

PART 3: HOW THE 'DOWNLOAD GENERATION'™ WILL DRIVE ELECTRONIC CHARTING IN A NEW DIRECTION

Citizen Mapping and Charting (part 3)

We are about to see an amazing transformation over the next decade, as the generation that grew up with the internet, wireless communication and geo-location starts to take over the work force. Never before has a generation had such a technological leap over their parents. As technologically savvy as 'baby boomers' perceive themselves to be, they are no match for their offspring. It is so common that parents defer to their offspring or grandchildren for technological guidance that it's no longer a cliché or point of humour; it just "Is what it is". This 'download generation' will change our charting world.

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With the phrase 'download generation' I refer to those born in 1990 and beyond. Most are entering university now and soon will be flooding the job market. In the next 10 to 15 years they will be having an enormous effect on how the mapmaking and charting world operates. They see things differently than we do. They don't think about the possibilities of the internet or GPS - it is the air that they breathe.

Download Generation

When they think about what their world could be, they start at a different place. What we have lodged in our imagination they have as basic intuition. What we take as amazing technology, *they* take for granted. Already, they are starting to drive applications of those technologies in new directions. They have far different expectations than we have or had. They are showing the energy, creativity and ingenuity to remake their world to their own liking. This will certainly change electronic charting as we know it.

Digital Youth

1990 is an important year for several reasons. For one, by that time the PC market was starting to mature. In fact Apple's flagship product was called the Mac 'Classic'. So these children grew up in a digital environment. By the time they went to kindergarten they could see their parents carrying laptop computers. The worldwide web was the internet, and GPS became fully operational. Throughout their early years they could see that people communicated with mobile phones - and soon they would have their own. The educational flip-flop began as children began to take it for granted that they had to show mom and dad how the mobile phone really worked and all the features it had. They also developed patience as they realised that they had to explain these things several times. The same with the home PC - by now networked on broadband. In their early teens, Wikipedia became the source of quick reference, Google became a verb and mom and dad needed help with the GPS in the car. The iPod changed music marketing forever, downloading music took off in earnest and social networking came upon us. Soon FaceBook and Twitter dominated their time, they mastered smart phones, understood 3G networks, and rated and ranked the latest iPhone apps. Yet none of them have ever 'dialled' a phone. Yes, this cohort is *very* different.

In the words of the Berkman Center for Internet and Society at Harvard University, they are "Digital natives and we, the digital immigrants" (1). The unique characteristics of this generation have been documented in several recent books such as *Born Digital*, *Grown Up Digital* and *The Emerging Millennials*, as well as several web communities such as websites 1 and 2.

Technically Fluent

When people who lack a degree of technical fluency approach a technical problem, we see hesitation, apprehension and often counter-

intuitive behaviour as they grope for a solution. Further, this may occur seemingly at random, and all because of a basic lack of intuitive understanding about just how the technology works. They don't seem to know what actions are important and which are marginal. Neither can they articulate what the problem issue is as they lack the new language and terminology. Something just doesn't work and their frustration level can rise to a fever pitch. Having an intuitive understanding of how technologies can work together (convergence) gives you a big advantage.

Young people understand convergence better because they start at a different place. They have an innate sense of how something will work and so they frequently will ignore any documentation or training and just jump right in. They may make errors but they quickly learn and are fearless about trying things. This carefree approach gives them a big advantage. Often, the mistakes they make are based on a false assumption that the technology is better than it currently is. They know something specific should happen but the technology is not there - yet. Older, non-digital natives, lack this basic intuition of how things flow together. They may have a better basic understanding of how the *underlying* technology actually works, but they lack the social context of how it will be used and that is the more important of the two.

Understanding the Download Generation

Lacking this deep level of fluency makes the terrain difficult to navigate as it is all unknown. Digital natives seem to be able to effortlessly glide - like a gifted athlete - with little hesitation, as if they were born to do this. That's why they will make big changes in the mapmaking and charting world. We need to understand this gifted generation in order to provide some level of guidance. They may not look to us for technical assistance or training, but they will depend on us for the wisdom acquired through years of experience.

From my own observations, I see the following values being particularly important to this generation:

- timeliness: not as within weeks or days - but as within seconds
- connectedness: always connected, always on
- free: as in virtually costless
- choice: multiple ways to customise what you want
- content: if it isn't online it doesn't exist
- copyright: new media means new rules
- collaborative knowledge: everybody adds, everybody shares
- spatial awareness: knowing where you are, where your friends are
- depth: links to ever-increasing detail
- realism: as in photo-realistic 3D models mirroring the sighted experience
- activism: as in bottom-up knowledge creation
- improvisation: if I see it's wrong I will fix it
- wikis: fellow travellers contribute the most meaningful information
- trust: technology works, large institutions don't
- rating and ranking: what other people think of this product.

