

# THE APP EFFECT

Jaap Bloem, Menno van Doorn, Sander Duivestein, Andreas Sjöström

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See also [THEAPPEFFECT.org](http://THEAPPEFFECT.org)





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# Sources of inspiration

This book's trigger came in particular from the many divergent organizations wanting to launch their own mobile apps and develop their own app portfolio. We began by coming together in inspirational strategy sessions. Working through coherent visions based on customer profiles, new business initiatives and scenario planning, we learned first hand how serious organizations are about display devices and app development. And right they are! It is abundantly clear that the "new mobile" is the future. This is apparent from all statistics, indicators and predictions.

Recently, the Sogeti Mobile Lab and the Sogeti research institute VINT (Vision • Inspiration • Navigation • Trends) had literally hundreds of discussions with customers about app strategy. We distilled this effort into our eight-legged reference model.

Our socio-psychological inspiration came from the many specialists in the field of Information Behavior with whom we spoke. In particular, the insights of Professors Amanda Spink and Luciano Floridi helped us put digital information behavior into a broader context.

We synthesized all the insights we uncovered in a multi-day scenario workshop conducted in collaboration with Next Agenda and FreedomLab Future Studies. Next Agenda is an American company led by Peter Leyden, the former editor of *Wired* who has worked with scenario planning guru Peter Schwartz. FreedomLab is an independent research institute and think tank specializing in *Scenario Based Reasoning*.

In *The App Effect*, we build upon ideas from previous VINT studies. One of these is the new form of collaboration based on crowdsourcing, which developed in the past decade from the *free & open source* communities. This is the subject of our book *Open For Business: Open Source Inspired Innovation* (2006). Of course, we also go into ideas about new social media behavior, free expression and narcissism, as published in *Me the Media: Rise of the Conversation Society* (2008). Finally, we also explore the VINT investigation *Don't Be Evil: Imagineering 21st Century Business* (2010), which is about the techno-economic paradigm shift that we are experiencing.

# Foreword

*“We shape our tools and thereafter they shape us.”* Never has this been more true than in the present mobile revolution that we are now all part of. That is the claim of this book in front of you. Although still early days, the technology of mobile and social is changing people’s behavior to which organizations will have to respond. About two years ago, the authors set out on an exploration to find the impact of these technologies on people, organizations and society. This book is a reflection of the emerging insights and identifies some of the possible effects that this app revolution can have for your organization, the so-called *App Effect*.

We are constantly surprised by what is going on around us. Since the time of Aristotle, surprise or even amazement has invariably constituted the first step toward new insight. Our research into *The App Effect* also began in that way, with surprise about the way in which new technology has altered our whole style of life. People in transit, at home, at work or out for the evening: it never takes long before we are reaching for our mobile devices. Everyone is or wants to be on the smartphone and tablet, especially with their own apps as well. All that technology is marvelous: it has never been so beautiful and intense.

Smartphones, tablets and their apps have embedded digital functionality deeper in our lives, even to the extent that the pet name “tech” currently stands for one vast sum – the sum of technology, economics, culture and history. This also allows us a good view of reality and of the future. Billions of apps will be downloaded in the coming years. All our attention, experience and knowledge are captured there. Whatever we can imagine, there seems to be an app exactly for that purpose.

So there it is – the true New Economy based on the other patent three: the Attention, Experience and Knowledge Economy. It is still insufficient to rapidly solve the present-day debt crisis, but still... All this taken together must enormously surprise everyone or at least have been noticed by everyone, consciously or subconsciously.

This surprising tech-alteration taking place around us is most intriguing, but it is the consequences of this development that represent the crux of the matter. We refer to this complex of factors as *The App Effect*, after the most striking phenomenon. On the one hand there is a deep crisis, but on the other, there is an explosion of apps on the most powerful and handy small computers ever marketed. In the attention, experience and knowledge combination, deliberately linked to our social nature, plenty of benefits are being realized throughout all businesses.

Seize the opportunity by moving from the social web to Social Business: that is the message. First there was the shift from the e-commerce consumer experience in 1994 to robust e-business in 2002. Social Business is a logical evolution of this. With its focus on people first, engagement and transparency, Social Business dovetails perfectly with the consumer experiments of Web 2.0, which began in 2004. This history of Facebook ran parallel to that. It was founded in 2004, and in 2012 it probably will be the first social media giant to be floated on the stock market. 'Social' is thus obviously the new capital!

The radical growth of apps and mobile facilities is in sharp contrast to the gradual growth in large sections of the economy. Nevertheless, *The App Effect* is directive in this context too. Apps and mobile devices mark the growth process in which new structures arise and settle as a foundation for new radical developments in the rest of the economy. At present, the deadwood is being cleared in preparation for the new cycle, thus largely corresponding to the seasonal rotation.

The remarkable tech-character – technological, economic, cultural and historical – of *The App Effect* is also expressed in culture clashes. Such clashes have always existed but are now more intensive than ever before due to digital opinionation and other empowerments such as hacktivism. Counter- and sub-cultures of diverse nature must be accommodated with transparency and engagement. They must be taken on board in the shift to a new Digital Commons situation: to a new Social Society.

Whether you are a business leader, IT-executive, practitioner or just interested in where all this magical technology will take us, I do hope this book will inspire you to go on your own personal exploration to determine *The App Effect* for you and your organization. There definitely will be surprises and challenges along the way, but building an understanding and insight early on will prove invaluable in drafting a successful course.

