Impact of consolidation in the Internet economy on the evolution of the Internet

Event Report

29 June 2018 | Bangalore

Event sponsored by **Internet Society**

Authored by **Akriti Bopanna** and **Gurshabad Grover**
Edited by **Swaraj Barooah**, **Elonnai Hickok** and **Vishnu Ramachandran**
Inputs by **Swagam Dasgupta**

The Centre for Internet and Society, India

TABLE OF CONTENTS

1. Introduction

This report is a summary of the proceedings of the roundtables organized by the Centre for Internet and Society in partnership with the Internet Society on the impact of consolidation in the Internet economy. It was conducted under the Chatham House Rule, at The Energy and Resource Institute, Bangalore on the 29 June 2018 from 11AM to 4PM. This report was authored on 29 June 2018, and subsequently edited for readability on 25 June 2019. This report contributed to the Internet Society's 2019 Global Internet Report on Consolidation in the Internet Economy.

The roundtables aimed to analyze how growing forces of consolidation, including concentration, vertical and horizontal integration, and barriers to market entry and competition would influence the Internet in the next 3 to 5 years.

To provide for sufficient investigation, the discussions were divided across two sessions. The focus of the first group was the impact of consolidation on applicable regulatory and policy norms including regulation of internet services, the potential to secure or undermine people's ability to choose services, and the overall impact on the political economy. The second discussion delved into the effect of consolidation on the technical evolution of the internet (in terms of standards, tools and software practices) and consumer choices (in terms of standards of privacy, security, other human rights).

The sessions had participants from the private sector (2), research (4), government (1), technical community (3) and civil society organizations (6). Five women and eleven men constituted the participant list.

2. The impact of consolidation on the political economy and modes of regulation

2.1 What is consolidation?

The participants were keen to define the meaning and contours of the term 'consolidation' prior to commencing the discussion. Five possible perspectives were laid out:

1. Consolidation of all the entities which offer goods and services such as in social media where entities like Instagram, Whatsapp and Facebook are all owned by a single parent company or alternatively, merging of such entities. Concentration in ownership within a specific market was seen as a relevant concern as well.
2. Companies which offer similar services are consolidating because they have realized that there is no market for differentiation.
3. Many companies now provide similar infrastructure, such as 3G, broadband and Internet of Things devices.
4. Capital, via owners and investors could be another mode of determining consolidation. Capital itself does not have the agency, but through artificial pressure, regulators can create competitive oligopolies. This is best seen in cases where there are allied property rights necessary to participate, such as spectrum or even licensing.
5. Consolidation could also be thought of in geopolitical terms. For example, nearly all Tier One ISPs are based in the United States (US) or European Union (EU). Similarly, none of the DNS root name servers are located in any developing country. Therefore, consolidation is also happening in terms of which jurisdiction's regulations control and govern these companies. Hardware was another facet brought up in this context, citing the example of China-US trade issues which have led to China relying on its domestic semiconductor production capacity, which is currently not well developed.

A discussant noted that when talking about consolidation, it is useful to note that a competitive market may not always have the same meaning, as currently the competition law framework (in India) does not incorporate the parameter of diversity. For example, in broadcast television, a variety of individual firms decide to give the same offering to the market, but it is still considered a highly competitive market even though the content is largely the same.

It was seen relevant to dissect the pressures leading to consolidation and not only the direct effects of it. Three driving factors for consolidation were identified in this segment:

a) Capital: as investors find their investment in many different places and want to consolidate them into fewer sources.
b) Nature of the market: dynamics of the market decide the form of competition that exists because, sometimes, there is no place for different players resulting necessarily in a duopoly or oligopoly.
c) Regulators: conditions promulgated by the regulators drive the process.

2.2 Is consolidation specific to a region or a global trend?

Many developing countries like India are introducing initiatives, such as Digital India through which there is a push to bridge the digital divide, often in short deadlines such as two to five years. Indirectly through such endeavors, consolidation is encouraged because the only companies who can invest vast resources in a short span of time are large conglomerates. For example in India, Google was approached and has started to provide free and high speed Wi-Fi access to railway commuters at over 400 stations in India.[1] Telecom penetration increased in India due to Reliance (one of the biggest conglomerates in India) starting their telecom company, Reliance Jio. It led to data prices falling and many more people being able to afford Internet services. The push by Facebook in India to introduce Internet connectivity to rural areas through its Free Basics initiative was one such controversial attempt. A massive civil society campaign ensured this did not eventually take place, but as a discussant commented, it was a tempting proposition to have more people online even though they would only have been able to access the websites chosen by Facebook. If countries want quick changes in the digital landscape, then large companies would almost always be the sole ones that can make it happen.

