

The Smartphone Annales

Japanese inventions and Western narratives throughout the history of mobile wireless telecommunication technology

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ASIA IN FOCUS

When it comes to the history of the smartphone, there is a general idea of the kind of technological achievements that led to its development. Most of these achievements are by US or European actors, while inventions that stem from other parts of the world, such as Japan for example, are largely excluded from the history of mobile phone technologies. As is usual with the construction of a canon of science and technology, the West constructs an image of itself as the classic 'master of the machines'. Japan in this regard is an interesting case because over the years it has actually manifested an image of being technologically advanced, despite being a non-Western country. Nevertheless, its achievements in telecommunications have been largely overlooked. Written from a historiographic perspective, this paper discusses how inventions in mobile and wireless telecommunication technology that came from Japan have been either ignored or otherwise devalued, arguing that this is because of a dominant techno-orientalist narrative which has changed in form somewhat over time. Furthermore, the paper offers an explanation of how the canon of achievements of telecommunications came to be, thus contributing to the understanding of power dynamics in the global history of technology.

Keywords: Japan, mobile phone, smartphone, history of technology, techno-orientalism

In 2014, TIME published an article on the occasion of the 20th birthday of what is regarded as the world's first smartphone: IBM's 'Simon' (Aamoht, 2014). Simon was a Personal Digital Assistant (PDA), which entered the US market August 16, 1994. It was a regular PDA in the sense that it had all the usual attributes (such as a calendar option, a calculator, and a notepad) and was also equipped with a program to send and receive emails with (albeit after a rather difficult set-up process). On top of that, it could be used to make phone calls with. Although the word 'smartphone' did not exist back then, Simon is now widely seen as the world's first smartphone because unlike the other PDA's that were on the market back then, it had the ability to make and receive phone calls. Unfortunately, its inconvenient size, limited battery life and high costs limited Simon's popularity. Sales were suspended a few months after its launch, after only 50,000 Simons were sold. Nevertheless, Simon's birthday was celebrated widely in 2014 and made it to many European news agencies such as TIME, Der Spiegel and BBC. To honor it, Simon even got a prominent spot in the exhibition on the Information Age that was hosted by the London Science Museum.

Simon's widespread celebration strikes one as somewhat odd as Japanese mobile phones, even around the mid to late 1990s, were more advanced than their European or US counterparts, and the early Japanese mobile phones that worked on 1.5G or early 2G

networks that were established in the second half of the 1990s might seem more likely to be called 'smartphones' than a PDA with some cellular functions. Granted, the Japanese mobile phones came on the market a few years after Simon, but their widespread use and early internet access makes them at least fair competitors for the title. These phones, such as for example the 'J-Sky Walker' developed by J-Phone (later Softbank), featured the ability to send and receive e-mails ('Sky Mail'), and could download ringtones. Other carriers, such as DoCoMo, introduced similar services for their mobile phone users, all in the late 1990s. Also, unlike Simon or the other costly PDA's of the 1990s, these early e-mail capable mobile phones were very affordable, and widely used. In 1997, the provider DoCoMo had almost 20 million contractors for their mobile phone e-mail service (DoCoMo Report, 2012). Moreover, in 1999, DoCoMo introduced 'i-mode', the world's first nationwide mobile phone internet network. The first mobile phone that had the ability to use an internet browser was the F501i HYPER, manufactured by Fujitsu and sold by DoCoMo. Theoretically, to answer the question which of these phones is more deserving of the title of 'smartphone' would depend on the definition of the word, but the debate on this question could go on forever as in fact there is no clear standard definition of the word 'smartphone' at all. There is, however, a rather vague general sense of what a smartphone should be capable of (sending e-mails, for example). It is

therefore remarkable that there still is a device that is said to be the world's first smartphone and, furthermore, that this device is of US origin.