*Paul Hermelin*

Vice-Chairman, Chief Executive Officer of the Capgemini Group



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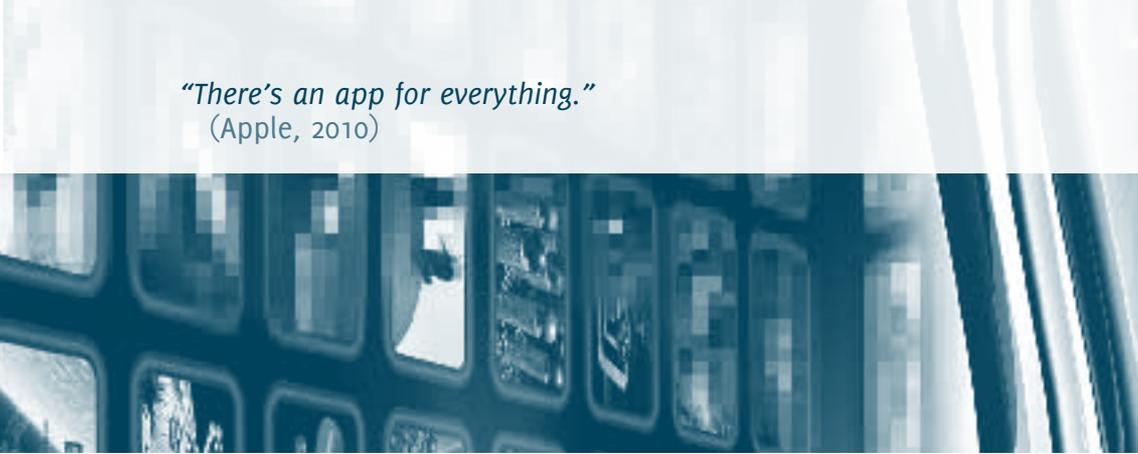
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The website [TheAppEffect.org](http://TheAppEffect.org) has two interactive lists, one with illustrations and one with the referenced literature. For the illustrations, you will find supplementary information and as many URL's for the illustrations as possible for each page in the book. The illustrations in *The App Effect* are practical in nature and relate directly to the subject matter of the book. Usually the source material is also directly related. This list of illustrations on the Internet offers the reader more added value from graphic source material that provide facts, events and products that by necessity can often only be briefly mentioned in the text of the book. The same applies to the relevant literature. Anyone wanting to propose an addition or change in any of the lists based on the illustrations or the literature, may do so via the website [TheAppEffect.org](http://TheAppEffect.org).

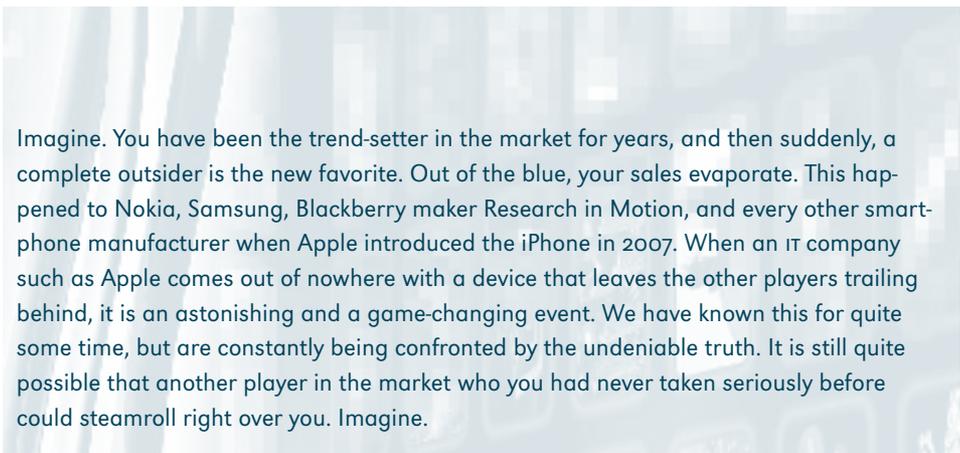


*"There's an app for everything."*  
(Apple, 2010)

# 1 What's app...?

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Imagine. You have been the trend-setter in the market for years, and then suddenly, a complete outsider is the new favorite. Out of the blue, your sales evaporate. This happened to Nokia, Samsung, Blackberry maker Research in Motion, and every other smart-phone manufacturer when Apple introduced the iPhone in 2007. When an IT company such as Apple comes out of nowhere with a device that leaves the other players trailing behind, it is an astonishing and a game-changing event. We have known this for quite some time, but are constantly being confronted by the undeniable truth. It is still quite possible that another player in the market who you had never taken seriously before could steamroll right over you. Imagine.

## 1.1

### The mobile post-PC era

Apple had never made a mobile device before it brought out the iPhone. Within four years of its introduction, the company had seized half of the profits in the entire mobile market with its hardware and software. One of the most intriguing aspects of the digital disruption phenomena is why Nokia, Samsung, or RIM had not already invented their own version of the iPhone. Mobile operators had a similar experience. The amazingly popular WhatsApp appeared out of nowhere. WhatsApp is a free app and an alternative to SMS. Before the carriers even had a chance to blink, their SMS business was starting to dry up. The emergence of Skype for voice calls was another hard knock for sales. These are all first-order direct effects in the industry that occurred when, in 2007, Apple barged in. The full-touch display device and apps concept was immediately aped in its entirety. History was repeating itself, like with the *browser wars* and the onslaught of web pages beginning in 1994. First, we had the web effect and now we have the app effect.

All of a sudden, display devices and apps are the new standard. From one moment to the next, the neatly divvied up mobile sector has been turned upside down. And the addition of the iPad in 2010 settled it for certain. We had entered the long-awaited post-PC era. Apple's mobile revolution had spread into the PC industry. App stores were opened online for both the iPad and the Mac. You can now find apps for anything: puzzles, games, weather, your blood pressure, energy usage, and even business applications such as SAP dashboards and real-time BI reporting. There are millions of apps of all conceivable sizes and types. And billions of apps, both free and paid, have been downloaded, both free and paid.

Apps on display devices are much more than a trend. This was clear from the very beginning. Everyone falls for these new irresistible temptations. Are you exploiting these new opportunities? How are apps affecting your IT situation? Do each of your employees bring their own device to the office? Just like a few years ago when all of us collectively started using web-based email? “*What’s app...?*” represents the bewildering perplexity that has taken us over. Mobile apps and their conjunction with the web are the icons of a new order. What does this mean? And, what will this mean in the future? The core issue is nothing less than the augmentation and personalization of our own information and how it is accessed. To coin a phrase: “digital information behavior.” And, consequently, the way we do business.

This book is about the app effect. We will, of course, discuss new interfaces, changing behavior, and the coming decade brimming with interactive displays. However, at heart, this book is about the ever-tightening relationship between people and the Internet. And it is also about the new type of relationship we have with each other and with every conceivable form of interactive content. There is a veritable deluge of apps and all kinds of touch screen devices from Apple, Google, RIM, Microsoft, Nokia, Acer, Toshiba, Dell, Samsung, Motorola, Lenovo, Archos, LG, HTC, Sony-Ericsson, HP and on and on. This deluge is a new beginning. It is the start of the post-PC era. In hindsight, the web should have been mobile from the very beginning. And it should have been multi-touch as well. “*Swipe me*”: *information at your fingertips*. That is exactly what we now have with the new generation of mobile display devices. And it will keep moving forward from here on out. The handheld computer, mobile phone, Internet, multimedia, social media, GPS, widgets, icon interfaces, and touch controls have all been around for quite a while. Finally, these are all combined into one... the display device.

