Theme

ICT and Internet Governance on the BRICS Agenda

Title

Digital Liberty, the Knowledge Commons and some Challenges for the Governance of Information and Communication Technologies and the Internet for Brazil, Russia, India, China and South Africa (BRICS)[1]

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ABSTRACT

This paper explores the challenges posed by the current dynamics in the political economy of ICTs and the Internet for Brazil, Russia, India, China and South Africa (BRICS). The paper comprises four sections. After an introduction which broadly defines the domains and identifies the focus of the paper, we turn our attention to an exploration of some of the contemporary dynamics in the political economy of ICTs and the Internet, including some aspects of ICTs, Internet infrastructures, global knowledge and culture, and the debate concerning the governance of the Internet. Section three provides a brief economic history of ICTs and the Internet in the BRICS with a particular emphasis on South Africa. The fourth and concluding section synthesises the paper and recommends a strategic orientation appropriate to the progressive objectives articulated by the BRICS in working together and seeking to realise a better world-order for all.

Keywords

Information and Communications Technologies, Internet, Political Economy, Brazil, Russia, India, China and South Africa (BRICS), and Governance.

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1. INTRODUCTION

That the world of today is qualitatively and quantitatively very different from that experienced a mere century ago appears incontrovertible. Interestingly, in 1837 Vladimir Odoevsky had already envisioned a very different scenario when he described the world in the year 4338. With a scenario horizon still 2,323 years ahead of us, Odoevsky foresaw a much better word where science, technology and innovation shrunk vast distances through connectivity: "Houses are connected by means of magnetic telegraphs that allow people who live far from each other to communicate". Besides the Internet, Odoevsky also presented a vision of communications that largely resembles the contemporary practice of 'blogging': "The thing is that many households here publish such journals that replace common correspondence. Such journals usually provide information about the hosts' good or bad health, family news, different thoughts and comments, small inventions, invitations to receptions" (ibid.). Thankfully, the prediction of the comet 3D/Biela colliding with our planet has been forestalled by it burning out. Some 178 years later, we share our contemporary world with some of the things foreseen by Odoevsky. These have been realised through digital technologies and connectivity's derived from scientific advances in the fields of information and communications technologies (ICTs).

The United Nations Development Programme (UNDP) defines ICTs as 'information-handling tools' that comprise mainly of a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. The early generation of ICTs included newspapers, radios, telephones and televisions. The subsequent generation of ICTs included computers, mobile telephony, satellites, wireless technologies, and the Internet. The next generation of ICTs has been speculated to advance along the trajectories of digital convergence and ubiquity. The International Standard Industrial Classification of All Economic Activities defines the ICT sector as enterprises concerned with the production of goods and services that "must primarily be intended to fulfil or enable the function of information processing and communication by electronic means, including transmission and display" (UN: 2008: 278). ICTs are also infrastructure technologies that "cut across all economic activities and have a wide range of applications, offering the potential for increased availability of information, new communication opportunities, reorganisation of productive processes and improved efficiency in many different economic activities" (UN: 2003).

The Internet is a worldwide system of interconnected networks and computers utilising the Transmission Control Protocol - Internet protocol (or TCP/IP). The origin of the term: Internet derives from 'internetworking' which means interconnecting computer networks with gateways. Whilst the Internet generally acts as a means of transporting content (information), this role has changed with the times. The intangibility of information means that it possesses characteristics that are both non-fungible and non-rival, meaning that it is not consumed exclusively by a single person. Thus, the Internet of today allows for the *multiplicitous* (sic) replication of information and its copying[3]. Originally, only four host computers were connected together into the initial

[3] The author is grateful to Andrew Rens for emphasising this point.

Advanced Research Projects Agency Network (ARPANET) at the end of 1969. In the current times, the Internet has become a critical prerequisite for many types of communication, information access, and participation in global cultural, social, political and economic processes. Because of its strategic role, the Internet could also be considered as a "component of the global digital divides that serve to amplify the differences between the privileged and underprivileged" (Graham: 2011).

The artefact that is the World Wide Web (WWW) was invented by Tim Berners-Lee as a mechanism to meet the demand for information sharing between physicists in universities and institutes around the world in 1989. According to the World Wide Web Consortium (W3C), "WWW is an information space in which the items of interest, referred to as resources, are identified by global identifiers called Uniform Resource Identifiers (URI)." The first website[4] was located at *Conseil Européen pour la Recherché Nucléaire* (CERN)[5] in 1991. CERN put the World Wide Web software into the public domain in 1993 and made the next release available with an open licence. According to Netcraft, there were 849,027,856 web-sites[6] and 5,228,046 web-facing computers[7] in April 2015 (2015). Whilst this large number represents massive log-scale growth, the monthly fluctuations are immense and a peak of one-billion[8] websites on the internet was apparently achieved in September 2014 (ILS: 2015).

Working together, ICTs have combined into a global infrastructure of interconnected information and communications. Whilst technically discrete, it is important to note that "(a)ll computing systems, and therefore all web applications, and also all forms of media can be considered as social because they store and transmit human knowledge that originates in social relations in society. They are objectifications of society and human social relations" (Trottier and Fuchs: 2015: 5). The United Nations had warned, now almost twelve years ago, that "… technological research, innovation and capabilities remain concentrated in a limited number of countries. There is growing concern that many developing countries are being left behind, not able to participate in shaping these technologies and deprived of the benefits of technology and ICTs. Such marginalisation has led to serious inequalities within and between nations and created what has been termed the 'digital divide'" (UN: 2003: 4).

Expanding knowledge frontiers within the fields of computer science, electronic engineering, telecommunications and geo-informatics, amongst others, have helped shape competence areas such as data and information management, software engineering, and ICTs. Associated with this phenomena has been the fairly explicit assumption that an increased diffusion of ICTs contributes to economic development, social connectivity and a redress of knowledge asymmetries. These potentialities, whilst generally realised in some parts of the world, are not

[4] http://info.cern.ch

[5] The European Council for Nuclear Research was in 1952 with the mandate of establishing a world-class fundamental physics research organisation in Europe.

[6] A unique hostname which can be resolved, using a name server, into an IP Address.

[7] Computers acting as web servers on the internet.

[8] This was 'tweeted' by @timberners_lee as "internetlivestats.com/watch/websites/ recently passed a billion websites by their count…." at 17h20 on the 16 September 2014.

universally shared nor equally developed. It therefore remains imperative to better appreciate the underlying dynamics of the political economy and the socio-economic forces that shape the digital paradigm.

In this vein, Evgeny Morozov warned against the folly of technological determinism (2013). This scepticism builds upon his earlier argument that the Internet does pose a double-edged sword dilemma (2011). Whilst there are revolutionary and progressive potentials embedded within ICTs and the Internet, countervailing threats to their realisation also pose a real and credible risk (ibid.). As evidenced by the courageous exposures by Edward Joseph Snowden[9] and the late Aaron Hillel Swartz[10], ICTs and the Internet are not free from the political economy dynamics within which they are located and the politics of empire that seeks to maintain and extend the historically determined global hegemony occupied by the core more mature capitalist economies of the world. As noted by Christian Fuchs, the "(p)roduction and use of digital media are embedded into multiple forms of exploitation. The information society is first and foremost a capitalist class society" (2014). Significant civil society initiatives such as the 'Association for Progressive Communications[11],' and 'IT for Change[12],' continue to advance the struggle for progressive ICT and Internet governance reforms.

This paper explores the challenges posed by the current dynamics in the political economy of ICTs and the Internet for Brazil, Russia, India, China and South Africa (BRICS). The paper highlights the need for a global regulatory and governance regime that supports national actions and capability-formation to better harness the potential of ICTs and the Internet. The paper comprises four sections. Next we turn our attention to an exploration of some of the contemporary dynamics with ICTs and the internet considered within a political economy perspective, including some specific aspects of ICTs, Internet infrastructures, global knowledge and culture, and the debate concerning the governance of the Internet. Section three provides a brief economic history of ICTs and the Internet in the BRICS, with a particular focus on South Africa. The fourth sections concludes the paper and makes recommendations for consideration about some strategic options for BRICS under in its goal of realising a better world-order for all.

