Swiss GEM
BridgeAI overview

Claire Morris, Innovation Lead
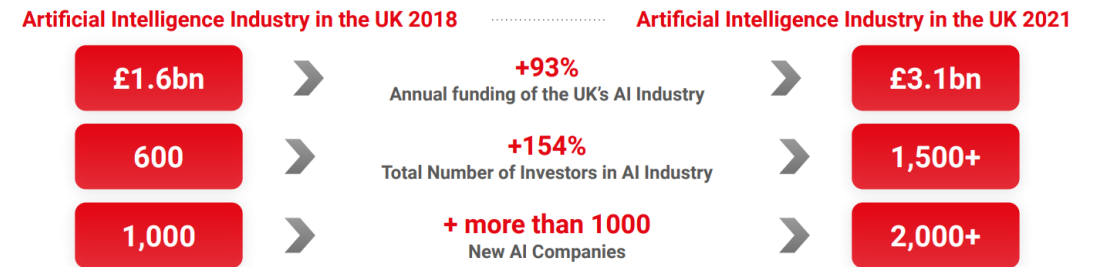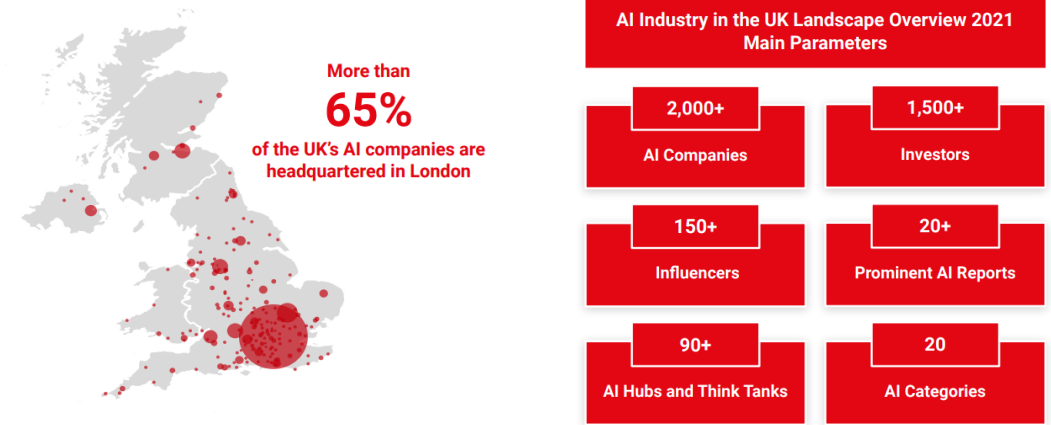
November 2023

UKRI Innovate UK **BridgeAI**

BridgeAI

AI Landscape in the UK

- UK has a thriving AI ecosystem and with world class research output and strong start-up scene.

- Annual funding for AI in industry in excess of £3 billion per year

- There are more than 2,000 AI centric companies addressing business opportunities across 20 sectors.
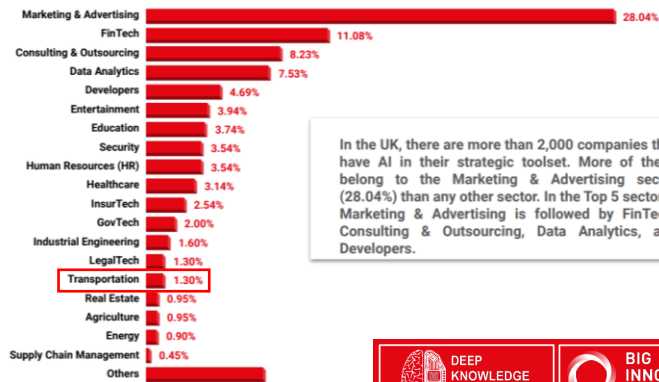
More than
65%
of the UK's AI companies are headquartered in London

AI Industry in the UK Landscape Overview 2021 Main Parameters

2,000+ AI Companies	**1,500+** Investors
150+ Influencers	**20+** Prominent AI Reports
90+ AI Hubs and Think Tanks	**20** AI Categories

Artificial Intelligence Industry in the UK 2018 ⋯⋯⋯ **Artificial Intelligence Industry in the UK 2021**

