WHERE *in the* *FUTURE*

Trends in Location Information

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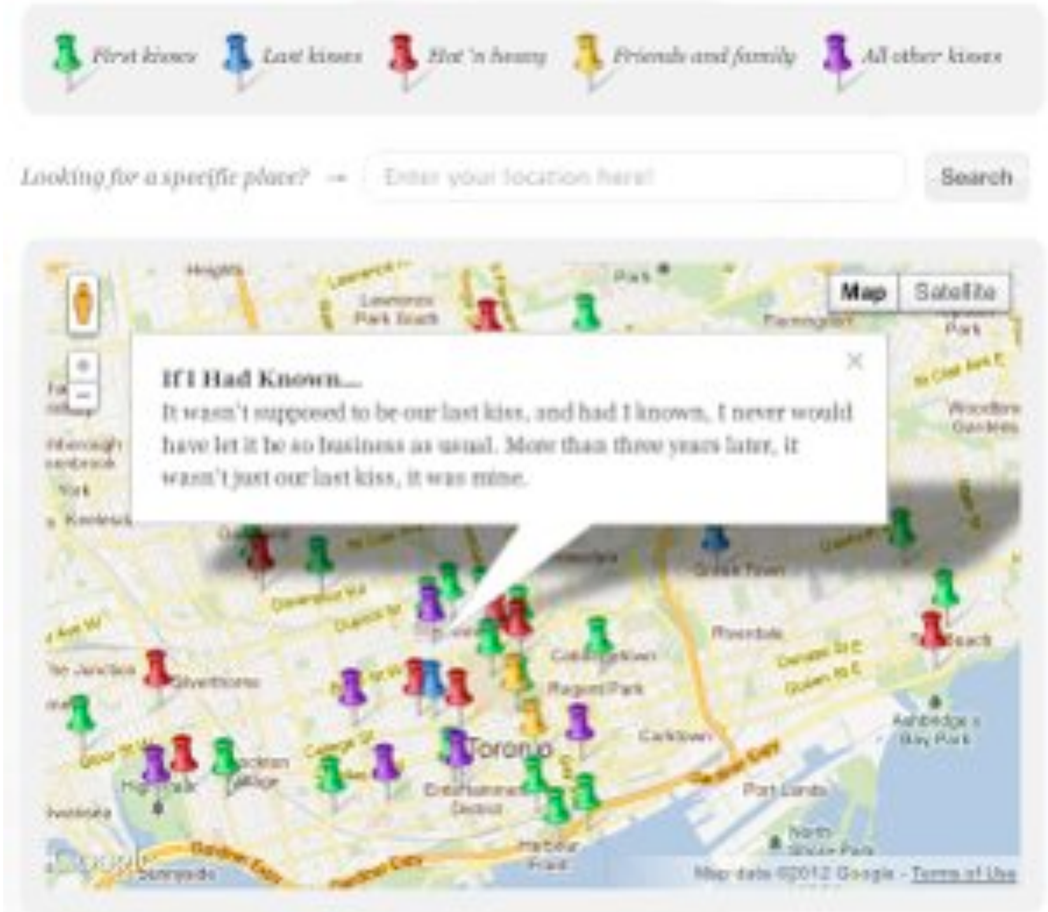
squiggle courtesy of Damien Newman

Location Goes Social

In the past year, many of the world's dominant social networks and social software players have embraced location data in their products and services, leading to an explosion of user numbers now and in the years to come.

Locative media no longer belong to esoteric art practice, they underpin our global social interaction and community. Twitter, Google, and Facebook have all launched functionality enabling users to share locations with friends and networks, near and far. But these behemoths are competing with smaller dedicated competitors for the data from those transactions.



Human moments, vector landscape. *Canada Kiss Map* canadakissmap.com

While this competition between diverse ecosystems of location-specific social players and network juggernauts plays out, important new questions about the connections between social activity and geographic location are rapidly emerging and interacting. Are users more comfortable tweeting a #hashtag that maps to a globally trending topic with millions of followers, or a neighbourhood issue that may only be seen by dozens? Does the venue one haunts as *Mayor* influence one's popularity, or one's behaviour online? What about offline?

Market research firms like Forrester[1] suggest that as few as 5% of online adults in the US make regular use of location-based social networks, but growth is blistering, with Foursquare experiencing nearly 300% growth in its numbers since 2010. Whatever change we see now will likely accelerate over time.

[1] http://econsultancy.com/us/blog/6323-forrester-marketers-don-t-need-foursquare

Location Goes Social

Implications

Although the total number of users of location check-in services remains small compared to total numbers of Internet (or even smartphone) users, those that are checking in at present are early adopters likely to explore new approaches to brand engagement, discounted goods and services, and social climbing (or spelunking).

