, and other digital solutions are impacting manufacturing, healthcare, education, infrastructure, retailing, energy and financial services.

Activities in these sectors will not only help the world's most sophisticated businesses but can also benefit the poorest in society through job creation and low-cost product and service innovation.

There are challenges to further and deepen UK-India innovation collaborations, and there is a role for governments to turn these challenges into opportunities.

Our respondents indicate that, for a collaborative innovation ecosystem to thrive, governments need to act as facilitators and interact with the private sector and academia to create the optimal enabling environment. This would include tax incentives, strong physical and

digital infrastructure, and the creation of a talented and mobile workforce, funding to catalyse partnerships, and a mechanism to share technological breakthroughs and create a UK-India technology and innovation ecosystem, bringing together the best from both countries.

To achieve the greatest success, innovation collaboration in every sector needs to focus on each country's respective strengths.

The transformation of India into a global manufacturing hub, with a highly skilled workforce, world-class physical and digital infrastructure, and opportunity for all is a bold and exciting programme. The UK and India, as equal and complementary innovation partners, have much to gain by working together to make this vision a reality.

This partnership will help both economies and will reach beyond their boundaries into third countries. Because globalisation heralds tremendous new economic possibilities, the UK-India partnership can secure long-term benefits for both.

INDUSTRY 4.0
CREATES EVEN MORE
OPPORTUNITIES FOR
THE UK AND INDIA TO
COLLABORATE.

WITH SPECIAL THANKS TO ALL OUR CONTRIBUTORS

Name	Company
Rhydian Poutney, Managing Director UK and RoW	Renishaw
Oliver Trumble, Partnerships Manager (Americas and India)	King's College
David Landsman, Executive Director	Tata Limited
Priyank Tiwari, Regional Head – Corporate Strategy and Marketing	YES Bank
Amy Gooden, Head of Public Affairs	Bupa
Wenwei Wu, International Development Manager	University of Birmingham
Larry Stone, Chairman	BT India
Amit Khandelwal, Senior Partnership Manager	UCL
Rohit Ramesh, Head of International Recruitment	University of Liverpool

Authors
Victor Firmin - UK India Business Council
Richard Heald - Chief Executive Officer, UK India Business Council

Design and Production
teammagenta

UK INDIA

BUSINESS COUNCIL

WHO ARE WE?

The UK India Business Council believes passionately that the UK-India business partnership creates jobs and growth in both countries. Through our insights, networks, and policy advocacy, we support businesses to succeed.

GET IN TOUCH

UK INDIA BUSINESS COUNCIL LONDON

12th Floor, Millbank Tower
21-24 Millbank London SW1P 4QP
enquiries@ukibc.com
Tel: +44 (0)20 7592 3040
+44 (0)800 0196 176

UK INDIA BUSINESS CENTRE MUMBAI

Trade Centre G/F & 1st Floor,
Bandra East,
Mumbai,
Maharashtra 400051
enquiriesindia@ukibc.com

UK INDIA BUSINESS CENTRE BANGALORE

Concorde Towers, UB City,
1 Vittal Mallya Road, Level 14 & 15,
Bengaluru, Karnataka 560001
enquiriesindia@ukibc.com
Tel: +91 (0) 806 7590 319

UK INDIA BUSINESS CENTRE GURGAON

16th Floor, Tower 9A, Cyber City,
DLF City Phase II,
Gurgaon Haryana – 122002
enquiriesindia@ukibc.com
Tel: +91 (0) 124 4155 700

DOING BUSINESS IN INDIA HELPLINE

For support call 0800 0196 176

WEBSITE

www.ukibc.com