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"Growth of the gadget":

An Introduction to the Rise of Mobile Devices and its Impact on the Business World.

In 2011, for the first time, global sales of (advanced) mobile phones exceeded those of personal computers (PCs) – a major technological shift predicted by Steve Jobs in June 2010,[1] and from which there will be no turning-back. In a graph entitled "Growth of the Gadget" which illustrates this trend, *The Economist* reveals that close to 500 million mobile devices were shipped in 2011, 100 million more than desktop and laptop computers together.[2] *The Economist*'s figures only take into account smartphones (not ordinary mobile phones or "features phones") and tablet computers, also considered as mobile devices. While still in their infancy, tablet sales nonetheless added up to 40 million for Apple's iPads alone in 2011.[3] *The Economist*, based on reliable industry sources, expects the combined sales of smartphones and tablets to be double those of PCs by 2013. The total shipments of mobile phones in 2011 actually amounted to over 1.5 billion.[4]

Around the world, the number of mobile phone users has soared in the last few years. 5.9 billion mobile cellular subscriptions around the world, including 4.5 billion in emerging countries: these are the striking figures unveiled by the International Communications Union for 2011.[5] The penetration rate is now well over 100% in developed countries while the developing world is catching up fast, with a 79% penetration rate overall.[6] After much talk about "the digital gap" between rich and poor countries during the first Internet revolution and the PC revolution, this time round the developing world is not being left behind. 30% of the world's mobile phone users live in China and India. Mobile phone penetration in India is expected to reach 97% by 2014.[7] Only Africa is lagging behind at 53%, but rising.[8] All the signs are there to show that emerging countries are skipping the PC revolution and

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[1] In a 90-minute interview granted to Kara Swisher and Walt Mossberg at the "D8: All things digital" executive conference organized by the Wall Street Journal in June 1-3, 2010 (Rancho Palos Verdes, California), Jobs talked of the post-PC era when only "one out of x people" would actually need a PC. A summary of the discussion is available online: 3 March 2012 <http://news.cnet.com/8301-13860_3-20006526-56.html>

[2] "Growth of the gadget," Special Report on Personal Technology, *The Economist* 8 Oct. 2011: 4.

[3] Figures released by Apple.

[4] MobiThinking, "Global mobile statistics 2012." 3 March 2012 <http://mobithinking.com/mobile-marketing-tools/latest-mobile-stats>

[5] MobiThinking, "Global mobile statistics 2012."

[6] MobiThinking, "Global mobile statistics 2012."

[7] IHS iSuppli. 3 March 2012 <http://www.isuppli.com/Mobile-and-Wireless-Communications/News/Pages/India-Cell-Phone-Penetration-to-Reach-97-Percent-in-2014.aspx>

[8] International Communications Union, "The mobile penetration divide". 6 March 2012 <http://techie-buzz.com/mobile-news/mobile-phone-penetration-across-the-world-infographic.html>

moving straight onto the mobile revolution as mobile devices, including entry-level smartphones and even tablets, become more and more affordable for a larger proportion of the world's population:[1]

> Earlier this year, the Chinese firm Huawei unveiled IDEOS through Kenya's telecom titan, Safaricom. So far, this $80 smartphone has found its way into the hands of 350,000+ Kenyans, an impressive sales number in a country where 40% of the population lives on less than two dollars a day.[2]

Mobile devices do not require major computing skills but are powerful enough to handle more and more tasks previously reserved to PCs. Smartphones and tablets have the capability to access the Internet without a physical connection, but other phones are also web-enabled. Mobile networks, with Internet connectivity, are developing quickly around the world and covering areas where fixed telephone lines remain non-existent and will probably never be built. Many emerging countries now have 3G access[3] available in some areas and "mobile", as industry specialists call it, is fast becoming the number one way of connecting to the Internet around the world. Already in advanced countries such as the USA, up to 25% of the population uses only their smartphones to browse the web. With flagship firms like Apple driving innovation – and desire – among consumers, with globalised supply chains enabling manufacturers to produce devices at an ever-lower cost,[4] and with other complementary technological offers such as "cloud" solutions for companies and individuals,[5] it is expected that by 2015, more people will be using the mobile web than a fixed broadband connection. By 2020, there should be 10 billion mobile connected devices in the world.[6]

Almost thirty years after the first commercial mobile phone call was made in 1983 on a Motorola DynaTAC handset measuring 25 centimetres, weighing over a kilogram and costing close to $4,000, no-one can doubt that almost every aspect of our lives, across age groups, cultures, and continents, is or will be impacted in some way by the mobile revolution currently under way. In turn, it will soon be

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[1] Gartner, an IT research firm, forecasts that 1.1bn smartphones will be in use by 2015, with some of them costing only $75. "If we take today's top phones with a 3.5in screen, 3G, Wi-Fi, 8-megapixel camera, full web browser – that kind of phone will cost only $10 to sell profitably in ten years" according to Tomi Ahonen, a former Nokia executive, now head of his own mobile industry consultancy. Charles Arthur, "How the smartphone is killing the PC," *The Guardian* 5 June 2011. 5 March 2012 <http://www.guardian.co.uk/technology/2011/jun/05/smartphones-killing-pc>

[2] Tim Worstall, "Africa might just skip the entire PC revolution," Forbes 17 August 2011. 5 March 2012 <http://www.forbes.com/sites/timworstall/2011/08/17/africa-might-just-skip-the-entire-pc-revolution/>

[3] 3G is the fastest mobile broadband network currently widely available in the developed world. Most handsets currently sold have can access 3G. 4G networks, also described as LTE, are even faster and already exist, but have limited geographical coverage at present, in some areas of the USA, in Stockholm, and in Oslo for instance.

