Senedd Cymru
Pwyllgor yr Economi, Masnach a Materion Gwledig
Ymchwiliad: Deallusrwydd Artiffisial ac Economi Cymru
Cyf: AI04
Ymateb gan: AMPLYFI

-

Welsh Parliament
Economy, Trade, and Rural Affairs Committee
Inquiry: AI and the Welsh Economy
Ref: AI04
Evidence from: AMPLYFI

AMPLYFI

AI and the Welsh Economy

November 2024

AMPLYFI is an AI company based in Wales providing world-leading market intelligence services to NATO, the UN, US Govt, E.ON, Bayer, HSBC, Deloitte, PwC and many other organisations. Throughout this response, we apply our tools and services to provide similar insight to "AI and the Welsh Economy" Consultation that we provide to the aforementioned firms.

Our analysis of Wales & AI suggests that there are more opportunities than threats, but these quickly diminish as the world invests in AI transformation. In response to the panel's questions, our recommendation is that Wales should double down on existing strategies and better connect them through an "AI Supply Chain" lens. Through this process, Wales should seek to facilitate specialisms in the AI supply chain that attract investors and partners and provide a platform that enables Welsh businesses to win in foreign markets. To facilitate this we recommend a collaborative, focused and agile approach - using national UK strategies as a platform for more specifically focused Welsh programmes and recognising that while Wales has a disadvantage in scale to larger regions, this facilitates an advantage in its ability to act and change faster.

The AI supply chain is made of the following:

- **AI Infrastructure** - Semiconductors, data centres, high-performance computing and the physical infrastructure required to train and deploy AI models
- **Foundational AI Models** - a type of machine learning model that is designed to perform a wide range of tasks and can be adapted for various specific applications
- **Renewable Power** - integral to the processing requirements of AI models both at training and deployment, without scaling the environmental impact
- **AI Solutions** - technology companies capable of solving specific market needs beyond Wales that attract investment, employment and tax revenues for Wales
- **AI Consumption** - use cases, training data for models and integration with workflows from Welsh companies around AI

To deliver this ecosystem, we propose that the Welsh government continues to invest but better connects disparate areas of strategy around the AI-Supply Chain theme:

- **Build on the Semiconductor Cluster** - there is an ongoing shortage of AI chips globally[1] driving the need an opportunity for ongoing supply chain diversification; we suggest following up on the UK National Semiconductor Strategy with more specific programmes to establish AI-Infrastructure IP & Capacity across Wales, leveraging the existing specialisms[2] in South Wales around compound semiconductors and partnerships[3] with semiconductor leaders, but expanding this to explore next-generation AI-server architectures. Where current capabilities are not directly aligned with AI-Infrastructure requirements use knowledge transfer strategies to rapidly pivot capabilities and attract, invest and grow new focused, but world leading expertise in AI-infrastructure-niche areas.
- **Align the National Energy Plan** - The Electric Power Research Institute forecasts that data centres may see their electricity consumption more than double by 2030, reaching 9% of total electricity demand in the US[4]; we suggest aligning parts of the new National Energy Plan with the AI Infrastructure Programme through developing a specialism around "Sustainable AI Infrastructure".
- **Catalyse an AI Solutions Cluster in Wales[5]** - Global spending on AI is projected to reach $235bn in 2024, tripling to $630 billion by 2028[6]. To capture this market growth, we suggest rapidly aligning relevant parts of the Digital Transformation Strategy and better-connecting budgets from Cardiff Capital Region (Innovation Investment Fund), Development Bank of Wales Technology Fund, Fintech Wales, Life Sciences Hub to more AI-specific Seed & Scale support to build an AI-Cluster in Wales, as well as connecting and aligning with the new UK Governments emerging AI Opportunities Action Plan[7]
- **Rapidly Facilitate Welsh Organisations to Adopt Proven AI –** AI adoption in industry - defined as "using AI for a core process, or at scale" jumped to 72% in early 2024 up from 50% for the previous 6 years[8]. We suggest

---

[1] https://www.bain.com/insights/prepare-for-the-coming-ai-chip-shortage-tech-report-2024/

[2] https://www.cardiff.ac.uk/news/view/2848410-compound-semiconductor-consortium-announced-as-a-finalist-for-prestigious-award

[3] https://itritoday.itri.org/114/content/en/unit_01-3.html

[4] https://iea.blob.core.windows.net/assets/18f3ed24-4b26-4c83-a3d2-8a1be51c8cc8/Electricity2024-Analysisandforecastto2026.pdf

[5] https://amplyfi.com/wp-content/uploads/2024/11/A-Technology-Catalyst-to-Fuel-the-Cardiff-Phenomenon-vNov2024.pdf

[6] blogs.idc.com/2024/08/16/a-deep-dive-into-idcs-global-ai-and-generative-ai-spending/