UK 2018			UK 2021
£1.6bn	**+93%** Annual funding of the UK's AI Industry		£3.1bn
600	**+154%** Total Number of Investors in AI Industry		1,500+
1,000	**+ more than 1000** New AI Companies		2,000+

DEEP KNOWLEDGE ANALYTICS   BIG INNOVATION CENTRE

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UKRI Science and Technology Facilities Council Hartree Centre   CATAPULT Digital   The Alan Turing Institute   bsi.   BridgeAI

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AI Landscape in the UK

But there is an uneven adoption on the demand side and uneven supply of products and services across different sectors on the supply side

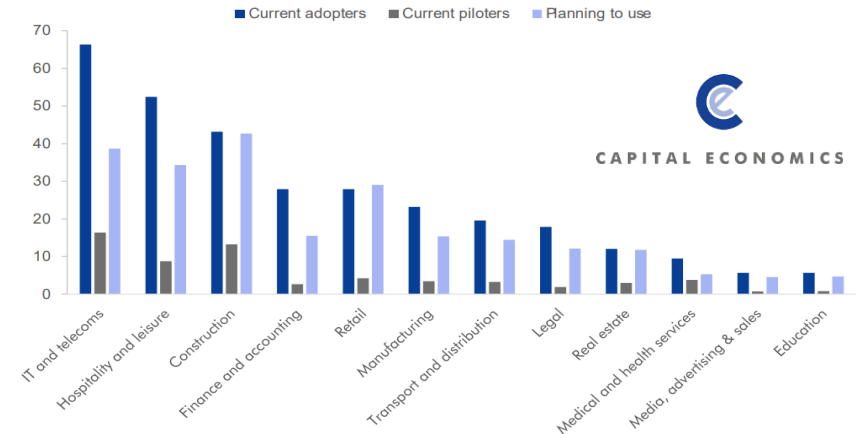### *Supply side*

Breakdown of AI Companies in the UK by Sector

Sector	%
Marketing & Advertising	28.04%
FinTech	11.08%
Consulting & Outsourcing	8.23%
Data Analytics	7.53%
Developers	4.69%
Entertainment	3.94%
Education	3.74%
Security	3.54%
Human Resources (HR)	3.54%
Healthcare	3.14%
InsurTech	2.54%
GovTech	2.00%
Industrial Engineering	1.60%
LegalTech	1.30%
Transportation	1.30%
Real Estate	0.95%
Agriculture	0.95%
Energy	0.90%
Supply Chain Management	0.45%
Others	

In the UK, there are more than 2,000 companies that have AI in their strategic toolset. More of these belong to the Marketing & Advertising sector (28.04%) than any other sector. In the Top 5 sectors, Marketing & Advertising is followed by FinTech, Consulting & Outsourcing, Data Analytics, and Developers.

DEEP KNOWLEDGE ANALYTICS   BIG INNOVATION CENTRE

Demand side

Figure 3.4: Number of businesses adopting by sector, 2020 (thousands)

Current adopters · Current piloters · Planning to use

CAPITAL ECONOMICS

Innovate UK BridgeAI empowers UK businesses in high-growth sectors, driving productivity and economic growth through the adoption of Artificial Intelligence. We bridge the gap between developers and end-users, fostering user-driven AI technologies.

With a focus on ethics, transparency, and data privacy, we aim to build trust and confidence in the development of AI solutions. Strengthening AI leadership, supporting workforces, and promoting responsible innovation, BridgeAI shapes a collaborative and AI-enabled future.

BridgeAI is an Innovate UK funded programme, delivered by a consortium including Innovate UK, Digital Catapult, The Alan Turing Institute, STFC Hartree Centre and BSI.

UKRI Innovate UK **BridgeAI**

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BridgeAI programme

High-growth potential sectors

As part of our commitment to driving AI adoption across the UK, BridgeAI has identified the key sectors with high growth potential, but currently, low AI adoption rates. By offering funding and support, the programme aims to enhance productivity and efficiency, and help businesses stay ahead of the curve in an increasingly competitive marketplace.
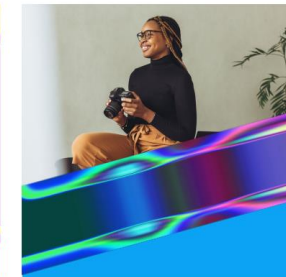
Agriculture Food-processing

Transport Warehousing & Logistics
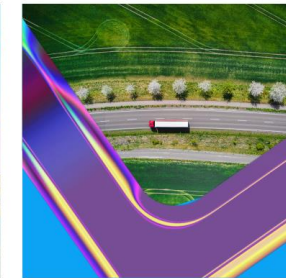
Construction

Creative Industries

Construction

Construction is one of the largest sectors in the UK economy, but the adoption of new technologies has been more challenging to implement. With output 23% below the whole economy average, and significant labour force challenges emerging, AI has the potential to transform and invigorate the industry [27].