Another discussant pointed out that the Indian government helps cement certain big players, giving the example of Twitterseva, a Twitter enabled dashboard service given to the government, that encourages people to tweet to the government to quickly resolve complaints.[2] India is the only jurisdiction where Twitter has launched this service, effectively allowing corporations to infantilize native Indian e-government services. This not only makes it harder for competitors to break the market but also raises another problem at a consumer level. Users of Twitter are predominantly English speaking, but in India, a country that is especially heterogenous in its languages, it disadvantages non-English speaking citizens from interacting with the government.

---

[1] Shruti Dhapola, "Explained: What is Google's Wi-Fi at 100 railway station project and how will it work", The Indian Express, 17 December 2015,
<**https://indianexpress.com/article/technology/tech-news-technology/explained-what-is-googles-wifi-at-railway-station-project-and-how-will-it-work**>
[2] Ramarko Sengupta and S Prabhakaran, "How Twitter is helping India reboot public services, publicly", FactorDaily, 22 September 2016,
<**https://factordaily.com/twitter-helping-india-reboot-public-services-publicly/**>

The government in India also actively promotes social media companies like Facebook and Twitter in its advertisements, giving them free publicity.[3] In France, on the other hand, the government has banned television and radio personalities from saying "Twitter" or "Facebook" on air unless it is a new story about either company. This is done to prevent distortion of competition.[4]

It was observed that India is known for its good digital policies that suffer from lack of enforcement such as the National Open Standards Policy. The Central Government does not consistently implement the open standards policy, in contrast to other jurisdictions, such as in the EU, where similar policies are followed to a greater extent. The EU has also been more active in pushing against dominance by some companies in the Internet economy through different methods. For example, they are trying to combat, albeit unsuccessfully, Google's dominance in the search engines market by promoting their own search engines and technology. Similarly, in China, the government limits Google's dominance through censorship and protectionism.

Finally, financial services came up as a sector which may be consolidating. Many new entrants are challenging the dominance of banks out of which some are telecom companies who already have a customer base and are expanding to the finance sector by opening payment banks. The National Payment Corporation of India (NPCI), an organization owned by a consortium of the major banks, is the biggest retail financial network provider in the country. It has been supported by the government to create financial infrastructure in India. Now, anyone who has to provide a financial service has to link to NPCI since they operate multiple payment systems such as Unified Payments Interface (UPI), Immediate Payment Service (IMPS), Aadhar enabled payment systems (AePS) and RuPay among others. [5] This is creating a different kind of consolidation with NPCI being both the provider of payment infrastructure as well as an operator of consumer products, the Bharat Interface for Money (BHIM).[6]

2.3 How do we observe the effect of consolidation on competition and consumers?

This part of the session dealt with components of competition with respect to existing law, thoughts on how competition should be perceived, challenges when it comes into play in the Internet economy and policy changes that need to be implemented to better suit the digital domain.

---

[3] Akriti Bopanna, "Government gives free publicity worth 40k to Twitter and Facebook", Centre for Internet and Society, 10 April 2018,
<**https://cis-india.org/internet-governance/blog/government-giving-free-publicity-worth-40-k-to-twitter-and-facebook**>
[4] Christina Warren, "Why You Can't Say 'Twitter' Or 'Facebook' On French TV", Mashable, 3 June 2011,
<**https://mashable.com/2011/06/03/twitter-facebook-mentions-banned-france/#MFGUcLjPimqK**>
[5] "NPCI has done a good job, but more competition good", The Financial Express, 24 Jan 2019,
<**https://www.financialexpress.com/opinion/npci-has-done-a-good-job-but-more-competition-good/1453093/**>
[6] Anuj Srivas, "How the RBI Forced National Payments Body to Hire Government Favourite as CEO", 14 Feb 2018,
<**https://thewire.in/business/rbi-npci-digital-india**>

The two-pronged approach of the Competition Commission of India[7] (CCI) to discern the factors affecting competition were observed to be: (i) the effect of consolidation on the competitors, and (ii) the effect on consumers of these goods and services. In the context of the Internet economy, it was said that the main concern should be the effect on competition as opposed to consumers. Historically, there was a proclivity to view a company negatively if it appeared monopolistic. Gradually, there has been a shift accepting monopolies and duopolies as long as they do not misuse their positions. Dominance itself is not perceived as a cause of concern but rather abuse of dominance, defined as an adverse effect on consumers, is. It was observed during the discussion that, recently, this trend could be reversing as fundamentals of competition law are questioned, deliberating if abuse of dominance is necessary or if mere consolidation is sufficient.