## 1.2 Empowerment and business impact

We need not concern ourselves with all those millions of apps *per se*. The real value is the decisive success of this development. Considered in the proper light, this is the basis for all “app” effects. On the whole, mobile apps on mobile devices are synonymous with personally selected and physically perceived functionality. The organic and “bionic” (as in *bio*-logy and *electro-nics*) sensation that we experience with an app on a display device or interactive media is the most obvious reason why the technology is such an extraordinary success. Personal, sensory, and bionic, it is a combination that is a prelude to a different kind of interface.

It is called a *Natural User Interface* as compared to the indirect *Graphical User Interface* used in the familiar windows, menus, keyboard and mouse setup on the PC. Interfaces that are more natural harmonize so much better with our natural behavior. From the business perspective, it is important to profit from this ergonomic benefit, this key to success, this *Critical Success Factor*, by stimulating and supporting economic activity. Apps on display devices are primarily a new and desirable phenomenon. If set up properly, they also function as a new platform for making economic decisions such as purchases.

### **Empowerment from all sides**

Our business transactions will go much further than just commercial endeavors. In particular, consider social and cultural behavior and the corresponding effects within societal and organizational contexts. Apps on display devices are also the heralds, the very icons of this type of app effect. *Empowerment* is key, simulating and supporting the ability to express ourselves that is possible thanks to the bionic convergence of people and media. It is the enlightened model called the *Digital Commons*, a new digital togetherness in which individuals and organizations meet and dialogue with each other. As companies become increasingly more social, increasingly more authentic and transparent, it will also stimulate the use of display devices and apps to initiate direct conflict as we have seen in recent history. The media contains countless examples of freedom fighters and rioters alike making use of their smartphones and social media.

Who is actually *empowered* now? Is it us with our remote control in hand, our *smartphone*? Or is it the companies who are continuously seducing us to buy things? Is it the IT departments that rule the systems within our organization? Or is it the employees that buy apps for their own mobile devices? What will the continuous struggle look like on the different fronts and where will the new forms of collaborative interactivity flourish? Everyone already agrees that the way we do our work must and will change. It seems almost a given now that even more control is shifting from companies to employees and customers, and that new forms of collaboration will emerge, evolving toward the Digital Commons.

### **Creative destruction and culture clashes**

This is just the beginning. The current developments will continue but not without some resistance. We can expect quite a lot of creative destruction and, indeed, culture clashes. The culture of the established order, *The System*, will collide with the *Digital Subcultures* and *Countercultures* that will continue to prosper. Twitterazzi, WikiLeaks, 2.0 employees and anonymous cyber attackers are the new digital opponents that organizations are already constantly dealing with. The ideal would be these three movements coalescing via a well thought-out, practical System into the model of a

new Digital Commons where new technological opportunities, economic feasibility and the needs of society meet, complement and reinforce each other.

This unique perspective provides us with many new information behaviors. The question is what form this empowerment, currently embodied in apps on display devices, will finally take on. In this book, we have worked out an answer for the energy and health care sectors. Of course, other sectors will also be affected, such as the automotive industry, and so on. The car is a perfect example. It was literally our very first “mobile” and has now developed into our *Smartphone on Wheels* complete with special apps. There are many, many such examples within and across other sectors. For example, it is intended that the energy chain also include electric cars, which may use solar panels to generate electricity.

The scope of IBM’s *Smarter Planet* campaign identifies the following thirteen cross-sector domains: *Energy, Money, Healthcare, Trade, Infrastructure, Oil fields, Government, Retail, Cities, Telecommunication, Traffic, Food and Water*. Naturally, there are Smarter Planet and Social Business apps using multimedia to keep us informed on the progress of all the initiatives being taken. IBM is also using its Venture Capital Group to stimulate start-ups to build content-based Smarter Planet apps.

### **The imperative of Social Business**

The business impact of the central issue of empowerment goes beyond the traditional commercial domain of turnover, profit, and share value. Business impact is now determined more than ever before by the individual and by society. This humanization of economic logic by the *hearts and minds* of altruistically empowered individuals, who will not allow their feelings to be brushed aside by numbers, requires a complex form of attention. This is very different from what we are used to, and we must learn to work with it. It requires undivided attention for the combination of authenticity, transparency, engagement, accountability and responsibility, human behavior, awareness of cross-sector chains and networks, and, not least, the ability to deal with criticism and opposition. When we look at increased app empowerment to discuss a new kind of Social Business that is developing, we are not just taking one step beyond the Web 2.0 focus on communication and collaboration using new media. The difference is unmistakable. Mobile display devices and attendant apps in the cross-sector private and corporate value chains are the driver of a new transformation. And organizations must begin their transformation by planning and acting within the context of the impact on their business.

## 1.3

### The perfect storm, an economic and cultural tornado

The post-PC era is characterized by the app effect. First, the impact of mobile apps has affected the products and services of the hardware, software, and telecom sectors, and, apps have gained wide acceptance by the public and in other industries. Communication, marketing, and digital business between individuals and organizations have increased globally. Data traffic for every conceivable configuration has intensified and become more personal. This is a trend we were already familiar with from the Internet. We have already experienced the app effect in recent years through the flood of mobile personal display devices.

#### Apps bring display devices to life

The apps that we select from an online store bring our display devices to life. They are fast and immediate. It is a considerable shift from the elaborate and time-consuming efforts needed to install software on a PC. This new enjoyment is experienced primarily through the use of the touch controls, display quality, and sensors extending our own perception. Apps are integral to display devices just like the web and the PC. First came the desktop and then the laptop. The laptop is along for the ride in the post-PC era integrating itself with all the new developments. Even the desktops that remain will work with apps and multi-touch. As will the touch tables and walls that are fast arriving. *Post-PC* is, therefore, *PC-plus*, just as Microsoft correctly concluded. In fact, there will be a much more diverse gamut of devices and the controls will feel much more natural to use. These will harmonize with our senses and also with our higher faculties such as speech and movement. And, eventually, with our subtle body language and thought processes. As we go to press, experiments are being carried out to use a brain interface for our original “mobile” device, the car. Multi-touch is already a killer app. Research performed by Pixar Animation Studios and U.C. Berkeley show that multi-touch is twice as fast as using the mouse to click on menus and windows.