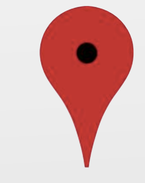
If sharing places and real-world activities with friends (and foes) online turns out to be the viral cocktail of success that many are predicting, the potential growth we could witness in the coming years is staggering. comScore data from October of 2011 suggests that as much as **78% of the smartphone market has yet to mature in terms of uptake on location-sensitive software** and services, more than 65,000,000 users in the US alone.[2]

Signals

Foursquare goes for Mayor
The check-in service has gone from 5 to 15 million users in less than 12 months, with as many as 2.2 million utilizing the service on a daily basis as of December 2011.

Facebook Enters the Fray
With more than 800 million active users globally, and an IPO imminent, Facebook is a serious player by default in the location game - even if the company's first attempt at rolling out "Places" flopped, and had to be redesigned prior to an acquisition of Gowalla for talent + IP late in 2011.

Google's Attempt to Check-In
Google's launch of it's own version of Places has been awkward, and while their social network Google+ is more sparsely populated than Facebook and seems to foretell their demise as the location social network of choice, their grip on online search / mapping services is tight.



Twitter Mentions Location
Initially successful as a vehicle for users of other location services to blast their whereabouts to friends not on a particular location-centric service, Twitter rolled out the option for users to attach a location to their text-sized messages throughout 2010 and into early 2011.

Implications for the future of location-based products and services are difficult to ascertain from today's crowded and increasingly competitive landscape, but growth is highly likely. It seems clear that in spite of privacy concerns (to be explored in a ***P****olitical* trend), issues with compatibility across platforms, and the risk of overdose on gamification in the quest to demonstrate locative technology's social value; future check-in services will be built as (or upon) social networks. Players in the smartphone app space like Instagram, already surpassing Foursquare in terms of number of accounts and frequency of use, will be particularly interesting to watch in terms of their integration of location data and social interface design.

Links of Interest:

