

MOBILE ACCESS AND SOCIAL CHANGE

Over the last two decades there has been a veritable explosion in the proliferation and potential of mobile technologies and services. Technological progress in the field has reduced prices and improved the performance of mobile devices, such as smart phones and tablets. As a result, these devices are now cheaper, lighter and have improved battery life, making them an increasingly integral part of society. This widespread adoption of mobile devices enables entrepreneurs to develop innovative mobile services that are able to transcend geographical borders and connect users.

Advances in mobile technology and services are serving to transform society both locally and globally. Technological developments are increasing mobile access to users irrespective of their socio-economic status or geographical location. This is becoming a reality as much in the developing world as it is in the developed world. According to the International Telecommunications Union (ITU), there are now over 5 billion wireless subscribers, and over 70% of them reside in low-middle income countries¹. Whilst barriers still remain regarding outlay costs, equity of access and signal coverage –particularly in rural areas– as well as concerns over the security implications of these new technologies, their potential for positively impacting human development is considerable.

DISSOLVING BORDERS: MOBILE TECHNOLOGY, HUMAN DEVELOPMENT AND THE ENVIRONMENT

Mobile services impact societies by dissolving geographical borders, democratizing information and eroding dependence on intermediaries and middle-men as well as the state. This trend is likely to continue as the software market for mobile applications is expected to grow strongly. According to HIS iSuppli, revenue is predicted to increase by 77.7% to \$3.8 billion by the end of the year and to \$ 8.3 billion in 2014². This level of growth shows the potential for a global market that could boost or disrupt existing industries.

Mobile technological innovation has the potential to arrest environmental degradation and biodiversity loss. By providing a locally relevant, flexible and adaptive means of environmental management, mobile services may actively engage local stakeholders. For example, one start-up company (Insight Innovation & Technology Ltd.) recently initiated a project for forest protection. Using a network of sensors distributed throughout a forest, the project enables authorities to prevent and track fires³. The sensors provide real-time data and significantly improve potential response times. Another recent application enhances environmental conservation efforts in Western Africa. By using mobile data capture technology, a team of researchers from the North Carolina Zoological Park tracks various data on endangered species such as primates and elephants. This allows them to track and study the species' populations and distributions to improve prevention measures⁴.

The global health industry is another key industry that may benefit from mobile innovations. The availability of accurate, timely information on epidemics and outbreaks is often key to their detection, prevention and treatment. A recent project in Botswana, for instance, enables medical staff to follow information on malaria outbreaks. The project initiator (Hewlett Packard) provides medical staff with smart phones that collect information concerning malaria outbreaks. Medical staff can then access an analysis of the data in graph or chart format to make informed decisions on preventive measures when signs of outbreaks appear.

Furthermore, while in developed countries being able to access financial services via your mobile phone represents just another alternative, in underdeveloped states it can be of vital importance. In regions with people with limited income ranges formal financial services are often inaccessible. A recent development, Mobile Money, addresses this issue by enabling users

SCANNING EMERGING ISSUES OF THE FUTURE: FOCUS AND METHOD

SCANNING EMERGING ISSUES OF THE FUTURE are a series of briefs produced by the Strategy & Change Program. The briefs in the series identify emerging strategic issues that are relevant for the four themes of S&C: security, technology & innovation, economy & society, and sustainable development (see strategyandchange.nl/).

For each of these issues, we explore policy implications across the four themes. To identify these issues, Strategy & Change employs an innovative approach analyzing a wealth of forward looking resources available the Internet. This process is supported by *Leximancer* text mining software. For a full description of the methodology, please see strategyandchange.nl.

to access and transfer money using their mobile phone, effectively circumventing ATM machines or shady middle-men. Initially developed for dissemination of microfinance funding, this software service turns mobile phones into cash accounts⁵. These mobile payments are gaining in popularity, according to Pyramid Research, by 2015 the total value of mobile money transfers in Africa alone will exceed US \$200 billion⁶.

