“Digital Natives, Digital Immigrants” in the US Intelligence Community: Generational Cognition and Effective Knowledge Management for the J-Curve

By Chris Rasmussen

The US Intelligence Community (IC) is suffering from a divide in generational cognition. The IC’s knowledge management and mentoring programs are antiquated and reflect learning models of the past. These older systems and learning models need to be updated (not replaced entirely) in order to tap the cognitive power of younger workers. To ameliorate the IC’s cognitive divide, two conditions (the IC’s J-curved workforce and neuroplasticity) and several existing technologies (podcasts/vodcasts, social software, and videogame-based learning) need to be explained and built upon.

The basis of this assessment builds upon an odd feature of the IC’s workforce—the absence of GenXers—a phenomenon know as the J-curve. Second, this unique demographic affecting the IC is developed by explaining neuroplastic brain structure studies suggesting that thinking and learning patterns of people socialized amid the backdrop of high digital technology have changed dramatically. Finally, three existing technologies (podcasts/vodcasts, social software, and videogame learning) are explained and recommended as tools needed for more effective knowledge transfer and management that will not only register with younger workers but with everyone in the IC workforce. Of course, as technology develops, more such technologies will become available.

The IC’s J-Curved Workforce

For several years now many in the IC have been talking about the J-curved workforce: experts with twenty-plus years of experience and others experts close to
retirement (short part of the “J”), a missing middle (loop of the “J”), and many new hires
with fewer than three to five years on an account (the so-called long part of the “J”).

The missing middle needs to be explained a little further. The “peace dividend” of the
1990s blocked many GenXers (1965-1977) from the IC. This missing middle could
have helped soften the generational gap in the IC because many late GenXers
experienced the Internet revolution in post-adolescence.

Many in IC are simply “admiring” the J-curve problem by suggesting back-to-
basics campaigns rooted in the perceived haleon days of “yore.” Business consultant
Michael Hammer is quoted as saying, “One thing that tells me a company is in trouble is
when they tell me how good they were in past.” This back-to-basics methodology is
often “updated” by simply posting documents to IC intranets, which cuts out audio/verbal
learners and perpetuates the world of text-based “product” when there are so many other
media available for knowledge transfer. Before you think about setting up a class, a
mentoring session or even preparing a “product,” ask yourself, would my kids like and
learn from this? This is not just “edutainment” for the kids. Many adults enjoy
podcasted knowledge and interactive, multi-media learning tools. A rising tide raises all
boats.

---

1 Capt. Ron Rice (USN) Director of National Intelligence Office of Analysis delivered a PowerPoint and
speech at a conference sponsored by the Disruptive Technologies Office, San Diego, August, 9, 2006.
2 Generational date ranges extracted from “Defining Generational Values and Recognizing Differences: To
Make a Happier Healthier Work Environment,” Private Briefing.
3 Dr. Tom Fingar, deputy director of national intelligence, speech at the DNI’s Information Sharing
Conference in Denver 2006.
4 Thomas L. Friedman, *The World is Flat: A Brief History of the Twenty-First Century*, (New York: Farrar,
Straus and Giroux) page 451.
page 5.
Marc Prensky’s 2001 essay “Digital Natives, Digital Immigrants” argues that the decline of education in the United States stems from a disconnect between “Digital Immigrant” educators with thick accents of printing out emails, going to the Internet as a second source not the first, asking kids for help with computers, and teaching in a boring “step-by-step, tell-test”\(^6\) fashion, and “Digital Natives,” whose brain structure has changed amid the backdrop of high digital technology and thus learn and think differently than “Digital Immigrants.”\(^7\) The IC is a microcosm of American education and is suffering a similar knowledge transfer issue.

The aging and retiring Builder (born before 1946) and Baby Boom (1946-1964) workforce need to transfer their knowledge to the growing and upcoming Net Generation (1977-1997)\(^8\) workforce in a “Digital Native” format. Too much content, training, mentoring, and tradecraft is based on the didactic model of handing over manila target folders, “step-by-step”\(^9\) linear instruction with PowerPoint, and interacting with aging and isolated agency-specific electronic tools, simply to produce electronic paper. This needs to be updated to include more random and interactive learning models based on what most new workers grew up with and use at home such as collaboration, tagging, and annotation services, mashups, wikis, podcasts/vodcasts, video nuggets, and videogames.

**Neuroplasticity**

---


\(^7\) *Ibid*, page 1.

