

Productivity, Part 1: Getting Things Done, Using E-Mail, Scanners, Reference Managers, Note-taking Applications, and Text Expanders

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In an era of declining reimbursements and tightening of the job market, today's radiologists are forced to "make do with less." With the rollout of the Patient Protection and Affordable Care Act, commonly called "Obamacare," radiologists will be expected not only to interpret studies but to also take on many additional roles, adding a new layer of complexity to already demanding daily duties. These changes make it more important than ever to develop a personal workflow management system incorporating some of the most potent productivity tools. In this article, the authors discuss current productivity techniques and related software with the most potential to help radiologists keep up with the ever increasing demands on their time at the work place and help us lead more balanced lives.

Key Words: Productivity, workflow, time management

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This is an opportune time in radiology to focus on productivity skills. A study of the recent US recession of 2007 to 2009 found that overall productivity at the workplace increased, with each worker putting forth more effort and producing more output than in normal times, an effect deemed "making do with less" [1]. With the rollout of the Patient Protection and Affordable Care Act, commonly called "Obamacare," it is predicted that radiologists will have to do more than just read a large number of studies to succeed [2]. Although the specific details of "postreform" radiology may remain somewhat murky, it is clear that radiologists are expected to use informatics to deliver timely, content-rich reports; develop meaningful relationships with hospitals,

referring physicians, and patients; manage the utilization of imaging; and participate in the medical, social, and political structures of hospitals [3]. With increasing performance expectations and complexity, it is more important now than ever to be productive [4]. The good news is that productivity is a skill like any other that can be learned and honed through constant practice [5]. In this article, we focus on personal productivity techniques a radiologist could use to keep up with these ever increasing demands. Part 2 focusses on other productivity techniques [6].

GETTING THINGS DONE

The past two decades have seen an explosion of "time management" or "personal productivity enhancement" methods in an attempt to teach people efficient routines for dealing with information overload. However, they fail to address the central problem: we are constantly bombarded by new information, which typically requires reconsideration of priorities, objectives, and resources, commonly rendering detailed planning ineffective [7].

With Getting Things Done, or GTD for those in the know, David Allen has proposed a simple and flexible method intended to minimize stress and anxiety while maximizing productivity [8]. The basic principle of GTD hinges on moving tasks out of the mind by recording them externally, thereby freeing the mind, enabling it to concentrate on actually performing those

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tasks. It proposes a productivity framework (Fig. 1), which involves gathering all of the “incompletes,” including anything personal or professional that has some type of “to-do” attached to it, and sorting them into essentially 5 categories (5 D’s) [5]:

- Delete it: If you don’t need it, delete it!
- Do it: If it can be done quickly (<2 min), do it now.
- Delegate it: An often-ignored strategy!
- Deposit it: Create an easily accessible and organized archiving system.
- Defer it: Schedule and track the tasks that will take >2 min to complete, such as future projects, and time-bound “to-dos.”

The “do” portion of the GTD model is the most difficult part of being productive. Staying motivated and healthy and achieving work-life balance is key to an effective productivity model [5]. Adopting a few healthy practices, such as daily exercise, goal setting, decluttering, taking regular breaks from work, and learning to prioritize, will lead to an almost effortless increase in energy and productivity [9]. These habits, along with limiting distractions, will thus allow more work to be done in a shorter amount of time. The Pomodoro Technique (named after the tomato-shaped kitchen timer) is a productivity method designed to enhance concentration by focusing on only one task at a time, resulting in reduction of the impact of internal and external distractions. With the aid of a simple timer, also available as simple applications on several smart phones, the user will spend short, 25-min bursts of focused energy on a task, followed by a 3-min to 5-min rest

interval. After 4 “Pomodori,” a longer break of 15 to 30 min is taken [10]. This method, one of the more popular time management techniques among productivity enthusiasts today, can thwart procrastination by streamlining concentration, thereby increasing output.

A both crucial and incredibly rewarding step in any workflow management system is the weekly review [5]. A small amount of time should be carved out weekly to get caught up (keep up with the paperless workflow, process inbox, capture notes), stay current (review actionable items, plan next actions), and be creative (brainstorm new ideas, set short-term and long-term goals, analyze the effectiveness of productivity practices) [11].

