

Is the future of communications on the West Coast?

Professor William Webb, June 2013

Introduction

Innovation in the world of mobile communications has been dominated in the last few years by companies based on the West Coast of the US. Apple has led the way in smart phones and support of applications. Google has dominated mobile operating systems and is currently a source for leading-edge concepts such as Google Glass. Qualcomm is dominant in the mobile chipset space with innovations in chip architecture as well as having much of the IPR relevant to 3G and 4G. Microsoft has been less noticeable but is trying to build a present in operating systems for mobile phones and tablets. Cisco provides the routers that power much of the mobile operators' core networks.

There are competitors. Samsung is also innovating in mobile phones, but not as strongly as Apple or Google, with features that are add-ons such as eye-tracking. Ericsson and Huawei are the dominant suppliers of base stations to the mobile operators, but these are rarely innovative, being implementations of standards such as LTE.

In this paper we consider whether this is broadly a coincidence of location or whether there are fundamental drivers that will result in an increasing concentration of innovation in this part of the world.

The West Coast as a source and acquisition of innovation

Silicon Valley is widely seen as the pre-eminent tech cluster in the world. It has a scale unsurpassed by any other similar cluster and a long history of over 60 years of consistent re-invention. Attempts to replicate the cluster elsewhere have generally been unsuccessful, with the closest perhaps being Cambridge, UK ("silicon fen"). Many of the ideas that shape our world today from Google to Amazon to Apple have come out of Silicon Valley.

Where ideas have not been home-grown the West Coast companies have become excellent at acquiring them from elsewhere. For example, Qualcomm did not invent the OFDM technology at the heart of 4G but in 2006 acquired Flarion which had much of the relevant IPR. While headquartered in the US, much of Flarion's team was UK-based. More recently, West Coast companies have been moving into small-cell technology with examples such as Cisco's acquisition of Ubiquisys, another UK company. This willingness to acquire, from outside the US if necessary, is a key part of the reason why West Coast companies have stayed dominant. By comparison, we have not yet seen much acquisition from large Far-Eastern companies and there are few large tech-companies in Western Europe left in a position to make acquisitions.

Advantages of being in the US

The US brings a number of general advantages as well as more specific ones relating to telecoms. Generally, the US is well known as being entrepreneurial. There are many reasons for this including:

- A culture that celebrates start-ups and new ideas.
- The US Government is pro-SMEs with rules such as requiring a certain percentage of Government procurement to be from SMEs.
- The US provides a home market that is big enough to generate economies of scale, making it simpler for entrepreneurs who do not need to export.
- Good availability of capital from VCs, angels, banks and other financial bodies.

The results of this are easily found. For example in a 2012 survey of the “top 100 innovative companies” 47% of these were from the US, up from 40% in 2011. In another survey looking at top ten patent listings across 12 classes of industry, 118 out of 120 were from US. It is clear that the advantages to innovation from being in the US are huge and not readily replicable elsewhere.

Turning more specifically now to telecommunications, the US has particular advantages here as well:

- The US regulator, the FCC, is pro-innovation and often leads in the introduction of new ideas such as ultra wide-band, power-line communications, TV white space and novel auction approaches. There are clear links between policies adopted by regulators and the location of companies that exploit them – for example almost all innovative companies looking to exploit TV white space are in the US and UK, the two countries pioneering this regulation.
- The predominant telecoms industry standards body, the IEEE, is US based which helps local companies as they can more readily attend meetings and influence standards. The European equivalent, ETSI, has done little in recent years, although a global initiative, the 3GPP group, has better traction in the mobile space.
- The US has an excellent pool of talented telecoms engineering and the top universities needed to generate a steady stream of new ones.

These could be replicated elsewhere to some degree. For example, the UK regulator Ofcom is also pro-innovation, the UK also has excellent universities and access to the IEEE is somewhat easier for UK engineers with English as a common language.

US dominance is also assisted by a general move in telecoms from hardware innovation towards software innovation. Increasingly smart-phones use the same basic platform and the differentiation is in the software that runs on these platforms. Networks are moving towards a “software defined” world where general-purpose computing hardware is used to run custom-designed software. Broadly, the hardware is becoming commoditised with limited innovation and value. This is at a time where manufacturing is mostly performed in low-cost countries in the Far East making it harder for developed countries to play a key role. However, software is not subject to the same economics of low-cost manufacturing and can be readily developed by start-ups due to the low barriers to entry. Hence, the move in telecoms to hardware commoditisation but software innovation suits the West Coast well both in terms of global trends and start-up mentality.

A self-reinforcing trend

Once a country gains an advantage as an innovator it tends to become self-reinforcing. There can be a “cluster effect” as engineers, companies, sources of finance, patent lawyers and others cluster together in a particular place which makes hiring easier, encourages an interchange of ideas, allows partnerships to be formed quickly, makes acquisitions and mergers simpler, etc. This has been seen with many industries and seems particularly strong in high-tech sectors. It is self-reinforcing as new companies perceive that the best place to be is within the cluster and so locate themselves there, further growing the cluster. This helps to explain why the allure of Silicon Valley has remained so strong over more than half a decade and why there has been so little competition from elsewhere.

Possibilities of reversing the trend

As explained above, there are strong advantages to US West Coast companies that are not readily replicated elsewhere. Nevertheless, nothing lasts forever. Here we examine what might either cause the West Coast to stumble, or other centres to emerge.

As groupings become ever-larger problems emerge. The cost of living grows and people have to live ever more densely packed with resulting congestion and other factors detrimental to quality of life. This can encourage the formation of clusters elsewhere. To some degree this is why we see Silicon Valley “spreading out” along much of the West Coast of the US from Seattle down to San Diego. Litigation also appears to be problematic for the US, with ever more disputes over IPR in a culture that is inherently litigious. This may slow innovation and increase costs, or alternatively it might spur further innovation to find ways around the issues. Dominance by US companies such as Google is viewed with some suspicion world-wide and may also place a brake on the size and market power such companies can achieve.

Challenges may arise from other countries. Within Asia-Pac there is increasing strength in telecoms with companies such as Samsung, LG and Huawei gaining market share and with huge numbers of engineers graduating. To date, these countries have been fast-followers rather than innovators but in coming year they will likely attempt to become market leaders. Whether they have the culture and corporate structure for this remains to be seen. There are also established clusters such as Cambridge in the UK that could become more dominant. Already companies such as ARM are leading the world in some key competencies. However, Cambridge has been innovating for many decades with few large companies resulting and it seems more likely that it will develop acquisition targets for West Coast companies such as the recent Autonomy purchase from HP.

Living in a world of West Coast dominance

Companies and countries have a choice as to whether they will accept this West Coast dominance and adapt accordingly, or whether they will attempt to change things by growing centres of excellence elsewhere. In practice, as set out above, making a change is very difficult. Many have attempted it and many have failed. The benefits enjoyed by West Coast companies are so strong and self-sustaining that replicating them is near-impossible. Only if the West Coast falters might others be able to step in and start attracting key companies away. Hence, the sensible approach of companies in other countries is to link as closely as possible into the eco-system of the West Coast. This can be done in many ways such as local offices, seeking funding from West Coast sources and

ultimately seeking partnership with, or acquisition from, West Coast entities. It is a case of “if you can’t beat them then join them”.