A discussant gave the example of a case was filed by Meru, a cab company in India with the CCI against Ola and Uber, which are the biggest app-based cab providers in the country. Meru argued that because Ola and Uber are funded by the same investors, the authorities should investigate the relationship between them for possible signs of collusion. The regulatory authority found no such action necessary stating that there is no discernible impact on competition at the moment, and hence, CCI will not intervene in capital and ownership issues. However, CCI added that if in the future there is a merger between Ola and Uber, then the questions of capital and ownership can become relevant.

The Competition Act in India, at present, does not take into account network externalities and capital dumping but only focuses on abuse of dominance, which is worded vaguely enough that many situations could fall under its ambit. A discussant noted that the main issue was not in the definition of abuse of dominance but in the definition of relevant market. This is particularly different in the Internet economy due to the difficulty of defining a substitutable good. Take a scenario where you buy a kettle from Amazon; you can go to your nearest retail shop and do the same as well. Consequently, if the test is one of substitutability, there is no separate online market to speak of. Thus, there cannot be any blanket rule and each case will have to be assessed on its own merits. The danger is, if our definitions of market continue to grow narrower, the chance of finding a dominant entity will become higher.

It was said that the nature of certain markets can only support one or two dominant players due to economies of scale. Due to such business models, the natural trend in markets is skewed to one or two dominant players preventing small competitors from competing effectively. This is especially present in markets where the first mover advantage is prevalent.

---

[7] The Competition Commission of India (CCI) is the apex body in the country with the mandate of preventing activities that have an appreciable adverse effect on competition in India.

The concept of abuse of dominance originated at a time when network effects were negligible, whereas now, network effects are part of business models as well as barriers to entry for competitors. Some discussants were vocal in advocating that we should not penalize companies merely for being big, successful or doing well in their field. The kind of consolidation we see is creating new challenges, which may require new regulators for the Internet Economy as well as new law such as the combination of data protection and competition law, to uphold fair competition. Regulating the nature and types of data that can be collected can ensure it is not used by a company to give themselves an unfair advantage. A discussant noted that India could learn from other jurisdictions that have a competition and regulatory impact assessment done while making policy decisions. As competition regulation stands today in India, there is nothing to say that Facebook is abusing its dominant position in just the social network domain, not considering its advertising or any other aspect. This is so because Facebook has no other competitor; no network comes as close to being a social network for the people. The Competition Act does not have any provision that allows one to regulate Facebook to create competition. However, having ex ante competition law and regulation could inhibit growth and development of new technologies.

Further, a participant pointed out that it was useful to think of consolidation in layers, and all the companies thus far spoken of were primary related to content. We have Internet Service Providers and Infrastructure Providers at a different level so either consolidation could conflate the two or some might find it more meaningful to discuss them in isolation. The discussion then veered towards how some markets are difficult to enter because of the language or local model nuances. Consumers often prefer dominant players in the market because of the quality of service. The government cannot change this fact unless they boost local competitors through artificial pressure.

Increasingly consolidation is going to affect governance and regulation, especially in a country like India which is highly susceptible to influence and prone to corruption. Companies which are bigger will have more access to the government and resources to lobby them, and this coupled with their access to huge swathes of consumer data could potentially alter regulation to favor their business.

Lastly, it was foreseen that our notion of regulators and regulation could extend beyond national levels. The General Data Protection Regulation, for instance, is applicable to all data originating in the European Union but is seen as a benchmark for data protection law now and as regulators cooperate with each other extraterritorially, national boundaries might become less relevant in this process.

3. The impact of consolidation in the Internet economy on the technical evolution of the Internet

The roundtable started with a discussion of the technical landscape and properties of the Internet. As a starting point, the panel considered *Internet Invariants: What Really Matters*, an Internet Society document which identifies "unchanging properties of [the Internet and its] underlying networks, technologies and standards, as well as emergent properties that impact users and uses of the Internet."[8] Some of these include global reach (i.e. any endpoint should be able to connect to any other endpoint on the Internet) and that the Internet is general-purpose, supports permissionless innovation, and is based on the principles of interoperability and modularity.