The aforementioned examples signify a critical potential implication of mobile technology and services. By circumventing the usual constraints of geography and time, mobile access helps redress information asymmetry and provides typically marginalized groups –such as the rural poor– with greater access to the market and up to date information. For instance, the Mobile Money project helped facilitate remittance transfers to rural areas by allowing subscribers to bypass costly –and frequently unavailable– banking services. Furthermore, mobile services provide up-to-date market information and allow producers to access accurate data on commodity prices without needing to trust middle-men. These impacts have demonstrable socio-economic consequences with one recent study even reporting that for every increase of ten mobile handsets per 100 people in a developing country, GDP growth per person is increased by 0.8 percentage points⁷.

POLICY IMPLICATIONS

Security and privacy

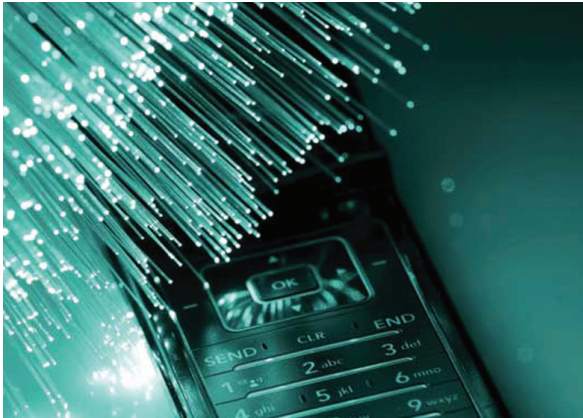
The proliferation of mobile access and services has enhanced the capacity for both intentional and

unintentional security threats, including the theft or misuse of information, unauthorized destruction or modification of data, or spread of illicit materials. For example in May 2010, investigators reported that Google Inc. was collecting information from unsecured wireless networks as its vehicles roamed residential streets. The company was accused of unlawfully harvesting data including emails, passwords and website addresses during the creation of its Street View maps⁸, indicating the potential for a new era of privacy challenges.

Politics

The increase in mobile access and services present new challenges to governments and the societies they represent. The internet may be considered a digital environment in anarchy. Consequently, the lack of an authoritative narrative allows for the easy spread of propaganda and misinformation. This makes it difficult for important political messages to reach the general public.

However, as a channel for the growing influence of (mobile) social networking, mobile services may also facilitate processes of democratization by providing greater transparency and accountability⁹. First, in a recent article in The Economist, Kaushik Basu, the chief economic adviser to India's finance ministry, argues that online financial transactions reduces contact with officials and therefore could decrease chances for corruption¹⁰. Second, social applications (e.g. Facebook or Twitter) have made it increasingly difficult for governments and security services to engage in oppressive behavior. People can now more easily



exercise their political voice and organize collective action. This new political force recently revealed its true strength in Cairo when in 2011 former Egyptian president Hosni Mubarak was forced to resign after mass protests orchestrated largely through social applications.

Conversely, the growing popularity of mobile (social) services also led governments to consider their own regulation policies to protect state interests. Whilst government interference in internet regulation is more salient in oppressive regimes, such as the recent blocking of internet access in the Middle-East, they may be found in any state. The Echelon network in the United States and China's Great Firewall (also known as the Golden Shield project), both serve as examples of governments employing the internet as a tool of power and control¹¹. These developments for the online domain have not yet fully matured, but it requires just few high-profile cyber incidents before politicians are able to exploit public concerns.

Mobile Minerals

The benefits of mobile technology are noteworthy, but the increased production and consumption of the technology raises other concerns. Innovations that allow for longer battery life and greater functionality, for example, rely increasingly on scarce resources such as rare-earth metals. Extracting these minerals is not only energy intensive and damaging for the environment but is also politically sensitive. Many deposits for materials such as Coltan are located in fragile, conflict prone states such as the Democratic Republic of Congo, and form a key factor in sustaining belligerent groups and fuelling environmental degradation¹². Furthermore, rapid developments in the field generally increase the rate at which consumers

choose to upgrade, generating concerns for disposal and waste management. Current recycling rates remain low, with estimates suggesting that only 13.6% of consumer electronics in the USA were recycled in 2008¹³.

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HCSS, LANGE VOORHOUT 16, 2514 EE DEN HAAG
T: +31 (0)70-3184840 E: INFO@HCSS.NL
W: STRATEGYANDCHANGE.NL