From these values I believe that several deductions can be made about how the download generation might think about re-engineering our charting world. It starts with the collaborative knowledge, activism, customisation, realism and the search for ever-increasing detail values as they apply to our mapping world.

Changing Charting

Crowdsourced mapmaking, such as OpenStreetMap (OSM) will be increasingly important. It appeals to the download generation for a number of reasons. First, it involves joining a group of activists who are focused on change. Second, acquiring and processing the data is fun and collaborative and it uses the same technology that they grew up with and know so well. Third, it allows them to stretch themselves intellectually into a new domain and learn some new skills. Additionally, it allows them to acquire as much detail as they feel is necessary for their purpose and enjoyment, to build upon what others have done before them, and to be judged and appreciated by their peers for their work. If the previous 'values' are reduced down to eight essentials (see Table 1), it becomes apparent that the OSM movement has a high degree of appeal to the download generation.

The Issue of Free

One of the more vexing issues will undoubtedly be the issue of fee-based licensing. The download generation has been raised in the era of Napster and they adopted Pirate Bay with abandon. They are notoriously unsympathetic to the entertainment industry's complaints of illegal downloading and are outraged by measures such as Digital Rights Management (DRM). That didn't go so well for the entertainment industry. The download generation will carry that same attitude about ENC licensing when they graduate from navigation colleges and become a force to be reckoned with on the bridge. One option might be to support a fee-based service in the image of Spotify (3), a streaming customisable music service that runs constantly. Should such a parallel chart service eventually come to pass, it would be the culmination of one of the dreams of an electronic charting pioneer, Neil Anderson, who during a joint workshop of the Canadian Hydrographers Association and the Hydrographic Society of America in 1985 envisioned a chart server 'in the sky' that would stream out nautical chart information in an endless stream. That kind of technology didn't work 25 years ago, but times have changed.

Marine Navigation World

The effect on workplace demographics as shown in Figure 1 will somehow be reproduced in the workplace of marine navigation. The effect of the download generation may be accelerated in places where there are a disproportionate number of deck and navigation officers approaching retirement in the next decade. If the effect seen in eastern Canada (4) is replicated elsewhere, then we can expect their influence to be felt even sooner than in the population in general (see Figure 2).

Most likely, the changes the download generation will expect (and eventually get) can be summarised as: openness of display options for

customisation, drill down detail, 3D realism, crowdsourced overlays, chart changes within minutes of the action being reported, all content online all the time, and ratings and feedback from fellow mariners. All of these expectations can be met, some in the short term, others requiring changes by Hydrographic Offices and port state regulators. Some will require changes to existing technical standards and others need international regulatory approval.

Wiki-based

A clear and straightforward step forward to crowdsourcing useful navigation information would be a wiki-based Coastal Pilot or Sailing Directions. The contribution of other mariners who regularly sail within an area are those best suited to document the relevant information and to keep it up-to-date. It is almost certain that some form of marine wiki-based navigation device will be implemented, particularly when a significant percentage of download-generation mariners start to flood into the market.

3D Realism

Although not a new development in electronic charting, 3D chart models have not met with great acceptance among the marine navigation community. That will probably change when the new generation of mariners takes command. I suspect that this is exactly the kind of display detail they want. And one specific movement that I'm sure will have direct relevance to the mapping and charting world in the near future is the amazing free work being done by volunteers in developing 3D models for display in Google Earth.

While the greatest volume of work is being done by commercial organisations and municipal governments to develop 3D models of sections of cities for their own purposes (see, for example, Digital Urban at website 5), it is the free work being done by gifted volunteers that can be breathtaking in its complexity, realism and, ultimately, its usefulness. Visiting the Google SketchUp Warehouse one can view amazing models of some of the most beautiful buildings in the world. Additionally, and of great significance to the charting community is the work being done modelling bridges over navigable waterways and waterfront detail (see Figure 3). A [beautiful example of this exists](#) for Portland, Oregon, but there are many others.

As much as the world is changing shipping will remain as the safest, most economic and sustainable form of transportation. So there will always be a need for vigilance assisted by advanced nautical information technology. The 'Download Generation' is perfectly suited to this environment. We need to recognise that they will influence the future.

More Information

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