[4] It is a misconception that Apple iPhones and iPads are the number one selling mobile devices. Apple has so far followed a high-end policy. Nokia and Samsung are far ahead in terms of device shipments around the world. 5 March 2012 <http://mobithinking.com/mobile-marketing-tools/latest-mobile-stats>

[5] "Cloud", or the cloud, is defined in different ways but can be understood more or less as the Internet: one talks about cloud-based servers, and cloud computing, which means that the storage and the servers are online, and not in a physical server or PC at home or in the company. The idea is to be able to back up your data online, to access it from any Internet-connected device anywhere in the world, and potentially to share it with others. Some common ways of using the cloud are Internet-based email and photo sharing sites online for instance.

[6] "Growth of the gadget," *The Economist* 8 Oct. 2011: 4.

virtually impossible for any company to expand without asking the question of mobile, regardless of economic sectors and types of products or services. Mobile users are a huge pool of potential consumers that cannot be ignored or engaged in the same way as other consumers. New habits have developed and expectations are constantly shifting as new devices are commercialised and offer new possibilities. Mobile affects all aspects of sales and marketing, communication, logistics… While some companies are trying to adapt, others are set up specifically to meet the consumers' new demands or to help other businesses take advantage of the mobile revolution. In short, mobile is relevant for companies involved in what is described as mobile commerce or m-commerce – selling goods or services via mobile terminals – but it is also a new media to reach audiences even when no products are actually sold over the mobile terminal, and a tool that can help companies in many different sectors.

While mobile is creating opportunities, it is also challenging organisations. A key issue is that of skills. Technical skills of course – IT students can expect smooth career paths if they choose the mobile industry. But beyond those who invent new devices, design apps, imagine new functions, most white-collar workers should expect to be confronted sooner or later to mobile in some way or another. We may get the impression that mobile devices are everywhere, and that everyone masters their uses, but companies still have a long way to go to make full use of their potential. Companies have to train their workers. Education institutions have to prepare their future graduates. For business students especially, it is becoming increasingly critical to have some knowledge of mobile devices and technologies, and to possess an understanding of how they can be leveraged for the benefit of the business.

With all this in mind, and with a view to gaining an insight into the opportunities and challenges related to the mobile revolution for companies and workers, we will focus here essentially on why and how the rise of mobile devices is forcing companies to change both the way they manage, train and recruit staff, and the way they do business.

In the wake of mobile technology itself, people's habits have changed profoundly. Most workers today are also mobile users, at least in rich countries, and they do not shed their mobile habits when they step into the workplace. Quite the opposite. The scale of their addiction to mobile devices means companies have or will have to review their information technology (IT) and human resources (HR) policies.

A key characteristic of the current mobile revolution is that, essentially, individuals are driving it. This trend is described by *The Economist* as "the consumerisation of IT:"[1]

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[1] "Growth of the gadget," *The Economist* 8 Oct. 2011: 4.

> For years many of the most exciting technological advances in personal computing have come from the armed forces, large research centres or big businesses that focused mainly on corporate customers. […] Over the past ten years of so, however, the consumer market has become a hotbed of innovation in its own right.[] Many exciting developments in information technology (IT) are appearing in the hands of consumers first and only then making their way into other arenas – a trend that tech types refer to as "the consumerisation" of IT.[1]

Mobile phones have become indispensable to most people in rich countries. Considering the rate of adoption of cell phones in the developing world, there is little doubt that this is the shape of things to come in a few years for most countries around the world. It is still too early to tell what the future of tablets will be like, but it looks promising too. In places like France or the United Kingdom, it already seems difficult to remember an age when people had no mobiles. Teenagers, sometimes even children, have them. A survey published in 2009 in the UK found that British children get their first cell phone on average at the age of 8 and that three quarters of children aged 7-15 own at least one mobile phone.[2] And these are old statistics in such a fast-moving industry.

Phones are mostly used for calls and text messaging. A few figures demonstrate the scale of the addiction to text messaging. It was calculated that over one billion text messages were sent over the New Year in 2012… in France alone,[3] and that 8 trillion text messages were sent throughout the world in 2011.[4] In America, one in three cell-owning teenager sends more than 100 text messages a day, one in two sends more than 50, and 15% actually send more than 200.[5] Beyond SMS, a new world of possibilities has opened to both teenagers and adults since the introduction of smartphones. The SMS addiction remains and is complemented by "sticky applications"[6] such as Facebook and the permanent availability of a web browser. Smartphones can also hold a vast amount of personal data: contacts, email history, sometimes passwords, house and health insurance, banking details, calendars…   In short, phones (and tablets now) have become all-in-one tools which offer solutions to almost any problem. They are intimate items, portable and held in the hand, repositories which contain someone's entire life details, and that users can customise to suit their needs. It is what *The Economist* describes as "the shift from personal to personalised computing,"[7] which provides most of the explanation for the current addiction to mobile devices. "Nomophobia" – short for "no mobile phone phobia" or the fear of being with no mobile phone – has become a subject of research for statisticians, who

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[1] "Growth of the gadget," *The Economist* 8 Oct. 2011: 4.

[2] Stephen Adams, "Children get first mobile phone at average age of eight," *The Telegraph* 18 February 2009.

[3] By the three main mobile carriers in France. Benjamin Ferran, "Nouvel An: le SMS résiste aux réseaux sociaux en France," *Le Figaro* 3 January 2012.

[4] MobiThinking, "Global mobile statistics 2012."