[2] comScore Check-In Service Statistics

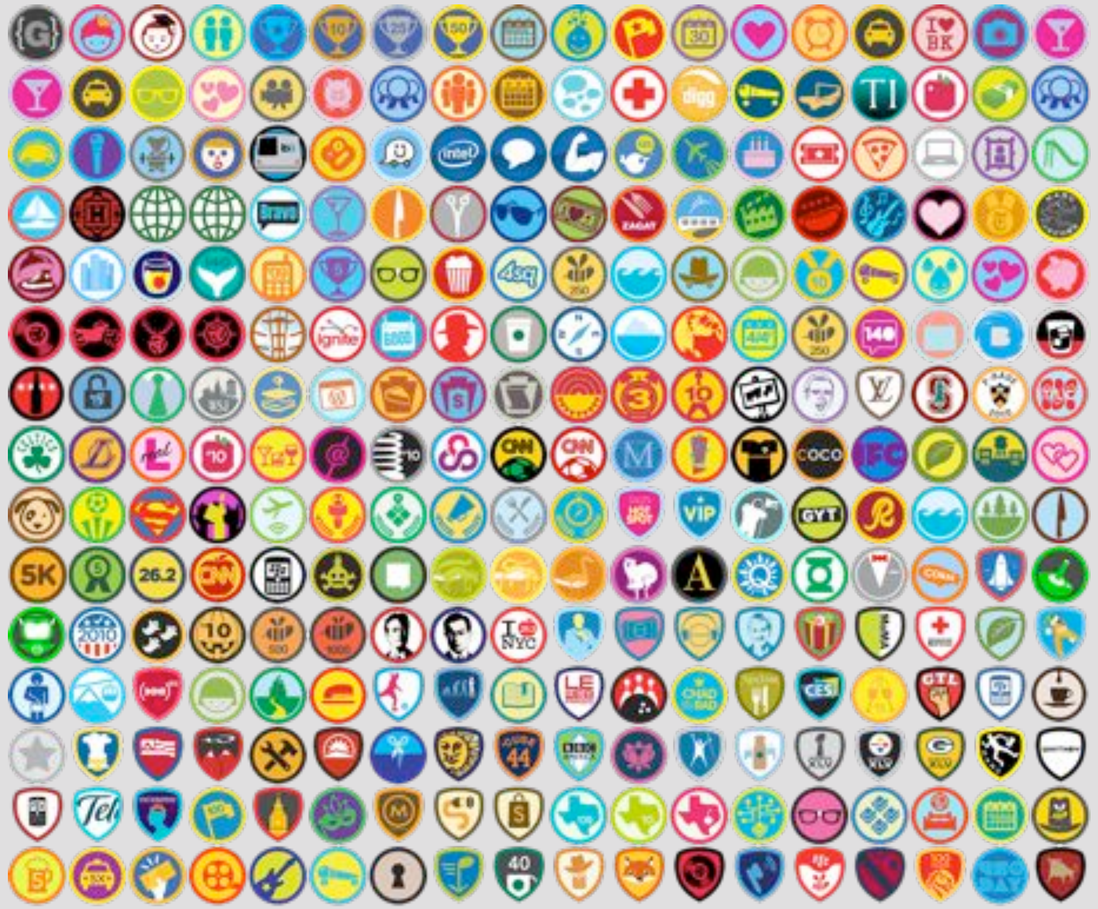
ClickZ Foursquare User Data

Econsultancy: Location Services + Marketing Dollars

Rules of the Game

The boundaries dividing games from serious tasks, group activities from solo activities, are blurring. As games and mobile software platforms incorporate more information inputs and advanced sensors, numerous real world activities are streamlined and adapted into revenue-generating software experiences that make the activity addictive, engaging, and even enjoyable.

Many of our relationships and destinations are being reframed as elements of a game, but the impact of all new valuations of the world and each other is uncertain.



Worn with pride. *Foursquare's most popular badge rewards.*

Seth Priebatsch, the creator of a location-based social platform called SCVNGR, refers to this new paradigm of design as like "*building a game layer on top of the world*." SCVNGR, which has been funded to the tune of $20 million dollars via Google Ventures (and valued to over $100 million), can be approached as a wayfinding tool that motivates players to explore new environs for challenges with associated real world and virtual rewards.

In a TED Talk[3], Priebatsch laid out what he perceived to be the four foundational mechanics (he calls them dynamics) that make games fun, and that can even render enjoyable activities that aren't *really* games at all. These are the **Appointment**, **Influence**, **Progression**, and **Communal Discovery**. From countdowns to happy hours, credit card holograms, and LinkedIn profile completion ratings, they are present throughout our lives.

[3] http://www.ted.com/talks/seth_priebatsch_the_game_layer_on_top_of_the_world.html

Rules of the Game

Implications

But while gamification can help make tedious personal tasks bearable - from visiting the dentist to completing one's profile on a social network - it's also being taken up in the workforce and for broad social change. Tim Chang, a venture capitalist with Norwest Capital Partners, has suggested the **application of game mechanics and dynamics to systems as enormous and complex as healthcare**. In a 2010 article, Venture Beat explored how some "sin taxes", set up to discourage littering or the purchase of environmentally unfavourable materials, work well as others are mocked and ignored.[4]

Aza Raskin, cofounder of Massive Health and designer of *The Eatery,* understands gameplay as just another attribute of what makes us uniquely human. By ignoring our penchant for stimulating new behaviour via new technology, we are selling ourselves short.

Signals

Virtual Demographic Shift
Booyah's MyTown 2, SCVNGR, and PerBlue's Parallel Kingdom each have userbases of over 1,000,000. Together, they have more people than Denmark.

Gaming in the Streets
More and more of the games at NYC's Come Out & Play festival incorporate digital location data into design patterns from an era of chalk and touch tag.

***StayPuft*-Sized Brands and IP**
Toronto game developer XMG has secured the *Ghostbusters* license for a location-driven game title that moves players across real cities hunting ghouls... or discounts on lattes at Starbucks via the Foursquare interface...

MyTown and Parallel Kingdom

Yesterday's street games versus today's

But the implications of this ludic revolution are unclear. If (as Al Gore has suggested) "games are the new normal", what happens when the novelty of the game wears off? What happens if oppositional legal forces from labour, gambling, and data privacy begin to subversively influence or limit the design of the games of our lives? [5] Where are our own internal motivations when spreads of points and shiny badges get us walking around our own neighbourhoods, not a desire to connect with our surroundings? A 2011 paper by Swedish researchers from the proceedings of the CHI conference reveals that there are more conflicts between gamification and location-sharing services than might be apparent [6] - and how the rules of the game don't match up cleanly with our desire for fun.

Links of Interest: [4] Venture Beat: Healthcare Reform could be Fun [5] Laws around Gamification [6] Emerging Gamification Conflicts Gamification Encyclopedia

See, Click, and Fix.

It's easy to look around the locative data landscape and focus in on the fun and games. But while social networks built on novelty and superficial social connection may rule in terms of raw numbers, there are whole other orders of services built around meaningful change in the real world.

Apps and platforms that harness user location information to streamline the ways in which we understand the history of our urban environment, rescue neighbourhood networks from decay, and help those affected by natural disasters are springing up everywhere.

Ushahidi as utilized in 2010. ushahidi.com

The philosophy behind a software company called **Ushahidi** is seemingly simple - to democratize access to the tools for making sense of information. But the ways in which their open-source platform is being used are amazingly diverse. Using the Google Maps API and a suite of intelligence-gathering products called SwiftRiver, Ushahidi's Crowdmap software sources and aggregates eyewitness reports of relevance in a disaster or social uprising, and geolocates them on a map so that they can be easily searched, found, shared, and understood in relation to one another.