Leveraging the power of artificial intelligence and machine learning the construction industry can reduce waste, improve processes, and accelerate project timelines, significantly enhancing productivity across the sector.

£116bn	**2.15m**
Contribution to the UK economy 2021 [28]	Individuals employed in the industry [29]
61%	**2.79%**
Of the current workforce is expected to leave in the next decade [30]	UK construction industry contribution to global sector revenue [31]

The PSC | UKRI Innovate UK | BridgeAI

BridgeAI

How we provide programme support

Connecting businesses in priority sectors with AI experts
Building an innovation community to help businesses adopt AI through collaboration with developers

Developing new trusted AI services and technologies
Supporting the development of cutting-edge AI technologies through co-creation between both the supply and demand side of the AI ecosystem

Elevating high-growth potential sectors
Building new capabilities in businesses through training and upskilling in AI providing access to scientific expertise

Addressing standards gaps
Providing standards clarity and guidance as well as identifying standards gaps and fast-tracking the development of appropriate standards

Opportunities

BridgeAI Partner Contributions

Innovate UK (UKRI)

- Grant Funding
- AI skills Hub
- Global Innovation Programmes
- Investment Partnerships

The Alan Turing Institute

- Turing Independent scientific advice
- AI advanced skills training
- Turing Way Practitioner Hub
- Collaboration with AI standards Hub

Catapult Digital

- Strategic ecosystem engagement
- Industry toolkit development
- Industry-start-up collaboration
- Business & Technology acceleration

Innovate UK KTN (UKRI)

- Innovation Network
- BridgeAI portal
- Industry mobilisation events

bsi.

- Standards landscape review and gap analysis
- Visualisation of standards landscape
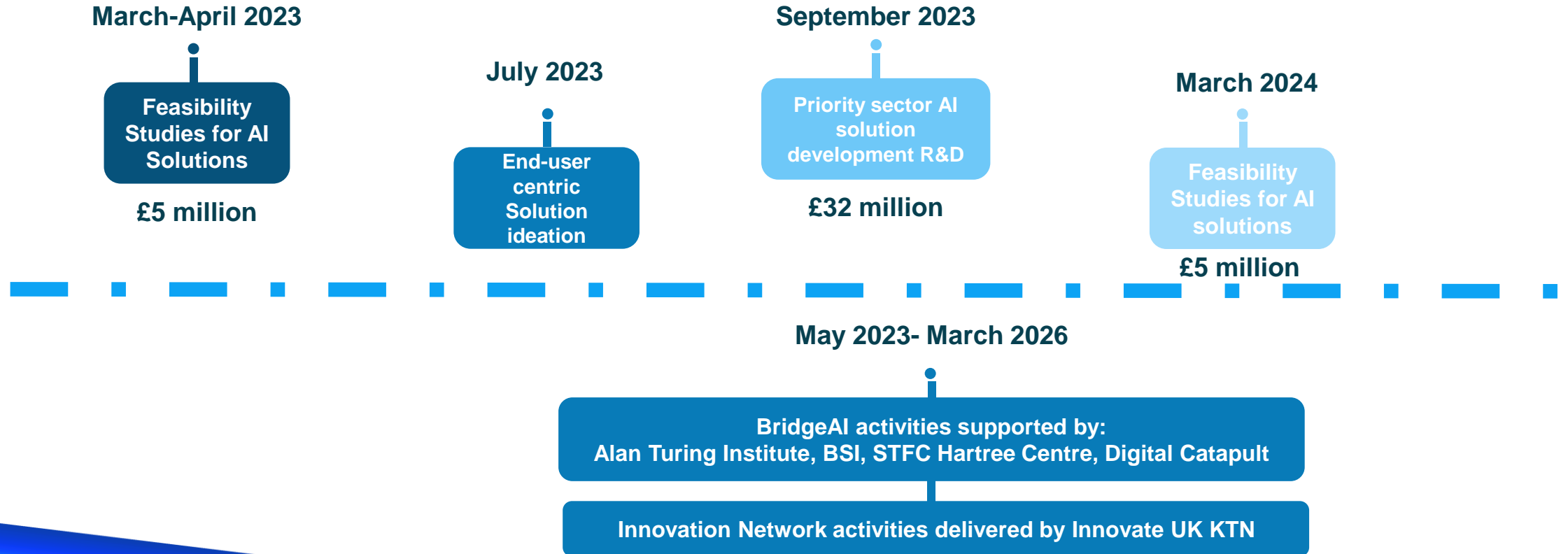- Standards guidance
- Fast-track standards development (TBC)