IBM's Simon is only one of the examples that show the prominence of Western inventions in the history of communication technology. The 'world's firsts' are predominantly made by US or European inventors or companies. IBM made the 'first smartphone' in 1994, Motorola made the 'first mobile phone' in 1973. If we look at the history of telecommunication further back, other names that immediately come to mind are Alexander Graham Bell and Guglielmo Marconi. In addition, when looking at discussions of mobile phones in popular contexts, except for perhaps mentioning the first mobile phone internet network, which was developed by DoCoMo in 1999, Japan (or any country outside of the West) receives little to no mention. Nonetheless, there are in fact several technologies which are deemed crucial to the development of the smartphone as we know it that are of non-Western origin. Simon's birthday celebration therefore should perhaps rather not be seen as 'the world's first smartphone' but as the most recent example in a series of celebrations of American or European inventions that ignore any contributions in the history of telecommunication technology by inventors that are not from a 'Western' country. In this article, I will discuss the writing of the history of mobile telecommunication and how it came to be that so little is known on Japan's contributions to our current 'Information Age'. This paper is written from a historiographic perspective, paying attention to why certain developments happened and offering an explanation on how and why a canon of achievements of mobile telecommunications is created, thus showing the power dynamics behind the writing of the history of telecommunications.

Before beginning this discussion, it should be noted that although this paper has a focus on Japan, when it comes to mobile phone technology, other Asian countries such as South Korea and China have also been main players. In particular, South Korea has been exceptionally active over the past few years. I do not mean to ignore the contributions of these countries or other countries besides Japan, as there are without doubt many that I have not mentioned (ironically perhaps, as omission is the very theme of the paper). However, as the aim of this paper is to deepen the understanding of Japan and Japanese telecommunication technology in global history, as well as for the sake of the length of this paper, I have made a selection. Furthermore, although I have mainly focused in this paper on a history of engineering, I want to add that in the academic discussion of the Information Age or Information Society, Japan has made significant contributions as well. The very word 'Information Society' was actually a term coined by a Japanese scholar. Thirdly, I want to make the reader aware that while this paper focused on exclusion due to race or ethnicity, the documentation of the history of mobile telecommunications also sees exclusion based on gender (think of for example the case of CDMA wave technology, the very basis for 3G Internet itself, which was invented in 1940 by Hedy Lamarr).

Master of the Mobile Phone

When it comes to the history of mobile telecommunication technology there is a persistent narrative that portrays the smartphone as a 'revolutionary' form of technology. The idea entails that the smartphone is essentially revolutionary in nature, and that its history is limited to a few decades, starting with mobile phone technologies that were developed sometime between the mid-1990s and now. While it is true that the mobile phone only

made its entrance among the general public in the 1990s, technologically speaking the device has a much longer history that connects it to many other media. While the similarities between the smartphone and the PDA or the pager are relatively obvious and have been discussed in length elsewhere (K. Ito, 2016; Ling, 2004; Natsuno, 2002), smartphones actually continue a long tradition of wireless communication stemming from radio technology (Ling, 2004), and even older, paper media (Briggs & Burke, 2014). Seeing that a medium always relates to a broad spectrum of other media (Briggs & Burke, 2014, p. 12), it would be incorrect to take a device such as the smartphone out of historical context and portray it as a 'revolutionary' and recent development – yet this is what is happening in the case of information technologies (Blyth, 2017), especially with the mobile phone. Details about the early history of communication devices are important, as they show us the transformation of media over the ages, but they are nevertheless often ignored or overlooked as it goes against the popular image of the 'Information Technology Revolution', which treats mobile phones as well as other ICTs as a sudden revolutionary development that is regarded as defining our current 'epoch'. In addition, if the history of the smartphone or mobile phone does receive attention in the form of research, researchers often focus only on the 'telephone' aspect, and connect the device only to previous forms of telephone technologies (i.e. Agar 2004; Katz and Aakhus 2002; Woyke 2014). This has all resulted in a narrative of smartphone technologies as hyper-renewing and 'disconnected' from previous forms of communication technologies. Central to this narrative of the 'smartphone revolution' is Manuel Castells' theory on the 'Information Age' (Castells, 1998). Because of the IT boom of the 1980s and 1990s, Castells defines our current era as revolutionary differ-

ent from our previous eras ('Zeitgeists'), and poses Information at the center of our new society. According to Castells, because of the invention of IT in the late 1980s, society shifted from being industrial societies to 'information societies' which are driven by Internet networks. This 'IT revolution', as Castells calls it, has supposedly thoroughly changed the nature of political and economic systems worldwide.