Historically, the Internet has been driven by mutually-agreed-upon standards and protocols that uphold these "invariants"; thus, an important research question is understanding the extent of influence of consolidation in the Internet economy on standard-setting bodies.

3.1 Tech giants and open standards

3.1.1 How do major technology companies influence the deployment and popularity of standards?

To explain a possible lens through which the impact of consolidation on the future of the Internet should be viewed, a discussant quoted science fiction writer William Gibson: "The future is already here — it's just not very evenly distributed." In this particular context, the discussant examined the adoption and popularity of a certain technology: it either "rides on a vacuum" (wherein it is the first to solve a problem, like Bitcoin) or "relies on muscle" (of corporations like Google in the case of HTTP 2.0) to ensure widespread adoption. When both these factors are lacking, the technology fails to gain traction, as exemplified by SMTP 2.0.

Another discussant chose IPv6 as another case wherein a technology relied on corporate influence. India, in the matter of two years, has jumped to a top position in per capita IPv6 adoption because of the new telecom provider, Reliance Jio.

---

[8] Internet Society, "Internet Invariants: What Really Matters", Internet Society, n.d., <**https://www.internetsociety.org/internet-invariants-what-really-matters/**>

It was pointed out that this particular power enjoyed by big corporations can be used to defeat better standards or prevent others from emerging in the same market. As an example, a discussant narrated the story of OpenSocial, which was initially promoted by FriendFeed and Google.[9] The vision of OpenSocial was to develop a set of open standards for social networks, which could have been used to facilitate interoperability in two distinct ways: (i) communication between different platforms that provide similar services like email (i.e. Orkut and Facebook users could communicate with each other); (ii) service portability (i.e. users can quickly switch services because of the commonalities). Facebook, the dominant social network at the time, refused to participate in or adopt the vision of OpenSocial. Eventually, the OpenSocial effort was converted into a W3C working group[10], which was subsequently closed down in February 2018[11] with minimal adoption. The discussant similarly attributed the failure of OpenID (despite it perceived drawbacks) to Facebook's desire to develop its own delegated authorisation framework.[12]

3.1.2 When and how do tech giants stray from standards?

A discussant pointed out that interoperability might be a far-fetched dream for social networks which differ technologically and in their product design: *e.g.* Twitter replies are different from Facebook replies, images are handled differently across Instagram, Facebook, Twitter, etc.. Another discussant similarly pointed out that open standards as proposed by OpenSocial would govern the technology and the relationship between the service and the user. When faced with a choice between rapid product evolution and standard compliance, corporations may find themselves in a better position if they ignore the standard entirely. The discussant supported their argument with two examples:

- When making the transition from Google Talk to Hangouts, Google decided to drop their use of Jabber because they felt that their technological evolution was faster than what was offered through the open standard.
- In the early days of HTTP, W3C (which maintained the standard) could not keep up with the proprietary innovations by Netscape and Microsoft. This led to Microsoft straying away from the standard. Later, a splinter group (Web Hypertext Application

---

[9] Jacqui Cheng, "Google goes after Facebook with new OpenSocial social networking API", Ars Technica, 11 February 2007, <**https://arstechnica.com/uncategorized/2007/11/google-goes-after-facebook-with-new-opensocial-social-networking-api/**>

[10] Ian Jacobs, "OpenSocial Foundation Moves Standards Work to W3C Social Web Activity", World Wide Web Consortium, 16 December 2014, <**https://www.w3.org/blog/2014/12/opensocial-foundation-moves-standards-work-to-w3c-social-web-activity/**>

[11] Social WG, "Socialwg", World Wide Web Consortium, n.d., <**https://www.w3.org/wiki/Socialwg**>

[12] *While Facebook added support for OpenID, it now pushes its own authorisation framework. See* Adweek Staff, "Facebook Announces Users Will Soon Be Able to Login to Facebook Via OpenID", 27 Adweek, April 2009, <**https://www.adweek.com/digital/facebook-announces-users-will-soon-be-able-to-login-to-facebook-with-an-openid**>, and Facebook for Developers, "Facebook Login", Facebook, n.d., <**https://developers.facebook.com/docs/facebook-login**>

Technology Working Group, 'WHATWG') was formed in 2004 by Apple, Mozilla, and Opera "in response to the W3C's sluggish approach to standards development."[13]

XMPP was provided as an example of an open standard which is technically sound, but companies found incentives to develop a closed system instead. Examples of straying from XMPP included Google (which dropped XMPP support when making the transition from Google Talk to Hangouts); Whatsapp (which still runs on the FunXMPP protocol, but is closed to other clients); and Facebook Messenger (which allowed restricted XMPP access in contradiction to the intended XMPP behaviour).