[5] "Teens and mobile phones," Pew Research Center in the USA (20 April, 2010). 3 March 2012 <http://pewinternet.org/~/media//Files/Reports/2010/PIP-Teens-and-Mobile-2010-with-topline.pdf>

[6] A "sticky app" is a smartphone application which is addictive. The user will go back to the app several times a day. According to research, some users will look up their Facebook page on their phone more than 30 times a day.

[7] "The Power of Many," *The Economist* 8 Oct. 2011: 5.

discovered, for instance, that 66% of the British population suffer from this psychological condition in 2012, up from 53% in 2008, and that 41% attempt to protect themselves by owning two phones or more. Interestingly, these percentages also show that the over-55 are the third most "nomophobic" group behind the 18-24 and the 25-34 ages groups.[1]

Mobile owners are less and less willing to leave their personal devices behind or to switch them off when they go to the office. Ideally, most white-collar workers would even like to use their own device for work as well as in their personal lives. Known as the "BYOC" or "Bring your own computer" trend a year ago, this is being described now as the "BYOD" or "Bring your own device" trend now in order to include tablet computers.[2] *The Economist* published a survey which showed that personal devices were used by 40.7% of workers to access business applications in 2011, up from 30.7% in 2010. "People are demanding to use their own gadgets in their jobs. Trying to thwart them is futile" runs the sub-headline of the article.[3] Given that on joining a company, the two objects many workers receive nowadays are a phone and one, sometimes even two, computers (a desktop and a laptop), the BYOD trend clashes with well-established corporate practices. Several good reasons drive companies' IT departments to push their own choice of devices onto their staff. In terms of cost, buying in bulk is cheaper for firms than to give each employee their own choice of equipment. After-sales servicing and general maintenance are more straightforward than when trying to work with a large number of different models. For security purposes, it also makes sense for a company to keep track of the devices their staff works with, and to bolster them up with anti-virus and anti-spyware software. Yet, the technology used in companies often lags behind what workers have in hand in their personal lives and a survey carried out by networks and communications company Cisco showed that 40% of college students and 45% of employees would accept a lower-paying job in exchange for the possibility to bring their own device to work.[4]

The BYOD trend is reinforced by – but not entirely due to – the arrival on the job market of the so-called "digital natives", also known as the Net Generation, the Millennials or "Generation Y", that is to say the 15-30 or 17-34 years-olds (depending on definitions) who have literally grown up with the Internet and a computer and who are now well-used to touchscreen devices, smartphone applications, and social networking. Obviously, this is a wide generalisation about a very diverse age group, in which some individuals are actually not interested in IT and others have never had the

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[1] According to a survey published on 16 February 2012 by SecurEnvoy, a company that provides solutions to increase user online security. The survey was widely relayed in the general press both in the United Kingdom and abroad. Deborah Netburn, "Nomophobia – fear of being without your phone – is on the rise," *The Los Angeles Times* 14 Feb. 2012. 3 March 2012 <http://www.latimes.com/business/technology/la-fi-tn-nomophobia-on-the-rise-20120216,0,2865154.story>
[2] Fiona Graham, "BYOD : Bring your own device could spell end for work PC," BBC News 14 February 2012. 3 March 2012 <http://www.bbc.co.uk/news/business-17017570>
[3] "IT's Arab Spring," *The Economist* 8 Oct. 2011:8.
[4] "BYOD : Bring your own device could spell end for work PC," BBC News.

chance, or the money, to manipulate a touchscreen smartphone or a tablet. Let's say that a high percentage of that age group, in developed countries, corresponds to the definition or will in a few years. Those youngsters have difficulties dealing with "older" technology and abiding by the complex procedures sometimes in place to regulate the use of IT in firms, but those who have already joined the workforce do not consider it as an issue to be connected after hours – this is how they live. Gone are the days of the "work-life balance" debate, when the smartphone was denounced as the latest means to enslave workers and invade their private lives. For the Millennials, the focus is on flexibility and immediacy. Having only one device for work and play is the simple way of doing things.[1]

As a result, "companies need to make decisions about how they are going to handle employee demands to use their own devices, or risk devices being used on the network without their knowledge."[2] This is a difficult problem for firms, which they are having to address now. There are three aspects to it. One is security. Are employers going to let employees use their own devices, and if yes, how are they going to protect the company data? A second issue is cost-related. Should they let each individual manage the maintenance of their device? Who pays for the device in the first place? For the subscription? And the third problem is the separation between work and personal life. If the same device is used in both contexts, how are employers going to regulate its use, for example, can they prevent an employee from accessing a personal app on a work/personal mobile during work hours? Judging from the level of security and the amount of IT training that new employees must sometimes go through before they can actually start work, many firms have a long and difficult road ahead to adapt to employees' new demands. However, preventing workers from using their own devices sounds more and more like an obsolete option. Andrew Jaquith of Forrester Research says that companies in the USA are currently in the "bargaining" phase with employees, which is usually the last stage before a novelty is accepted.[3]

If they want to play an active and informed part in this process, managers need to possess a certain level of understanding of the mobile technologies. If they do not have it, they need to acquire it. Interestingly, a good number of press articles focus on how critical it is for employees but also for CEOs to be up-to-date on technology. *Business Week* magazine online is currently running a series of

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[1] A survey recently carried out in France confirms this. Interviewed about the use of smartphones (and laptops) for work, workers under the age of 30 tended to say that the new technologies make life easier for them both at work and at home. They feel they have to be permanently connected, but they find it easier to take their minds off work compared to older workers who are also connected. Workers over 50 often switch off their devices after work hours, and yet, they declared they found it difficult to stop thinking about work. "Les Effets du travail sur la vie privée," enquête Technologia/UMC (mars 2012) published by *Le Parisien* online on March 6, 2012. Available only for subscribers after this date.