There are several problems with this theory, but the main issue is that it portrays Information Technology as revolutionary and something brand-new. Not only do Castells and other scholars who pursue this vision hereby take the history of information technologies out of context and ignore continuities concerning information and knowledge transfer through history (Callinicos, 2004), this theory creates a linear and specific timeline for the history of IT. The results are twofold. On the one hand, it creates a schism in the documentation of history, and ignores a vast history of technology by portraying IT devices as 'sudden' inventions (Blyth, 2017; Callinicos, 2004; Hardt & Negri, 2001). Information has always circulated – societies have always economically, politically, and socially, relied on networks of information (Briggs & Burke 2014), long before the invention of the Internet. On the other hand, driven by a technological determinist way of thinking, the idea of the 'IT Revolution' has led to a canon of 'the world's firsts', and it is this canon that is especially prone to a Western or Euro-centric way of thinking. Technology, after all, is one of the fundamental pillars of the ideas of Western supremacy (Lévi-Strauss, 1952). Historically, the West has developed an image of itself as, as Lévi-Strauss (1952, p. 47) puts it, 'maître des machines': master of the machines. Although it is undeniable that Asia has played a crucial role in the development of science and technology since the dawn of history – think of only algebra, the alphabet,

and astronomy for example, which all came to Europe via Asia – when it comes to the history of science the West always, as Shohat and Stam (2013, p. 14) argue, “organizes knowledge in ways flattering to the Eurocentric imaginary” (see also Bala, 2006; Park, 2014; Raj, 2007). It is no different when it comes to the history of mobile and wireless telecommunication technology. “The lion’s share of technology studies – alongside research on the appropriation of mobile phones – has focused on Western countries, which has led to a tendency to center on Western-based concepts,” states Tenhunen (2008, p. 516).

(Pre-)Keitai

When it comes to Japan, however, we cannot simply reduce this to a typical victim-of-Western-oppression story in which an Asian country has been completely ignored or left out in a Euro-centric drive to create a self-glorifying documentation of the history of technology. Unlike the blatant neglect of scientific research from researchers from other non-Western countries, Japan has actually been ‘granted’ a position in the struggle for a mention on the techno-historical timeline of inventions. Sometime at the end of the last century, Japan even became associated with technologies of the future (Morley & Robins, 1995). Their advances in mobile phone technology in the early 2000s are also relatively well-known (Lim & Goggin, 2014). Yet it is only in a particular context that Japan is seen as a country of advanced technologies – a context that is very much shaped by ideas reminiscent of postmodern science fiction (Yu, 2008), and heavily influenced by techno-orientalism (Chun, 2000; Nakamura, 2002). Japanese technology can only be superior at the cost of something else. Morley and Robins (1995) argue, that it is at the cost of being seen as human: by attributing Japanese technological supremacy to an inhuman,

mechanical quality, the Japanese are dehumanized and their technological achievements thus devalued. Besides this, there is also an obvious ridiculing factor, as for example stereotypes about Japanese as ‘technophiles’ who are ‘crazily’ into technology not only dehumanize the Japanese, but also ridicule and belittle their technological achievements. This is a part of a recent form of Orientalism in which Japan is portrayed as ‘crazy’ and ‘weird’ (Wagenaar, 2016). As one of the first non-Western countries that have challenged the Western hegemony of modern science, it is the price Japan has paid. When in the early 2000s Japan developed a thriving mobile phone culture, the Japanese mobile phones were generally seen as impressive advanced forms of mobile communication technology (Hill, 2003; Holroyd & Coates, 2007; Rheingold, 2002; Srivastava, 2004). Yet even this was something that was sometimes more seen as a cultural phenomenon - perhaps more as an expression of the essential (obsessive) ‘technophile’ side of the Japanese: “No one will deny the perception that the Japanese are a highly technophilic people who are regularly seen sporting the latest technological gadgets” states Srivastava (2004, p. 246) for example, comparing mobile phone cultures. Rheingold (2002) labels young mobile phone users “Tokyo thumb tribes,” in an almost alienating way. At that time, the Japanese mobile phone was also almost exclusively referred to in English-spoken research on the topic as ‘keitai’, the Japanese name for the device, as if to detach the device from the general history of mobile phones by deliberately not referring to it as such.