Additionally, a discussant pointed out how tech giants have felt at liberty to diverge from standards, sometimes without making that divergence clear and without sending the changes back to the standards body. A couple of examples were provided by the dicussants of this trend:
- Google in its Google Calendar product claims to comply with the CalDAV standard, but developers quickly realised that many features were not standard-compliant.[14]
- For HTTP 2.0, even though the IETF community decided at large that encryption should be left optional in the protocol, Google Chrome and Mozilla Firefox do not support unencrypted HTTP 2.0 traffic.[15]

At least three discussants felt that these were some of the ways in which significant influence over the market has led the companies to evade the "real openness" intended by open standards. They also agreed that if big corporations do not find that contributing to standard-setting bodies feeds back well into their work, they will ignore or evade standards.

3.1.3 Can companies exert disproportionate control over standards?

A discussant pointed to Android as a case study for when technology companies have dominant influence over open source code and open standards. Android, even though it is open source and popular, is controlled by a single company: Google. In what started as a completely open source project, current development is mostly done by Google, and new versions are only released when they are deemed ready for public use. Several key features of the Android ecosystem are closed-source.[16]

---

[13] Thomas Claburn, "Go away, kid, you bother me: Apple, Google, Microsoft, Mozilla kick W3C nerds to the curb", The Register, 13 April 2018,
<**https://www.theregister.co.uk/2018/04/13/apple_google_microsoft_and_mozilla_kick_w3c_to_the_curb/**>
[14] *See* Google Developers, "CalDAV API Developer's Guide", Google Developers, n.d.,
<**https://developers.google.com/calendar/caldav/v2/guide**>
[15] HTTP/2 Working Group, "HTTP/2 Frequently Asked Questions", HTTP/2 Working Group, n.d.,
<**https://http2.github.io/faq/#does-http2-require-encryption**>
[16] Ron Amadeo, "Google's iron grip on Android: Controlling open source by any means necessary", Ars Technica, 21 July 2018,
<**https://arstechnica.com/gadgets/2013/10/googles-iron-grip-on-android-controlling-open-source-by-any-means-necessary/**>

Additionally, multiple conditions are imposed on device manufacturers which choose to offer Android as the operating system on their devices. For example, under Google's conditions, device manufacturers are not allowed to market Android devices without Google certification. If such a device is released without certification, the company loses the right to manufacture even a certification-compliant product in the future. This policy prevents other companies like Amazon to have their own alternative Android with a different application store. A few panelists deemed current competition law to be unequipped to deal with such issues.

Another discussant pointed out a similar pattern in the smart cities space, wherein Google exerts great influence over the General Transit Feed Specification (GTFS) since it initially developed the standard. Now that it has been adopted as the *de facto* industry standard for public transportation information, competitors like Apple face immense difficulty in getting their proposals to the specification approved.

It was noted by several discussants that the technology corporations have not always been successful in promoting standards developed by them. For example, a discussant pointed to when Google tried to advance the source code of sqLite as the standard specification itself. Mozilla Foundation fought back in the process at the W3C, highlighting that sqLite bugs cannot be a part of the specification. Ultimately, Mozilla Foundation's position was backed up by the W3C. Similarly, QUIC and HTTP 2.0 significantly differ from Google's initial proposals as a result of continual discussions with the IETF community.

3.1.4 How does scale impact insight into standards?

A discussant offered a different lens to view the influence of tech giants on standards bodies: deep insight into how standards work in the real world and at scale is only possible for these corporations and organisations.

For example, one may perceive Google unfairly pushing HTTP 2.0 and QUIC on to the standards body and the consumers. However, it is important to note that protocols operating at the global scale face a unique challenge: given the diversity of devices that connect to the Internet, it is difficult to implement a standard without extensive testing. By virtue of market share, only Google has the ability to run tests and fix bugs in protocols such as HTTP 2.0 and QUIC. Another example was how Google still uses SHA-1 even after everyone moved to SHA-2. Their reason for doing so was the sheer number of devices that connect to Google that would stop functioning if Google made the switch to SHA-2.