[9] Edward Snowden is currently residing in Russia under threat of criminal prosecution by the government of the United States of America (USA) for disclosing the scale and extent of espionage and surveillance perpetrated by that country's National Security Agency.

[10] Aaron Swartz, an inductee onto the Internet Hall of Fame by the Internet Society, unfortunately committed suicide under threat of criminal incarceration by the federal authorities of the USA for his activism in promoting access to the information assets on the Internet. He published the *Guerrilla Open Access Manifesto* in 2008.

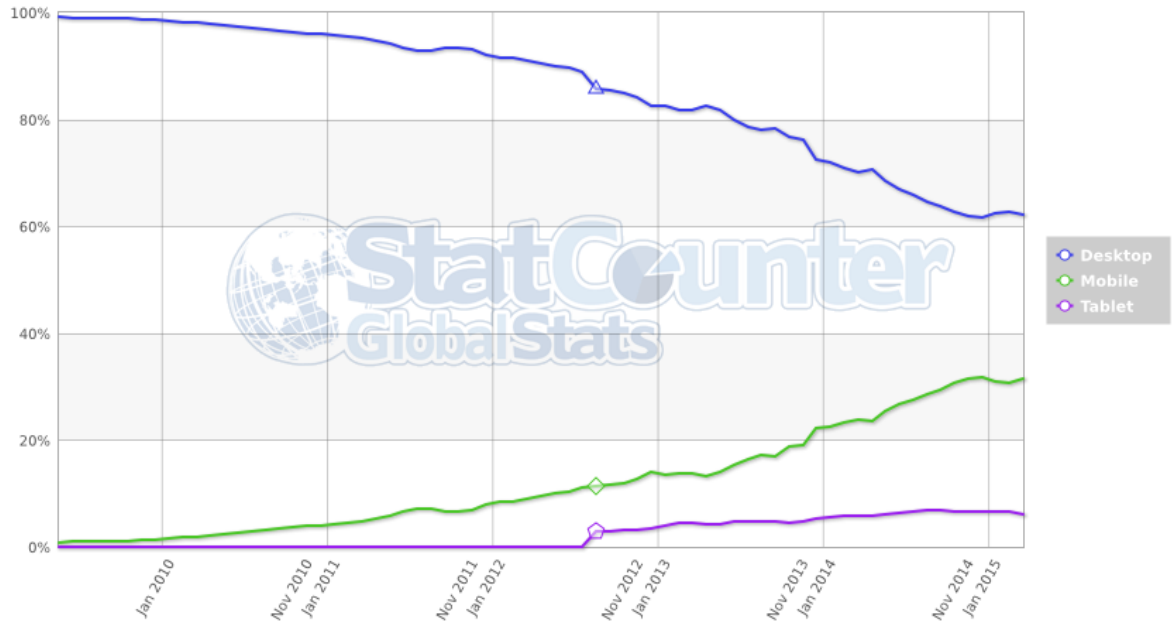
[11] The APC is a pioneer organisation for ICT mobilisations and began in 1990.

[12] IT4C is a non-governmental organisation based in India that plays a significant role in advancing debates on the international governance regime for ICTs and the Internet. It has engaged variously with the BRICS, most recently in the Russia Internet Governance Forum in 2015.

2. CONTEMPORARY DYNAMICS IN THE POLITICAL ECONOMY OF ICTS AND THE INTERNET

Globalisation has indeed ensured that our contemporary conjuncture is characterised by an increased integration of production, distribution and consumption through globalisation. In this period of immense change, intense rivalries are emerging between the more mature capitalist economies and the rapidly emerging developing countries of the world. Simultaneously, the world was also experiencing profound transformations in the organisation of work, and the generation of enterprise driven largely by the accelerated diffusion of ICTs and the Internet. Indeed, it would appear that the Age of Information Technology comprising global digital telecommunications and ICT support networks, has operated as the fifth Techno-Economic Paradigm (TEP) of the end of the 20th Century (Perez: 2002). As noted by Perez, a TEP is "is a set of principles for the most efficient and adequate organisations and practices for using the potential of each technological revolution. It evolves and diffuses with each revolution making obsolete the practices and structures of the previous revolution and becoming the new 'common sense'" (Perez: 2014: 3). The logarithmic-scale rise in the ubiquity of the Internet has also witnessed the rise of competing technological platforms through which people access the WWW. Figure-One shows the decreasing share of desktop devices in the face of rising mobile services, including Tablet versions.

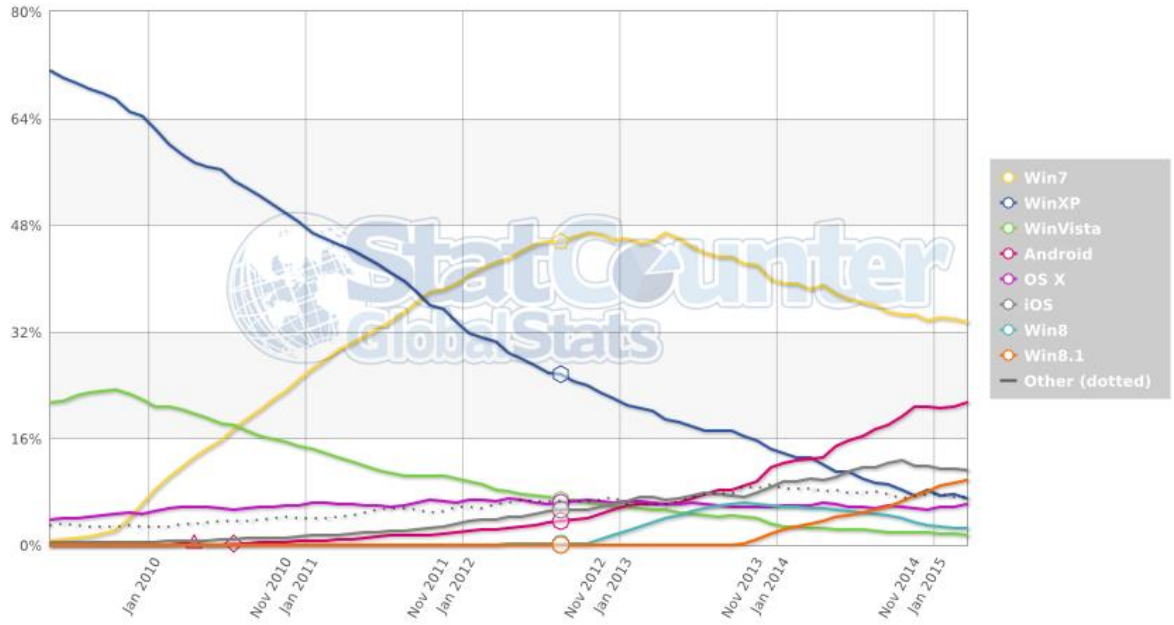
Figure 1: ICT Platforms (2009 - 2015)



Source: StatCounter Global Statistics: 2015

The rise of mobile platforms has also brought about significant changes in the total shares of competing operating systems. Figure-Two shows the eight main operating systems through which people access the Internet. This data also shows the persistence of the monopoly of the Microsoft Corporation which owns five of the top eight operating systems (Win7, WinXP, WinVista, Win8, and Win8.1). The other three are Android which was developed by Google and the Apple Corporation's OS X and iOS. Four of the eight are also Mobile Operating Systems as opposed to being Desk-top Operating Systems. Three transnational corporations essentially own the critical software that manages computers. This generalised oligopoly poses threats to interoperability and new entrants to the market.