[2] "BYOD: Bring your own device could spell end for work PC," BBC News.

[3] "Mobile apps in the workplace," *Business Week* 1 Nov. 2010. This podcast is an interview of Andrew Jaquith, Senior Analyst at Forrester Research and author of a report on the post-PC era.

podcasts aimed specifically at CEOs and entitled "The CEO guide to technology – a monthly primer on the innovations impacting top execs". Topics tackled so far have ranged from "Corporate Cloud Computing," "Bringing iPads to work," "The virtual workplace," "Microblogging for businesses" to "The post-PC era" and "DIY apps at work".[1] There is a need and a demand for such coaching on the part of the targeted audience, also partly because the digital natives are joining the workforce at the moment. Everything about these new entrants into the workforce seems to be new and different, so much so that many studies strive to define what pleases or hampers them and to give clues to how best exploit their strengths and integrate them into the company staff:[2]

> "This new generation is well-known for its unrestrained ambition, but its largely unparalleled handle on technology presents a significant management challenge," he [James Callander, managing director of recruitment consultancy FrechMinds] says. "I think one of the biggest problems is that older members of the workforce feel scared of looking foolish in the face of new technology and are threatened by these younger peers who seem to hold all the cards." He observes two common approaches to tackling this challenge. "The first is almost a 'divide and conquer' approach, consigning technology to different divisions or units in the business. But the internet and mobile technology is now so all-encompassing ... that separation is all but impossible. The second and better approach is to encourage younger workers to train and enfranchise their older colleagues." In principle, that makes good sense, because while they may be reluctant to admit it, older business leaders have much to learn from their younger co-workers, says Urs Gasser, executive director at the Berkman Center for Internet and Society at Harvard University and co-author of *Born Digital: Understanding the First Generation of Digital Natives*.[3]

While it may not be easy to understand the digital natives, on the other hand their skills are in high demand. Companies need to recruit them simply because they are best able to understand and to cash in on the new trends in society at large. Today, it is a plus for workers to be fluent in the use of the new mobile technologies and all their applications for business. Tomorrow, workers will not be recruited unless they have these skills, and young workers who are not familiar with mobile devices will suffer more. The workforce today gathers three different generations: the baby-boomers, who are slowly retiring, the so-called "Generation X", and the incoming "Ys". For firms of all sizes, recruiting young, technology-savvy employees is not sufficient to adapt to a new business environment in which mobile technologies are key. The staff already in employment needs to be trained too, and not least the CEOs themselves. In October 2011, *The Financial Times* published an article summing up the findings of surveys about CEOs and technology. CEOs' level of understanding of the new technologies was reported to be insufficient, with serious consequences for the firms they head: "Chief executives who don't think about technology, make it appear unimportant to their management teams, who may then

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[1] 3 March 2012 <http://www.businessweek.com/mediacenter/podcasts/guide_to_tech/current.html>

[2] See for example Gaëlle Hameury-Lemoine, *Le Coaching pour intégrer la génération Y au travail*, Mémoire de Certification (Nancy Metz : ICN Business School, 2010) 10. Also: "Motivation – crédo générationnel. La génération Y bouleverse les standards de la motivation en entreprise," *Le Nouvel Economiste* 2 February 2012. 3 March 2012 <http://www.lenouveleconomiste.fr/lesdossiers/motivation-credo-generationnel-13565/>

[3] Jessica Twentyman, "Skills: Business must Learn from the New Tribe," *The Financial Times* May 28, 2009. 3 March 2012 <http://www.ft.com/cms/s/0/497a9870-4a54-11de-8e7e-00144feabdc0.html#axzz1oM87Xs8L>

marginalise it. This can leave the organisation vulnerable to attacks by new business models."[1] Owning an iPad, comments Ade McCormack in another *Financial Times* article published in the "Connected Business" column, does not make you a "digital leader" and business leaders need to "be on top of the current technological trends that are influencing business models and markets."[2]

Mobile users are not only workers influencing the way organisations are changing internally, especially in their IT policies and their recruitment and training practices. They are also consumers. As such, they are a major driving force. They are demanding new services on their mobile terminals. These can be smartphones or tablets, but many simple mobile technologies like SMS messaging can also be used to provide or access mobile services or products. Considering the soaring number of mobile users, it is clear that in the very near future, not using mobile, not going mobile, or not being "mobile-enabled", will simply not be an option anymore, especially for companies involved in sales, be it of products, services or content. The demand for mobile devices is such in society at large that it is forcing existing businesses to come up with new products and services, and sometimes to change their business models or revamp their strategies. It is also opening up new fields. Once again, mobile users themselves are pushing the trend rather than companies. In a "B2C"[3] context, companies which fail to adapt risk losing out in terms of sales and opportunities.

After the era of "e-business" (business over the internet), which is still growing strongly, the future now lies in "m-business", that is to say business via mobile terminals. Firms need to ask a central question: what does mobile really change? How different is mobile from other sales or marketing channels, and especially websites? Is m-commerce not just like e-commerce gone mobile?

> To many people, m-commerce is a natural extension of e-commerce, the selling of stuff on the web moving to the mobile channel. In its basic form that is exactly what m-commerce is. As mobile phones have become more like wireless computers, so the difference between what constitutes m- and e-commerce has become a grey area.[4]

Yet, for a consumer, there are two major differences between shopping from a computer, and shopping via a mobile terminal: the size of the screen, especially on phones but also to a lesser extent on tablets, and the personal, if not intimate, nature of the devices. Furthermore, consumers have developed a very different set of expectations on mobiles. It is a mistake for companies to consider a mobile phone or tablet as just another Internet-enabled device. Businesses who really want to take advantage of the mobile revolution need to change the way they engage their customers. We will focus

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[1] Paul Taylor, "Vital for CEOs to understand technology," [*The Financial Times*] *Gulf News* 29 October 2011.
[2] Ade McCormack, "Don't you get IT?" *The Financial Times* 20 October 2011.
[3] Business to customers: the case when a company sells to individual consumers, not to other businesses.
[4] Paul Skeldon, *M-Commerce – Boost your business with the power of mobile commerce* (Richmond: Crimson, 2011) 4.

here mostly on sales and marketing in a B2C environment and show what the consumers' expectations are and how companies can adapt their strategies.