\(^8\) Generational date ranges extracted from “Defining Generational Values and Recognizing Differences: To Make a Happier Healthier Work Environment,” Private Briefing.

Prensky expands on the implications of brain “rewiring” in the digital age, and by extension, shows how this affects a knowledge community such as the IC:

Although the vast majority of today’s educators and teachers grew up with the understanding that the human brain doesn’t physically change based on stimulation it receives from the outside—especially after the age of 3—it turns out that that view is, in fact, incorrect.

Based on the latest research in neurobiology, there is no longer any question that stimulation of various kinds actually changes brain structures and affects the way people think, and that these transformations go on throughout life. The brain is, to an extent not at all understood or believed to be when Baby Boomers were growing up, massively plastic. It can be, and is, constantly reorganized. (Although the popular term re wired is somewhat misleading, the overall idea is right—the brain changes and organizes itself differently based on the inputs it receives.) The old idea that we have a fixed number of brain cells that die off one by one has been replaced by research showing that our supply of brain cells is replenished constantly. The brain constantly reorganizes itself all our child and adult lives, a phenomenon technically known as neuroplasticity.¹⁰

Many young people have received and continue to receive massive doses of random, interactive, hyperlinked, multi-tasked, and videogame-like inputs.

Before we go any further, two things need to be clarified. First, generational studies are abstractions of time and context, and thus there will always be exceptions to every rule. For many, the word “generalization” has become pejorative, but without generalizations the human mind could not grasp hard or social science. Does the table structure of a database actually look like a table inside the computer? No. Does a model of a molecule actually look like a bunch of balls linked with pipe fittings? No. Does Beijing really speak with one voice when political scientists give a national capital human characteristics? No. But, these generalizations help us understand the world we live in. That said, a twenty-five-year-old that likes Frank Sinatra and a tech-savvy

Boomer-Geek are exceptions that do not invalidate other generational rules. It is fair to state that people socialized in the digital age tend to be more tech savvy than people not socialized in the digital age. This phenomenon, according to Prensky, ultimately affects brain structure and thinking patterns.\textsuperscript{11}

Let me emphasize again, interactive videogame-based learning and podcasts/vodcasts are not like the “edutainment” efforts of the past.\textsuperscript{12} If done imaginatively, not as “drills with eye-candy,” Digital Native methodologies and technologies can extend far beyond conveying mere facts\textsuperscript{13} to include comprehension of classic philosophy, area studies, engineering, mathematics, history, and structured analytic techniques (intelligence analysis).

**The Podcast/Vodcast**

The term podcast is an amalgamation of the words iPod and broadcast. An iPod is Apple Computer’s extremely successful hand-held portable audio and video (vodcast) player with desktop computer-sized storage space (tens of gigabytes). While many podcasts/vodcasts are download to an iPod for mobility, many listen or view content on their “larger” computers.

Many podcasts/vodcasts are syndicated over the Internet via an RSS feed (Really Simple Syndication). Users subscribe to an RSS feed and receive email-like updates in an RSS reader when new content is available. In addition to RSS, there are also one-stop-shopping sites like Apple’s iTunes that not only contain millions of songs and

\textsuperscript{11} Ibid., 1-2.
\textsuperscript{12} Prensky, “Digital Natives, Digital Immigrants,” page 5.
\textsuperscript{13} Prensky, “Do They Really Think Differently?,” page 6.
videos, but thousands of business and educational podcasts. Organizations that podcast their content range from businesses and academia (Microsoft and Stanford University) to media outlets and prestigious journals and magazines (National Public Radio and *Nature*).

Stanford University has a long-standing relationship with nearby California-based Apple Computers, which is the parent company of iTunes. Stanford and iTunes "provides its students—as well as the general public—with downloads of faculty lectures, campus events, performances, book readings, music recorded by Stanford students and even podcasts of Stanford football games."\(^\text{14}\)

The scientific journal *Nature: International Weekly Journal of Science* sponsors one of the more popular hard science podcasts. The content includes shows on genetics, chemistry, biology, etc.\(^\text{15}\) Predictably, there are thousands of technology-related podcasts that talk about computers, programming languages, the Internet, space exploration, etc. On the social science front, the *Discovery Channel* syndicates podcasts on Egyptology, the Roman Empire, World War II, and women’s history. There are also many "learn a language" podcasts that help users learn Italian, German, French, Chinese, and so on.\(^\text{16}\)

In addition to the "professional" podcasts/vodcast with good production values, there are millions of amateur productions that can range from Sophomoric to very informative. All you really need to have your own radio or TV show on the Internet is digital audio/video recording equipment and server space. Many often wrap their audio/video files in their blogs to syndicate the content.

