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## Maximize Your Decision-Making: A Review of Emerging Technology Trends

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# **Maximize Your Decision-Making: A Review of Emerging Technology Trends**

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## **Introduction**

“The future has a way of arriving unannounced.” George Will

The technology revolution has irrevocably disrupted every facet of our personal and professional lives. Technology is ubiquitous and evolving at a faster pace than we could have ever imagined. Some of the more drastic examples that we are all familiar with include: the impact of the digital camera on photographic film; the printed book is threatened by e-books; cell phones are more popular than traditional telephone land lines; and the U.S. Postal Service is proposing no mail delivery on Saturdays.

Although lawyers as a whole are not greatly interested in technology, the legal profession is not immune from disruption. We have to ask ourselves, what sort of services does the digital generation of individual clients expect from lawyers? What do corporate clients expect? If we're not keeping pace, will our services be rendered obsolete? Technology has encouraged clients to expect immediate and informative responses, 24/7. Can we rise to the challenge? Law firms will never return to the pre-recession glory days. With an eye to the future and a willingness to be innovative, the lawyer who embraces technology can maximize decision-making and will be poised for success.

To assist you with planning for the future, in this paper, I will discuss the future of legal research. I will then describe current legal technology trends including courtroom technology. Finally, I will conclude with a list of general technology predictions that will hopefully provide food for thought and excite you about the coming prospects of technology.

## **Legal Research Trends**

**Single Search Box** – Let's be honest...most people start an intellectual inquiry by searching Google. The single, simple search box has universal appeal and legal research information vendors are jumping on the bandwagon. For example, with the introduction of Westlaw Next and LexisNexis Advanced, the two major proprietary legal research databases have taken steps to "Google-ize" or simplify the search process. Both services offer a simple search box and allow users to refine or filter their search after running it by choose the type of materials such as case law, statutes, treatises, etc. to focus upon.

In addition to Westlaw and Lexis, other legal research vendors such as Fastcase, Hein, CCH Intelliconnect and Bloomberg Law prominently feature a single search box on their websites as well. User surveys and research studies have determined that users prefer a single search box and integrated list of search results. The legal information market vendors have complied.

**More like Siri** – Now that the single search box is widely available, the next consumer requirement will be....why can't legal research function more like Siri? The astonishing ability of Apple's technology to interpret language has created even higher expectations for improvement in search technology. Some have even referred to Siri as a Google Killer or the Future of Search. Siri's search experience is similar to artificial intelligence rather than literally searching for words entered into a search box.

Siri has even been predicted to be the killer of apps. With Siri, you don't have to choose an app like Open Table to make a dinner reservation. Instead, you simply speak your request to make a dinner reservation. Siri decides how to accomplish the task without you having to download anything else special.

**Predictive Software** – Siri's "speak and serve" model is somewhat limited. Background noise can affect its outcome. Not all users like to speak their requests aloud. The next wave of research software is expected to move beyond Siri-like speaking interfaces and become more anticipatory.

Software that can predict or anticipate future actions is becoming increasingly more accurate. Predictive technology developed from the need to prepare for disease outbreaks, military flare-ups and disastrous weather. By studying past news events, data patterns such as weather and statistics, software can predict upcoming events. Like many technologies, this software also has many business applications. For example, predictive software such as Recorded Future (<http://www.recordedfuture.com>) advertises their ability to anticipate what companies and people will do. Recorded Future can offer law firms a competitive intelligence advantage by projecting a company's acquisitions, product releases, or similar activities.

Grokr (<http://grokrlabs.com/>) is another example of predictive software that is in its formative stage. Grokr is a mobile app analyzes your personal likes, habits and interests to predict what tasks you need to accomplish or what information you would like to be presented with. For example, by knowing your morning commute, Grokr can present you with a traffic report first thing in the morning without you having to inquire. Based upon your favorite sports, Grokr warns you when a game is about to

start and relays important game outcomes to you. There potential applications for the legal field. For example, Grokr could push relevant information to you depending upon whether you are in a courthouse, negotiating a business deal or making a restaurant reservation for a business lunch with a new client.