The first iteration of the service launched in 2007, designed to spread awareness of incidents of violence following Kenya's presidential elections. Since then, Ushahidi has been used to raise awareness and coordinate aid from the 2010 earthquakes in Haiti to last year’s pro-democracy uprisings in MENA.

[7] Ushahidi in Action: http://www.youtube.com/watch?v=Hh_PiVqf8BA

See, Click, and Fix.

Implications

From Toronto to Tehran, software platforms that connect users to their cities and neighbourhoods through design patterns associated with location and geography are growing in popularity. As the feedback loops between personal lives and civic values become shorter and shorter, **what impact will these platforms ultimately have on the cities and citizens they are designed to assist and augment?**

Might a better understanding of location prompt citizens to become more engaged with what has come-and-gone in urban environments? Murmur, a locative narrative artwork created by artists Gabe Sawhney and Shawn Micallef, prompts users to key codes found on streetposts across the city into their phones. A voice from that neighbourhood then reads out a story about that place - but the stories are from the past, drawn out of a tapestry of civic memory and personal meaning.

Signals

Share Some Sugar
Why buy new tools, camping equipment, books or DVD's when you can borrow them from neighbours you didn't even know you had?

SeeClickFix
For $100 a month, cities can easily deploy a localized install of the SCF platform, which allows citizens to chime in on everything from potholes to break-ins, bike parking to illegal dumping. With over 75,000 issues logged and fixed, it's safe to say that founder Ben Berkowitz is on to something.

Gomorrah Streetview
This tool enables virtual walkthroughs of the Campania region of Italy, a particularly polluted and neglected stretch of countryside. Mashing up Google's StreetView tool with values around environmental responsbility, and a mandate for independence from such services at the same time.

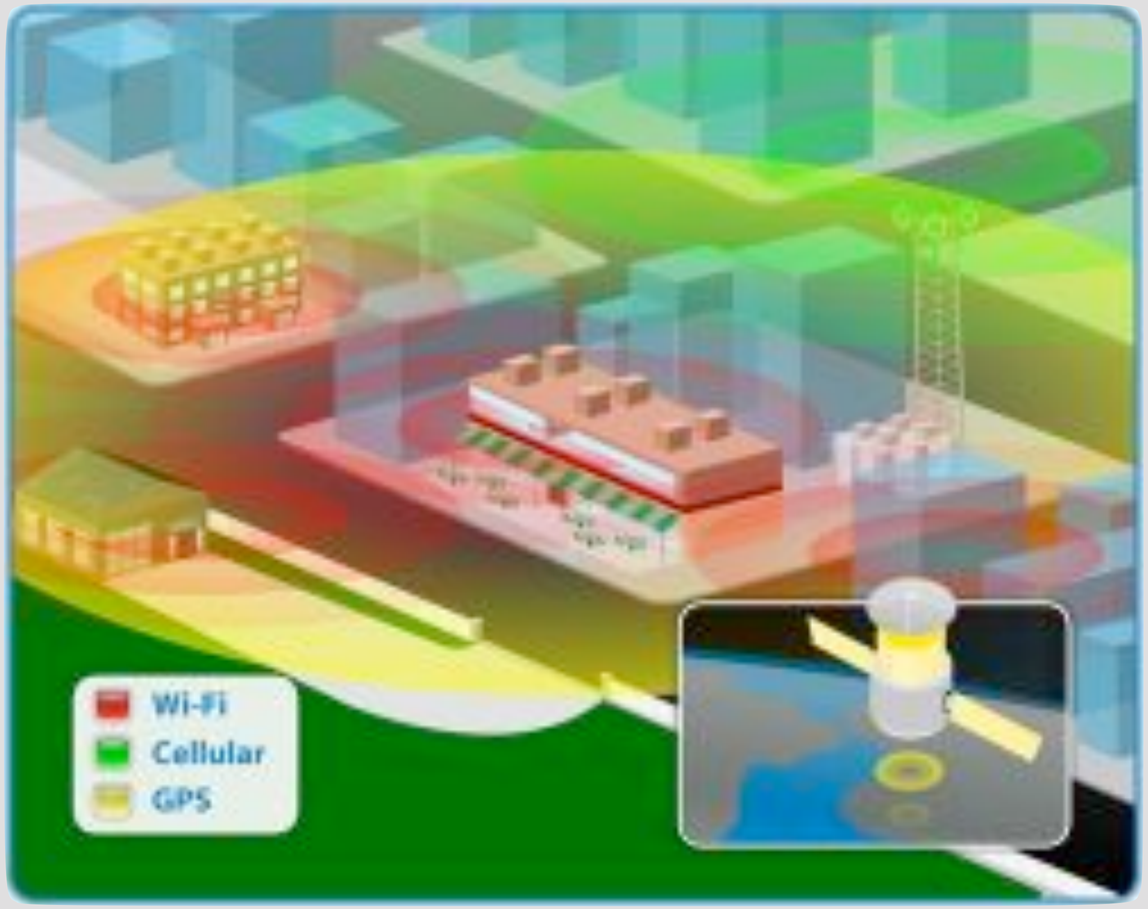
If our sense of civic responsibility and engagement is informed by the degree to which we merge with locative media platforms channeling our world into coordinates on a Google Map, what might the future hold if we continue to move in this direction? **It's not hard to imagine current rules on voter turnout and social media being overturned, and eventually transformed into support structures for real-time electoral analytics with lasting community impact.** The last two elections in the United States have demonstrated the value of increased use of locative data - the Obama campaign's generation of automatic social referrals based on ZIP code is the most elegant example. Other projects accelerate locative data gathering already underway, like the San Francisco STOP AIDS project that, by going digital, reduced the turnaround on data processing from months to days or weeks. [8]