---


\(^\text{15}\) Podcast index, www.nature.com

\(^\text{16}\) iTunes client and www.itunes.com
Multi-media content is standard on the public Internet and growing more creative everyday, but inside the IC’s intranets there is very little multi-media content compared to text. Many search engines inside the IC are missing audio and video search tabs. Even when multi-media, like video or flash, is discovered it is often subordinate to a text report and is not the primary medium for transmitting knowledge.

As far as I know there has only been one podcast done on Intellelink-JWICS. The blogger “Need-to-Share not Need-to-Know Guy” recorded a five minute audio piece summarizing the Director of National Intelligence’s 2006 Information Sharing Conference in Denver and syndicated it via his blog.\textsuperscript{17} Judging from the comments near the time of the posting people really liked it.\textsuperscript{18} However, others commented they could not hear it because their computers didn’t have speakers. This speaks volumes to the IC’s text bias and lack of modern computer equipment.

This blogger’s crude podcast was a step in the right direction toward more “professional” podcasts/vodcasts with good production values, guest IC speakers, video nuggets of best practices, and other types of multi-media knowledge transfer. For example, a weekly China podcast on recent military developments and the history behind the evolution of China’s military would be wildly popular and effective in transferring knowledge on all things China to everyone, not just “green” analysts.

\textsuperscript{17} Bruce Finley, “Intelligence fixes floated at conference,” Denver Post, August, 22, 2006.
\textsuperscript{18} Intellelink, renamed Intelligence Community Enterprise Services (ISES), is an office and web presence that, inter alia, offers instant messaging, blog, and wiki services to the US Intelligence Community. Joint Worldwide Intelligence Communications Network (JWICS) is a US-sponsored TOP Secret network and Intellelink rides “over the cloud” of JWICS.
Not only can podcasts help people learn, they can also be used to sell new IC policies. For example, the standard policy document—certified by an organizational seal and signed at the bottom—is the traditional foundation of guidance and action within the IC. However, the message of important documents needs to be actively and enthusiastically marketed beyond the letters on the page. Consider: the quarantine order signed by President Kennedy during the Cuban Missile Crisis was the "legal" foundation, but the message was also sold on TV with clear, forceful, and fair language. Likewise, IC leaders should use podcasts to advertise new reforms and messages within the IC. A weekly Controlled Access Program Coordination Office (CAPCO) podcast/vodcast highlighting classification changes would be very helpful.

Many seniors accustomed to text and linear PowerPoint briefs often project their preferences onto others and into the future arguing against the use of multi-media technologies and products. As more Builders and Boomers retire and subsequent generations fill the void, who is to say that Net Generation leaders will carry on the hardcopy, briefer tradition of the past? How can one argue into the future and claim that Net Generation and Millennials (born after 2000) will not want "graphics before text," look for intelligence on a wiki, or listen to a podcast briefing on their own. In fact, the IC has some experience with preparing non-traditional products and briefs.

The President’s Daily Brief (PDB) is based on the President’s preferences. It is well known that Bill Clinton sometimes liked to receive intelligence briefings in video

---

Moreover, if a President wanted to listen to his/her morning intelligence brief on an iPod-like device while jogging, the IC would make it happen. If intelligence format can be tailored to fit the preferences and style of the Chief Executive it can also be modified, at pennies on the dollar compared to non-traditional production costs in the early 1990s, to reach other audiences.

**Social Software-based Knowledge**

Social software is a category of interactive web-based services that generate content from the “wisdom of crowds” (individual users, not centralized production units). Examples include blogs, wikis, social bookmarks, annotation services (marking up web content with electronic sticky notes), and folksonomy tagging (users generate the tags, not a central organization) of pictures and video. Calvin Andrus’ 2004 Galileo paper “The Wiki and the Blog” argued for the utility of these specific technologies in an IC context, and I will not expand on them here. However, I will talk briefly about social bookmarking, tagging/ranking services, and mashups.

Social bookmarking allows users to save and tag URLs. Once tagged and saved, the user can see how many other people found the URL useful. For example, one might see a page describing bin Laden saved by 345 other people and tagged with associated

---


21 The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations, first published in 2004, is a book written by James Surowiecki about the aggregation of information in groups, resulting in decisions that, he argues, are often better than could have been made by any single member of the group. The book presents numerous case studies and anecdotes to illustrate its argument, and touches on several fields, primarily economics and psychology—extracted from Wikipedia.

words like terror, non-state actor, Wahhabism. The user can get into the bookmarks of others to see what they have saved/tagged on similar topics.

