Creative designs: Geography of Australia's digital technology industries

August 1 2023, by Stefan Hajkowicz
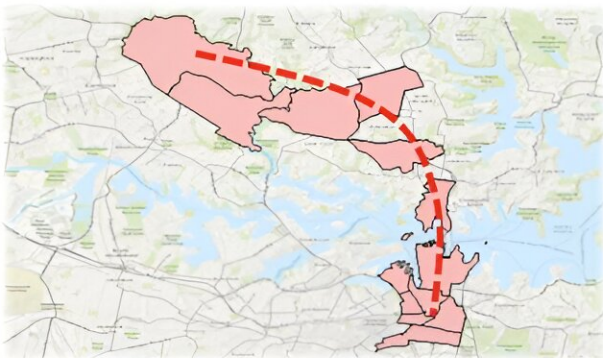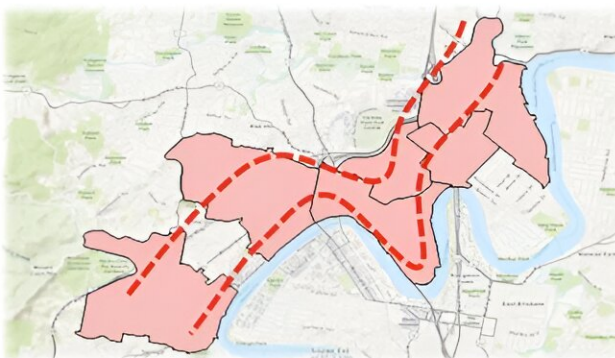

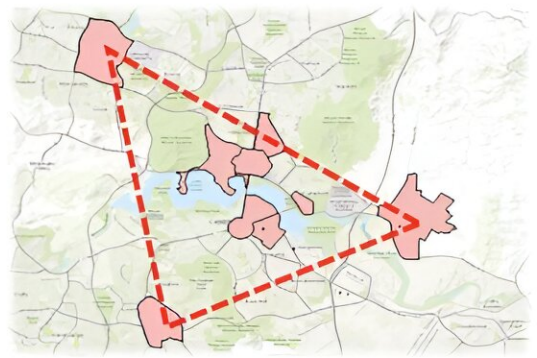Australia's four digital technology industry super-clusters identified in the report. Credit: CSIRO

A short walk down Melbourne's Lygon Street will take you past around

30 Italian restaurants, cafes and pizzerias.

The Lygon Street precinct can safely be called a "cluster" or "hotspot." These terms have similar meanings and typically refer to a geographically concentrated group of companies and organizations within a similar or related industry sector.

But it's not just restaurants. Patterns of geographic clustering have been observed in practically every industry and country across the globe. And digital connectivity and "work anywhere" employment models don't seem to be having much impact.

Patterns of settlement and mobility may have changed during the pandemic, but geography still matters and clusters are still going strong.

Why do clusters matter?

Over the decades many researchers have observed clusters and asked the question: why? What are the reasons businesses of the same sector want to co-locate? Well, it turns out there are a lot of good reasons to be in a cluster.

Research has shown firms in clusters tend to grow faster, innovate more, gain access to a larger workforce-pool with specialized skills and attract more investment. A famous example is Silicon Valley in the United States. It has only 2.5% of the US population but attracts 48% of venture capital, 18.4% of patents granted, and 8.6% of workers in high-skilled digital technology jobs.

We see similar patterns across the globe. The United Kingdom has the Silicon Fen (Cambridge) cluster and France has the Toulouse aerospace cluster.

Australia's digital technology industry

Australia has technology industry clusters too. [Prior research](#) has identified clusters in the [information technology](#) and telecommunications sector in Sydney, and geography plays a major role in the formation of Melbourne's software sector. However, overall Australia's technology industry clusters haven't yet received much attention.

With a team of CSIRO researchers and Tech Council of Australia, I have spent the past year analyzing digital technology industry clusters at the national scale. We assessed 2,473 small-area statistical regions at the national scale to develop this report: The geography of Australia's digital industries.