Links of Interest: [8] Report of the Aspen Institute on Mobile Media and Civic Engagement · Gomorrah Streetview · Henry Jenkins: "What is Civic Media?"

Every Which Where

As location information becomes more valuable to mobile applications, platforms, and social networks; the accuracy of that information across new and varied environments is becoming highly valued.

GPS is often presented as the dominant location information technology, but it was invented with a particular purpose; and is being augmented by WiFi, cellular location sensing, and new contexts of use as well as new questions around privacy and the pace of service design.



Aggregate location determination. *Courtesy of Skyhook Wireless.*

When you use your iPhone Maps application, you may think that you're only using the GPS chip built into the phone to determine your location. In fact, your device is triangulating your position relative to dozens of cellular network towers and a database of over 300,000,000 WiFi network transmitters curated by a company called **Skyhook Wireless**. It is this aggregate determination technology (generally referred to as Assistive GPS) not some firmware update to the international GPS system, that drops the pin on your location in seconds rather than minutes.

While new standards for absolute location are emerging (the **Natural Area Code system uses letters rather than numbers to display coordinates** [9] more memorably), the difficulty of tracking positions and maintaining identities in crowded indoor environs has necessitated a new wave of technologies.

[9] http://www.nacgeo.com/GEOTec/

Every Which Where

Implications

Technologies like RFID, and the MAC address-hunting AGPS techniques like those employed by Skyhook, **some scholars suggest that the point of reference in locative information is shifting towards the relational** - and that "non-human things seem poised to reclaim their long-forgotten status as governing assemblies." [10]

As we move towards a Kurzweil-esque *Internet of Things* (with more and more devices, objects, and natural systems teeming with sensors) will we enter into a new paradigm of understanding location? Issues surrounding personal privacy are only now being addressed, and it's hard to imagine what conflicts might emerge from the emergence of nano-scale locative information in the near future. **On one hand, you might never lose your keys or remote control again... or it could become impossible not to leave a digital trail of your presence** on the people, objects, and environments which which you interact.

Signals

GPS to be EOL'd
By 2020, a whole class of high-end GPS equipment will be rendered obsolete in the face of the less powerful but better supported civil standards for the technology. Source.

Wal-Mart is Watching
University of Arkansas research suggests that RFID can reduce out-of-stocks by upwards of 21%. US Department of Defence and FedEx reportedly following suit and mandating the use of EPC codes on all packages and communications.
"This is no longer a take-it-on-faith initiative."
-Wal-Mart CIO + EVP Linda Dillman

NFC is the new RFID
RFID is being included in a new umbrella certification that allows smartphones and other devices to communicate on contact and with tags on objects / in environments.

Spimes: Telling it like it is?
A concept introduced by sci-fi author Bruce Sterling, a Spime is an object that recycles itself and keeps track of its connections and supply chain elements.

As Wal-Mart, FedEx, and Google demonstrate the economic advantage of tracking location with more detail; we need to find a way to assess the value of doing the same with day-to-day human information, as well as what the tradeoffs that come with that value proposition might be. Will we enjoy relationships with the things in our lives in the same way that we enjoy socializing with people today? What lessons have we learned from the virtual P2P era that can be applied to the real-world challenges ahead in the age of P2T, or T2T?

Links of Interest: Google's Database of Locations with Indoor Maps Bruce Sterling's Spimes @MIT [10] Forget Psychogeography: The Object in Locative Media

Rise of the iDevices

As the PC industry's growth climaxes and goes into decline, a new class of devices are taking to the spotlight to showcase their unique capabilities.

While desktop and laptop computers aren't getting any less powerful in terms of processor cores or network bandwidth, Post-PC devices are closing the gap with sensors tuned to location and environmental cues, new models for always-on data connections, and ecosystems of innovative accessories that are revolutionizing user experience and the high-tech economy.