Science and Technology Facilities Council (UKRI) — Hartree Centre

- Industrial Digitisation Acceleratory
- Innovation vouchers
- Access to HPC and GPU compute clusters

UKRI Innovate UK BridgeAI

BridgeAI

Milestones

March-April 2023

Feasibility Studies for AI Solutions

£5 million

July 2023

End-user centric Solution ideation

September 2023

Priority sector AI solution development R&D

£32 million

March 2024

Feasibility Studies for AI solutions

£5 million

May 2023- March 2026

BridgeAI activities supported by:
Alan Turing Institute, BSI, STFC Hartree Centre, Digital Catapult

Innovation Network activities delivered by Innovate UK KTN

UK RI Innovate UK

UK RI Science and Technology Facilities Council — Hartree Centre

CATAPULT Digital

The Alan Turing Institute

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BridgeAI

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Questions?

BridgeAI@iuk.ukri.org

GEM report overview

Claire Morris, Innovation Lead

November 2023

Mission Overview and Objectives

- To help determine how Innovate UK can best support UK businesses more effectively and efficiently when considering innovation partnerships with Switzerland.

- To provide insights into where there are synergies between the two countries in AI and determine whether there is an appetite for further collaboration.

- To identify and showcase key future market opportunities for innovative products and services to UK businesses that may be interested in collaborating with Switzerland.

- To capture key UK R&I and emerging market opportunities/challenges for developing innovative products and services when considering collaboration with Switzerland.

Funding

Data Access & Privacy

Standards

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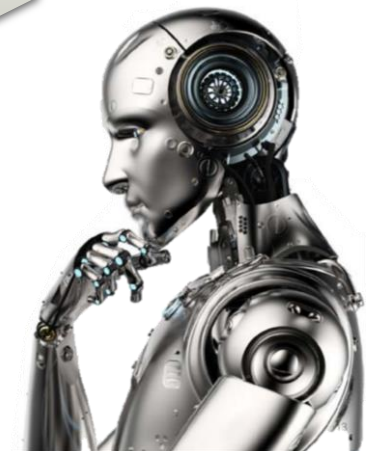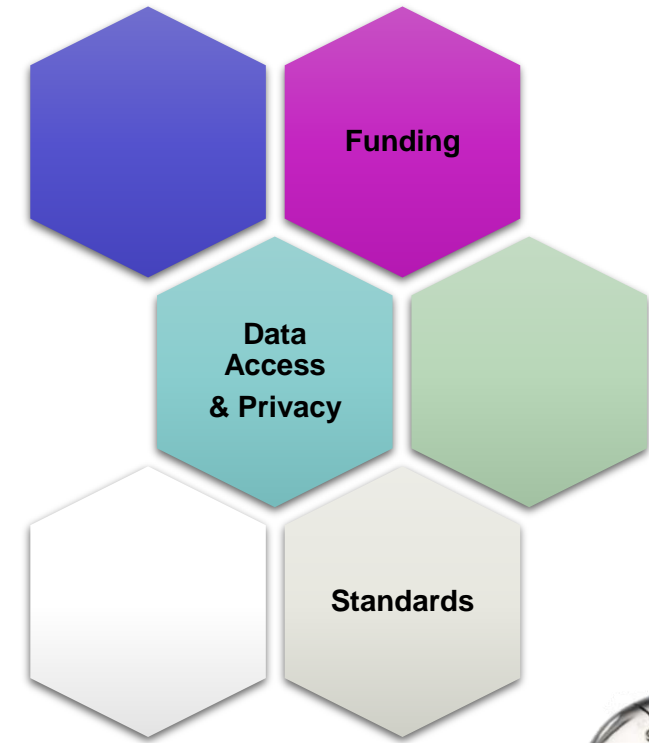
List of UK participants