The first key expectation, probably the most obvious one, is simplicity of use, convenience and speed. This is why consumers have their mobile phones or tablets. Those devices can be switched on almost instantaneously – in fact, more to the point, many users never actually switch them off. They can be used "anytime, anywhere", as one of the mobile industry's favourite phrases goes. It is not enough though: if the desired piece of information is not available at the tip – or tap – of the users' fingers, the company – whatever its products or services – will lose customers. On ordinary mobile phones, users can send an SMS to a specific phone number and receive in exchange, within seconds, services like the weather forecast, or contents such as a new ringtone for their phone. On smartphones, websites that are not mobile-enabled are often illegible and slow to upload, which sends users straight over to the competition and gives a poor image of the brand. For companies this means they need to optimise their websites so they have a mobile version that fits the screen of a phone or tablet. The best websites automatically detect use from a mobile terminal and redirect users to the mobile version of the site. The alternative is to write an application or "app," that is to say bite-sized software designed specifically for smartphones, which can be downloaded for free or at a cost, and which then enables the user to avoid the web altogether when wanting to access a website.[1]

Examples of mobile-optimised websites include those of airlines: on the Air France mobile website, launched in 2006 and recently upgraded, users can now get information in real time, purchase tickets, check in and receive a boarding pass on their mobile device. News websites often have a mobile version as well, which is essentially a streamlined page with only the headlines, less images, and links rather than text. Some newspapers also offer apps, usually to their subscribers – *The Economist* for instance. On February 2, 2011, among much publicity, Rupert Murdoch even launched an iPad-only newspaper, *The Daily*, investing £18.6m into this venture. He wrote in the first editorial of the newspaper that "new times demand new journalism."[2] The vision is that soon enough, people will not buy paper magazines anymore. If Amazon's figures for the sales of its e-books are anything to go by, the trend towards less paper and more electronic publications is well on its way already.[3] The giants of e-commerce were among the first to set up mobile websites, so much so that Amazon and eBay are currently among the top mobile retailers. Already in 2009, Amazon's total sales on the

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[1] Some apps, however, are not gateways to websites *per se*. They could be dictionaries for instance, or databases or recipes, or tools such as notepads, or games, etc.

[2] Ian Betteridge, "The Daily : a review of Murdoch's iPad newspaper," *The Guardian* 2 February 2011. 3 March 2012 <http://www.guardian.co.uk/media/2011/feb/02/murdoch-daily-ipad-newspaper-review>

[3] In 2011, Amazon announced that for the first time, it was selling more e-books than paper books on its website. Claire Cain Miller and Julie Bosman, "E-books outsell print books at Amazon," *The New York Times* 19 May 2011. 5 March 2012 <http://www.nytimes.com/2011/05/20/technology/20amazon.html>

mobile website amounted to \$1bn. Their net sales worldwide totalled \$24.51bn[1] and the mobile segment is expected to grow dramatically. Their mobile site now includes a "Price Check" app in which consumers can scan a bar code in a shop and search for better prices for the same item. This also helps Amazon collect information about competitors…

Those companies that offer mobile websites tend to get good return on investment. In 2010, when online betting became legal in France, PMU launched a mobile site. As a result, by June 2011, it was registering 300,000 bets per month on that site only. It has recently launched a site for tablets.[2] Baby-gaga.com, an online publisher for educational materials and support for pregnant women, saw a 64% increase in mobile visits within two weeks after the launch of their mobile-enabled site, as well as a 50% rise in their mobile revenue, which is generated classically by advertising: users were viewing more pages.[3] Worldwide, m-commerce (strictly understood as the purchasing of goods and services via a mobile phone or tablet) is predicted to reach \$119bn in 2015, which is 8% of the total e-commerce market.[4] With the fast rise of smartphones – already 16% of the world's mobile subscriptions and close to 40% in advanced countries – the percentage might grow more quickly than expected. Already in 2012, 34% of Americans, 30% of Britons, 24% of French people, 27% of German people, and 40% of Japanese people declare they have already purchased a product or a service over the Internet with their smartphones. Yet, 79% of top advertisers in Google do not have a mobile-optimised website.[5]

As for apps, they can also be of real interest to reach consumers in many different industries, not just retail. Apple's AppStore alone recently announced they had reached 25 billion downloads… Domino's Pizza, a large chain of franchised take-away restaurants, now has an app which lets users read the menu, find the closest restaurant thanks to location services, get discount vouchers, order and then follow their order as it is being prepared. After the purchase, the app also remembers the customer's information for the next visit. Domino's say their combined online and mobile orders now

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[1] "Amazon will pay shoppers \$5 to walk out of stores empty-handed," All things D website 6 Dec. 2011. 3 March 2012 <http://allthingsd.com/20111206/amazon-will-pay-shoppers-5-to-walk-out-of-stores-empty-handed/>

[2] *Stratégies* 1637 (9 June 2011): 12.

[3] Google, "Baby Gaga boosts Mobile Visits 64% with new Mobile Site," 2012. 6 March 2012 <http://www.howtogomo.com/images/_cms/en/BabyGaga_CaseStudy.pdf>

[4] Figures released in 2010 by ABI Research, a market intelligence company.

