How Regional Artificial Intelligence ecosystems can best be measured and mapped to help inform local leadership. Brief insights from *in progress* research.

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This submission is based on the author's expertise at the intersection of economics, Artificial Intelligence and Policy Engagement. This submission is supported as part of a university fellowship award based at Salford Business School.

The following is based on a current *in progress*[3] project being conducted by Salford Business School and Manchester City Council. This project seeks to measure and map the Manchester AI ecosystem with a particular focus on the interaction between policy levers for sustainable and inclusive growth, and the ecosystem.

Measuring Regional AI ecosystems

When measuring the Manchester AI ecosystem, the calculation and method are similar to (Whittle et al., 2019) which maps the Greater Manchester retail economy. A broadly behavioural 'deep dive' (Pendleton et al., 2019) is used to supplement the analysis developing richer insight into the mechanisms of the Manchester AI ecosystem. Additional methodological insight is adapted from (Massini et al.2024; Massini et al., 2022).

The following table displays the difficulties and solutions encountered when measuring and mapping the Manchester AI ecosystem.

Table 1: Measurement and Mapping Difficulties and successful solutions

Issue	Trialled / Considered Solution(s)	Successful Solution and rationale.
Various definitions and different understandings of key terms. For example Artificial Intelligence is understood to mean numerous slightly different things.	1. Using standard definitions. 2. Developing a dictionary with AI support. 3. Co-producing definitions.	**Solution:** Co-producing definitions. **Rationale:** Given the nuances of any AI ecosystem as well as the various different objectives of

[1] No expert opinion, insight or evidence presented should be read as representing the view of the West Yorkshire Scientific Advisory Group (WYSAG) or West Yorkshire Combined Authority (WYCA).
[2] No expert opinion, insight or evidence presented should be read as representing the view of the Manchester Digital Strategy (MDS) or Manchester City Council (MCC).
[3] *This project is due for completion March 2025 and as such all discussion should be regarded as preliminary.* Should the committee wish, a full and final version of the project report can be obtained from R.R.Whittle@salford.ac.uk from 4th April 2025.

These difficulties are quite pronounced between local policy and Artificial Intelligence Organisations. Equally there is a clear 'language barrier' between academics, policy and organisations.		parties. A co-produced set of definitions allow for
Data Collection Issues. Many traditional industry coding techniques are too generalised to correctly identify the range of organisations which make up an AI ecosystem. Whilst primarily a definition issue, distinctions around digital firms, deep research and AI wrappers (firms which in essence sell a generalised service built around an existing AI tool) are difficult to tease out in the data. Likewise, 'AI hype' has led to several examples of firms rebranding existing digital (or not) products and processes as 'AI'.	1. Create a standard reporting framework for firms to detail their AI use. 2. Work with various organisations (such as chamber of commerce networks) to harness relevant data. 3. Refine a web-scraping approach to assess *if* organisations should be considered part of the AI ecosystem.	**Solution:** Web-scraping supplemented with systems mapping approaches. **Rationale:** Web scraping allows for identification of ecosystem components within agreed definitions. However due to the perceived value to firms of being considered 'AI' and the need to identify policy levers, relationships and interventions. The primary tool of enquiry is an adapted systems map approach based on the design trialled by IPPO[4].
Pace of Change. Ultimately this area of research is rapidly changing and the approaches detailed above provide a static analysis.	1. Develop a real time data collection process. 2. Develop a forecasting and nowcasting approach.	**Solution:** Develop a nowcasting approach. **Rationale:** Time and cost restrictions prohibit a real time data collection process (though ideally this would be the selected approach with an accompanying publicly accessible dashboard). An AI ecosystem is highly vulnerable to new exogeneous shocks making its forecasting contentious. Nowcasting however will provide some current input.
Boundary Definition. Regional Economies often intertwine. Allocating AI	1. Use the physical location of an AI organisation's main office (As listed on their	**Solution:** Use the physical location of an AI organisation's main office

[4] https://theippo.co.uk/systems-maps/

activity to a particular region can often be difficult and futile. The benefits of an AI ecosystem may not be felt there, particularly if wages are spent elsewhere.	website or similar). 2. Calculate the regional impact of an AI organisation and allocate it to the region where it is largest.	(As listed on their website or similar). **Rational**: Time and cost limitations prevent the use of the preferred solution (2).

Key finding for the Science, Innovation and Technology Select Committee: Differences in shared understanding of key terms (such as artificial intelligence itself) can result in incorrect reporting by organisations and inefficient policy design. A commonly agreed – co-produced – set of definitions can result in a more precise measuring of a regional AI ecosystem.

Next: (Systems) Mapping of a Regional AI ecosystem

A systems map can provide insights to support evidence-based decision making. The systems map currently under construction for the Manchester AI ecosystem requires the components of the AI ecosystem (above) and their relationships with policy organisations and agendas.

Systems maps can help identify causal links (Jeong, 2014)[5] between policy interventions and, in the case of this briefing, sustainable inclusive growth of an AI ecosystem. The map also helps differentiate between national policy agendas, regional agendas and devolved powers. Interventions are evaluated by effectiveness (statistical significance or similar), subjectivity, sufficiency and scalability. The use of this 4S framework (Mills & Whittle, 2023) allows policy makers to evaluate various interventions to support a regional AI ecosystem.

Initial finding for the Science, Innovation and Technology Select Committee: Behavioural Science interventions around skills, AI adoption, education and digital inclusion can provide cost effective interventions for local government to positively impact its regional AI ecosystem.

This submission is based on a research project which is currently being undertaken. The final report will fully address:

1. Measuring a regional AI ecosystem.
2. Systems mapping a regional AI ecosystem to identify overlapping and intersecting policy areas enabling the design of interventions to support the development of a sustainable AI ecosystem.
3. Insights and experiences of informing policy and evidence-based decision making.

This report will be available by emailing R.R.Whittle@salford.ac.uk from 4th April 2025.

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