Yet when it comes to the history of telecommunications before 2000, Japan is completely overlooked by scholars outside of Japan, even though many early crucial steps towards mobile and wireless telecommunication technologies were made by Japanese

inventors. Engineer and historian Morishima (2006) states that Japan has always been a frontrunner when it comes to wireless communication technology, and that its advanced mobile phone technologies have a much longer history, which logically led to the invention of the advanced mobile phones of the late 1990s and 2000s. In his historical overview, Morishima (2006) lists all the Japanese inventions that contributed to the field of wireless communication throughout the 19th and 20th century. For example, in 1885, ten years before Marconi's work on long-distance radio transmissions, engineer Shida Rinzaburō already successfully experimented with wireless electromagnetic communication methods over the Sumida River in Tokyo. Furthermore, in 1912, Annaka Electric Corporation (now known as the multinational corporation Anritsu) manufactured the TYK, the world's first wireless telephone (radio telephone). As maritime transport had become increasingly crucial for the Japanese economy, there became the need to quickly be able to communicate around bay areas, which is why Annaka Electronic Corporation developed a wireless communication system not too long after the turn of the 20th century. In 1914, the first words spoken through a wireless telephone device that could cross significant distance were "Honjitsu wa seiten nari, honjitsu wa seiten nari, kochira wa Toba, kochira wa Kami-shima, Kami-shima" (Anritsu, n.d.) or, "Today's weather is clear, today's weather is clear, this is Toba, Kami Island, Kami Island". Still, these words never make it to most historical accounts. If the TYK is discussed at all, it is often only briefly mentioned in one sentence (see for example Sitaram, 1999, p. 464). In 1926, another pioneering Japanese invention contributed to wireless telecommunication: the Yagi-Uda antenna, named after its inventors Uda Shintarō and Yagi Hidetsugu. The Yagi-Uda antenna, still prominently visible

with its comb-like shape on the roofs of many houses in cities all around the world, is used for configuration for radio and television reception. It quickly became one of Japan's most important and ground-breaking inventions of the 20th century, after Yagi went to the US in 1928 to give a talk about his invention. By 1950, the antenna was used all over the world. Ironically enough, it actually played a large role in the defeat of the Japanese army in the Second World War, as the Yagi-Uda antenna was used by US troops for effective communication in the military, without the Japanese even realizing their countrymen's invention had become so popular overseas (Sato, 1991).

National Pride

There is a reason, however, that Japan was doing well in the field of radio technologies in the early 20th century – strategic imperial expansion. Yang (2010), in his historical assessment of the telecommunication technology of imperial Japan, points out that the rapid early progress and breakthroughs Japan made in the field of wireless telecommunications should be attributed to the imperial expansions that Japan undertook at the beginning of the 20th century. The early advances in the field of wireless telecommunication should therefore be seen as military developments, similar to many of the technological developments in Europe, Russia and the USA that were made around the same time. Science and technology are fields that are historically connected with military power, but telecommunication developments in particular have a history of being driven by militarist, nationalist or semi-nationalist purposes (Yang 2010). Some even argue that the underlying nationalist sentiment to develop wireless telecommunications was not only present during the early discoveries but was also present later on in the 1990s and 2000s (Hjorth, 2009, p. 91). Indeed, if we look at the current situation

of mobile phone technology, we clearly see a competition among several countries to be the first to successfully implement a 5G network - a competition that shows clear underlying techno-nationalist intentions. In their goals for the Tokyo 2020 Olympic Games, Japan pledged to be the first country to have a 5G network up and running. The country's largest mobile phone provider, NTT DoCoMo, is currently working on realizing this ambitious pledge in an international 'first-to-5G' race with, among others, South Korea's Samsung, and Sweden's Ericsson.