Electronic Media Services Ltd. www.ems-uk.com

EMS develops cloud-managed 5G SD-WAN and Edge AI Computing appliances. The company's solutions are used in the construction, events, transport and logistics, outside broadcast and retail sectors, local government, and emergency services. Customers in the UK include DHL, CRH Tarmac, Warwickshire Council and Humberside Police

Department for Business & Trade www.gov.uk/government/ organisations/department-for-business-and-trade

The Department for Business & Trade is the Department responsible for the UK's trade policy and supporting international trade and investment links, as well as the productivity and international competitiveness of business sectors, including construction. In relation to the infrastructure and construction sectors the Department works to support the adoption of digital and offsite manufacturing technologies, including AI applications, as well as strengthening the system that supports skills development in the industry and reforming payment practices.

KOPE www.kope.ai

We are KOPE and we are dedicated to revolutionising how we design and construct the built environment. Technology has the power to transform the way we create our world in a more equitable, more effective, and more environmentally sound way. Combining deep knowledge of industry practices with new technologies, we are revolutionising the way people work in Offsite Construction. Our key focus is KOPE Construct, our Product Application Platform enabling offsite construction through the instant exploration and integration of prefabricated products and systems directly within construction projects.

Digital Catapult www.digicatapult.org.uk

Digital Catapult is a partially-government funded not-for-profit company whose mission is to accelerate the adoption of advanced digital technologies in the UK, for its benefit. It is a leading UK authority on such technologies, and is working with a range of businesses, from hundreds of startups to the largest UK firms. It is a part of the UK's Catapult Network, a government established group of nine companies covering a range of advanced technology areas.

UK RI Innovate UK **BridgeAI**

AI in Switzerland

- Switzerland is ranked as first in the world in the Global Innovation Index, and renowned as a highly innovative country.

- Switzerland is third in the world for both the number of AI patents as well as AI professional density.

- The country does not have an integrated national strategy for AI development and adoption, or targeted specifically at construction.

- Recognised need for international collaboration on AI particularly around standards and regulation.

1st	1st	1st
Global Innovation Index (WIPO)	Global Talent Competitiveness Index	Impact of AI publications per country
1st	2.53	34.6
Highest number of AI companies per capita in the EU	AI companies per 1 million inhabitants	AI patents per 1 million inhabitants
500	Zurich	50
AI companies	canton has the most AI companies	R&D centres, hubs and non profits

37%
of Swiss AI patents filed are world-class

Innovate UK BridgeAI

Bilateral cooperation

GOV.UK

Home > Education, training and skills

Press release

UK signs major science co-operation agreement with Switzerland

From: **Department for Business, Energy & Industrial Strategy** and **George Freeman MP**
Published 10 November 2022

UK to sign
research agreement
with Switzerland

- The UK and Switzerland sign Memorandum of Understanding deepening the relationship between the 2 countries' world-leading research and innovation communities
- memorandum will encourage particular focus on cooperation in 'deep science' and 'deep tech', as well as commercialisation through innovation, and policy and diplomacy in science and innovation
- agreement was signed by UK Minister of State for Science, Research and Innovation, George Freeman MP, alongside Federal Councillor Guy Parmelin, Head of Switzerland's Federal Department of Economic Affairs, Education and Research

UKRI Innovate UK BridgeAI

Government Agencies and Non Governmental Organisations

The State Secretariat for Education, Research and Innovation (SERI)
The federal government's specialised agency for national and international matters concerning education, research, and innovation policy.

Innosuisse is the Swiss Innovation Agency
Serves to promote science-based innovation in the interest of the economy and society in Switzerland.

The Competence Network for Artificial Intelligence (CNAI) - part of the Federal Statistics Office (FSO).
While CNAI does not play a role in funding, it governs AI projects within Switzerland and facilitates knowledge transfers for businesses, government, and research. The CNAI also contributes to informing the public and enabling transparency of ongoing AI projects both within and outside the Federal Administration

Shared Challenges
- Construction sector challenges such as ageing infrastructure and workforce, skills shortages, and consistent quality control, that AI can help to mitigate.
- Pace of AI development
- Trustworthy responsible AI, standards and regulation

Key Difference

- No top down strategy for funding of industrial innovation.
- Switzerland adopts a market driven bottom up approach.