Figure 2: Main Computer Operating Systems (2009 - 2015)

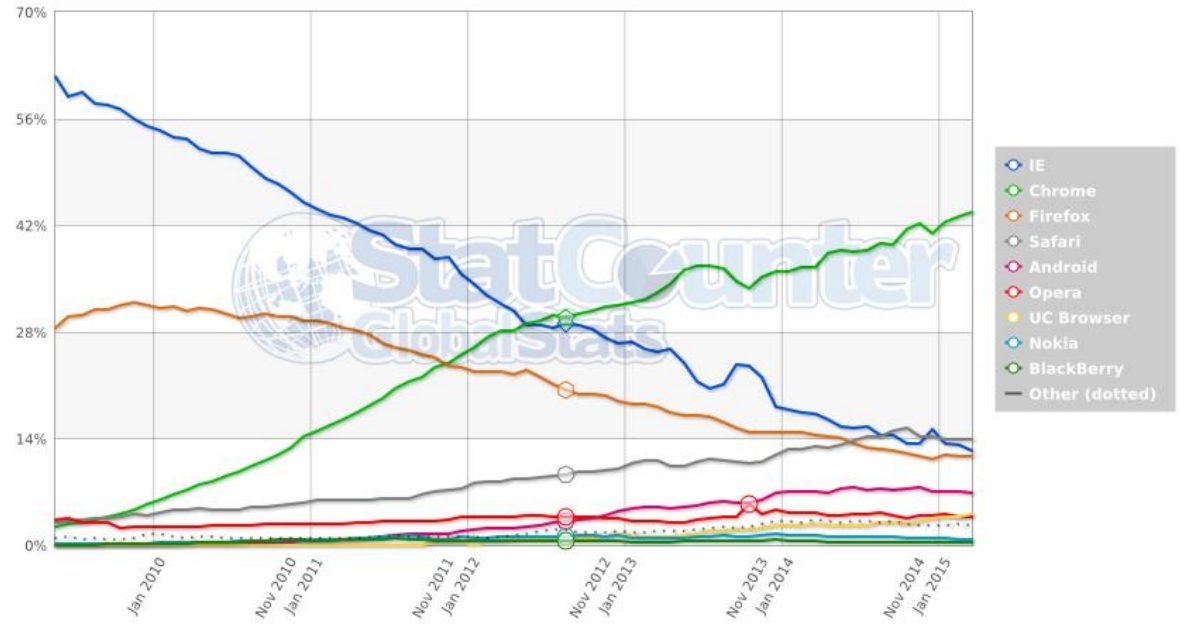


Source: StatCounter Global Statistics: 2015

'Browsers' enable access to the Internet. Figure-three shows the nine main browsers currently used globally. The dominance of the proprietary Microsoft product: Internet Explorer has decreased significantly. It was estimated that Microsoft had approximately 90% of the user-market in 2003. As noted by Glenn Pound, "(w)ith no serious rivals, and enormous profits, they had the resources to explore new ground. Their strategy was to develop their own counterparts to the standard web programming languages, languages that could only be read by their IE browser" (n/d). Resistance to this monopoly resulted in the establishment of the Mozilla Foundation which sought to counter this threat to innovation and return the web back to the open standards that it was founded upon (ibid.). Mozilla's Firefox clawed back at the monopolisation

by Microsoft's Internet Explorer. Subsequently, Google's Chrome has experienced the largest growth in the recent past.

Figure 3: Main Browsers (2009 - 2015)

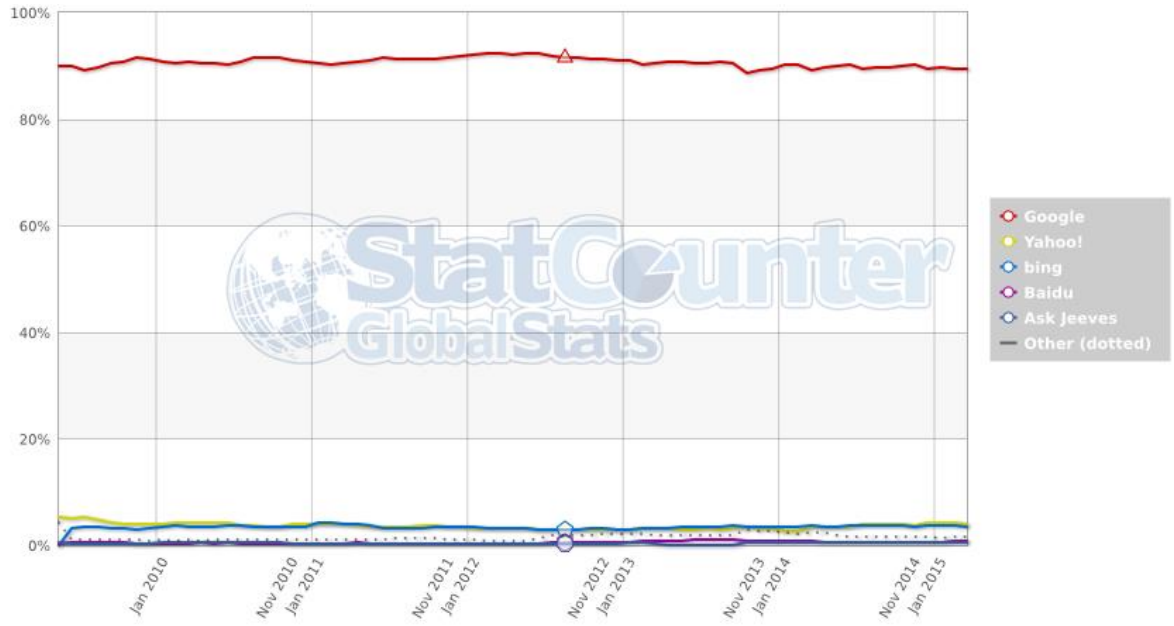


Source: StatCounter Global Statistics: 2015

Google is one of the largest global transnational corporations. It is headquartered in Mountain View in the USA and is estimated to be valued at US$133,400 million as at the end of March 2014[13]. The huge size is maintained and extended through its dominance of the market in Internet Search Engines. These are software systems designed to search for information on the WWW. Figure-four shows how the lead of Google appears unassailable. All other competitors are at less than ten percent. Whilst Google had a share of approximately 30% in China in 2010, it has dropped to 2% as Chinese web services companies such as Baidu, Haosou and Sogou have grown in popularity. In its domestic markets, Russia also has a strong alternative in the form of Yandex has nearly 41% relative to Google's 50%. In India and South Africa, Google dominates performing over 95% of all Internet searches.

[13] Cf. https://investor.google.com/earnings/2015/Q1_google_earnings.html

Figure 4: Main Global Internet Search Engines (2009 - 2015)