Therefore, deep insight into scalability and adoption-readiness of new standards and technology is only achievable by big players in certain cases.

3.2 Impact of consolidation on privacy and security

3.2.1 Geopolitical considerations

A discussant pointed to a different type of consolidation, a consolidation of power in the hands of individuals from Western liberal democracies wherein privacy is considered a core societal value. These values play a significant role in deciding the values reflected in Internet standards. As Timothy Garton Ash noted in the book *Free Speech: Ten Principles for a Connected World*, the Internet Engineering Task Force has historically consisted of engineers who "did not just have tools, [but] also had views — and generally their views had a strong libertarian strain."

For example, since Snowden's revelations about the NSA's surveillance capabilities impacted the West more than India, there was a greater push for security and privacy in the Internet standard-setting bodies like the IETF. In the informational RFC7258, the IETF took what a discussant considered a "political stance" against state surveillance by unequivocally stating that pervasive monitoring is an attack. This informed the further development of protocols and standards meant to circumvent known methods of traffic analysis and surveillance. This has facilitated secure Internet communication for millions of Indians who were otherwise unaware of the developments in the US, and still reaped the benefits of avoiding state surveillance in their country.

3.2.2 Privacy and security in online product and services

Similarly, these values have informed the engineering practices in the development of online services and products. Since the tech giants have an influence over consumer choice, a discussant pointed out that Whatsapp ensures end-to-end secure communication for the millions of Indians who otherwise would not care about encryption. Considering these factors, maybe a net increase in civil rights and privacy has resulted in developing nations like India.

Overall, because of the implications of the business models of most tech giants (popularly referred to as *surveillance capitalism*), civil rights and privacy may be harmed in the long term as these companies consolidate power and influence. But the short-term gain in securing online civil rights and privacy rights has also been considerable because of their influence.

Discussants agreed that the answer to whether consolidation in the Internet economy has increased or decreased standards of security and privacy on the Internet requires case-by-case analysis rather than a normative one.

3.2.3 When openness collides with privacy and security concerns

A discussant pointed out how openness and privacy may sometimes be competing interests, and in such cases, the community may find itself divided over what constitutes

better results because of different value systems. The discussant provided several examples:

- Apple's primary reason for strict control over the App Store is security; this in fact may be the reason why iPhones are considered more secure than Android phones, because the barrier to entry to the Google Play Store is much lower.
- Facebook, citing the Cambridge Analytica fiasco, closed down some of the permissions given to apps and started closely monitoring app developer activity. Hence, it has ended up more of a "walled garden".
- Signal, the messenger of choice for many privacy-concerned individuals, does not federate server-side or client-side, i.e. users cannot communicate with the Signal server from non-Signal clients, and the Signal client cannot communicate with other servers.

In a similar vein, historically, the choice of multiple encryption algorithms has been viewed as better in protocols and standards. The freedom of choice increases the possibility of bad choices, and subsequently, there has been a rise of paternalism in decisions made by online services and standards. The discussant said this might be perceived as sacrificing modularity and openness, but may have positive outcomes in terms of privacy and security.

3.3 The changing topology of the Internet

The Internet was envisioned as a decentralised network which facilitates communication between two endpoints. However, a discussant pointed out that the landscape of network traffic is wholly different now: video streaming makes up a significant chunk of the traffic now, with Cisco estimating the 80% of the Internet Protocol traffic will be video by 2021.[17] Since video hosting is dominated by a few companies such as Youtube, Netflix, and Facebook, there has been an emergence of "super-nodes" in the Internet.

