

# The Wireless Digital Convergence

## What You Don't Know Can Hurt You !!

### 1. Introducing the Concepts:

#### from “bits co-mingling” to “smart wireless convergence”

The notion of Media Convergence is not new: The first definition ('co-mingled bits') was proposed by Nicholas Negroponte in his 1995 book 'Being Digital'.

Negroponte's definition of Digital convergence is: *“Bits co-mingle effortlessly. They start to get mixed up and can be used and re-used separately or together. The mixing of audio, video, and data is called multimedia. It sounds complicated, but it's nothing more than co-mingled bits.”*

**This is the first level:** the same computer can process (duplicate, and store) photos (which used to be a chemical process), voice (which used to be an analog magnetic process), text (remember the type writer), etc. Once a piece of information is digitized, it can be processed by a general purpose machine via a program, regardless of its final look.

**The second level** is more subtle: if the information contained in various “objects” can be processed through a program on the same machine, this information can probably be easily merged: this is what leads to the extension of the Web as we know it, with multiple types of medias appearing on the same page.

**The Third level** is more advanced: not only this information can be processed on the same machine, but it can be done in real time, in a seamlessly integrated process: we all own a “cell phone”, which of course is also a video camera, a text browser, an email processor, etc. Any type of information is collected in the same device: from my voice to my geo-location, to pictures and videos, I just do not pay attention to the source or the code (latitude/longitude versus text); I simply copy/paste and send my position in a picture as an email to a friend.

**The fourth level is much more interesting**, and rarely mentioned: if a cell phone can access various sources (think various servers receiving specialized information), the convergence is that not just anymore that the cell phone can access (pull) all this information, but also that the information can be sent (pushed) to the device. This is where the word “wireless” in the title of this article takes all its importance. The customer will now receive messages automatically, according to his/her location. Everything can be processed in “the background”. A clear example is the payment of a soda directly from a cell phone. The real processing, authentication, authorization is not in the phone, but in the servers that are accessing the phone to automatically deliver the service to the user.

If we look more closely at this example, we discover an interesting property: the payment is activated by a purchase which sends a message to a phone. The message is decoded by the

payment system that retrieves the phone user ID, location, and location of the machine (just to make sure the user is actually in front of the machine, ready to receive the soda). The system then accesses the account and completes the transaction. The soda tumbles on the receiving shelf. At the same time we can imagine that the inventory is updated and compared with the minimum acceptable on-hand inventory, etc.

With this example, it is obvious that the “intelligence” is NOT on the phone. It is resident on the various servers containing the application chain finally delivering the service. Users actually do not care where these servers are. They can be (and probably will be in a short future) “on the cloud”. What they care is that there is an application intelligent enough to make sure they will receive the soda, bill the correct amount, and take appropriate actions in case of problem.

Now, we can go a little farther and reach what we will call **Level 5: *the smart wireless convergence***.

To continue with our simple example, let’s suppose now that the user is in a marathon and wants to minimize his/her stops. The user can find an application that will monitor his/her body temperature (captured by a sensor on the user’s chest, and sent as an SMS to a location (like a server on the cloud). This temperature is stored and analyzed by a program that will also receive information from air temperature on the ground, humidity, etc. If the user level of temperature becomes too high, the system can now easily send a signal and check where the closest soda machine is, verify that the user’s favorite drink is available and –after confirmation– automatically order the drink when the user is in front of the machine...

This interest of this example is that it shows what an “Intelligent Web” (sometimes called Web 3.0) can do: it is not “just” sending text, not just text and documents (HTML), not just data (XML), but dynamic objects with the proper decoding code to make these objects “active”. The fact that the links are wireless is important: many of these applications are interesting because the user is mobile, and has to be “found”. It is worth to note that this is the difference between a land line (it is attached to an address, but you do not authenticate WHO is there), and a wireless device (it is attached to a person, and can give a location).

By going from level 1 to level 5, we have **totally changed the focus** of the convergence. We went from a **processor centric** view (a computer can process multiple media type) to a **user centric** view (a mobile user automatically receives services according to rules processing various data sources on the cloud). Reciprocally, the user does not have to worry about the source of “intelligence of the system”. The “phone” should be able to retrieve information from various sources, and possibly dynamically chose the best support. I can be the cellular network, then a WiFi WiMax network when it is available, or the data band to exchange text-based information on the fly.