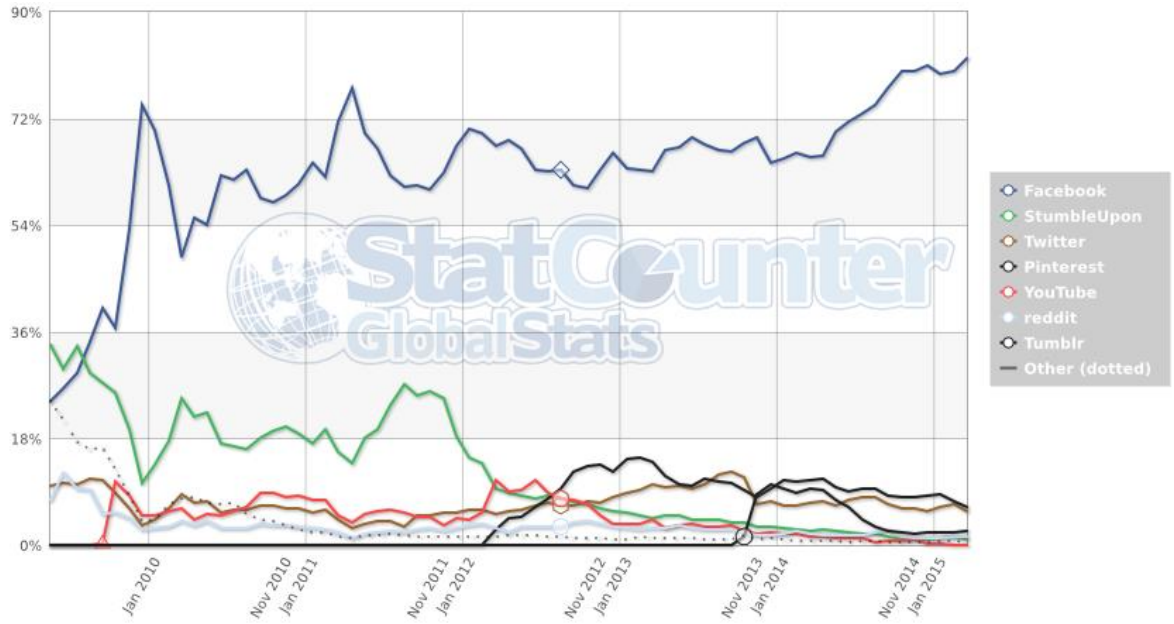


Source: StatCounter Global Statistics: 2015

The growth and diffusion of ICTs and the Internet enabled the emergence of Social Media. Figure-five shows the most popular global social media sites. Seven of these sites were built using an English-language interface. StumbleUpon was larger than Facebook in 2009. By 2015 the situation had radically changed. Now Facebook is the main global social media website. It already holds over 8o% of the market. Facebook had more than a billion users or 1/7 of the global population in 2015. With this market dominance, Facebook has also become a critical vehicle through which advertising is currently being sold. It can be seen that the logic of advertising revenue generation plays a large role in determining the strategies of the social media sites. So Taylor suggests that the "main source of Facebook's profits is other firms' advertising expenditure; but this in turn depends on the surplus extracted from workers who produce 'actual things' (2014). Fuchs utilises Marx's concept of surplus value to argue that capital accumulation in this period is based on the infinite exploitation of *prosumers*[14], who are sold as Internet prosumer commodity to advertising clients (2010). For Fuchs therefore, the users of social media as part of the proletarian class that is exploited by capital (Ibid.).

[14] An original formulation of this term is in Alvin Toffler's blending of a producer and a consumer (1980) and the subsequent portmanteau of the terms professional and consumer. A fuller description and use of the term is found in Fuchs (2012a).

Figure 5: Most Popular Global Social Media Sites (2009 - 2015)



Source: StatCounter Global Statistics: 2015

Furthermore Taylor states the Internet has a distinctly 'earthly' reality and can be decomposed into three different layers: physical infrastructure (cables and routers); software (code, applications); and content (2014). With respect to content, the current situation contrasts with the multiple distribution grids that previously diffused film, radio, telephony, and TV. These are now increasingly being carried on cable or wireless platforms that are monopolised by a handful of transnational corporations. According to Mark Surman, the Executive Director of the Mozilla Foundation, "(n)ever in the modern history of humanity have we seen the kind of narrow control on the distribution of cultural goods that we are seeing today" (Pound: n/d). As we move deeper into the 21st Century, just three main platforms: Android, Apple, Microsoft control how books, software, music, and movies are being consumed on the Internet. A smaller set of transnational corporations such as Amazon, AT&T, CBS, Comcast, Condé Nast, Disney, Facebook, Fox, Google, Reddit, Sony, Spotify, TimeWarner and Vice Media are enjoined with the three to constitute the core enterprises defining the future of ICTs and the Internet.

Aron Swartz had argued that, "(i)nformation is power. But like all power, there are those who want to keep it for themselves. The world's entire scientific and cultural heritage, published over centuries in books and journals, is increasingly being digitised and locked up by a handful of private corporations" (2008). Access to digital information is mediated through the ICTs and the Internet. According to the UN, "while there is continuing diversification in Internet content and language, much still needs to be done to improve equitable access to content, especially in minority languages. At the end of 2013, there were an estimated 185 million active websites and 245 million Internet domains. Internet content has become linguistically more varied and automated translation is becoming more effective. The proportion of websites registered in

developed countries has remained relatively constant, at about 80 per cent" (2015: 17). On a world-systems basis, most of the growth being experienced globally is originating in the fast emerging developing countries.

Much of the global infrastructure of ICTs and the Internet, both hardware and software, is owned by transnational corporations that originated in the USA. Whilst they continue to occupy physical space in North America, the actual registration of the companies have increasingly been shifting to territories which are considered as 'tax-havens[15].' Figure-six reveals a "staggering amount of inequality in the geography of the production of academic knowledge" albeit through the coverage of 9,500 journals taken from the Web of Knowledge Journal Citation Reports (JCR). Whilst this does not represent the entirety of all published journals, the influence of the JCR, and its claims to provide a "systematic, objective means to critically evaluate the world's leading journals," means it does provide an important visualisation to appreciate the geography of academic knowledge (Graham et al: 2011)

[15] Note on Amazon and tax liabilities in the UK

Figure 6: The Location of Academic Knowledge (2011)