Apple's iPad and iPhone - perhaps the definitive Post-PC devices.

With new modes of interaction; including multitouch and natural language speech recognition; devices like the iPad, iPhone, and Android are changing the game in terms of portable computing. It's hard to find a home or office without one in North America. But its not just the touchscreens that are new.

At the introduction of the iPhone in 2007, Apple CEO Steve Jobs was determined to highlight the other sensors that made the new product unique - from proximity detectors that shut the screen off when raised to a user's face, to accelerometers that reoriented its screen depending on how it was held. In the coming years, the addition of GPS chips along with a compass and gyroscope further increased the degree to which iOS devices could evaluate the world around them and use those inputs to customize the user experience.

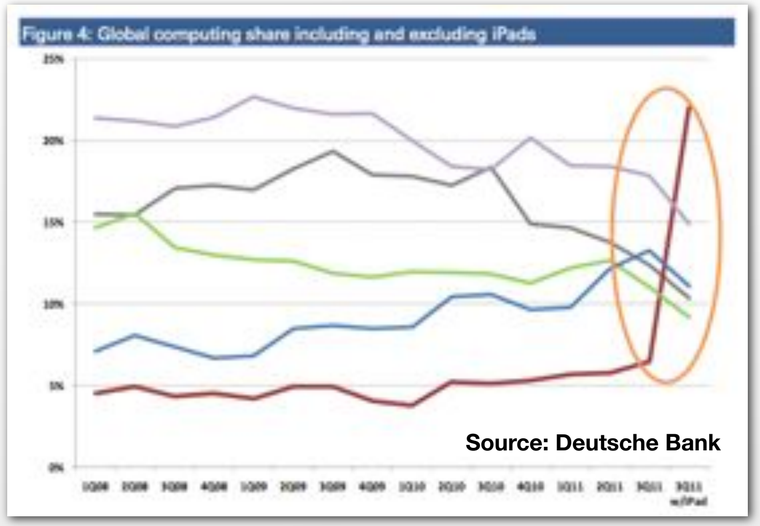
Rise of the iDevices

Implications

While many audiences lined up for Post-PC devices upon their release were curious about what affordances they would offer to bridge the conventional UX paradigm with a new one, most were interested in what new experiences would be on offer. **With the launch of Apple's App Store and the Android Marketplace, whole software categories were created overnight.** A flood of applications designed to capitalize on relational and absolute location information have emerged, alongside those that can tell you what song is playing in a bar, or map the positions of stars and space stations on the horizon. **It's *almost* like living in the future.**

While the Post-PC paradigm so fresh, it's easy to assume that we'll spend another 20 years with 160ppi screens, and that this revolution will experience a growth curve not unlike the PC industry's.

Signals



Dominating the Party
If you exclude sales of iPads, it's difficult to find any evidence of substantial growth in the PC industry.

In the 3rd quarter of 2011, Apple sold as many of the tablet devices as it had sold Macs in the entire 30 year history of the company... now one of the biggest in the world by market cap.

Post-Post PC Devices
Biometric sensors like Jawbone's *UP*, Nike+'s *Fuelband*, and the FitBit *Ultra* are all the rage - they can help users monitor everything from heartrate to sleep patterns, to diet... and are just as good at sharing that information.

But a subsequent generation of biometric sensors and wearable technologies, coupled with the ongoing miniaturization of existing chipsets, could bring us into the day after tomorrow faster than anyone has expected. The tablets of smartphones of today may well go down in history, but for providing the foundation for a renaissance in sensory accessories as much as the reinvention of mobile blogging or social networking. You can already find everything from heart monitors to BBQ thermometers at your local Apple Store, and as Moore's Law of exponentially increasing electronic advancement plays out across product categories and use-cases, it may not be long until you can pick up a DNA sequencer or 3D printer sporting a Bluetooth 4 connection. Those with eyes on the healthcare market seem most excited by this revolution - pacemakers with user-friendly analytics are a gamechanger.

Links of Interest: Google working on Wearable Locative Tech | Scenarios of Post-PC Ubiquitous Computing | Gartner: Collapse of the Traditional PC Market

Funnelling Location

Building a successful location-based service is a good idea, but being able to aggregate data from multiple location services would be great.

A product that could syndicate check-ins to and from multiple platforms is so desirable, that it should come as no surprise that all of the major players have API's on offer. But actually building a location meta-platform that accomplishes that goal while generating value may be more challenging that it seems.

Many of the universal check-in apps and services that have appeared in recent years have already vanished - victims of constantly changing partner-service API's, legal quagmires, or poorly conceived business models.