[5] Both results are from a survey carried out by Google in 2012: "We recently conducted a study that examined the mobile post-click experience of some of our largest advertisers. After looking at over 200 diagnostic points to measure 'mobile readiness,' including load time, device detection and mobile site optimization, we found that only 21% of Google's largest advertisers have a website that is optimized for mobile. That's 79% serving up a less than ideal experience for their mobile customers." "Getting mobile ready," Google Mobile Ads Blog March 22, 2011. 5 March 2012 <http://googlemobileads.blogspot.com/2011/03/getting-mobile-ready-part-1-creating.html>

amount to 30% of all orders.[1] Daily deals site Groupon has recently reported that in December 2011, 25% of its deals were purchased through its app on a mobile platform.[2]

At this point in time, most people still use other devices, mobile or not, as well as their phones. For them, practicality and simplicity also include a "seamless" experience and companies need to make sure they can provide it when selling their products. Customers want to find the same apps, the same links, the same coupons, etc., on all their devices without having to carry out the searches again or to download anything manually. For instance, Amazon, once you have identified yourself, will remember your basket on your mobile and on the Internet. If you search for a book and place it in the cart on your mobile but prefer to buy from your home computer, it is an easy move. Another common case is the fact that you can have an app on your iPhone and on your iPad, and when you update the content on either of these two devices, or even on a PC, you will then find the same content everywhere, updated automatically. "Google Docs" for instance, lets you upload documents on the website, and view them through the mobile app on your phone or tablet without any further move on your part. "Google Calendar" can synchronise with your smartphone calendar if you wish to: you have nothing to do once you have set this up. The automatic synchronisation of data across various terminals is one of the wonders of the "cloud", which was described by Steve Jobs as the new centre of our digital lives when he introduced iCloud, Apple's cloud computing service, in 2011. It is not only possible with iCloud, but also with many other cloud computing solutions.

A seamless experience between multiple devices is essential but consumers are also eager to have more and more possibilities open to them on their favourite device, the one they carry all the time, namely their phone or tablet. It makes sense for them to use that device to its full potential. Many companies are vying to satisfy the demand and to find a niche in the market. We will give just a few striking examples. There is much hype about "mobile money" for instance. Beyond mobile banking, which is developing along with security, and mobile money transfers, which do not necessitate a smartphone and are particularly popular in emerging countries,[3] now full payment through mobile phones is taking off in Europe and the United States. It has existed in Asia for many years. It involves simple technology: a chip in the phone, called NFC (near field communication) chip, and a terminal in a shop. The user just waves the phone close to the terminal, and the payment goes through instantly, debited straight from their phone bill, their credit card, or a prepaid debit card. It is the same system as the chips used in travel cards such as Oyster in London or Navigo Pass in Paris. This "contactless payment" system is being pioneered and tested in the French cities of Nice and Strasbourg at the

[1] Rimma Kats, "Domino's Pizza continues mobile ordering push with Android app," *Mobile Business Daily* 29 February 2012. 5 March 2012 <http://www.mobilecommercedaily.com/2012/02/29/domino%E2%80%99s-pizza-continues-mobile-ordering-push-with-android-app>
[2] *Mobile Business Daily* 29 February 2012.
[3] Workers who send remittances to their families back home can do so over a mobile phone. They money is received on a mobile phone at home, and the family can then get the money from a bank.

moment, with Citizi.[1] Mobile users can use the public transport system or pay in shops, and their mobiles can also store loyalty cards. It is becoming an electronic wallet of sorts. The same product has been recently released by Google in the USA.[2] This has led firms in the field, like Lemon Way[3] in France, to predict the fast development of contactless payment and electronic wallets now that the product is being marketed by Google.[4]

A second example of a useful feature on mobiles is bar code recognition, which is available on many types of web-enabled phones equipped with cameras. It can be used in different ways. The face of retailing, for instance, is being changed beyond all recognition at the moment, slowly but surely. In shops, customers can now be savvy consumers all thanks to their phones: compare prices while they are shopping, get information on a product, receive a marketing coupon with a relevant discount, and even in the shop of the future, scan the items as they put them into the trolley for immediate payment at the checkout, with their phones.[5] Very often, bar codes come under a new format: the QR code ("quick response" code, also called 2D code), which is a white square containing black designs. They can be read thanks to a QR reader on a smartphone or a mobile phone. This type of code enables much more information to be added than a simple bar code. QR codes can contain text (the description of a painting in a museum, information about a product, etc.), numbers (a phone number to call, a business card to add straight into your contacts), websites... Retailers or wholesalers can use bar codes to check stocks and to order new products. Bar code recognition also has less commercial purposes: identifying a product and checking it is genuine is particularly vital in emerging countries. In Africa for instance, the United Nations estimates that up to 50% of all malaria tablets are fake, 15-30% in Asia. Scanning a code on the pack of tablets can help confirm that they are not counterfeit.

To give one last example of the many possibilities offered by mobiles today, "mobile health" – providing health care / patient data / health information over a mobile phone – is a booming sector. It holds good potential for companies that are looking at mobile and great benefits for individuals.

> Since our first mHealth report was published last year, the growth in this market has greatly accelerated. The main drivers for this growth have been the increase in the smartphone user base on the demand side, and the doubling of the number of mHealth applications on the supply side. A majority of the major healthcare companies have discovered mHealth applications as an innovative way to promote and deliver healthcare services and products. A testament to this is that a number of these large players published mHealth apps in 2011 that go far beyond a simple allergy tracker or pill reminder, e.g. Sanofi Aventis'

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[1] See the website at <www.cityzi.fr>

[2] 5 March 2012 <http://www.google.com/wallet/>. This is the video demonstrating the product.