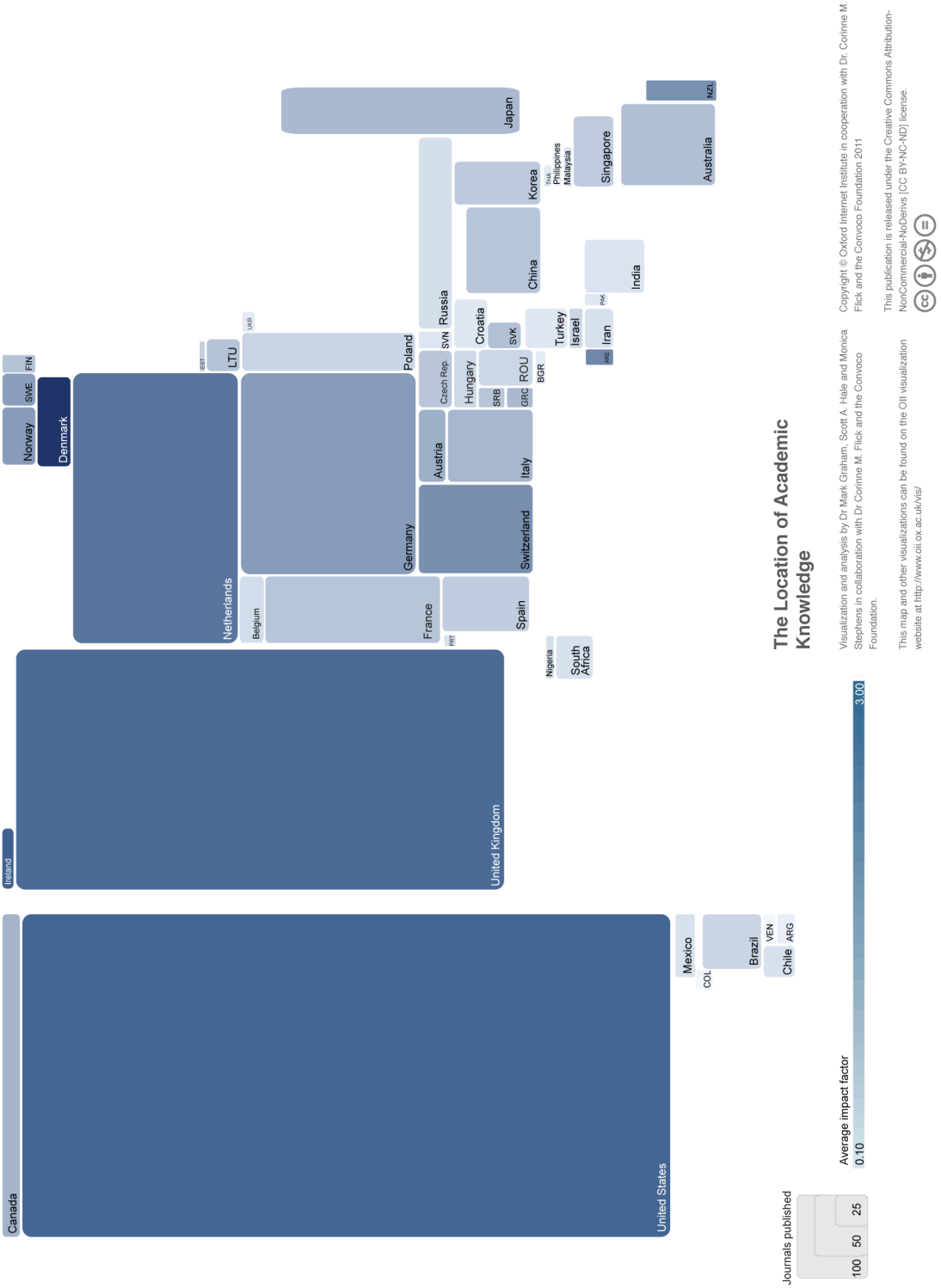


Figure-six shows that the USA and the United Kingdom (UK) published more indexed journals than the rest of the world combined. Western Europe, in particular Germany and the Netherlands, also scored relatively well. Most of the rest of the world is scarcely represented in these rankings. This is starkly illustrated by the representation of Switzerland which is % the size of Africa yet is depicted as more than three times the size of an entire continent. Besides these few countries, the rest of the world is not only under-represented in these rankings, but also ranks poorly on average citation score measures. Despite the large number and diversity of journals in the USA and the UK, those countries manage to maintain higher average impact scores than almost all other countries. Figure-seven looks at the various publishers of scientific fields across the broad domains of the *two cultures*[16]: sciences and social sciences.

[16] A pun on the famous Rede Lecture by Charles Percy Snow (1959) "The Two Cultures and the Scientific Revolution," Cambridge University, Cambridge.

Figure 7: Academic Knowledge and Publishers

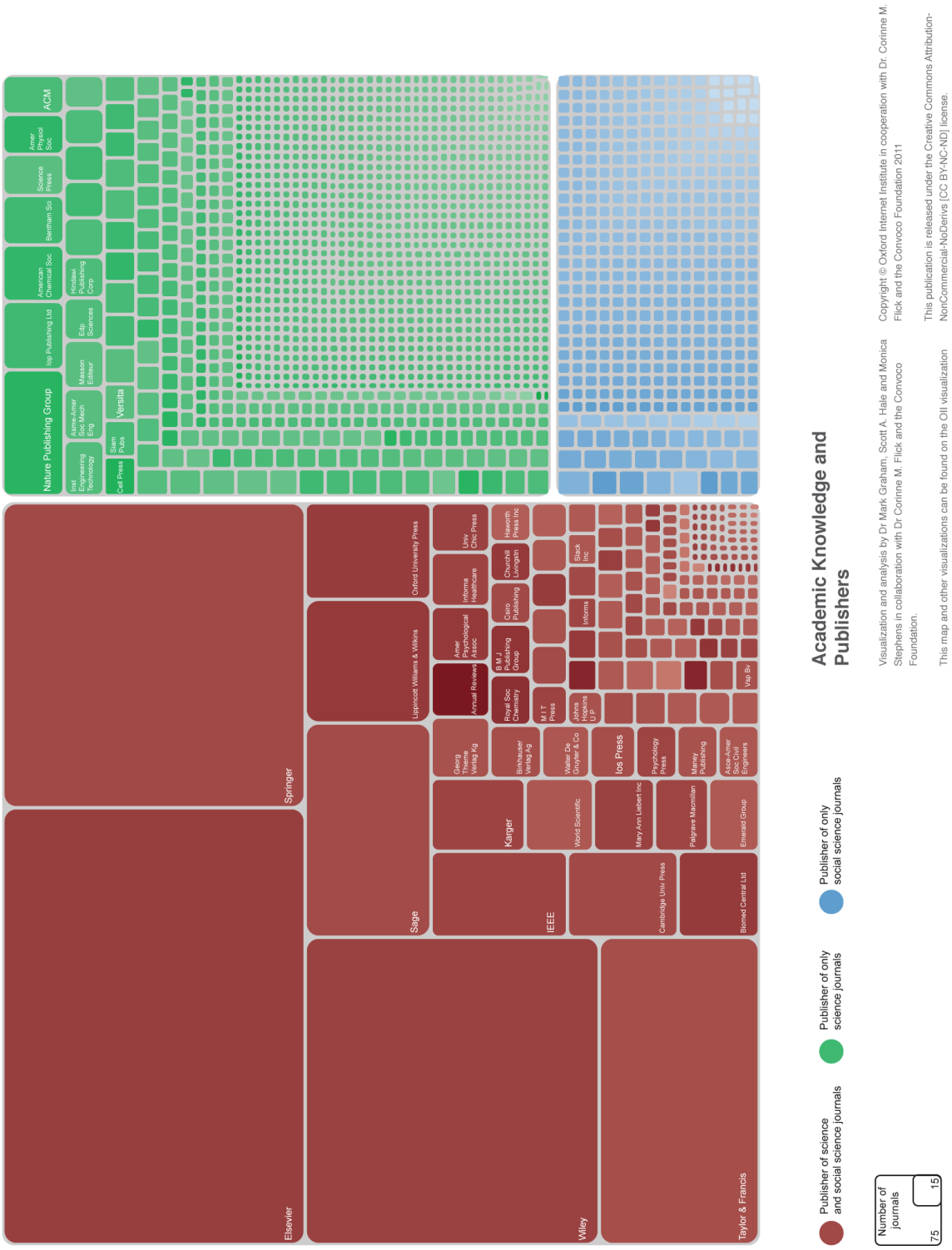


Figure-seven shows how that a large number of publishers generated a large number of scientific journals. Despite the absence of linguistic and geographic diversity in academic publishing, there remained a surprising lack of concentration amongst journal publishers. Within the groups of publishers that focus only on journals in the sciences or social sciences, the publication of journals was distributed through many organisations and companies. The larger group of publishers that control both science and social science journals, on the other hand, were characterised by a greater degree of concentration and attention is drawn here specifically to "Springer, Wiley-Blackwell, Elsevier and Taylor & Francis control a large amount of the academic publishing market and all have relatively high average citation scores" (Graham et al: 2011).

As BRICS, we should be emboldened by the words of the late Aaron Swartz and recognise that "(w)ith enough of us, around the world, we'll not just send a strong message opposing the privatisation of knowledge - we'll make it a thing of the past. Will you join us?" (2008). Swartz was found hung to death on the 11 January 2013. In a statement issued by his partner and his family, it was noted that the death of Aaron Swartz was "… the product of a criminal justice system rife with intimidation and prosecutorial overreach. Decisions made by officials in the Massachusetts U.S. Attorney's office and at MIT contributed to his death. The US Attorney's office pursued an exceptionally harsh array of charges, carrying potentially over 30 years in prison, to punish an alleged crime that had no victims" (2013[17]). It is on this real experience that we shift our attention to the contemporary contestations over the international governance of the Internet.

The World Summit on the Information Society (WSIS) was organised by the International Telecommunication Union on behalf of the United Nations and took place in two phases: the first, in Geneva (2003), the second, in Tunis (2005). In the Geneva Declaration of Principles, the first phase of the Summit adopted a common vision and commitment to building a people-centred, inclusive and development-oriented information society. The second phase endorsed the outcomes of the first phase and adopted the Tunis Commitment and the Tunis Agenda for the Information Society, which addressed, inter alia, the themes of financial mechanisms and Internet governance. The latter declared that the "international management of the Internet should be multilateral, transparent and democratic, with the full involvement of governments, the private sector, civil society and international organisations. It should ensure an equitable distribution of resources, facilitate access for all and ensure a stable and secure functioning of the Internet, taking into account multilingualism" (WSIS: 2005: 6)

Virgilio Fernandes Almeida provided an apt metaphor to appreciate the current contestation over the complex domain of ICTs and the Internet when he argued that "We can see in a rainforest that we have many processes at many levels operating simultaneously to shape its development. The same is true for the Internet. We can't govern it but we can damage or even destroy it with

[17] http://www.rememberaaronsw.com/memories/

certain actions" (2015)[18]. Dilma Rousseff, the President of Brazil, in her speech to the 68th Session of the United Nations General Assembly on 24 September argued that "(i)nformation and communications technologies cannot be the new battlefield between States. Time is ripe to create the conditions to prevent cyberspace from being used as a weapon of war, through espionage, sabotage, and attacks against systems and infrastructure of other countries" (2013).