**Growth of Free Legal Information** – Currently citizens have unprecedented free access to legal resources on the web. It's possible that in the future, we'll ultimately have a comprehensive "law" cloud with complete and free legal information. Successful lawyers of the future will have to add value to their advice and services. Simply providing legal advice alone won't be a terribly valuable commodity. One example of how the legal information landscape is changing is the recent announcement by Thomson Reuters of its vision for the future of the company. Thomson's long term vision is not information. Instead it will focus on enhancing the ability of lawyers to deal with information by providing "solutions" to streamline daily operations. Lawyers will need to adapt to this changing information landscape.

**Knowledge Management** - Rather than starting each research project from scratch, the tech-savvy lawyer will make use of knowledge databanks and not "reinvent the wheel." As more clients push for alternative fees or predictable billing, lawyers who reuse and repurpose their work product will be the most successful.

Effective knowledge management has long been the holy grail of law firms. Law firms seek the ability to deal with their mountains of data and paperwork. Storing and organizing data centrally for all attorneys in the firm to access can increase productivity

significantly by reducing the need for attorneys to waste time searching for answers to common questions

Be forewarned: knowledge management solutions are difficult to implement in all industries. Why do these initiatives fail? As you can imagine, organizing complex documents into an easy to use system is difficult. Furthermore in our current legal environment, attorneys are often still rewarded for billable hours. Finally, some attorneys are reluctant to rely upon the work of others. However, with the increasing demand for alternative billing, the advantages of knowledge management will become much more appealing.

**More E-books** – As you know, sales of e-books are on the rise. The number of legal treatises that are now available allows law firms to be completely print free if they so desire. In fact, recently LexisNexis announced the closing of its Matthew Bender law publishing plant in Albany, NY for economic reasons. There is still some turf battling over the best platform for e-books. Kindle, iPad, Nook? These are but a few of the choices. Most titles are available on several different platforms so you can choose your reader based upon your personal preferences. Ironically, although Amazon jumpstarted the e-book reader market with the Kindle, it has since introduced the multi-functional Kindle Fire which now outsells dedicated e-reader devices.

## **Law Office Technology**

It is sometimes difficult to dream or fantasize about the technology of the future. Could any of us have predicted the rise of the internet? The development of the iPhone and iPad? Or the popularity of social media such as facebook? Technology is a major



component of our professional lives and its rapid evolution is unstoppable. Clients expect 24 hour access and immediately responses to inquiries. It's no longer acceptable to say, "It's in the mail."

As a result of increased technology requirements and needs, law firms are adding non-lawyer professionals to deal with technology issues. For example, it is not unusual for a law firm to hire e-discovery specialists, social media strategists or forensic analysts. On the other hand, traditional legal support staff such as paralegals is being replaced by software solutions. Information security expertise is particularly valuable as law firms implement cloud solutions, analyze big data, and experiment with mobile lawyering. Lawyers who cultivate relationships with information technology professionals will have an advantage over their non-techie counterparts.

**Cloud Computing** – Any discussion of future trends in legal technology or technology in general inevitably must include cloud computing. Cloud computing is generally defined as software that is hosted by a third party for your office and delivered via the web. In other words, consumers of cloud computing "rent" software from the vendor of choice and don't install any programs locally. Owning software will soon become a thing of the past. Already many IT consultants advise that purchasing servers rather than opting for cloud solutions is a waste of funding. Attorneys can save money and get better performance from cloud services rather than trying to purchase and maintain local networking hardware. Clearly the future of technology includes software as a service or cloud computing.

Some lawyers are avoiding cloud computing due to security concerns. These fears will inevitably be addressed and overcome. The productivity gain from being able

to access all of your documents from your mobile device (laptop, phone, or tablet) from anywhere with a decent internet connection is too enticing. For example, Thomson Reuters is developing its own private cloud in an attempt to reassure the legal profession.

The launch of Microsoft Office 365 has been a major impetus for changing the average consumer's use of cloud software. Office 365 is a web version of Microsoft Office that provides look and feel of current Microsoft programs with documents being saved online rather than your hard drive. For a subscription fee, law firms can use Microsoft Office 365 and no longer have to worry about supporting in-house networking hardware and software. In addition to automating general office productivity tasks, cloud computing offers specialized solutions for law offices such as online case management and e-discovery.