[3] <www.lemonway.fr>

[4] Chairing a workshop entitled "Is your wallet obsolete?" at the "Buzzness Mobile" show in Paris in June 2011, Nicolas Goubly, CEO of Decode Consulting, a French firm specialised in mobile consulting and digital convergence, explained how mobile payment was going to boom in the next few years. 1 million French people were expected to be equipped with NFC enabled phones by the end of 2011.

[5] See the demonstration video of the "Future Store", a German supermarket that is using all the latest mobile technology for a new shopping experience. 5 March 2012 <http://news.bbc.co.uk/2/hi/technology/7476672.stm and http://www.bbc.co.uk/news/business-12310809>

sensor-based iBGStar Diabetis monitoring app. As a consequence, the smartphone application based mHealth market increased by a factor of 7 to reach $US 718 million in 2011.[1]

To some extent, doctors can now monitor their patients' health remotely. Patients can take their blood pressure, monitor their heart rate, or measure sugar levels in the blood themselves. This data can be entered into a phone via a connected device or manually, and sent for analysis by SMS or through an app. Some firms and NGOs are working on cheap simplified tablets for example, which could be reserved for those medical uses. Again, this is not only a field where companies can expect return on investment. Developing mobile health solutions is critical in countries where hospitals or medical practices are far and few between.

Phones nowadays, and even more so smartphones, can really become all-in-one tools that make life easier for their owners, whose demand is pushing innovation. Because mobile terminals are so personal, users expect the information they receive on them to be customised, just like they can customise their smartphones or tablets with their favourite apps and games. This is particularly relevant for companies' marketing strategies. Advertising can be sent to mobile phones through text messages, but also into apps or on mobile websites. It has become clear to many industry specialists that mobile users have a different outlook on advertising, compared to PC users for instance. They do not want to receive "spam" on their mobiles. On the contrary, they want to "opt in" for the advertising that is relevant to them. For instance, a Nike fan might want to choose to receive special offers from Nike, but they do not want to receive discounts from another clothes retailer they never buy from. Also, if they live in San Francisco, they do not want to receive information about a store in New York. Local information is the most sought for on mobiles and for that, geolocation is essential: routes, films on show at the closest cinemas, restaurants… Overall, "Push strategies", or "top-down" strategies, are out. "Permission marketing" is in: users choose what they want to receive, or which app they want to download. This makes them more responsive to adverts, and enables marketers to send the right information to the right people. In fact, the rate of response from mobile marketing campaigns reaches 30%, which is extremely high.[2] In 2011, Nestlé designed an app for chocolate lovers who have iPhones. They can scan bar codes in the shop and get recipes, or just enjoy the app which is supposed to entice them to buy more Nestlé chocolate. In the first three months after the app was launched, it was downloaded more than 350,000 times.[3] Huge opportunities are up for grabs in mobile marketing: the global mobile marketing market reached $1.75bn in 2009, and is progressing on average by over 40% a year.[4] The most advanced part of this business uses geolocation (geofences) to customise advertising even more. Any mobile user, providing he or she has a GPS-enabled phone, can opt in for

[1] Research2Guidance, *Mobile Health Market Report 2011-2016* (11 Jan. 2012).
[2] *Digital Media* 13 (March-August 2011): 17.
[3] *Stratégies* 1637 (9 June 2011): 12.
[4] *Digital Media* 13 (March-August 2011): 17.

marketing from a brand for instance. If they walk next to a store that sells that particular brand, the system might send them a relevant "coupon", with an offer for an interesting discount over a limited period of time in that particular shop. This is called location-based marketing. A company like Placecast for instance, is specialised in it. This is the advertisement for their service "ShopAlerts": "A location-based mobile marketing service that offers unprecedented relevance and reach. Target consumers at the right time and place, in the right mindset, on any phone, only if they have opted in."[1] Victoria's Secret, a famous American brand of lingerie and female clothing, "is driving consumers in-store via geo-targeted mobile banner ads that promote the company's new NFL gear."[2]

What all marketers insist on is the fact that m-marketing, e-marketing, marketing via other digital media such as connected screens, and even via more traditional media such as TV screens, newspaper ads, and billboards complement each other. Brands are strongly urged to use a "multichannel strategy". A mobile marketing campaign or an in-app plug might push users to walk into a bricks-and-mortar store and buy. Recent surveys have confirmed the importance of the salesperson in shops, but they also show that mobile users often use different types of devices at once, for instance they browse the web on their smartphones while watching television.[3] This means an ad seen on television might lead to a search on a mobile. At other times, smartphone users may see a billboard or a paper advert and scan a QR code to get more information on the product or service.

Scanning a QR code is still a somewhat novel experience which many people are not familiar with yet. It corresponds to a demand in the sense that it is fast, simple, and fun. Fun and interactivity are the last consumer expectations that companies need to take into consideration when planning a mobile strategy. 50% of all downloads from the AppStore are games. Market intelligence firm ABI Research says that mobile gaming is expected to grow from less than $5bn in 2011 to over $16bn in 2016 and a key finding is also that the audience for mobile games is much wider than that for PC and online games and includes males and females, of all age groups. Online, 3 billion hours per week are invested into online games like Farmville and World of Warcraft,[4] but the number of players is increasing much faster on mobile than online. For companies, this growing audience is another opportunity to seize. They are learning how to engage their customers through mobile games. The "gamification of business" has been identified as one of the top trends for 2012 in the mobile industry. It is also a major aspect of online business at large and the techniques are the same for e-commerce

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[1] Placecast has a demonstration video online. 6 March 2012 <http://placecast.net/shopalerts/index.html>

[2] Rimma Kats, "Victoria's Secret drives in-store traffic via geo-targeted mobile ads," *Mobile Marketer* Sept. 26, 2011. 5 March 2012 <http://www.mobilemarketer.com/cms/news/advertising/11051.html>

[3] "Getting mobile ready," Google Mobile Ads Blog March 22, 2011. 5 March 2012 <http://googlemobileads.blogspot.com/2011/03/getting-mobile-ready-part-1-creating.html> In many rich countries, over 50% of smartphone users declared they usually watched television while using their phones.