One of the software programmes exposed by Snowden was the USA government's National Security Agency's Treasure Map which provides a 'near real-time, interactive map of the global Internet' and apparently uses 'red core nodes' as visual indicators which outline the carriers and private networks which have already been accessed by the *Five-Eyes*[19]. These red-signalled locations denote signals intelligence points-of-interest, and effectively comprise a visual map of network nodes currently or recently under surveillance. This software is also capable of mapping routers and end-user devices attached to the networks that they facilitate and instructs its analysts to 'map the entire Internet' on a constant basis and at device-level detail (Müller-Maguhn et al: 2014).

The leaders of African Network Information Center (AFRINIC), American Registry for Internet Numbers (ARIN), Asia-Pacific Network Information Centre (APNIC), Internet Architecture Board (IAB), Internet Corporation for Assigned Names and Numbers (ICANN), Internet Engineering Task Force (IETF), Internet Society (ISOC), Latin America and Caribbean Internet Addresses Registry (LACNIC), Réseaux IP Européens Network Coordination Centre (RIPE NCC) and the World Wide Web Consortium (W3C) met in Montevideo, Uruguay, to consider current issues affecting the future of the Internet in October 2013. These institutions are primarily responsible for the coordination of the Internet technical infrastructure globally. These ten organisations expressed "strong concern over the undermining of the trust and confidence of Internet users globally due to recent revelations of pervasive monitoring and surveillance" (ICANN: 2013).

The Montevideo Statement on the Future of Internet Cooperation "identified the need for ongoing effort to address Internet Governance challenges, and agreed to catalyse community-wide efforts towards the evolution of global multi-stakeholder Internet cooperation" and called for "accelerating the globalisation of ICANN and IANA functions, towards an environment in which all stakeholders, including all governments, participate on an equal footing" (ibid.). The government of the USA however argued that "(w)e believe it is wise to avoid excessive deliberation on issues known to divide participants beyond a distance that can reasonably be bridged in two days. For example, we would discourage meeting participants from debating the reach or limitations of state sovereignty in Internet policy. We are optimistic that NETmundial can meaningfully contribute to the development of Internet governance principles by focusing on those topics that enjoy broad support" (USA: 2014).

[18] Professor at the Federal University of Minas Gerais and chair of Netmundial conference at the UNESCO High-Level Governmental Dialogue, Tuesday, 3 March 2015.

[19] This is a reference to espionage agencies of Australia, Canada, New Zealand, the UK and the USA.

The 9th Annual Internet Governance Forum (IGF) was held in Turkey in September 2014. According to the UN, the IGF enabled "all stakeholders to exchange knowledge and ideas about the development of the Internet. … Discussions in the main sessions focused on a number of themes, including policies enabling access, growth and development, network neutrality, the role of ICANN and the stewardship transition of the Internet Assigned Numbers Authority functions and the evolution of the Internet governance ecosystem, including the role of IGF" (2015: 20).

The continued inability for the multilateral system to generate an effective and binding global agreement has resulted in the emergence of initiatives driven largely from civil society. These include the following two processes that are being taken forward. First, the Internet Social Forum (ISF) was launched at the World Social Forum, 2015, in Tunis, through a workshop entitled 'Organising an Internet Social Forum - A Call to Occupy the Internet'. The workshop gathered together over civil society organisations[20] and emerged with a call to hold an Internet Social Forum (ISF) and develop a People's Internet Manifesto. The ISF is intended as a space to vision and build the 'Internet we want' and which would be underpinned by values of democracy, human rights and social justice. It is anticipated that the People's Internet Manifesto would stand for participatory policy making and promote community media. It would also seek an Internet that is truly decentralised in its architecture and based on people's full rights to data, information, knowledge and other 'commons' that the Internet has enabled the world community to generate and share.

Second, is the Web We Want campaign which has suggested five key principles: 1) Freedom of expression online and offline; 2) Affordable access to a universally available communications platform; 3) Protection of personal user information and the right to communicate in private; 4) Diverse, decentralised and open infrastructure; and 5) Neutral networks that don't discriminate against content or users (WWW Foundation: 2014). This campaign is apparently aligned with the vision of the UN's Declaration of Human Rights, is orientated towards social justice and seeks to generate a 'Magna Carta for the Internet' (Tim Berners-Lee: 2014). From these emergent alternatives in advancing a new international regime for the governance of the Internet, we turn to the ICTs and the Internet in the BRICS countries.

[20] Just Net Coalition, P2P Foundation, Transnational Institute, Forum on Communication for Integration of our America, Arab NGO Network for Development, Agencia Latinoamericana de Información, Alternative Informatics Association, Knowledge Commons, Open-Root/EUROLINC, SLFC.in, CODE-IP Trust, GodlyGlobal.org, Centre for Community Informatics Research, Development and Training, IT for Change, Association for Proper Internet Governance, Computer Professionals Union, Free Press, Advocates of Science and Technology for the People, Other News, Free Software Movement of India, Global Geneva, Solidarius (Solidarity Economy Network), All India Peoples Science Network, Institute for Local Self-Reliance - Community Broadband Networks, Digital Empowerment Foundation, and Instituto del Tercer Mundo.

3. ICTS AND THE INTERNET IN THE BRICS

According to the Partnership on Measuring ICTs for Development "over 90 per cent of the world's population is now covered by mobile networks. The number of mobile subscriptions is almost equal to the world's population. Almost 50 percent of the world's people are estimated to be subscribers, while some 44 percent of households are estimated to have Internet access and some 39 per cent of people, to be Internet users" (UN: 2015: 3). Table-one provides summary ICT data that is officially hosted by the International Telecommunications Union (ITU) for the BRICS countries. Also included as a comparator is the USA, and all the data is normalised for population size. Whilst all the BRICS have a lower density of fixed-line telephone subscriptions in comparison to the USA, most BRICS have a higher level of Mobile-cellular subscriptions. This is indicative of the technological leap-frogging that characterises the international situation. With respect to broadband subscriptions, most access is generated through mobile connections. Households with computers are very uneven and those with Internet access generally lower than the rates in the USA. The USA maintains an over-20% lead with respect to individuals using the Internet. The next section details the history of the Internet in the BRICS countries

Table 1: ICT Statistics for BRICS (2013)

	Fixed-telephone subscriptions	Mobile-cellular subscriptions	Fixed (wired)-broadband subscriptions	Mobile-broadband subscriptions	Households with a computer	Households with Internet access at	Individuals using the Internet
Brazil	22.3	135.3	10.1	51.5	48.8	42.4	51.6
Russia	28.5	152.8	16.6	60.1	69.7	67.2	61.4
India	2.3	70.8	1.2	3.2	11.9	13	15.1
China	19.3	88.7	13.6	21.4	43.8	43.9	45.8
South Africa	9.2	147.5	3.1	25.2	25.8	39.4	48.9
USA	42.2	95.5	28.5	92.8	80	77.3	84.2
	per 100 inhabitants	*per 100 inhabitants*	*per 100 inhabitants*	*per 100 inhabitants*	*(%)*	*(%)*	*(%)*

Source: ITU (2015) ICT-Eye, Various Country Profiles as at April 2015.

The history of the internet in Brazil could be seen to have begun when Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) and the National Laboratory of Scientific Computing (LNCC) exchanged data packets with Fermilab in the USA in 1987 (Foureaux: 2010). The Universidade Federal do Rio de Janeiro (UFRJ) also successfully connected to the University of California in Los Angeles (UCLA) in 1988 and which enabled several other universities and research centres to also implement internet connectivity. The Brazilian Institute for Social and Economic Analysis (IBASE) created a basic email and electronic conferencing service called AlterNex to make possible the sharing of information among progressive non-governmental organisations throughout the Brazil in 1989 (Albernaz: 2002). Altenex would also become a founding member of the Association for Progressive Communications (APC) whose vision remains "(a)ll people have easy and affordable access to a free and open internet to improve their lives and create a more just world" (APC: 2015). The Country Code Top-Level Domain .BR was also generated in 1989. From its roots in academia and progressive NGOs, the internet became a public infrastructure in Brazil in 1995. It was estimated that 107,822,831 individuals could access the Internet, via computer or mobile device, within the home where that individual lived in Brazil in 2014. That number represented 53.37% of the domestic population and 3.69% of the world population of internet users.