Big social players like Facebook have little to gain from the existence of an aggregate service - they already bring tens (or hundreds) of millions of users to the table, and stand to lose ad impressions and clicks if check-ins are handled by a 3rd party application tying into their platform's backend. These heavy-hitters might be able to find value in building social buzz around a page representing a location, whether or not a user has actually visited it, but it's uncertain. The temptation must be great to applaud the efforts of smaller partners with a policy of openness around incoming 3rd party data, while keeping your own user profiles and location information locked away for safekeeping.

Funnelling Location

Implications

The implications for a market with multiple location aggregators and universal check-in services for every dominant location-based network are uncertain. Things make sense if you think of the dominant service providers as platforms, and the aggregators as developers undertaking the development of scaffold products... but a quick survey of the aggregators in use indicates that their value propositions don't often tend towards the terribly unique, or even well-defined.

Will the value of universal check-in services be to provide exotic, unconventional, branded... or malware-ridden... user experiences?

Companies like Factual and Locationary, that haven't concentrated on building their own brands into networks, may see benefit in selling or providing third parties with as much access to their data as possible. Corporations with larger revenues or more devious intentions for their users' data, may be less interested in giving everything away for free.

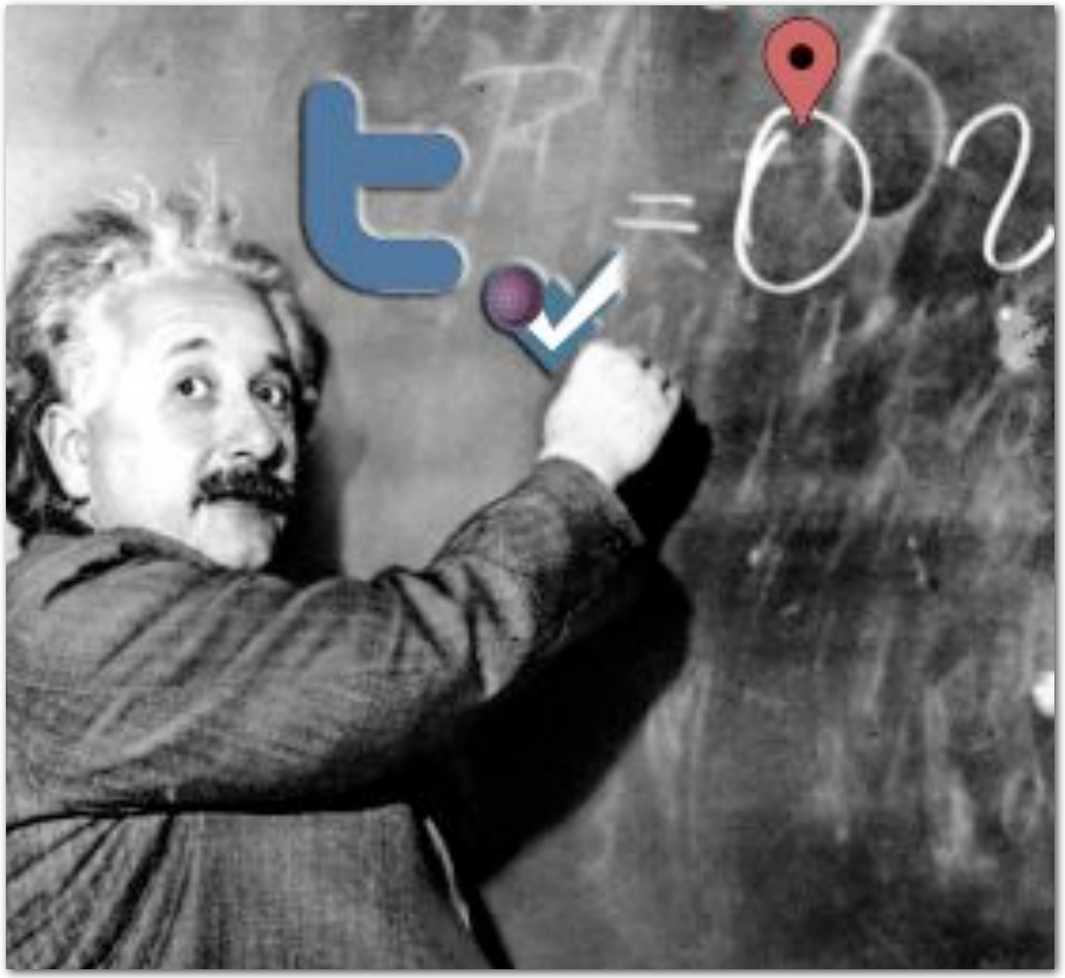
And this is where it becomes complicated to eke out a living as a provider of middleware. If the companies that you depend on for databases of location data or check-ins attached to user profiles are generating their own revenue from that information, they may be that much less likely to trust you with the keys to their vaults... or to notify you when a massive change to their API will shut your service out of their system for days, weeks, or eternity.