For further reading: Nicole Black, Cloud Computing for Lawyers, ABA Law Practice Management Section (January 2012) available for purchase from the ABA Web Store.

**More Mobile Apps and Devices** – It's a safe bet to predict that the number of mobile applications and devices will continue to grow exponentially. A fact that is demonstrated by the inclusion in this year's CLE two presentations devoted to mobile applications. Revenue from the sale of mobile applications has grown more than 500% in the past five years. That is an unheard of growth rate for an industry. Mobile devices outsold desktop computers last year for the first time. Forty-two percent of U.S. households now own a smart phone. The long-predicted convergence of technology into small portable devices is a reality. Mobile devices currently allow us to literally

carry the office in our pockets. In fact, in a recent press release, Thomson Reuters announced that mobile would be at the “heart and center” of its plans for future product development.

Consequently, Bring Your Own Device (BYOD) has become extremely popular in the legal profession. Remember the days when law firms bought all of their attorneys Blackberries? Those days are over. Attorneys are buying their own iPads, phones and other mobile devices. They are connecting them to the law firm network and expecting to access their work documents.

As mobile apps and devices become increasingly sophisticated, one of the side benefits is that law firms can reduce their footprint in traditional brick and mortar storefronts. It has been suggested that perhaps law firm offices should be on the endangered species list since more and more attorneys want to work from remote locations.

In the public sector, mobile wallets and near field communication devices that allow vendors to seamlessly connect with consumers will become more commonplace. You may have seen travelers flashing their iPhone rather than a boarding pass at the airport. Soon, you will be able to pay for services by flashing your mobile devices.

For further reading: Tom Mighell, iPad in One Hour for Lawyers, ABA Law Practice Management Section (April 2011) available for purchase from the ABA Web Store.

**Big Data** – Managing massive amounts of raw information, frequently referred to as big data, is now a major challenge in many industries and the legal field is no exception. Law offices are maintaining and organizing transactional and court records;

electronic communications such as emails, texts, and social media posts; financial records and billing information. The list is endless. However, extracting, analyzing and using the reams of big data require special expertise.

In the future, more law firms will apply data mining techniques to analyze their business practices and maximize their profitability. Popular in fields such as engineering and healthcare, data mining of big data is still a new topic for most law firms. Data mining is accomplished by using sophisticated statistical algorithms to study such key productivity metrics as billable hours, actual collections and unbilled times. By studying these metrics, law firms can gain a competitive edge. For example, does your firm know which employees are performing which tasks versus billing costs? Other trends you might analyze include determining the percentage of revenue you receive for each client; identifying referral sources that provide clients with larger percentages of revenue; and sorting clients by industry.

Currently third party vendors exist to assist law firms with data mining. Never fear though, in the future, our mobile devices will have enough power to perform analytics for every action undertaken in the law firm. As we become increasingly overwhelmed by the sheer amount of digital information, data visualization techniques portray data in meaningful visual displays. Data visualization can be used to identify trends and sort through e-discovery materials as well as to portray complex data to jurors and clients.

**Client Portals** – Lawyers have not hesitated to spend money on technologies supporting their daily business practices, but traditionally most of their expenditures have been for inward-facing technologies rather than outward or client facing

technologies. A future trend will be more lawyers developing ways to interact with clients and provide services via the web. Clients want 24/7 access to legal services just as they receive instant access to other types of professional services.

We all currently use online services to share information that we previously thought was highly confidential. For example, online banking is no longer viewed with suspect. Online secure client portals allow attorneys to share documents and communications with clients effectively and efficiently. For example, many common questions from clients that are currently handled by telephone and email can be provided via personalized client portals. Other tasks that clients can perform include paying legal fees online; answering basic questionnaires; and scheduling appointments. Lawyers can use portals to share documents and keep clients apprised of the case status. It's possible that in the future, artificial intelligence algorithms will be included so that clients might pose scenarios via the portal.

**Virtual Assistants** – More small and solo firms will use virtual assistants to reduce office overhead costs. You can hire a professional virtual receptionist to handle your phone messages 24x7 much cheaper than you can hire a full time 8 5 receptionist. Virtual assistants are independent contractors who use the web and telephone to provide administrative support. For example, a virtual assistant can answer your phone remotely without the caller knowing there is no administrative assistant physically present in your office. Greetings can be customized. Most law firms report the employees are highly trained and personable. The best way to find a virtual assistant is by word of mouth. However, you can also google law firm virtual assistants and many options will be available for you to choose from.