**Graphics, maps, audio, and video tagging services**

On-line picture management and sharing services like Flickr (http://flickr.com) and video management sites like YouTube.com (www.youtube.com) are popular sites on the Internet because they build upon what most young people nowadays like to do: share everything. A young person’s first thought after taking pictures or shooting video on vacation is to post and tag it for the whole world to see. I don’t want to debate the on-line practices of youth here, but rather talk about the technology behind services like Flickr and YouTube.

Social software services are random, interactive, and provide instant and near-instant gratification via feedback loops. Many young people use these services because random and parallel flows of knowledge (not sequential) register with their brain structure and thinking patterns.23 These services are popular with the youth, but their use and utility extends across age brackets. For example, a Flickr-like service used to manage U.S. Defense Attaché photos would be more efficient than the current system of posting thousands of pictures subordinate to text reports without tags or on-line feedback loops.

Let’s say a Defense Intelligence Agency (DIA) military attaché returns from a field trip with photographs of new facilities and military equipment. Rather than attaching the selected pictures to an Intelligence Information Report (IIR), the attaché

---

23 Prensky, “Do They Really Think Differently?,” page 5.
could upload them to a Flickr-like service and then tag them with keywords for association. To take it one step further, a geospatial mashup—a mashup is a website or application that uses content from more than one source to create a completely new service—would allow the photos to be geotagged and displayed on a map. The pushpins on the map could link back to original text. Users would be able to communicate with the collectors via comment links located near the photos.

Web services, mashups, and social bookmarks are making their way into the IC, but much too slowly and often inside agency stovepipes. The associative power of “wisdom-of-crowd” services cannot grow in an agency vacuum. Most content belongs in neutral and broad ground similar to Intellink, not isolated agency-specific cyberspace, for maximized access at all three levels of classification: the Top Secret JWICS Network, the Secret Internet Protocol Router Network (SIPRNET), and the Sensitive But Unclassified Network (SBU). Sharing with allies is extremely important, but US-Allied network consolidation is outside the scope of this paper. But the aforementioned social software services would be helpful to our friends as well.

**Videogame-based learning**

The US military has been using videogames and simulations to training soldiers, especially pilots and tank drivers, for over 20 years. In addition to these classic simulations, the military has invested heavily in learning games and “first person shooter” games like *Doom* to reach and teach Digital Native recruits. The military has

---

to reach and educate a quarter of a million young people per year.\textsuperscript{26} Militaries the world over and throughout history, typically, have been "young" entities, and the modern US military is no exception. According to 2004 Department of Defense statistics:

87 percent of new active duty recruits were 18 through 24 years of age compared to 37 percent of comparable civilians. The mean age of new active duty recruits was slightly more than 20. Almost half (48 percent) of the active duty enlisted force was 17-24 years old, in contrast to about 14 percent of the civilian labor force. Officers were older than those in the enlisted ranks (mean ages 34 and 27, respectively), but they too were younger than their civilian counterparts, college graduates in the workforce 21-49 years old (mean age 36).\textsuperscript{27}

The J-curve and more incoming analysts make the IC a "green" (young) force as well. IC demographics are classified, but one can speculate that many of the incoming and green analysts are of average post-college graduation age (early to mid-twenties). Incoming and new IC analysts with graduate degrees will on average be several years older. So, the question is: where is the IC analyst equivalent of the Air Force flight simulator? Where is the "first person shooter" game in which the IC analyst navigates the world, functioning in ambiguity and fragmentary information, and making judgments that are "good enough?"

As previously mentioned, opponents of videogame-based learning argue that it works for facts but not for complicated subject matter, which they refer to as "my subject." Prensky says, "Nonsense. This is just rationalization and lack of imagination."\textsuperscript{28}

\textsuperscript{26} Prensky, "Do They Really Think Differently?,” page 6.
\textsuperscript{28} Prensky, "Digital Natives, Digital Immigrants,” page 6.
The CIA Sherman Kent School for Intelligence Analysis uses a primer entitled “Structured Analytic Techniques for Improving Intelligence Analysis” to help analysts check cognitive biases associated with intelligence analysis that often lead to intelligence failures.\(^{29}\) With a little effort this primer could be turned into a highly effective videogame.