This has been followed by a concerted effort to be efficient at meeting consumers' needs, which further contributes to a change in the network topology. For example, several companies employ edge caches at various Internet Service Providers (ISPs) to optimise user performance. Another discussant pointed out that to provide a performance edge to consumers, several small ISPs ask operators of content delivery networks (such as Akamai and Cloudflare) and increasingly video streaming services (such as Youtube and Netflix) to install a server in their network. In return, the companies get free transit and peering to other networks with which the ISP has arrangements. Akamai enjoyed such a dominant position in the market that it started profiting from arrangements with ISPs under a program called, "Akamai Accelerated Network Partner."[18] The discussant stated that

---

[17] Cisco, "VNI Global Fixed and Mobile Internet Traffic Forecasts", Cisco, n.d., <**https://www.cisco.com/c/en/us/solutions/service-provider/visual-networking-index-vni/index.html**>
[18] Akamai, "Akamai Accelerated Network Partner (AANP) Program", Akamai, n.d., <**https://www.akamai.com/us/en/multimedia/documents/akamai/akamai-accelerated-network-partner-aanp-faq.pdf**>

dominant positions in the market have led to "double-dipping" practices, wherein where the company derives profits from its customers and then through arrangement with ISPs.

Additionally, this creates a need for closer inspection of transit and peering arrangements in India and elsewhere. Firstly, the discussant believed that transit ISPs would cease to be profitable in a few years if these trends continue. Secondly, the interconnection of autonomous networks has been left out of regulation in most countries including India. This is in contrast to regulations usually imposed on telecom providers wherein interconnection is mandated by law. Another aspect left out of regulation is the acquisition and operation of undersea cables.

3.4 The possibility of closed ecosystems

A discussant expressed a concern that excessive vertical consolidation may lead to closed ecosystems and splinternets. Google, for example, owns technology across the stack and across network entities: a typical communication may be someone opening Google Mail using the web browser Google Chrome on their Android phone. The address resolution of the domain may rely on Google's DNS server. Additionally, Google also owns undersea cables, and may be the user's internet service provider as well. This opens up the possibility of a closed ecosystem where traffic touches no network out of Google's control. Although the possibility exists, a discussant pointed out that no private company has shown such an inclination. Additionally, existing competition theory already addresses scenarios wherein a company uses its clout to enter or exert influence over other sectors. However, the panel acknowledged the temptation of countries like Russia and China to develop such a closed system.

4. Conclusion

The notion of consolidation was seen as wide enough to span facets such as concentration of ownership, in terms of one entity providing complementary or even competing goods and services, or different companies providing similar technical infrastructure, and even different companies having the same source of capital. Such factors can simultaneously influence, both, the possible regulation and technical evolution of the Internet.

Within policy changes, the structure of the existing regulatory authorities as well as the lacunae in the current competition law were thought to be areas that needed further development to better suit the Internet economy. These could range from competition law in India being tailored to focus more on the effect of consolidation on competition as opposed to the benefit for consumers, to the definition of relevant market itself. The latter was remarked upon a potential problem, one that needs more nuance considering the availability and substitutability of the online and offline market for the same product. Eventually, however, national laws could become less relevant as lessons are gleaned from other jurisdictions who are also facing similar challenges of regulating the actors of the Internet economy.

In terms of governmental regulation of technology and companies, a discussant expressed concern that several principles like interoperability and modularity, haven't found their way into our understanding of competition theory, especially in the technology sector. While economists in the US and Europe have done some work in the field, the influence of their work is limited to data protection laws, and is not sufficiently reflected in competition law. A discussant found that regulation of interconnection was a largely ignored battle in the government. Another discussant concurred, and pointed out that there is historical basis for such regulation: in the US, decisions about competition law in the railroad sector were made based on network analysis. At least two discussants agreed that the easiest lever for the government was to promote openness, interoperability and competition by mandating open standards, open APIs, and vendor neutrality. Another discussant pointed out that even though the Government of India has at least five distinct standards body, their participation in the conversation has been minimal and their roles unclear.

Throughout the discussion, various examples were highlighted wherein companies have used their dominant market position to promote their own standards and protocols. While in some cases, this has led to widespread adoption of newer technology and an increase in the privacy afforded to Internet users, in other cases, large companies often promoted in-house standards without regard to community feedback or other standards in the same space. It is difficult to conclusively state whether dominant technology companies, as a group, have advanced or regressed technological progress and privacy; a case-by-case analysis might be more insightful. More so, because certain conclusions might be value-based (as pointed out in the section 2.3.3) when privacy and openness may be

diametrically opposed goals in decisions. For standards, a discussant added that the best solution is for standards bodies to build a diverse participation from various stakeholders, which would prevent consolidation from having an unregulated influence on the technical future of the Internet.

To preserve competition and better technological standards in an economy that is consolidating, there is a need to build up an understanding of the philosophical and technical principles of the Internet in regulatory institutions, governmental standard-setting bodies, and the general public.