The All-Union Institute for Applied Automated Systems of the State Committee for Science and Technology (VNIIPAS) was a key organisation in advancing Russia's internet development and tested links between Russia and Austria in 1982. A major internet connection between Moscow and Helsinki University was established by the National Research Centre Kurchatov Institute in 1990. The APC's 'GlasNet[21]' project also connected citizens of various cities onto the internet in 1991. Russia was added to USENET in 1991 through the domain name: kremvax.demos.su which paid tribute to a now infamous hoax perpetuated by Piet Beertema on 1 April 1984. Whilst the .RU Country Code Top-Level Domain was registered in 1993, the .SU domain continues to be used.

The Educational Research Network (ERNET) was established in India as a joint initiative of the Government of India's Department of Electronics and the UNDP in 1986. The Country Code Top-Level Domain .IN was initially delegated to India in 1989. Videsh Sanchaar Nigam Limited (VSNL) introduced public internet access in India via dialup services in 6 cities on 15 August 1995. It was estimated that 243,198,922 individuals could access the Internet, via computer or mobile device, within the home where that individual lived in India in 2014. That number represented 19.19% of the national population and 8.33% of the world population of internet users.

Whilst Tsinghua University began to provide email services in 1988, the Chinese Academy of Sciences (CAS) established its National Computing and Networking Facility of China (NCFC) project in 1989. The Country Code Top-Level Domain .CN was registered in 1990 and the

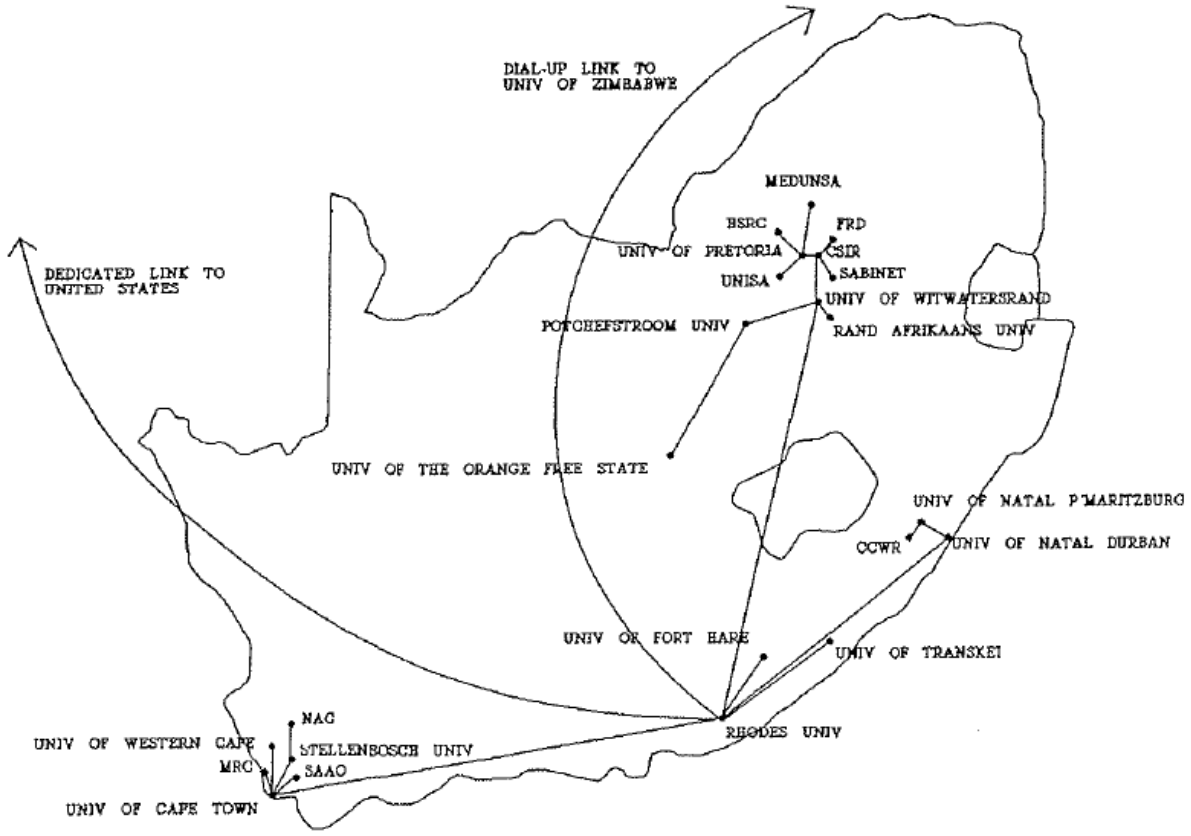
[21] The first non-profit, non-governmental telecommunications network established in the Soviet Union as a network for people there who have access to electronic communication equipment; typically a personal computer of some kind and a modem.

NCFC connected to the Internet in 1994. It was estimated that 641,601,070 individuals could access the Internet, via computer or mobile device, within the home where that individual lived in China in 2014. That number represented 46.03% of the national population and 21.97% of the world population of internet users.

The South African telecommunications industry can be traced back to 1958 (Kaplan: 1989). This was a decade after the National Party became the government of the country and began establishing 'grand apartheid.' The country's route to the Internet was therefore mediated by the struggle of the majority of the country's people against an illegitimate minority regime. By the 1980's, increased domestic resistance to apartheid, in combination with external solidarity and a growing international movement for sanctions had isolated the white minority regime and created conditions of 'dual power' in the country. In July 1986 a national state of emergency was declared and would remain in force until 1989. During this period, the country was effectively controlled through a National Security Management System through the State Security Council and had usurped even the tokenistic 'Westminster' apparatuses of the government.

It was in the context of the escalation of the national liberation struggle that a decision was taken for the establishment of the internet by the Committee of University Principles and the Foundation for Research Development in 1987. With the country already experiencing international academic boycotts and under duress of more general sanctions, Vic Shaw admitted that "(t)his problem was overcome by the willingness of the Fidonet organisation, and particularly one of its 'sysops' to provide a connecting node and thus to open up international networking to this part of Africa" (Shaw: 1992: 4). This network began operating in 1989 and the Country Code Top-Level Domain .ZA was registered in 1990. Figure-six shows this early Internet infrastructure in South Africa.