Although the world's leading mobile phone providers are currently all working towards realizing the world's first nation-wide 5G network, mobile phone networks have not always been globally aligned, interchangeable forms of technologies. For a long time in the late 1990s and throughout the 2000s, Japan's phones worked on a specific cellular network called Personal Digital Cellular (PDC), while Europe used a cellular system called Global System for Mobile Communications (GSM), which was ironically not a global system until very recently, and the US used so-called Code-Division Multiple Access (CDMA). Besides these, there were a plethora of other cellular network technologies used by different countries in different parts of the world. The only difference between the PDC and most other networks, was that the Japanese mobile phones only functioned on PDC, which made them unfit for export. This resulted in Japan manufacturing and catering only for the Japanese market, which caused a Japanese mobile phone 'Galapagos' effect (i.e., closed off from other countries and developing new technologies on its own). This has been called the unfortunate result of failing policies aimed at boosting the national economy (Zysman & Newman, 2006). Although it was clear that the Japanese phones from the early 2000s were extremely

advanced compared to most other countries because of their early mobile internet access, the Galapagos effect made it easy to devalue Japan's achievements by projecting a form of technological 'othering' (Morley & Robins, 1995). Although this essentially nullified Japan's physical presence on the global mobile phone device market, it is important to note, however, that Japan's *technologies* for mobile phone internet were exported and applied all over the world quite successfully (Holroyd, 2005). Perhaps the most striking aspect of the discussion on Japanese cellular technologies is that it so often goes unnoticed that Japan was actually the country that set up the first mobile phone network in 1979, the 1G network, which was put into use for the first time by NTT in Tokyo. Copying Japan's network, other countries were quick to follow; the US was actually quite late, and implemented their first 1G network only in 1983. The US has traditionally been slow to implement new cellular networks, and was also one of the last developed countries to implement 3G (Ahonen, 2009).

Conclusion

In the above, I discussed some of the Japanese contributions to the development of the wireless and mobile telecommunication technology. This article does not provide a complete overview; many of Japan's pioneering technologies have been omitted (such as the invention of mobile phone WiFi, the mobile phone camera, MMS, etc.), but the purpose of this article is not to show that Japan has a right to 'the world's first' titles in the history of mobile and wireless communication technologies. Rather, its purpose is to show how several important technological breakthroughs that came from a cultural realm outside of Europe and the US have been systematically ignored in a mobile telecommunication history 'timeline' that focuses on European and American, or in other

words, Western achievements. It is only in the 2000s that Japan received attention by English language scholars for their invention of the first successful mobile Internet system and their high-tech phones – which, in scholarly literature, were often not referred to as ‘mobile phones’, but as ‘keitai’, as if to distinguish it from other mobile phones completely. However, Japan, slowly from the mid-twentieth century onwards, is gradually recognized by the West as a country that has significant technological prowess, and it is relatively well-known that Japan had a thriving mobile phone culture in the early 2000s. Nonetheless, Japan being recognized as a player in the global history of telecommunications technology seems to be only possible under two conditions. The first is that this technological excellence is often attributed to a peculiar ‘technophile nature’. This devalues technological achievements as it dehumanizes the Japanese, and portrays them as either robotic (thus not human) or obsessed with technology. It is the continuation of a long tradition of Orientalism, which has taken on new forms in the case of Japan in the past decades. The second condition is that mobile or wireless telecommunication achievements previously made by the Japanese are often left undiscussed or only very briefly mentioned in general theories on information technology, in line with a tradition of the construction of a Euro-centric history of technology. All of this implies that the West is only selectively able to acknowledge Japan’s mastery of a powerful trait considered ‘theirs’ – science and technology. The writing of history of breakthroughs in mobile phone technology can in this regard be seen as a reflection of the West struggling to keep its most prized title of ‘master of the machines’ in an era where the fields of science and technology are increasingly rivaled by actors from outside of the West.

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