## 2. How the *Wireless Digital Convergence* will change our lives

### ***A new level of awareness.***

The capabilities resulting from the seamless integration of multiple wirelessly connected devices are already mind boggling:

- By putting wireless sensors in strategic locations in a vineyard, the farmers can precisely control the humidity, the quality of the grapes, etc. and maximize the impact of their efforts
- By subscribing to a service, a person with cardiac problem can have his/her heart monitored and in case of a problem have the doctor alerted (and receiving the latest data, including a list of ambulances close by and an offer to start registering the patient in an hospital)... all that before the patient falls on the ground
- A traffic application (reminiscent of the first project developed by Bill Gates in New Mexico) could automatically analyze the traffic from cameras and dynamically control the traffic lights, while sending messages to the individual cars' GPS telling them what optimum speed they should maintain. In case of sudden stop, the application can alert the authorities and locate the closest camera to send images of what is happening.
- Another traffic application can detect ice on a road and build a dynamic map. If a driver subscribes to the service and has a GPS phone or device, he/she will be alerter of the presence of ice a few seconds before the problem becomes dangerous.
- As systems become more integrated, the separation between home and office is going to blur, and new "life style" applications will appear that will closely follow users, at the office as well as at home. This could include automatic detection and monitoring, emergency response systems, health assistance system, time management integrated with online videos and transparent data storage and backup.

Seen from this new point of view, the system appears as an "always on" translator of core information: the identity of a user can be accessed from a server somewhere on the cloud, the location from a signal received from a satellite. If these two pieces of information can be combined we just have a dynamic map on which the location of a group of friends is indicated by various icons. One more step and we can have the system automatically suggest a place to meet, simply by looking into the files for each person, look for their favorite place and then find the most popular... and offer to dial it for a reservation.

We will probably see more and more "smart systems" to offer interesting and focused services like local traffic, weather, local merchants, events, etc. Between the user and the carrier, we will see a bigger role played by an intermediate partner: the "smart" translator whose responsibility is to automatically assemble the required resources. At this level the raw information is gathered, translated, and delivered to the user.

With the development of social networking, we can see new ways information is used: A user stuck in traffic could not only see a traffic map made by comparing location and speed from other users' phones in the same community, but also ask the other users to publish real time photos (like the "Street View" in Google, but done in real time).

This will totally change the way information is gathered and transmitted. We all saw a first example with the recent events in Iran. A new instant global awareness is appearing and it will profoundly change our lives.

### ***New system architectures.***

Providers who want to send their information to be seamlessly assembled will have to make sure that the raw data is delivered according to a protocol known by the “assemblers” (like our current APIs). But the providers have no control over the use of their information. Because demand can actually wildly fluctuate during the day, it will make sense to use cloud-based resources and standardize the interfaces.

Developers working with the providers will less and less worry about programming the database accesses, and more about the gathering and translation of raw information.

This is not a small evolution, but a radically different way of thinking the architecture and development processes of our applications. With sensors placed everywhere (think “nano radio tubes” or “smart dust”) all what is needed is a way to collect the information (it can be the temperature, the stress level on a bridge, vibrations, etc.), and send it to the cloud where the information will be accessed (often in real time) by all the services that need to have this information.

We will see at the system level the same evolution we saw with the hardware: the integration of a phone, a camera, a video camera, a tape recorder, in the same device changes the nature and the boundaries of previous “applications”. Add to it special applications already available like a compass, an accelerator, a level, a light sensor, a smart alarm clock, and you see a radically new way to structure files and applications: one service can gather “just” the raw data coming from a sensor. Another service may use this data for a different purpose: comparing, creating new data, providing archival, etc.

We see examples of these processes in the collection of trading information: the exchange give information on the fly. This information can be processed and presented by another company, and yet another will keep archives allowing the user to see all the information gathered on a specific stock (like the archived values of the various options for this stock).