We calculated location quotients from occupational data recorded in the Census (2011 and 2021). We wanted to determine the extent of specialization in digital technology overall and detailed sub-fields and professions under that broad category. We also examined the locations of technology-sector publicly listed companies.

Cities and regional clusters

Our research found Australia's digital technology industries are highly geographically concentrated in both cities and regions. We found 55% of digital technology workers are in a cluster, and these clusters contributed to 62% of national growth.

We found firms in a cluster generate 63% more intellectual property (IP) patent applications than firms outside a cluster (but still in a capital city). Clusters, and geography, matters when it comes Australia's tech sector.

Our analysis identified four super-clusters, 60 greater capital city clusters and 36 regional niche clusters. The four super clusters are the most significant agglomerations of Australia's digital technology industries. We refer to them as the Sydney Arc, the Melbourne Diamond, the Brisbane Corridor, and the Canberra Triangle, due to their unique spatial patterns.

We also find multiple, albeit smaller, clusters in Australia's capital cities outside of the super-clusters. There are significant digital technology industry clusters in Perth, Adelaide, Darwin and Hobart.

Australia's interesting patterns

But it's not just a capital city story. We found some interesting patterns in regional Australia too. In regional Australia the clusters tend to be smaller but focused on one (or a few) niche digital technology specializations.

For example, we discovered Australia's graphic designers (including web designers and illustrators) are spatially concentrated in coastal destinations renowned for their scenic beauty and tourism value. The largest concentrations were in Burleigh Heads (Gold Coast), Byron Bay (New South Wales) and Torquay (Victoria). These locations were employing graphic and web designers at 3.2, 2.9 and 2.7 times the rate of the national average respectively.

We looked at changes over time using the 2011 and 2021 Census data. We found if a location was a cluster in 2011, it was overwhelmingly a cluster in 2021. This means clusters were stable over time. We also saw some new entrants, which became much more specialized, and overall larger, in digital technology. Redfern in Sydney, for example, was a standout in terms of growth and development of the digital technology industry sector over the 10 years.

An interesting observation was that some places where governments have historically invested in science and technology precincts appear to have succeeded, albeit via a long-term play. An example is The Brisbane Technology Park in the suburb of Eight Mile Plains. It was opened in 2008 by the Queensland Government as part of the "Smart State" strategy.

More than 10 years later today it comes up bright red on our maps as a nationally significant digital technology hotspot. It has a large tech-sector company headquarters and a large number of workers and multiple digital technology workforce specializations.

Important data for policy makers

Through our work we know most local, state and territory, and federal government agencies are actively working to catalyze growth of the digital technology industry within their jurisdiction. One example is Lake Macquarie City's Smart City, Smart Council Digital Economy Strategy, which aims to grow and develop this important industry.

This new data on digital technology industry clusters can help policy makers working on economic development strategies. The data show where organic growth of specialized digital technology industry is already occurring, and where it can easily grow. If policy makers "go with the flow" and accelerate the development of these industries and specializations they'll be much more likely to succeed in creating jobs, salaries and economic growth within their jurisdiction. These data provide fresh insights into what is most likely to succeed where.

Once the what and where are better understood, governments can design and implement targeted policies. Examples include investments in transport connectivity, research and development, urban uplift, education and training, and investment attraction. The key is knowing

and catering for the unique mix of digital technology specializations within your jurisdiction.

People matter in clusters

One final consideration relates the importance of quality of life and social equity within clusters. In the San Francisco Bay area of Silicon Valley it was found that [every four workers in a low paid job were competing for one affordable rental unit on average](#).

Governments and [tech corporations are taking action to ease the situation](#), but sky-rocketing housing costs have harmed community cohesion and people's quality of life. It's certainly something to manage as Australia's tech industry clusters grow and develop.

  More information: The geography of Australia's digital technology industries: [author.csiro.au/en/research/te … s-Digital-Industries](#)

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