**Virtual Meetings** - As travel costs continue to rise and user friendly technology such as Skype, GoToMeeting and WebEx continue to develop, virtual meetings will become as common as face to face meetings. PowerPoint presentations can be easily commented upon. Virtual meetings can result in the ability to house staff in smaller offices. Not to mention, the green benefits of virtual meetings are an additional incentive.

Virtual meeting technology has leveled the playing field for upstart attorneys. It allows law firms to reach clients beyond their normal geographic reach. For example, some law firms advertise their Skype connectivity in case their clients are interested in getting touch via Skype.

## **Courtroom Technology**

Just as office technology will undergo changes in the new future, courtroom technology will also advance dramatically. The courtroom of the future holds tremendous promise.

**Video Displays** - We all learn via screens in today's world and it is likely that displays will increase in the courtroom. The majority of jurors are likely to be visual learners. More courtrooms will provide individual monitors for juries and witness to allow attorneys to have more visual contact with individuals. Jurors have already reported that having jury instructions printed on monitors as the judge reads them has helped their understanding tremendously. Additionally, monitors will employ touchscreen technology to allow witnesses to pinpoint and mark items of interest. Video displays of the future will become more and more high definition. Ultra high definition

TVs were very popular at this year's Consumer Electronics Show in Las Vegas.

**Jury Room** - Just as courtrooms become more electronic, jury rooms will become so as well. Jurors will have access to laptops, kiosk and monitors to review electronic exhibits.

**Self-Service Kiosks** – Self-service isn't just for grocery stores any more. Conveniently placed kiosks will allow jurors to scan their ids, print juror badges, print attendance letters, answer qualification questions and automate juror service payment.

**Videoconferencing** – The use of videoconferencing will continue to grow and will soon routinely include 3D high definition technology or ultra-high definition screens. As technology improves so that jurors can interpret the nuances of witnesses, testifying remotely will become the norm. Videoconferencing can also reduce the security and expense of transporting prisoners to the courthouse.

CourtCall (<http://www.courtcall.com>) and AppealByPhone (<http://www.appearbyphone.com>) are two currently available telephone conferencing services that allow attorneys to present routine, non-evidentiary, pre-trial appearances rather than physically attending proceedings. These services commit to facilitating and managing reliable phone conversations with court officials. Benefits of the service include saving time and travel expenses.

**Process Serving** – Courts will be seeking new ways to streamline delivery of process serving. Will they text it to our iPhone? Is a robot service processor in our

future?

**Virtual Reenactment** - Accident and crime scene reconstruction will become more and more realistic. Perhaps jurors will eventually wear virtual reality goggles?

**Online Dispute Resolution and Juries** - Currently online services exist to provide mediation services as well as virtual jurors to evaluate your case. In the past, it was expensive for small and solo firms to hire focus groups to evaluate potential jury presentations. Online services offer affordable jury consulting.

Some services currently use big data to analyze and predict settlement outcomes. For example, there was some buzz at the ABA's TechShow this year about, PictureItSettled (<http://www.pictureitsettled.com/>), a predictive software company that analyzes thousands of cases using probability theory and behavioral patterns to estimate when parties are likely to settle and for what amount.

Another example of the possibilities for software applications to replace traditional legal services is the use of settlement applications rather than live mediators. Software applications such as Cybersettle (<http://www.cybersettle.com>) facilitate blind mediation between two parties without the need for a lawyer.

Finally, as an extreme example, Poland has created an online court that allows individuals to conduct their entire proceedings online. In its first year, the court processed about two million cases.

**Court Reporting** – It's likely that court stenography or reporting will become an extinct profession. As more and more courts install digital recording systems, the need for human typists no longer exists.



## **Social Networking**

You might think that social networking is limited to Facebook and is only relevant to college students. Or that social media is only about socializing rather than business. Social media cannot be ignored and the legal profession is no exception.