[7] https://www.gov.uk/government/news/ai-expert-to-lead-action-plan-to-ensure-uk-reaps-the-benefits-of-artificial-intelligence

[8] www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai

considering tax and procurement incentives for Welsh businesses to consume from the AI-Supply Chain as part of the Digital Transformation Strategy

- **Drive Global Market Access for Welsh AI Firms** - 69% of failed startups attributed marketing and specifically "product market fit" as the reason for failure[9]. As Wales has a smaller[10] (GVA per head in Wales in 2022 was 72.1% the second lowest of the UK countries and English regions), public sector dominant market[11] (7.6% higher public sector employment than the UK average of 24%), it is critical that growing commercial organisations are supported to sell outside of Wales. We recommend driving market access for Welsh businesses for revenue, but also talent and investment. Explore more AI-focused trade missions - aligning with national post-Brexit trade strategies, drive the Development Bank of Wales to become a platform to attract investors into the Wales AI Cluster mentioned above and lobby the UK Government for more access to special talent visas that align with this strategy.

In conclusion, Wales once positioned itself as the beating heart of a technological revolution[12] - pouring value out of its ports to drive industrial dreams. This was facilitated by a combination of natural resources, capability, investment and ambition. Underpinned by strategic vision and timing. With AI as the catalyst for the Industrial Revolution 4.0 our analysis suggests that several of these factors are already in play and if correctly aligned could see Wales once again able to lead the transformation of global industries.

[9] https://www.failory.com/blog/startup-mistakes
[10] https://www.gov.wales/regional-gross-domestic-product-1998-2022
[11] https://statswales.gov.wales/Catalogue/Business-Economy-and-Labour-Market/People-and-Work/Employment/Persons-Employed/PublicPrivateSectorEmployment-by-WelshLocalAuthority-Status
[12] https://amplyfi.com/wp-content/uploads/2024/11/Industrial-Revolutions-Impact-on-Wales-Economic-and-Social-Dynamics.pdf

To what extent are businesses in Wales making use of AI and planning to do so in the future?

Specific data about Wales is not easy to access. However, the more significant trends are instructive. The UK (and Wales) are well placed in Europe[13][14], generally behind the two major players (US & China)[15], but Wales ranked 8th most attractive European region for AI investment and Cardiff, in particular, has seen a 35% CAGR growth in the digital technologies sector (2016-2022), outpacing London by 13%.

Most businesses in Wales will already be using some form of AI, most commonly AI will be embedded in "off the shelf" software they use, e.g. spell checking, translation, data analysis, or more rarely building their own bespoke AI solutions use cases.

Off The Shelf Examples:

Some common use cases for AI in business that all Welsh companies could adopt:

- Improving information access with smart search and summarisation
- Streamlines coding tasks
- Run analysis on large data sets
- Proof read content and suggest grammar improvements
- Act as a creative partner - generating marketing images and copy in seconds, that would have taken hours to produce

The benefits of embedding AI are numerous; it has been shown to improve productivity by 80% and improve corporate profits by 45%. Furthermore, it is evidenced that around 75% of companies waste time on manual tasks that AI can automate.

Bespoke AI Solutions Example:

AMPLYFI helps global organisations leverage AI in their workflows, for example:

- Supporting major oil company Aker build a Carbon Capture IP portfolio
- Helping consulting firm Deloitte reduce its project effort by 88%
- Mapping c.10m AI Jobs in China for Georgetown University, Center for Security & Emerging Technology

AMPLYFI has delivered several projects aligned with Wales through the Innovation Advisory Council and Cluster[16], but nothing to the scale and ambition of the projects mentioned above.

---

[13] https://techtour.com/news/2024/ai-landscape-in-europe-2024.html
[14] https://palife.co.uk/news/technology/ai-investments-by-country/
[15] https://www.pwc.com/gx/en/issues/artificial-intelligence/publications/artificial-intelligence-study.html
[16] clwstwr.org.uk

What are the potential economic opportunities and risks that AI may present for Wales, and how might these vary across different parts of Wales and across different sectors?

The Economic Opportunity

The greatest economic gains from AI are expected in China, with a 26% boost to GDP by 2030, and North America, with a 14.5% boost[17]. To capture these kinds of commercial advantages our analysis suggest that Wales should:

- Move rapidly to align existing programmes around an AI Supply Chain as documented in the opening statement
- Develop specialisms in the AI Supply Chain that are world leading, for example:
    - AI Infrastructure - look to next generation AI data centre requirements and chip architectures such as Water Cooling and Compound Semiconductors
    - Renewable Power - combine the properties of renewables such as wind/hydro with cooling properties required by data centres as mentioned above
    - Policies - build a set of data-centre specific policies to promote energy efficiency, such as permitting schemes, Minimum Energy Performance Standard (MEPS), consolidation policies, public sector procurement policies, incentive schemes, voluntary agreements, labels and certification schemes
    - AI Solutions - focus on rapidly scaling, niche global applications that drive export potential, such as Open Source Intelligence, Small Language Models and Representative AI
    - AI Consumption - look to drive base adoption of AI tools across Wales, but also catalyse more transformational projects
- Leverage this to attract talent, investment and economic growth

Initially the benefits would be concentrated in the Digital Technology sector, moving swiftly to generally support innovation across other sectors. We suggest considering a more sector by sector and region by region approach as the process and impact matures, however, this should not preclude moving rapidly to

---

17

https://www.pwc.com/gx/en/issues/artificial-intelligence/publications/artificial-intelligence-study.html

capture the value, as Wales is likely competing with other regions keen to execute the same strategy.