#### Exactly the bit that we want

The web effect became dominant in the PC era. We carried out small, practical tasks using the mouse and keyboard using comprehensive software application suites. We were able to share our work via email. Web 2.0 brought us communication and task domains, Salesforce, Facebook, Twitter, YouTube, LinkedIn, Google Docs, Microsoft Office 365, and so on. Contact between us became much more immediate. Apps providing practical functionality on mobile display devices intensify our experience and enthusiasm for the app experience. In no time at all, apps and their icons came to symbolize all the freedom that we had always wanted with our multimedia toolbox. During the Web 2.0 phase of the PC era, our tools became more accessible, more personal, and increasingly delivered in real time. The web became that platform where

all of today's popular social applications were built. Mobile apps offer us the luxury of sharing a part of our rich digital universe by hitting a button at any time and place we choose. And we are continuously up to date about the state of the world thanks to the newspapers, our Twitter timeline, a SAP dashboard, and on and on.

### **Noteworthy**

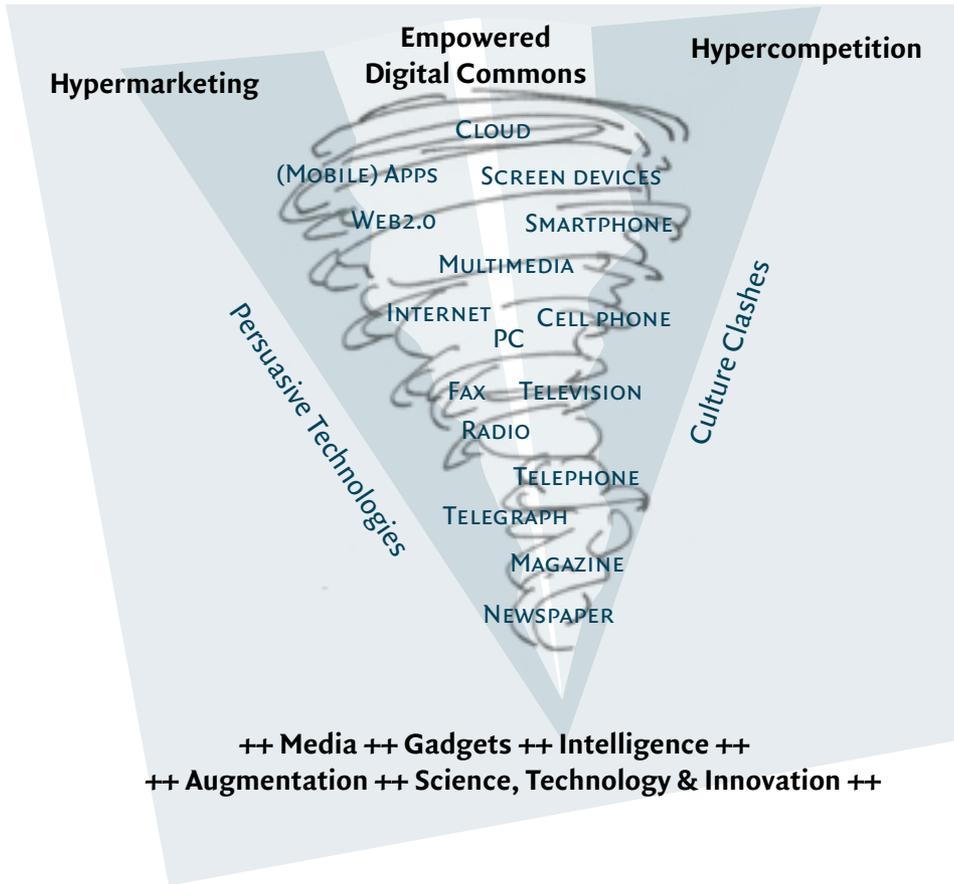
The evolution of the Web 2.0 platform into a combination of platform specific *native apps* and *web apps* can be considered a new dimension in *All Purpose Programming* (what's in a name?). HTML5 is the standard-bearer of this movement and apps can be seen as nano-platforms. In addition to HTML5, there are many more new, interlocking standards, such as CSS, SVG, and WOFF. And these have led to a proposed name for the emerging platform, NEWT, for *New Exciting Web Technologies*.

### **The evolution of gadgets**

The key to the social relevance of the app effect is the personal and social immediacy of mobile display devices, including new devices like Amazon's Kindle Fire, new laptops such as Google's Chromebook, and so on. A lot could be said about the device side of this evolution. In the PC era, we had a desktop or laptop with mouse and keyboard. Now, in the post-PC era or PC-plus era, we have sophisticated mobile display devices equipped with touch controls and apps, regardless of whether they have keyboards. Remarkable as it may be, what this is really about is the evolution of gadgets comprised of hardware and software satisfying human needs. At the core of this evolution are two trends that have always existed and have a huge socio-economic and societal impact on the future and therefore require special attention regardless of the issues of the day.

### **Persuasive technologies and culture clashes**

Let us begin with *persuasive technologies*. These persuade and seduce with tools, technology and media, and may prove addictive as a result. These go hand in hand with *culture clashes*. On the one hand, excessive persuasion (marketing, advertisements, and peer pressure) will provoke reflection and opposition. On the other hand, persuasive technologies — particularly in the form of Internet gadgets — contribute to personal responsibility and decisiveness, by offering *information at your fingertips*. We can now directly participate in discussions, stand up for ourselves, and organize. The intensification and personalization characteristic of modern persuasive technologies also turn culture clashes into a common occurrence. And these do not at all fall neatly within democratic and organizational boundaries. Persuasive technologies and culture clashes go together and are both the result of multimedia-based, intelligent (or *smart*) “augmentation” of human behavior. These fast-moving and continuous developments can be seen as a perfect storm.