Social media use by lawyers will extend beyond merely outreach and will focus on brand building. Reputation is a powerful tool for lawyers. Social media can give your firm a much greater reach than it can ever hope to accomplish face-to-face. You can only attend so many Rotary lunches, business events and cocktail parties. Similarly, many of your clients are using social media for enhancing their businesses. It makes sense to meet and greet them in forums that where they already are. Building a positive social media reputation is a time efficient technique that can lead to increased clients.

In addition to using social media to attract new clients, your social media footprint is an excellent vehicle for demonstrating your skills. It can be particularly beneficial for those seeking new jobs. The resume is a dying art. By proving yourself via blog posts, tweets and other social forums, you can leapfrog into a lucrative position. Not to mention, there is a greater change you will learn about an unadvertised job opportunity or make a new professional contact via social media.

Social media sites can be used to provide information about clients, rivals and business prospects. Expertise in social media will become increasingly relevant. For example, divorce lawyers can mine information on social media. Trade secret leaks can

be discovered via social media. Attorneys will need to know when to seek a social media injunction or gag order.

Aside from Facebook, some of the other major social networking technologies currently used in the legal community include: LinkedIn, Twitter and GooglePlus. A few of the up and coming social media platforms that you need to be aware of are:

**Vine** (free, iTunes app store) – Vine is a brand new service from Twitter that allows users to post 6 second videos. Although it has been predicted that in the future, we'll be able to digitally record our entire lives, it's ironic that one of the most popular apps currently is benefiting from brevity. Vine might seem silly to you, but didn't Twitter seem preposterous when it was first available? It is an enormously popular social media platform. How will Vine be used? As with Twitter, it's still too early in the game to predict the full impact of Vine. Twitter theorizes that people will be more likely to watch a video if they know it's only six seconds. Just as people who aren't interested in reading a blog post might be more likely to scan a tweet, Vine might also benefit from its predictable brevity. Unfortunately, Vine currently only works with the iPhone, but hopefully an Android version will be released soon.

**Pinterest** – Pinterest allows users to save web content onto bulletin boards and share their "pins" with other users. One attorney found Pinterest useful for collecting memes that simplified regulation of the oil and gas industry. He was able to network effectively with clients by sharing these images.

**SnapChat** - Using the SnapChat app, users send photos or videos to recipients. Users can draw or write on the images before sending. Users then set a time limit (up to 10 seconds) for how long recipients can view their photos, after which it will be deleted

from the recipient's device. Basically it's a self-destructing messaging application. SnapChat's demographic is the teen to young adult market. According to a recent Business Insider article, more than 60 million photos are disappearing daily on SnapChat. SnapChat is a reaction to the potential for facebook posts and tweets to "come back to haunt you." Attorneys need to be aware of the potential for abuse of SnapChat. It could be used for child abuse or sexploitation.

## **General Hardware and Software Predictions**

In addition to legal technology and social media developments, there are numerous general technologies on the horizon. Some of them are practical and others are simply fascinating. A few trends and predictions that I have found interesting include:

**The Death of the Desktop** – As discussed earlier, mobile is king. Smart phones and tablets are immensely popular while desktops and laptops are experiencing significant declines in sales. The one exception – all in one desktop models. All in one models have taken away the DIY aka build your own computer style desktop. Remember the kid down the street who built her computer with components? That tradition is winding down as more and more hardware parts are fused together thus preventing easy swapping of components.

The recent efforts of Dell Computer to return to being a privately owned company is a sign of the changing computer market. Michael Dell is well aware of the influence

of mobile technology and is scrambling to reinvent Dell. At this year's Consumer Electronic Show, Dell touted its "thumbtop" computer, basically a USB drive with everything a consumer could want already on it. Predictions are that the "thumbtop" would retail for less than \$100.

**Printers** – There are many new trends in printing on the horizon:

- **3D printers** – 3D printing is a reality. It was all the rage at the 2013 Consumer Electronics Show in Las Vegas. 3D printers use an inkjetlike process to create items one layer at a time. 3D printers allow users to create prototypes of materials. They are also useful for recreating models of fragile materials that can be touched, held and examined.
- **Small and portable photo printers** that allow printing from camera phones are forthcoming. Inkless printers are on the horizon. Inkless printers use heat technology to mark special paper with images. Ultrafast printers that print at the speed of sound are also predicted.