UK RI Innovate UK **BridgeAI**

Academic Institutions

Swiss Federal Institute of Technology in Lausanne (EPFL)

Center for Intelligent Systems (CIS) is part of EPFL, integrating AI, machine learning, and robotics for the development of intelligent systems, which perceive their environment and can learn from the data they collect to adapt to the changing world around them.

- 650 researchers across 5 EPFL faculties, working at 84 laboratories

- supports industry engagement via affiliation programmes and events.

USE CASE

Mechanised tunnel boring

EPFL researchers have developed a solution for mechanised construction using tunnel boring machines from the Intelligent Maintenance and Operations Systems Laboratory. Herrenknecht, a German tunnel boring company, has used this technology.

UK RI Innovate UK **BridgeAI**

Academic Institutions

Swiss Federal Institute of Technology in Zurich (ETH)

The ETH AI Center brings together research on AI for the benefit of society. Its three key pillars focus on research, skills, and impact.

Design++, ETH's Center for Augmented Computational Design in Architecture, Engineering, and Construction, develops digitally augmented design tools, AI, and computational processes primarily for the design phase to simultaneously increase construction productivity, improve the quality of the built environment and substantially reduce the ecological impact within the Architecture, Engineering and Construction (AEC) sector.

USE CASE

Digital building technologies to create "add-on" living spaces for existing structures

ETH research utilises digital technology in designing rooftop units to attach to pre-existing apartment blocks, creating affordable solutions for new housing.

UK RI Innovate UK **BridgeAI**

Research Institutions

Empa - NEST

- NEST is Empa's modular research and innovation building, where new technologies, materials and systems are researched, developed, and validated under real conditions.

- Each modular unit operates as intended for several years, after which it can be removed and replaced with a new test unit for a different purpose.

- Close cooperation with partners from research, industry and the public sector ensures that innovative construction and energy technologies are put onto the market faster.

Innovation Support for Business

KNOVA

- open innovation platform focused on building connections and strengthening networks between EPFL, Innovation Park partners, and startups.

- 16 industry members, including Siemens, Michelin, L'Oreal, and Swisspost

- 3 phases of onboarding firms
  - an exploration week,
  - a soft landing (1-6 months to test the value of innovation communities)
  - full membership.

Switzerland Global Enterprise (S-GE)

- official Swiss consultancy, promotion and platform organisation for export and investment promotion operating in 30 countries.
- S-GE supports Swiss SMEs in their international business
- helps innovative foreign companies with potential that are interested in settling in Switzerland

Switzerland Innovation

- Six Innovation parks
- facilitates collaborations for companies, startups, and universities.
- forms an ecosystem accelerating the transformation of research results into marketable products and services.

UK RI Innovate UK **BridgeAI**

Large Construction Stakeholders

Swiss Federal Railways (SBB)

- SBB runs over 11,000 trains per day carrying 1.1 million passengers across 3,200km of track.

- The AI projects aim to improve the maintenance monitoring of rolling stock via two use cases: prediction of flat spots on wheel sets and maintenance planning thereof and wear prediction for pantograph carbon strips (used for collecting electrical current).

- Change management within the workforce and the sharing of knowledge with the wider AI and transport sectors. SBB is part of Germany's Cross-Business Architectural Lab, which enables sharing with the EU railway networks.