An interesting success story is that of Norway who has risen as a leader in green data centres, now running 100% on renewable energy. Government incentives such as tax breaks and grants for technological innovation attracted tech giants and start-ups. These companies capitalised on the natural strategic advantages of the country's rainy and cool climate (similar to Wales) which fuels the country's vast hydropower production and is able to keep data centres naturally cool, to drive the production of energy-efficient data centres. New policies are being put in place to maintain the sustainable data centre industry, including discouraging cryptomining and ending tax breaks for power-intensive industries. These data centres support the growth of AI technologies.

The Economic Risks

Our analysis suggests that economic risks are mainly driven by the slower or less effective adoption of AI in Wales, specifically:

- Reacting slowly and missing the opportunity - the world is rapidly adopting and investing in AI at scale, therefore advantages are fleeting, but disadvantages grow as these efficiencies become "the norm"
- Not finding an edge over other regions - AI is too broad a field for Wales to compete in many areas, instead finding specialisms across the supply chain that build on existing capabilities are key
- Lack of connection across programmes - ensuring that every pound spent is supportive of the whole supply chain, as opposed to being siloed - this is a key advantage for Wales as a smaller player in the space
- Not driving market access, e.g. Brexit eroding the ability for Welsh firms to access markets or deterring inbound investors and customers, limiting the speed and value of the investment.

How is AI likely to affect jobs and workers in Wales, and what actions might the Welsh and UK governments need to take in response?

AI has the potential to make all knowledge workers more efficient. 85% of British knowledge workers who use AI tools say it's already improving their productivity[18]. In this sense adoption, rather than retraining is key, as this drives short term efficiencies that would allow for greater value capture.

However, AI is available almost universally to organisations who wish to adopt it and there is a global race for efficiency. For example, AMPLYFI supported the Deloitte Centre of Research Excellence in India to reduce the effort to product analysis by 88% without compromising the quality of the outputs. A task that took 4 hours previously now takes less than an hour. This technology is increasingly being adopted globally, if Welsh organisations do not leverage these efficiencies, other organisations are.

To frame this bluntly, our analysis shows that the early adopters of AI tools are already seeing benefits. Laggards will suffer and developing programmes that facilitate Welsh organisations to rapidly adopt proven AI technologies are required merely to keep pace with the rest of the market.

Beyond this we suggest that the most significant advantage the Welsh & UK governments can provide to protect economic value is to support innovation, investment and partnership across the AI-supply chain, incentivising consumption of locally built solutions and providing market access as defined in our opening section. This facilitates locally retained benefits, similar to what we see with the Welsh Government's establishment of renewable energy ventures, Ynni Cymru.

[18] https://d34u8crftukxnk.cloudfront.net/slackpress/prod/sites/6/Slack-Workforce-Lab-UK-report-1.pdf

What skills are likely to be needed as a result of increased use of AI in the workplace, and how well placed is Wales to deliver these?

Skills across the AI Supply Chain will be varied and specific - growing, attracting and retaining Science, Technology, Engineering & Mathematics (STEM) skills will be critical for Wales ability to innovate and private sector organisations, as well as higher and further education programmes should be aligned to deliver Knowledge Transfer without inhibiting the ability of organisations to generate and use new Intellectual Property.

Outside of the AI Supply Chain it is also worth noting the potential for disruption to all other forms of work and thus skills. One major AI disruption that should be considered is Generative AI. Generative AI allows machines to create and interpret unstructured data formats such as text, images, sound and video. Generative AI currently accounts for 17.2% of global AI spending[19] but is a key technology as it could be considered a "universal interface" allowing anyone to create, control or analyse complex digital information with simple instructions. This can lower barriers to entry, supercharge productivity and reduce our dependency on existing skills such as Computer and Data Science.

Our analysis suggests that key to a successful skills strategy for Wales is to drive access to Generative AI and other AI solutions at a broader level - empowering existing workers in Wales to do more/harder types of work with less effort. Whilst tangentially seeking to grow, attract and retain more specialised STEM skills to Wales and associated businesses.

[19] https://blogs.idc.com/2024/08/16/a-deep-dive-into-idcs-global-ai-and-generative-ai-spending/