Figure 8: South Africa's UNINET-ZA Internet before 1994

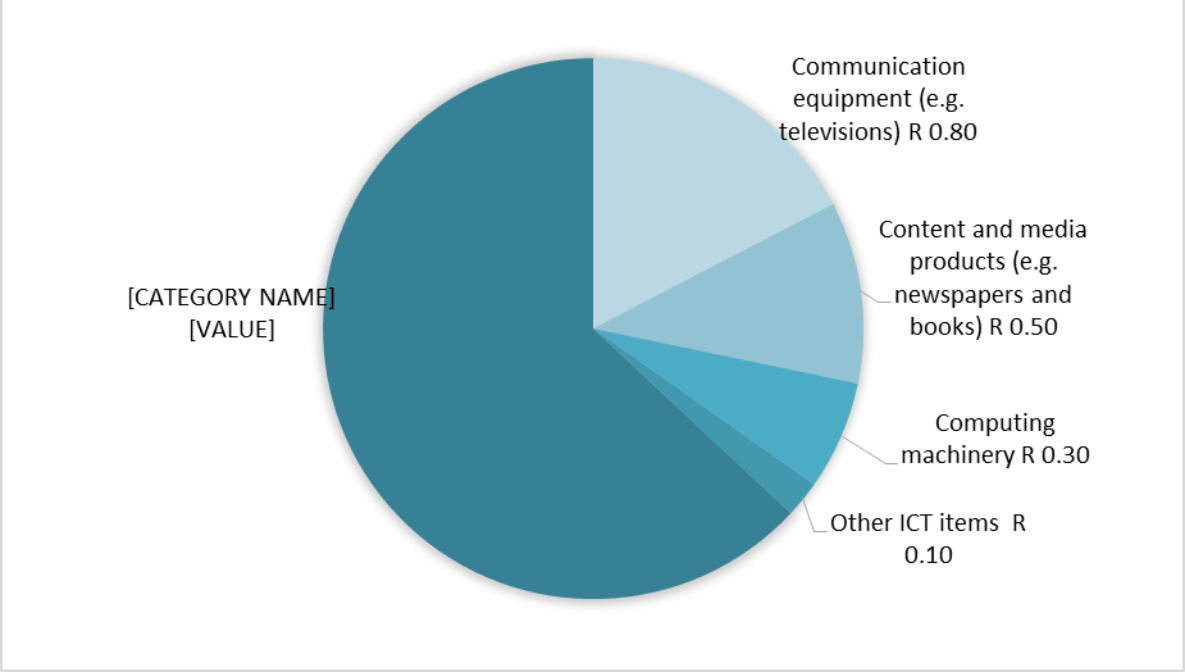


Source: Shaw (1992)

As noted by Adam and Gillwald, the reform of the sector in South Africa followed the following almost universal road involving "the revision of policy and regulatory frameworks, separation of postal telecommunications services, enacting of sector laws, creating autonomous regulatory agencies, privatisation of the state-owned telecommunications operator and liberalisation of the mobile and Internet sectors" (2013: 2-3). Charley Lewis has shown how the diffusion of the Internet took place under very difficult circumstances where the incumbent state utility, Telkom utilised its monopoly position to essentially retard the emergence of Internet Service Providers (ISPs) (2005). Lewis also recounts how Telkom itself miscalculates the future of the Internet and loses the opportunity to itself act as an early ISP (2005: 8). By 1997, an equity stake of 30% of Telkom South Africa was sold to a consortium of South Western Bell of the USA and Telekom Malaysia for US$1.3 billion (Adam and Gillwald: 2013: 3). South Africa's reform of the sector apparently sought an "incremental, yet organic approach to ICT policy making with a focus on building blocks such as national educational capacity, infrastructure, content and public sector service delivery through ICTs" (Ibid.: 6). In assessing the results of this process, it was noted that the "political economy of structural reform remained sensitive to issues of power relationships, leadership, incentives and interests due to the revenue streams, employment and political implications of liberalisation and privatisation" (Ibid.: 10).

Notwithstanding the environmental and institutional constraints, Statistics South Africa, estimated that 24,909,854 individuals could access the Internet, via a computer or mobile device, within the home where that individual lived in South Africa in 2014. That number represented 46.88% of the domestic population and only 0.85% of the world population of internet users. It also showed that households in the country spent approximately R91.6 billion on ICT products in 2012. With total household expenditure amounting to R1, 974 billion, ICT products and services constituted 4.6% of total household expenditure in 2012. On average, for every R100 spent by a South African household, R4.60 was therefore spent on ICTs. Figure-nine disaggregates the average South African household spending on ICTs.

Figure 9: Disagregated SA Household Spending on ICT (2014)



Source: StatsSA: 2015

As shown in Figure-nine, more than half of the total [R2.90] of R4.60 expended, is allocated to securing telecommunications, broadcasting and information supply services such as pay-television subscriptions, cellphone airtime and broadband. Smaller portions are then utilised for the communication equipment (R0.80); content and media products (R0.50); computing machinery (R0.30); with the remaining R0.10 being then spent on other ICT items (StatsSA: 2015).

Statistics South Africa further estimates the direct contribution of the ICT sector to the country's GDP was R94.7 billion or 2.9% of total GDP in 2012 (ibid.). The largest contributor to total ICT GDP was telecommunications services which was valued at R64.8 billion or 2.0% of total GDP, followed by computer services at R7.3 billion or 0.2% of total GDP, and ICT manufacturing at R6.6 billion or 0.2% of total GDP (ibid.). ICT exports constitute only 2.8% of South Africa's total exports in 2012. These exports consisted mainly of telecommunications, broadcasting and information supply services, including knowledge services. The total value of the ICT exports was worth R26.8 billion, whilst nearly R105.7 billion's worth of ICT products were imported in 2012. ICT imports accounted for just over 10% of all imports in that year. The largest imported ICT product was radio, television and communications equipment, comprising 47.5% of all ICT imports. Thus, South Africa generated a large ICT trade deficit of R78.9 billion for 2012 and continues the country's role as a net importer of ICTs.

4. CONCLUSIONS

As Odoevsky had imagined more than a century ago, ICTs and the Internet hold the possibilities of enabling a better life for all of the world's population. For BRICS to play a more central role in the domain of ICTs and the Internet, requires the five constituent countries to pay more attention to the scientific *domains* underpinning them, being acutely aware of the technological trajectories currently being advanced and intervening in the global policy debates about global regulation and governance of ICTs and the Internet. We also need to better understand the role and use of these enabling instruments in global struggles for emancipation from the avarices of transnational corporations, their political machinations of maintaining hegemony on world affairs and support substantive participatory democracies. As noted by Singh "…without systemic global responses to even the playing-field, if not control it, the disparate national and local level attempts at economic development and equity will never be enough" (2015a: 2).

The Durban University of Technology, the venue of the 5th BRICS Academic Forum, recently hosted a symposium entitled "Generation Open - The Promise of Open Access and Open Educational Resources" in October 2014. Emerging from the symposium was the following declaration: "We subscribe to the ideal of a Web which is a good basis for democracy and which resists balkanisation/fragmentation in the face of current concerns about surveillance. Yet we do want a Web that is safe for all: safe from intrusion, obstruction, manipulation and political interference. We expect a Web with "net neutrality" giving every user equal access to the bandwidth and ease of use available to big business and to governments. We also want an open Web which allows and promotes free expression and sharing of information and knowledge, but which protects personal privacy and curbs hate speech and child pornography. We want a Web that opens up and extends access to knowledge to the whole world population" (DUT: 2014). Such local articulations are important and necessary as they reaffirm the need to ensure net-neutrality.

Ensuring net neutrality requires the BRICS to intervene in the struggle to maintain a free and open Internet. Net neutrality is "an egalitarian principle as applied to a key building block and determinant of our new social systems, which the internet is. (Singh: 2015b: 14-15). This means that the rights of transnational corporations who seek to dilute the regulatory powers of multilateral institutions must be curtailed as this opens the possibilities of them establishing a tiered system through the slowing down of traffic to stifle competition and/or charging additional fees to speed up access and transmission. The transnational corporations and the resulting oligopolies must also be regulated to ensure that the digital commons is preserved as a global public good. Intellectual property rights must be used to ensure a transparent disclosure system that advances rather than retards research and development. By the BRICS taking a positive stance towards '*Open Innovation*[22]*,*' a strong international signal will be issued that encourages the generation of domestic capabilities and the building of local competences in critical ICT domains.

With the revolutionary role played by ICTs in connecting the world and the ubiquity of the Internet, ensuring universal access across all platforms from wired broadband to wireless connections beyond mobile telephony to include the internet-of-things must be realised as a global commons and public good. Redressing inequalities and safeguarding the citizens of the BRICS with respect to their privacy and civil liberties becomes paramount. This however must not be to the exclusion of the rest of humanity. The BRICS must ensure sufficient national, regional and global interventions that encourages local participation, advances and enhances multilateralism; and discourages unilateralism by historically hegemonic states that seek to reproduce the effective concentration and monopoly power occupied by their transnational corporations. The BRICS should enable a global governance regime for the internet whereby predatory practices will be discouraged. The BRICS as representatives of the majority of humanity must safeguard the Internet, ensure digital liberty, and expand our knowledge commons as a truly global public good for all.

[22] "Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. [This paradigm] assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology" (Chesbrough et al.: 2006).

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