**Screens** - There are also several innovations in screen technology evolving.

- **Touch screen technology** continues to become more prevalent. This trend is spurred not only by the popularity of iPads but also by Windows 8. It's possible that a touch screen television could be introduced in the upcoming year. Maybe even by Apple, Inc. Soon your television could be the equivalent of a giant iPad.
- **Bendable interfaces** prototypes were also very popular at the Consumer Electronic Show. Attendees are excited about the possibility of bendable tablets in our near future. Screens that wrap around curved surfaces will be possible.

- **Second screen experience** – Many users have a portable device such as an iPad in their lap while watching TV. Many TV shows now advertise websites to promote “second screen experiences” during view. The tablet then displays content related to the broadcast program.
- **3D display** – Soon you will be able to reach out and grab 3D objects while viewing an item on a screen. For example, a recently developed 3D display from Infinite Z uses a 3D screen display, 3D glasses and a stylus to allow users to interact with objects.
- **Double-sided Display** – it’s possible that in the near future your mobile phone will have screens on the front and rear. You can answer the phone on one side and read a book on the rear.

**Wearable Computing** – Both the New York Times and the Wall Street Journal are predicting that the long rumored Apple iWatch will be available very soon. Your favorite Apple functions such as Siri, maps, and iPhone could soon be accessible from your watch. There is not much information on what the watch will look like. It is known that Apple is working on a curved glass form.

Of course, no discussion of wearable computing would be complete without mentioning Google glasses aka the Google Glass Project. Google glasses have a built in camera, motion sensors, wireless internet and other electronics and are expected to retail for around \$400. Advertisements show people using voice commands to interact with their glasses. Currently, Google is still trying to figure out how to market their glasses. For example, ads show users getting directions via their glasses while traveling and sharing real-time video of a roller coaster ride. One of Google’s biggest barriers?

How to make the glasses look “cool” or fashionable.

Health monitoring devices that fit unobtrusively into the clothing will become more prevalent as well. In addition to monitoring physical activity, devices such as smart jewelry that can detect hazardous chemicals could be readily available.

**Keyboards** - Although touch computing and voice recognition might eventually replace keyboards, perhaps the keyboard itself will get a makeover. Tactus (<http://tactustechology.com>) has developed a keyboard that morphs from the surface of your smart phone or tablet when you need it.

Keyboards with small screens also have great potential. They are excellent for bilingual usage or for those of us who have trouble remembering keyboard shortcuts. Alternatively, your keyboard could have designated keys for popular programs that you prefer such as Gmail or Firefox.

**Cameras** - There will be a decline in sale of cameras as smart phone cameras continue to improve. A 12 megapixel smart phone camera will be available in the near future. On the other hand, the rise of 3D cameras could revive interest in consumer cameras. Future cameras will be able to focus automatically like we do with our own eyes currently....no small feat.

**Internet of Things (IOT)** – More and more appliances are reachable via the web for remote programming. For example, the Nest Learning Thermostat (<http://www.nest.com/>) is currently available at Target. Not only does the thermostat sense your presence at home and adjust temperatures but it is programmable via your

mobile phone as well.

Note Nest has its sights on the rest of your house as well. Soon your refrigerator might remind you to remove items that need defrosting. Near field communication with relevant context is right around the corner. For example, your Google Glasses might remind you to pick up the dry cleaning as you pass near the location. Or devices might detect your mobile cell phone readers and send related information. Soon you'll be able to wave your mobile phone at a reader to pay for services such as transportation costs, retail services and health expenses.

**Voice recognition** – Voice recognition applications will become ubiquitous. The popularity of the iPhone's Siri is a clear proof of concept. There are rumors that Apple will use voice control to replace TV remotes. We all know that TV viewers loath having to fumble with multiple remote controls and menus. Manufacturers are also equipping automobiles with voice-controlled options.

One Spanish bank is experimenting with using a Siri-like assistant, Lola, as a bank teller. Much of the bank's time and staffing was tied up in answering questions. The bank anticipates that it will be able to eliminate jobs if Lola is successful.

**Geo-location** – Google is extending its reach by expanding maps to include indoor spaces. You can now view interior spaces that have been voluntarily submitted such as airports or shopping malls.