### 3. Feedback:

#### How these new capabilities feed a redesign of “The Network”?

##### ***The evolution to a new content-based access to a richer kind of information***

Users will no longer care about the location of the servers or the data (the “Cloud” will deliver the needed information). They will also not have to pay attention to the nature of the information: “view of the stock market” may be a text, a video, a web site page, etc. Finding the right folder in a fixed hierarchy on a disk drive will look totally archaic to new generations of users. What will be required is only a way to name (i.e. a possibility to search later on) for a piece of content using Google Search, Bing, del.icio.us, or EverNotes and similar products and services.

The media convergence will make “document” become more visual and even “audio visual” Text will contain hyperlinks to web sites with videos. We already see this evolution with magazines (like Forbes), Newspapers living a symbiotic relationship life with their associated web sites (like the San Francisco Chronicle and SFGate). Reciprocally, television stations are pointing to web sites where users can download documents and reports.

The notion of a document itself will change: from existing objects with an “end” or delivery date to an ongoing “chat”, documents will morph into threads in community Blogs with more and more information provided by the “consumers” turned into providers of information or knowledge. Sites like facebook, twitter, wikipedia and specialized Blogs are replacing the traditional book or conference.

##### ***A more personal integrated visual world***

As the border between servers used in corporations and servers used on The Cloud are ignored, it will be difficult to keep the home as a separate island.

Most people today have a personal phone they synchronize with their “base system” at the office or at home. They synchronize their addresses, to do lists, agendas, documents, pictures, etc. They have often to use different software and different links... and when they are at home, they have to do it again, using different applications!

The situation is becoming even more urgent for a fast growing part of the management and salespeople. Now that they can be connected almost one hundred percent of the time, there is less reason for them to be attached to a desk or a computer in their office or their own.

The battle for the media aware home is only starting and it will draw many participants coming from places that were not seen as competition or substitution before:

- What is a “phone company” when you use VOIP at home, and WiFi/WiMax with episodic cellular connections?

- Is the service offered by Google Voice and Gizmo an Internet or a “phone” service?
- In a VOIP world, is there a difference between a “phone router” and a personal LAN router?
- Can we store our pictures, videos and personal documents anywhere? Is the solution of a “personal hub” a good one?

If it is true that “the computer is the network”, we can reverse the proposition by saying that the battle for the computers will replay itself as vendors start looking more and more to build machines working for individuals as well as large “computer farms”. We will see the same battle for the home network, this time with an enormous price: this is the combined market of the telephone, the personal computer and the cell phone.

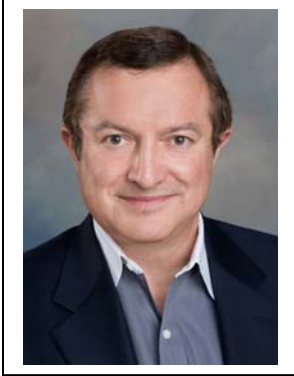
Finally, we need to point out that any change will not be limited to a region, even a country. In the new “flat world” in which we move with frictionless capabilities, the positioning battle will be instantly international. This will require people who are totally bi-cultural to express (and not just translate) the concepts between the vendor and the customers’ cultures.

By integrating multiple media into a seamless solution, vendors have created a totally new type of society based on instant communications, real time collaboration, and home-office connected life. The changes will be huge... and their implementation exciting!

**IG Partners has the resources and knowledge to help you “gracefully” migrate to this new architecture. We can:**

- **Analyze your business processes, evaluate how your company can take advantage of these new technologies and execute the most effective implementation strategy.**
  - ✓ **To speed up communications inside the company**
  - ✓ **To increase the ease, number, and quality of your contacts with your customers and prospects**
  - ✓ **Increase your presence and the efficiency of your lead generation system**
  - ✓ **Increase security of your business and the safety of your employees, even when they are traveling.**
- **Boost your marketing plan by judiciously using these new technologies**
  - ✓ **IGP has developed and implemented numerous marketing and business plans and developed funding strategies around those plans.**
- **Research available products and applications to meet your specific needs**
- **Work with your internal team to develop a logical, time and cost effective implementation work plan. IGP team members have been responsible for implementing large systems around the world.**

We can't identify all of the opportunities facing this convergence. IGP as a firm has over 50 years of hands-on experience in the software and wireless areas. I will also be happy to hear from you about these ideas. Just send me an email at the address below.



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