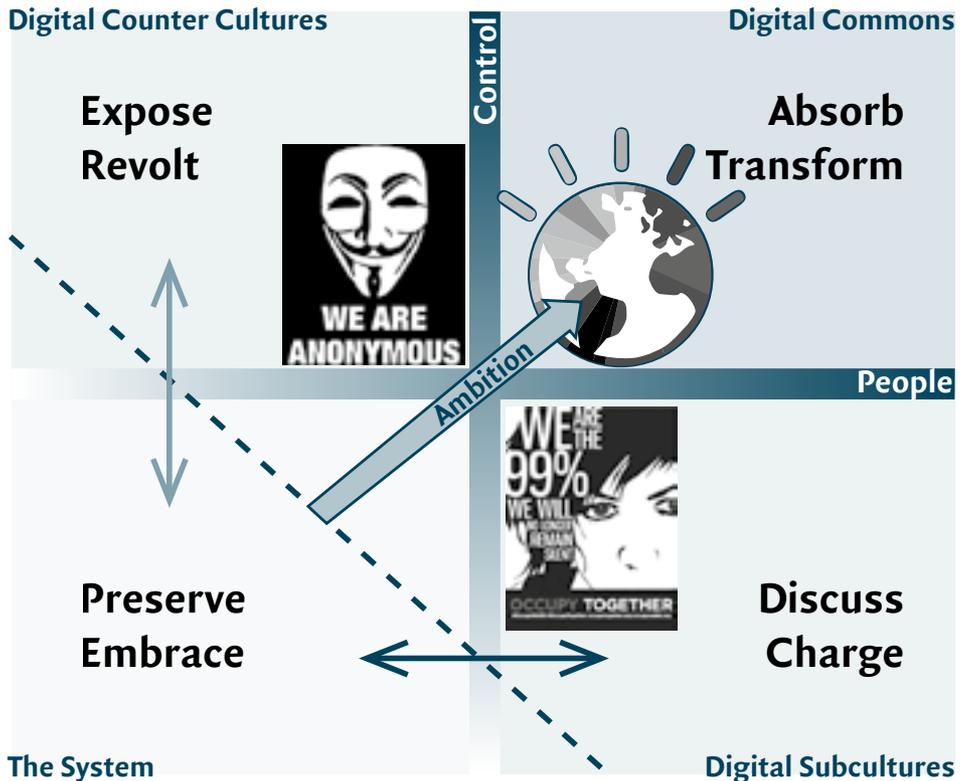


**Toward the Digital Commons model**

The “tornado” illustrates how persuasive technologies characterized by hyper-marketing and cultural clashes characterized by hyper-competition arise from the continuous development of media, gadgets, and smart applications, and, how these generally support human capabilities and appetites (*augmentation*). The basis for this continuous development lies in the power play between *Science, Technology and Innovation*.

The real question is which institutions, organizations, and sectors are going to accomplish the model of the Digital Commons via the tornado of tools and technologies being fed by hyper-marketing and hyper-competition. All sorts of entities, at all levels of government, business, groups, private individuals, and so on, will be built up and knocked down in the dynamics of this tornado and all according to their specific convictions about our society and economic apparatus. This is how we will advance, whether we can envision it or not. The status quo will continue to shift regardless.

The following picture illustrates the universal culture clash of our institutionalized *Systems* with the *Countercultures* they provoke and the *Subcultures that exist*. Today, the main ambition is to move the *Digital Countercultures* and *Digital Subcultures* from the existing System toward the new and palatable Digital Commons situation. Consider for example digital government, the Smart Grid, and eHealth. In the new digital or *smart* ideal, situations, processes must run like well-oiled wheels and interests must be managed without any damaging clashes. Chapter 2, 3, and 4 of this book discuss this dynamic from different perspectives.



Post-PC Empowerment 2005 > 2015

From "Smartphones" via Web + Mobile + Apps to Smart Web/App Ecosystems

### **Web presence becomes app presence**

“The Web Effect” was the title of a *Forbes* article about fifteen years ago. It was August 1997, when reaching one million websites made it the breakthrough year of the multi-media PC era. *Forbes* sketched the following portrait of the era:

“Plenty of old media entities are rushing to establish a web presence if they don’t already have one. But the story has other, less obvious dimensions that also merit notice. Money and ideas are not just going from old to new—they’re also flowing back the other way. New media culture, content, and even advertising money are enriching old media. There’s no established way of calculating this flowback dividend, but it’s already huge.”

Read *app presence for web presence* and this could describe the reality of today, fifteen years later. All media producers are trying to repeat the same trick using apps on the new display devices. There is a profusion of experimentation with sensory input, context sensitivity, and virtual reality. Hardware, software, content, design, ergonomics, economics, crowds and communities are becoming even more intertwined. But, how exactly? How will the app effect evolve in the post-PC world? How will our information behavior change? The simple answer is obvious... the web effect plus copious additions.

At the e-G8 meeting in Paris during May 2011, McKinsey presented the first quantitative macro-economic web effect analysis. It was titled: *Internet Matters: The Net’s Sweeping Impact on Growth, Jobs and Prosperity*. Clearly, the economic impact of the web continues to thunder on:

“The Internet accounted for 21 percent of GDP growth over the last five years among the developed countries McKinsey studied, a sharp acceleration from the 10 percent contribution over 15 years. If measured as a sector, Internet-related consumption and expenditure is now bigger than agriculture or energy. Most of the economic value created by the Internet falls outside of the technology sector, with 75 percent of the benefits captured by companies in more traditional industries. The Internet is also a catalyst for job creation. Among 4,800 small and medium sized enterprises surveyed, the Internet created 2.6 jobs for each lost to technology related efficiencies.”

### **Web effect becomes app effect**

McKinsey asserts that the web effect will continue its remarkable expansion on all fronts. This windfall allows us to state with certainty that the immediacy of the app effect will continue to build upon the web effect and that this will proliferate. This will be noticed first by replicating demonstrable web successes into a greatly improved user experience. And this explains the enormous media interest today, much like the situation that *Forbes* documented back in 1997.

## Countercultures versus institutions as the norm

In the context of an abundance of *persuasive technologies*, we must take into account the scale and impact in different arenas caused by the intensification of *culture clashes*. In the PC era, the nature of the web effect was primarily economic and social. In the post-PC era, the app effect takes the lead. Mobile display devices and apps will intensify the economic and social impact of the web and extend it into the organizational and societal front. And this will lead to direct contact with *Systems* and institutions. All established orders will be brought even further into the public's eye and be held accountable for their actions. They will be "owned" by engaged individuals and communities. Every issue will be weighed, measured, and brought to a head. In today's post-PC era, transparency and accountability will be elevated even further as the standard way of doing business. Any deficiencies in this light will arouse the fury of *Digital Countercultures* in the form of paralyzing hacktivism. This will occur more and more frequently. Consider, if you will, the attacks by Anonymous on MasterCard, PayPal and Visa, on the Sony PlayStation network by LulzSec (Lulz Security, "the world's leaders in high-quality entertainment at your expense"), on Google Mail, probably from within China, and the DigiNotar e-certificate scandal.

## 1.4 Information at your fingertips

New information behavior combined with a hugely improved user experience, better than any PC, has turned the hardware, software, and telecom sectors on their head. And all thanks to the mobile aspect of *information at your fingertips*, multi-touch for the masses. The question now is how all other sectors can provide attractive propositions and accomplish social and economical gains. This is the challenge for the coming years and probably even decades if the PC revolution that started in 1981 is anything to go by. Thirty years, an average generation, easily passes. The flood of persuasive technologies of display devices in all sorts and sizes — tablets, slates, pads and phones — combined with practical and appealing apps, are an important key to the more attractive propositions and attendant socio-economic gains.