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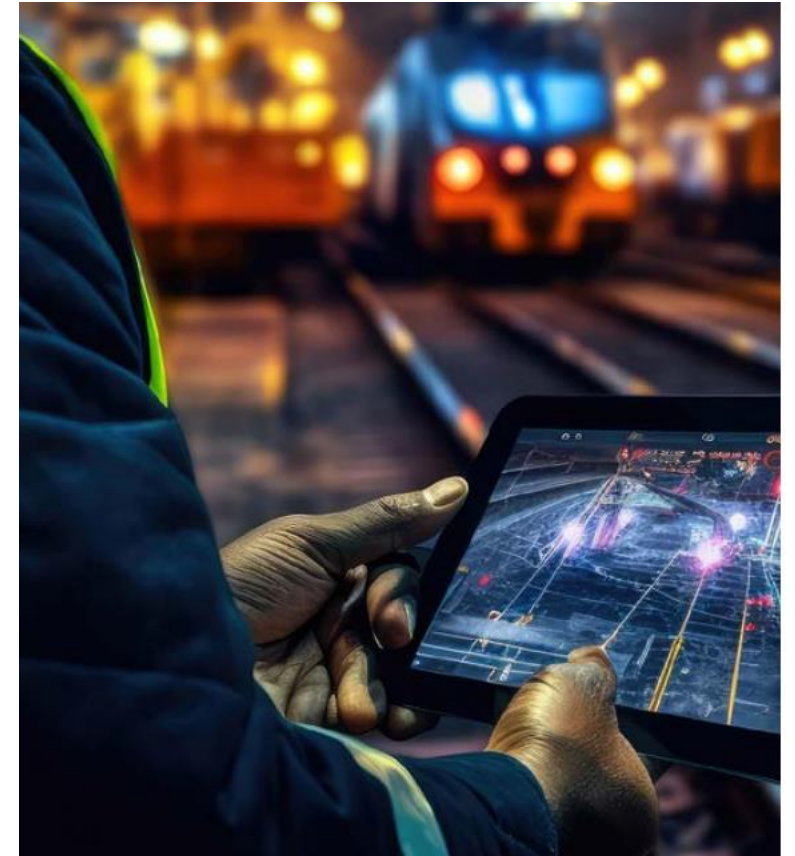
Large Construction Stakeholders

Implenia

- Switzerland's largest construction and real estate service provider, undertaking most commercial and civil infrastructure projects in the country.

- The company works with various partners – including research institutions such as the Fraunhofer Institute for Building Physics IBP, ETH Zurich and startups.

- The company has also worked with energy supply companies to optimise energy supply in neighbourhoods with ongoing construction or real estate activities.

CASE STUDY
Leveraging startup innovation

In 2021, Implenia worked with two startups – Imerso and Scaled Robotics – to develop a pilot creating new methods for quality and construction progress management using BIM, reality capture and AI.

Construction Start-ups

SwissInspect
EPFL spin out

Automated damage inspection of structures, e.g. bridges, buildings, dams etc.
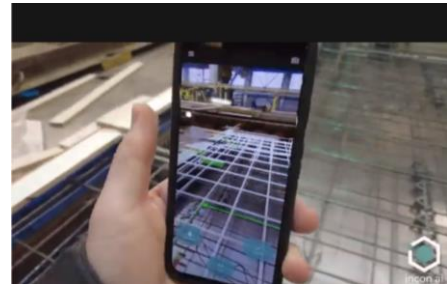

Benetics

AI construction communication app which aggregates data from multiple sources for construction project management.

Incon.ai
An augmented reality app that uses a 3D overlay with instructions for building any given construction project, thus lowering the barrier to building.

Gravis Robotics

Automates the operation of heavy construction machinery, including adaptation of existing vehicles.

Opportunities and barriers to future collaboration

- **Collaboration on specific AI research initiatives**

- **General networking and matchmaking for funding opportunities**

- **Establish joint effort on EU regulatory policy**

- **Expand NEST "test and deploy" capabilities to UK**

- **Low-hanging fruit in compliance and safety use cases**

- **Risk of excessive regulation**

- **General networking and matchmaking for funding opportunities**

- **Lack of data quality and standards**

- **Data sharing and commercial sensitivities**

- **Lack of industry readiness**

UK RI Innovate UK **BridgeAI**

Conclusions

- appetite for collaboration between the UK and Switzerland to tackle shared barriers and develop knowledge transfers within the construction sector.

- broad scope for the application of AI, from design and planning through to building construction and maintenance, with the opportunity to improve building and workplace safety, enhance energy efficiency, and increase productivity.

Overall, the key recommendation is to build on the initial success of the GEM with the development of further programmes to explore more specific opportunities to connect businesses and academic research initiatives, with a view to establishing bilateral innovation and trade partnerships.

Future Opportunities

Claire Morris, Innovation Lead

November 2023

Future Opportunities

Funding competition
UK – Switzerland Bilateral: Collaborative R&D

UK registered organisations, in collaboration with at least one Swiss registered business can apply for a share of up to £2 million for research projects resulting in innovative solutions. Swiss partners must apply for equivalent funding from Innosuisse.

Competition opens: Monday 17 April 2023
Competition closes: Thursday 27 July 2023 11:00am

⚠ This competition is now closed.

Next competition in planning for 2024

BridgeAI Swiss Global Business Innovation Programmes: helping high growth businesses explore global innovation opportunities

In planning for 2024

Opportunities

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