Links of Interest: Tales from the Cloud's API Comparison | Overview of LBS Commercialization at VentureBeat | CheckIn+ Aggregation + Augmented Reality

On-Location Science

As locative digital information shifts from being the domain of technological experts to the domain of masses, trends towards citizen science that have grown over the 20th century seem to be accelerating.

With the advent of locative ecological data accessed via mobile devices, we are experiencing change and growth in three key areas: in the rate at which citizen science projects coalesce, the ease with which they are able to network and share information, and the quality of the data gathered and hypotheses generated.



The synthesis of trends towards distributed computing and location-based services is manifest in a slew of citizen science applications and platforms that are getting attention in the headlines, and interestingly, they run the gamut from the very small to the very large. From protein synthesis to exoplanet scanning, there don't seem to be many domains untouched by citizen science.

It will be interesting to witness the transformation of social networks in an era of increasing knowledge about the significance of our location, ecologically speaking. Will environmental values already in flux evolve towards a greater appreciation in social spheres of the incredible small worlds within us and complex ones we live in?

On-Location Science

Implications

One advantage for tomorrow's citizen scientists is that location information is not itself proprietary or confidential. To be sure, location data can identify or signify valuable items or patterns, but it is important not to underestimate the value of the language of location information being essentially open-source. A march towards the use of open-source software in research and publication is underway in the corporate and academic research world [11], and it is uncertain how this will trickle down into citizen science - the distribution model of the App Store that is attached to some of the most interesting locative science applications out there doesn't necessarily favour all the flavours of open-source.

As microfluidics for self-diagnosis transform into cheap DNA sequencers for rapid discovery, we may automate the creation of Facebook pages for the organisms we encounter on our daily travels.

Signals

Project Noah
This gamified and location-sensitive tool for budding (or experienced) naturalists may lead to the discovery of new species someday.

RedWoodWatch
By photographing redwoods in the wild, citizen scientists are crowdsourcing important conservation processes.

Field Tools
Applications and location-based software platforms have revolutionized the experience and process of citizen science.

Seafood Watch
Even if you're not a scientist, location helps make dinner choices.

The nation of Bolivia has already initiated the process of granting fundamental rights to plants, animals, and ecological systems… and Foursquare has 1.5x the population of Bolivia at present. It remains uncertain as to whether a greater understanding of the world around us through locative technology would change our view of ecology, our place in natural systems, and our opportunities to learn as citizen scientists.

Links of Interest: [11] NATURE's mandate of open source science | David Pescovitz's favourite Citizen Science Tools | Locative Media + Place | The WildLab

Voting for Privacy

In recent years, governments have taken deliberate measures to address and investigate issues related to the privacy of information on mobile devices, particularly location information.

Scandals that have affected industry titans in mobile hardware and software have had high visibility in the media, alongside issues regarding bandwidth billing and intellectual property, leading massive numbers of users to demand action from political representatives.

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Voting for Privacy

Implications

While 2011 was the year when more and more Americans became frustrated that Congress apparently "*still did not know how the Internet works*"[12], it was also the year that mobile privacy became a hot topic on the international stage. The implications of governments investigating or directly cracking down on the loose treatment of personal data (including environmental location data) are uncertain, but it seems likely that hardware and software designers will have to stick to these new standards to ensure their ongoing existence in a highly competitive landscape.

Early in 2012, US President Barack Obama's insistence on "clear rules of the road that ensure [Americans'] personal information is safe online" seem to be cheerfully received. But if the hammer of justice swings too far in the opposite direction, the reactions tend to be frenzied - nobody wants the government intercepting or minding any more of their personal information than they already do at present.

Signals

Apple's Locationgate
Apple had been storing data on WiFi networks and cellular towers (see trend *Every Which Where*) on user's iPhones and iPads, for the purposes of system optimization. While the data wasn't even being returned to Apple's servers, its implications had many in a flurry. As a result, associated Senate hearings on mobile location information privacy were lead by none other than Al Franken.

Carrier IQ Scandal
The FTC mandates independent audits of Facebook and Google's privacy policies and protocols... but then:

In November 2011, the mobile phone diagnostics company was accused of running keylogger and location-logging software in the background on user's phones - and beaming resulting data back to their servers.

According to a recent article in PC World, the boundaries between nations that exist on our maps, and which occasionally manifest themselves in the physical world, can be most difficult to outline in cyberspace, and with more and more information trading hands across international lines through cloud services and mobile technology platforms, new standards are going to have to evolve quickly. Will standards of information security match up across the borders that are closer to home? It is uncertain how the Canadian government will respond to American calls for increased security and privacy.

Links of Interest: [12] Mother Board: "It's no longer OK" | Law.com: Export Reg Risks in the Cloud | White House: "Privacy Bill of Rights" | Senator Franken