There can be no doubt that we are smack bang in the middle of the post-PC era. Besides all those physical devices, apps in online app stores are especially an important constant up till now. Mobile apps are increasingly replacing the cumbersome application suites we are all too familiar with on the desktop and laptop. As you would expect, the laptop is adapting too. It is becoming thinner and lighter with an increasing number of multi-touch versions and apps. Another important constant is the "cloud". The Internet is scaling up and hopefully finally becoming safer. It is open and free, pay-as-you-go, and everything in between. Desktops and private networks

are being pushed out by portable mobile devices inheriting the laptop “book” moniker, Chromebook, Ultrabook, and so on. There is the choice of a fixed or free-standing keyboard, as keyboards are still very handy.

All of these post-PC developments are intertwined and have been a long time coming. And just like the beginning of the PC era, we can expect many more new developments in the area of “user experience”. Which is not at all surprising. In addition to tactile sensors, higher definition images and GPS, the near future will have speech recognition, gesture recognition, NFC (Near Field Communication) and 3D included as standard features.

### **Bill Gates’ vision: toward mobile information**

The digital convergence predicted for the post-PC era is the essence of Bill Gate’s vision that he presented in November 1994. Distilled to the core message, Gates said:

“At the centre of this will be [...] all the information—books, catalogues, shopping approaches, professional advice, art, movies—[...] on demand on a device looking like a TV, a small device you carry around, or what the PC will evolve into.”

With these words, spoken at the Alladin Hotel in Las Vegas, Gates let the genie out of the bottle. It is the idea that has inspired him since 1989: that the final outcome in the post-PC era is mobile *information at your fingertips*. This was the leitmotif that Gates had borrowed from the Information Industry Association that used it as their motto in the 1970’s. *Information at your fingertips* was the course set by Gates and Microsoft until the departure of the legendary co-founder in June 2008. And this is why it became the slogan of the PC era, even though Gates actually had a different vision in mind.

### **The iPhone is Gates’ post-PC portable television**

According to Gates, the tiny television that you would take everywhere with you would materialize in 2005. In fact, we had to wait until January 2007 when Steve Jobs announced the iPhone. The 3-in-1 device — telephone, iPod Touch, and Internet tablet — actually entered the market six month later. The iPhone settled it at that time for the so-called smartphones with their frustratingly awkward little buttons. This newly developed substitute had elegant multi-touch controls. And that was that. Mobile *information at your fingertips*. Literally! Not indirectly by typing on a keyboard and clicking with a mouse, but via finger sweeps on a fast and vivid handheld display device. Steve Ballmer scorned the iPhone saying that it was very expensive and was unusable for email without a keyboard. Nevertheless, it is abundantly clear that we have entered the post-PC era with the iPhone. This was the mini-television that Ballmer’s boss more than twelve years earlier had predicted for the year 2005. All

of a sudden, the convergence and attendant socio-economic dynamic that Bill Gates talked about were no longer a vision, but a reality that had everyone licking their lips.

### Display devices and apps are the new paradigm

Apple had worked on it for seven years. The original plan had been to produce a tablet. When the prototype was ready, Steve Jobs decided it would be a smarter move to re-invent the telephone first. At the same time as the announcement of the iPhone, Apple Computer changed its name to Apple Inc. to signify the dawn of a new era. It heralded a new era not only for the company, but as we now know, also for the entire computer, software, and telecom sector. Almost at once, display devices and their apps were the new post-PC paradigm. Thanks especially to the iPhone, iPod Touch and iPad, together with the Apple App Store opened in 2008 and then the iCloud platform, Apple made 153 billion dollars in May 2011 and pushed out Google as the most valuable brand. At about 400 billion, it became the most valuable company after Exxon Mobil. *Data is the new oil*. This idea, fathered by mathematician Clive Humby and taken up by many analysts, had acquired several extra dimensions. Thirty-five years after its foundation in 1976, Steve Jobs and his Apple, which had also been on the brink of bankruptcy in the past, were wearing the winner's laurel. On the day he died, October 5, 2011, the American President Barack Obama honored Jobs, the committed innovator, with the following words:

“Steve was among the greatest of American innovators—brave enough to think differently, bold enough to believe he could change the world, and talented enough to do it. [...] By making computers personal and putting the Internet in our pockets, he made the information revolution not only accessible, but intuitive and fun.”

### From Graphical to Natural User Interface

*Where do you want to go today and information at your fingertips?* Apple has made this fusing of Microsoft slogans into a reality. All of a sudden, display devices and apps became the new standard. It is not that PCs and laptops are no longer being made. These are no longer being produced in the same numbers. Keyboards, mouse, and windows — the WIMP GUI of Xerox from 1973 (*Window, Icon, Menu, Point Device*) — suddenly have stiff competition from *Natural User Interface* developments that are on the fast route to the future. And not just multi-touch and speech recognition, there will be movement recognition as seen in Microsoft's Kinect. This device made the Guinness Book of Records after 8 million units were sold in only two months. It tallied an average of 133,333 sales per day. The Kinect allows every single body position and movement to operate a control in a digitally created environment... these may be as functional, realistic, or bizarre as can be imagined. It recognizes arm movement, speech, and eye gestures, making it a perfect non-interface interface. The first derivative Kinect implementations were medical applications, Facebook avatars,

and fantasy games. The possibilities are endless as demonstrated on the website: [KinectHacks.com](http://KinectHacks.com).

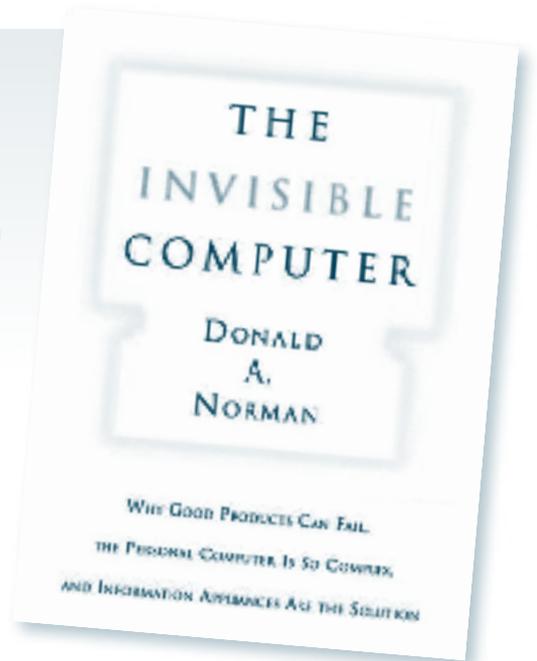
### Donald Norman's vision: What is wrong with the PC?