For example, a frequent mistake made within the IC is not checking for biases in perceiving causality. The assumption that our enemies “must be up to something” orderly and causal rooted in some long-term strategy is overestimated. Alternative explanations of banality and chance are often dismissed. Some basic definitions help explain biases in perceiving causality:

**Rationality:** Events are seen as part of an orderly, causal pattern. Randomness, accident and error tend to be rejected as explanations for observed events. For example, the extent to which other people or countries pursue a coherent, rational goal-maximizing policy is overestimated.\(^{30}\)

**Attribution:** Behavior of others is attributed to some fixed nature of the person or country, while our own behavior is attributed to the situation in which we find ourselves.\(^{31}\)

Imagine a videogame that revolves around key events, for example, the North Koreans have pulled some missiles out of a few caves. Prior to this incident the user would have interacted with a back-story of history, international relations, current events, and biographical information, to give context to the user’s evaluations. The user makes a call: the missiles were removed to increase operational tempo for an impending attack. The call goes out, the missile are targeted and blown up. But the call was wrong; the


\(^{30}\)Ibid., page 5.

\(^{31}\)Ibid
analyst's judgment had been rooted in a causality bias. The North Koreans were simply removing the missiles from the caves because they were rusting and need repair. This is a simple example, but the potential for teaching structured analytic techniques and lessons learned from previous intelligence failures is endless.

How about a detective-like videogame that tracks the DC sniper case and checks and monitors reasoning behind its well-publicized assumptions: the sniper being a white male, having military training, and driving a white van (these assumptions incorrectly and negatively affected the real-world investigation). What about a game designed around the failure to anticipate the 1998 Indian nuclear detonation? The user would have to task satellites for imagery coverage, track key nuclear scientists, and monitor Indian public opinion and government stability regarding national pride or reticence to embrace nuclear weapons.\textsuperscript{32}

Prescriptions, Hopefully not Nominalizations

The generational cognition gap in the IC is wide and will widen if the status quo is maintained as more and more new hires pour in. Neuroplastic theory suggests that the brain changes and organizes itself differently based on the inputs it receives. Most young people today have received and will continue to receive massive doses of random and interactive electronic inputs and this trend will not abate. In fact, it will only grow wider and faster in the future. However, there are several existing technologies (not blue sky R&D technologies) that can help bridge the cognition gap now.

\textsuperscript{32} \textit{Ibid.}, pages 10-11.
While major universities, businesses, and media outlets have invested in podcasts/vodcasts, the IC has made little to no effort in audio/verbal/video learning. A minor investment in inexpensive audio/video recording and editing software and hardware (microphones, minicams, and headphones) could kick-start IC “radio and TV” shows for transmitting knowledge.

Social software and multi-media services are more than static and redundant reports circulated by agencies in the hope of meeting vaguely defined customer needs. The nature of these services helps the IC move away from a collection of agencies to a collection of users and user-generated content. If there is a service that increases collaboration and flattens out knowledge flow, it needs to be integrated into agency-neutral ground such as Intalink as soon as possible. Not only do we need to expedite this process, but the Director of National Intelligence (DNI) should order (with the stick of budget cuts) all agencies to get their content out from behind firewalls and into neutral and broad ground in order for users to take advantage of social software services.

The IC should contract with digital game-based learning companies to develop innovative ways to transfer and retain IC knowledge. If the IC put in a fraction of the effort to develop intelligence-related videogames similar to Nintendo’s John Madden Football, we would be off to a good start. Traditional classroom instruction will always be necessary, but a teacher near a chalkboard up front peppered with those strange high-school hybrid desk/seats is not the only way to transfer knowledge.

Most important: keep an open mind! A noted analytic failure is projecting one’s values onto others (mirror imaging). If it’s a common “no-no” regarding countries and
peoples of the world, it should also be a “no-no” regarding tradecraft development and knowledge generation. I once heard a great Digital Native-Digital Immigrant divide story on the DC Metro. One young college girl mentioned microfiche and another replied, “What website or program is that?” I could have reacted like most Digital Immigrants and said, “These kids have no respect for” (fill in the blank), don’t work as hard as us, and should learn like we did, etc.”33 But I say good riddance to microfiche, and these kids are smart or smarter than us. Communicating in media Natives are used to will not only help Immigrants transfer knowledge to Natives, but it will also help everyone capture, access, share, retain, and dispose knowledge more efficiently as well.