[4] Figure quoted by game designer Jane McGonigal in "Gamification Gets Down to Business," *Forbes Magazine* 15 Sept. 2011.

and m-commerce in that respect. Games are addictive, so why not use them to increase loyalty on the consumers' side? Brands can plug their brands into mobile games. Car companies "lend" their latest model to a racing game: "Nissan wants to inspire eco-friendly driving with the new Leaf Electric Car. Drivers can compete with others in the region, winning virtual trophies for the most eco-friendly driving."[1] McDonald's got players of Farmville to go and pick vegetables for its salads so as to show a healthier image of the brand. Companies may also market their products in an entertaining way similar to what mobile users have encountered in games:

> HSN [The Home Shopping Network] teamed up with PlayFirst for the Cooking Dash application that incorporates chef Emeril Lagasse's cookware and kitchen electrics line and lets players buy the products without leaving the app. The Cooking Dash app includes a new restaurant venue called "HSN Cooks with Emeril" that lets players interact with virtual representations of his cookware and kitchen electrics line, and buy the real products via the mobile game. A partnership such as that is an ideal way to not only engage users, but also add a commerce element to the mobile mix.[2]

Psychologists have looked into how gamification works:

> When done right, games exert a strong psychological influence over consumers, says Amy Jo Kim, a game designer who worked on hits such as Rock Band after earning a PhD in behavioral neuroscience. "What games do is help you come up with stories about yourself," she says. Earning points or reaching new levels creates the illusion of progress and is akin to "telling you a story about yourself getting better and stronger and more powerful," she says. Social status is another motivator. "We have this tendency to care about what image we portray," says Dan Ariely, a professor of behavioral economics at Duke University. In real life, there are mansions and handbags. "In the gaming world," says Ariely, "there are badges."[3]

And badges are free to give away in the online/mobile world. When consumers have fun, they tend to be more responsive. By 2016, it is estimated that 70% of Forbes' Global 2,000 businesses will have a "gamified" app.[4]

On their mobile terminals, consumers look for convenience, immediacy, simplicity, customization and interactivity. It will be interesting to study how mobile habits of consumption and access to information impact business (and general behavior) outside the mobile world itself. Mobile consumers' expectations make traditional sales and marketing techniques largely irrelevant and firms can no longer do without a specific mobile strategy if they want to tap into this growing pool of customers. They will need the right people to develop and implement those strategies.

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[1] "The CEO guide to Business Gamification," Special Report, *Business Week* online (2012). 5 March 2012 <http://www.businessweek.com/technology/special_reports/20110404ceo_guide_gamification.htm>
[2] Rimma Kats, "Brand integration in mobile gaming will drive mcommerce," Mobile Commerce Outlook 2012, *Mobile Commerce Daily* (March 2012): 20.
[3] Douglas MacMillan, "Gamification: a growing business to invigorate stale websites," *Business Week* 19 Jan. 2011.
[4] Figure quoted by game designer Jane McGonigal in "Gamification Gets Down to Business," *Forbes Magazine* 15 Sept. 2011. The Forbes Global 2,000 is a yearly ranking of the world's top 2,000 public companies. Gamification can also be used in firms to motivate workers.

Mobile business is in its infancy and some obstacles are still in the way. Technology standards for instance need to be streamlined. At the GSMA Mobile World Congress on 27 February 2012, Brett Taylor, CTO of Facebook, announced the company, with others, was focusing on mobile web development in order to address fragmentation in the industry and stick to one global standard (HTML5).[1] Payment enabling is taking time too. What hinders progress in that field is the commercial war between the various players. Mobile carriers, traditional banking institutions such as Visa Mastercard, phone manufacturers, new mobile payments companies, all want their slice of the cake. At the moment, there are too many rival offers on the market for consumers.[2] Some even claim that NFC will never come through. However, a clear (and unfortunate) sign that mobile business is growing quickly is that hackers have started targeting mobile platforms, especially Android.[3]

The rise of mobile devices is changing the workplace and the workers, it is giving rise to new business opportunities and causing upheaval in a number of industries. Companies have challenges to take up but they are not alone. Education institutions too must understand how the mobile revolution is going to change both the working world and the economy. They must think about how to prepare their students efficiently to a fast-changing workplace in which technology, and more and more so mobile technology, is central. It is no easy thing.

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[1]   GSMA   website   updates   on   27   February   2012.   27 Feb. 2012 <http://www.mobilebusinessbriefing.com/articles/facebook-focuses-on-mobile-web-initiatives/22560?elq=3e99abef90fe492b856dcdce00622b94>

[2] See Brad Stone and Olga Kharif, "Pay as you go with smartphones," *Business Week* 14 July 2011. 5 March 2012 <http://www.businessweek.com/magazine/pay-as-you-go-with-smartphones-07142011.html>

[3] Harrison Weber, "The top security threats to mobile users in 2012? Malware, sneaky ads and data thieves," *The Next Web* 14 Dec. 2011, 3 March 2012 <http://thenextweb.com/apps/2011/12/14/lookout-reports-mobile-threats-for-2012/>