What is wrong is this... Traditional desktops and laptops are lacking immediacy and are impersonal. The post-PC era is all about interfacing with our senses and higher faculties, such as speech, body language, and eventually natural thought. Donald Norman was the first person in the world who could call himself a *User Experience Architect* and he worked at Apple Computer. In 1998, he made a fiery appeal for *The Invisible Computer* in his book of the same name. Norman spared no feelings in describing the PC of that day. His words are too well known and eloquent to not let them speak for themselves:

“What’s wrong with the PC? Everything. Start with the name. The Personal Computer is neither personal nor is it used to do much computing. Mostly, it is used for writing, reading, and sending things to one another. Sometimes it is used for games, entertainment, or music. But most of the time it is using us. When I prowl the halls of my workplace, a common sight is that of people on their hands and knees in front of their computer. No, not praying, but installing new things, rebooting, checking the cable connections, or otherwise just plain muttering under their breath.”

The PC is a so-called *end user computing* problem all by itself. According to Norman, the solution is individual elegant *Information Appliances*. We now have a plethora of choices thanks to the enormous number of apps in online shops. Back then you would especially not want to talk to Donald Norman about PC software. The typical PC application suites with cumbersome word processors, spreadsheets, and so on were already absolutely horrible for him:

“With today’s PC, we buy the hardware, the computer, in order to support computer programs, also known as ‘applications.’ Applications: what a terrible term. What a terrible concept. Applications have little to do with the tasks that people are attempting to accomplish. Look. We don’t do word processing: we write letters, or memos, or reports, or notes to ourselves. Some of us write books. I do not want to go to my computer to do word processing. I don’t want to go to my computer at all. What I do want is to be able to write, with a tool that fits my needs.”



What we actually want is to carry out a few tasks that are related to each other. Norman's time at Apple was directed toward *Activity Based Computing*. But, said Norman, as far as I am concerned, I prefer it with as little Computing as possible. Try to carry out tasks without using a personal computer. Assume what it is we actually want to do and ensure that the app(liance)s are built to do exactly that. In fact, the best option is to start all over again because the computer industry, according to Norman, is not able to rise above the level of the PC:

"The computer industry is stuck in a rut from which it can't escape. Its very success has driven it further and further down a path of no return. Its business strategy is caught in the endless loop of added features, continual upgrades, and as a result, ever increasing complexity and every increasing help systems aimed at coping. The only way out is to start all over.

There are many hurdles in the way of information appliances, but the goal is worth it: devices that fit the person, that fit the task. Devices that are easy to use, not only because they will be inherently simpler, but because they fit the task so well that to learn the task is to learn the appliance."

Do away with the traditional PC and with the application suites. Start all over again. At the IIT Design Research Conference of May 2010 and with wry self-mockery, Donald Norman hinted at the successful direction that Apple took after the return of Steve Jobs in 1997:

"You know what Steve Jobs did when he arrived? He fired all of us! And guess what resulted? Better products! Which have revolutionized the way we use machines. And he fired the usability groups as well."

### **What is wrong with the first post-PC devices?**

Apparently, the design and usability specialists at Apple back then were also unable to think outside the box, trapped as they were in the PC paradigm. Does this mean that Norman embraces the current generation of display devices and their apps — the software variants of his Information appliances — as the decisive new step in the direction of his Invisible Computer ideal? Not at all. In fact, just the opposite. Here are a few unvarnished opinions of Donald Norman and Jakob Nielsen who founded the Nielsen Norman Group, dedicated to *usability*, in 1998. In their opinion, we have taken one step forward with the new display devices, but also two steps back.

"The new applications for gestural control in smart cellphones (notably the iPhone and the Android) and the coming arrival of larger screen devices built upon gestural operating

systems (starting with Apple's iPad) promise even more opportunities for well-intended developers to screw things up. [...] There are no standards and no expectations. [...] Gestural systems do require novel interaction methods. Indeed, this is one of their virtues: we can use the body. We can tilt and shake, rotate and touch, poke and probe. The results can be extremely effective while also conveying a sense of fun and pleasure. But these interaction styles are still in their infancy, so it is only natural to expect that a great deal of exploration and study still needs to be done."

So, the display devices are wonderful, but do start out consistently and base your design on a fundamental knowledge of usability. This knowledge is ignored far too often at the moment. This is Norman and Nielsen's message. Contemporary top designers such as Josh Clark adhere exactly to this opinion. The calls for correcting course are all well and good, but we know from the development of the PC that in practice things do not just change all by themselves.

*Information at your fingertips* and other user experiences will evolve enormously in the coming years. Yet one thing is certain. The iPhone, iPod Touch, iPad, different Android devices, Windows Phone, Windows 8, Kinect and all the clones that can follow such a handsome array of products, have walked us definitively into the post-PC era. The movement is from GUI to NUI but preferably without losing the nice GUI aspects. The first step in this route is multi-touch for the masses accompanied from the beginning by app ecosystems. These are the software variant of the functional Information Appliances that Norman proposed in 1998 to replace the horrible PC experience.

### **The Long Nose of Innovation**

If we characterize the start of the post-PC era as mobile *information at your fingertips*, then we can certainly go back to 1982 to find the roots of multi-touch in digital electronics. For example, we can see it in the dissertation of Wayne Westerman, co-founder of FingerWorks, which was purchased by Apple in 2005. So says Microsoft Principal Researcher, composer, and multi-touch historian, Bill Buxton. In 1984, Buxton and associates developed a digital music touch pad. It was the same year that Apple popularized the Graphical User Interface on the Macintosh. It always takes a few decades before a technology trend makes a breakthrough. Buxton calls this *The Long Nose of Innovation*, and he is not just referring to the passage of time. When Steve Jobs brought out the iPhone in 2007, Steve Ballmer was just a little earlier with the Microsoft Surface multi-touch table. Leapfrogging over, and thumbing noses at, each other. And so it will continue — certainly in terms of the hyper-competitive digital innovation in the post-PC era.

## 1.5 Apple's success

Display devices and apps are all the rage. The app stores are overflowing — especially the Apple store — and every trend-setting platform has a terrific story to tell. Of course, Apple takes the cake with its own formidable ecosystem, whereas back in the year 2000, it only had the Mac. The lateral move of the producer of high quality PC/OS toward the iPod and iTunes converged in January 2007 with the computer division, with the entry of the first mobile multi-touch display device, exactly as Bill Gates had dreamed since the 1990's.

Success then followed for the App Store, the iPad and the iCloud. An app store was also opened for the Mac, while globally hundreds of official Apple stores — or, better said, Mac temples — are opening their doors daily. And this is how the 35-year-old Apple gained its value. It is a brand name and a business. The biggest company, Exxon Mobil, with a history going back 120 years, is feeling the hot breath of Apple on its neck. On 10 August 2011, both companies even traded places a couple of times on Wall Street. At one moment the market value of Apple was 343 billion compared to 334 billion for Exxon Mobil. This bears repeating. If there is one moment in human history where every person on the world could look on data as the new oil, it is this conjunction of events in 2011. No matter that it was only because the telecom providers had to adjust their rates as a response to the increase in free data traffic, so as not to jeopardize their profitability. And that was not only due to the Apple display devices and free services such as WhatsApp. Everyone plunged into the market and the frenzy was in full swing.

### Some numbers

In May 2011, when Apple became the most valuable brand, the sales of Android smartphones made by different manufacturers exceeded 100 million items. BlackBerry fell behind and Windows Phone was an ambitious newcomer. Microsoft was not aiming at producing a lot of apps. In July 2011, the milestone of 15 billion downloads was reached by about 200 million users of the iPhone, iPod Touch, and iPad. In total at that moment, there were about 425,000 apps of which about 100,000 were exclusively for the iPad. After 263 days in July 2011, the Windows Phone Marketplace contained a modest 25,000 apps. This platform differentiates itself even more due to its *tiles* interface (the trademarked Metro Design Style) and integration with the Xbox 360, with Facebook, with Skype, and the new Office 365 in the Azure cloud. The real attempt to catch up that Microsoft must make was planned in close collaboration with Nokia as of 2012.

## 1.6 Wrapp-up

We could continue to stack up more numbers, but the message is clear. Vivid display devices in different sizes and types embodied the mobile post-PC television of Bill Gates and multi-touch has become the normal user experience. The biggest constant in the midst of all the ferocious competition, and an assuredly giant cash cow for Apple, is the apps. Nevertheless, in the context of the post-PC era we want to look beyond *information at your fingertips* and apps as the standard bearer of the new order. In particular, we want to do justice to further developments in technology and human information behavior. And, in particular, focus on the business impact. This is not as easy as it might seem. At the moment, you could just do a straightforward Google search on “beyond information at your fingertips”. But that search at the time of writing this book surprisingly only provides one significant hit... a blog post by Mark Pesce, Virtual Reality pioneer. It is almost as if *beyond information at your fingertips* does not yet exist in 2011. So what should we expect?

### Augmented Humanity

The blog post mentioned above is titled “I Am Not Your Google” and dates from 2006. Eric Schmidt, then Google CEO, probably knew nothing about that post. What we do know is that Schmidt explicitly elaborated on *information at your fingertips* in September 2010 at IFA, the Berlin technology expo, when he welcomed us to the *Augmented Humanity* era. According to Schmidt, *information at your fingertips* was almost a reality at the time. In principle, we are ready to know everything. However, information and knowledge based on Google and Wikipedia are insufficient just as “I Am Not Your Google” rightly points out. What we need to do is make practical use of both. Only then can we gain a smidgeon of understanding about what the information and knowledge in question is all about. Both must be first transformed into actual behavior.

In 2010, it seems that Eric Schmidt wanted to respond saying that in the near future, it will no longer be people that will be searching for information and knowledge. It will take a little while before the roles are reversed. Relevant information and knowledge will follow people around. Google has grown far beyond raw unfiltered data. It knows our “context”. The network knows exactly what we do and what we want. And thanks to the soft hand of the information and knowledge that guides our context like a guardian angel, everything that we want to do and need falls into place. Automatically. This is how humanity is augmented. It is the ultimate form of *information at your fingertips*. It is not so much that we want to be led by the hand by technology. No, soon we will take each other by the hand, says Schmidt: “the computer and the human each does something better because the other is helping.” And then you will

see how wonderfully information overload will sort itself out. Information and knowledge will once again be a blessing and integrate with our behavior and complement it meaningfully.

### Culture clashes

We can make quite a few advances for commonplace situations. Augmented Humanity will be very handy in that respect, as Schmidt stated in his presentation. Schmidt also predicts that there will be quite a few snags to overcome even in commonplace applications, due to privacy issues and sharing of information. However, the greatest advantage is that everyone will benefit. It will not just be the elite. Schmidt is talking about *empowerment* for the masses. Well, yes, but whether everyone will blindly follow Google's *Don't Be Evil* motto is another thing altogether. It is not likely at all. The single thread through our entire history is the clash of cultures, and every new technology has escalated those clashes. In the post-PC era, mobile *information at your fingertips* — our new information behavior via web and apps — contributes to the escalation of old and the creation of new culture clashes. Consider, if you will, freedom fighters and rioting, such as the 2011 Arab spring and the London riots. And that is something else entirely than the commonplace Augmented Humanity. The web and mobile apps have a much, much deeper impact. Hopefully, it will go all the way toward forming virtual ecosystems and exceeding and integrating the economic sectors. And this provides lots of profitable opportunities.

Individuals and groups always find as many ways as possible to get the better of or guard their valuables from another. Competition and coaxing — with persuasive technologies — are in our genes. We look at different things in different ways. It is people power and power play. Constant change. Culture clashes. It has always been so. This dominant theme is why we should look beyond *information at your fingertips* and into the societal and socio-economic issues... of the app effect, including the web.



THE APP EFFECT is a post-PC book about the effects caused by our new mobile information behavior. It became clear soon after the introduction of the iPhone that the information age had entered a whole new phase. The deciding factor is not just our newly acquired mobility. It has a great deal to do with the world falling head over heels for the allure of Software as a Gadget. This book provides a solid foundation for anyone wanting to orient themselves toward an app methodology.

THE APP EFFECT describes how social and economic factors lead to unavoidable digital culture clashes. These clashes all have the appearance of stimulating the eventual development of a new Digital Commons situation. In this situation, organizations will only be successful if they take seriously the empowerment of digital subcultures and countercultures.

The app effects that we describe accompany the noticeably accelerating pace that media revolutions always bring with them and the new power groups that can be formed by organizations across sectors. The effects also work hand in hand with the new opportunities to entice consumers anywhere and at any time.

In addition, this book asks fundamental questions. Who is actually empowered? How will the brain be affected? And, what will be the outcome of the addictive behaviors and “sham” intelligence of the new information behavior in the coming decades?

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It is an arduous undertaking to attempt to keep up on all developments in the IT field. The state-of-the-art IT opportunities are often very far from the workings of the core business. Sources that provide a deeper understanding, a pragmatic approach, and potential uses for these developments are few and far between. VINT, a Sogeti research institute, provides a meaningful interpretation of the connection between business processes and new developments in IT.

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