DEALING WITH E-MAIL

E-mail is notorious for being a huge source of distraction and wasted time, but it can also be used as a productivity tool. An e-mail inbox often represents unprocessed items that need some decision. An overflowing inbox compromises focus, decreases efficiency, silently drains energy, and distracts from the task at hand [5]. Achieving “inbox nirvana” [11] is possible, and learning the “process” of regularly prioritizing incoming information can dramatically improve productivity. In a way, e-mail is a microcosm of an individual’s overall productivity framework, and the 5 D’s of GTD can, and should, be applied. For example, if an e-mail response will take <2 min to complete, doing it immediately eliminates the need for further processing, which would likely take more time than just getting it done now and out of the way. Processing e-mail in this way also provides a motivating “caffeine-like hit” of accomplishment. For

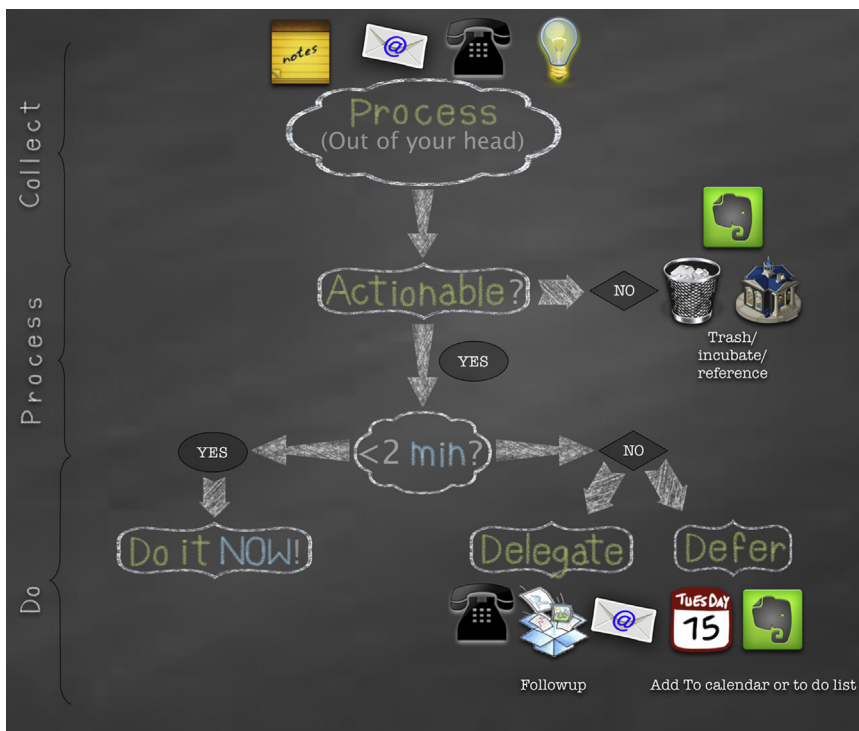


Fig 1. Illustration of the Getting Things Done workflow. Elephant icon represents Evernote application. House icon represents Papers 2 application. Open box represents Dropbox application.

most people, e-mail pours in constantly, and their multitudes of portable devices keep them connected at all times, creating a lifestyle without any real breaks from work. To avoid living in your inbox, push notifications must be turned off immediately, so that your inbox is updated at more reasonable intervals. It is best to check for new e-mail as seldom as your job and your patience will permit. If this is particularly difficult for you, start by setting it up for hourly updates. But do not be afraid to push the envelope, even for just half a day, and see the difference!

Getting inbound e-mail under control provides a huge productivity boost, but outbound e-mail communication has its traps as well. A well-written, concise message saves everyone time. A less than 5-sentence e-mail can be perceived as abrupt and rude, whereas more than 5 sentences can waste time. A good e-mail should have a single focus, have a compelling and actionable subject line, get to the point quickly, and avoid excessive details. It should answer these 5 questions [12]: Who are you? What do you want? Why are you asking me? Why should I do what you are asking? What is the next step? Most people need this information to make a decision. A powerful outbound e-mail time saver is using the “subject” line efficiently. A great “subject” line makes it easy for your recipient to immediately understand why you have sent an e-mail and to quickly determine what kind of response or action it requires, and it can even serve as the entire e-mail itself.

Innumerable derivatives of the GTD framework and associated techniques circulate on the Internet via blogs, articles, videos, and software. And although it is impossible for one single approach to guarantee productivity for everyone, by understanding your personal productivity needs and experimenting with different techniques, it is possible to develop a unique system that works. Myriad tools are available to aide in the incorporation of these efficiency techniques and habits into daily workflow. Some of the most powerful tools to enhance productivity are reviewed in this article.

GOING PAPERLESS

Going paperless is a potentially life-changing event that eliminates clutter and stress by saving both space and time and allowing instant, ubiquitous access to all of your personal documents [13]. Most important documents are now available in electronic format, and the first step in achieving a paperless lifestyle is to stop the incoming paper by receiving as many items electronically as possible [14]. There will still be some amount of paper that enters your daily life, such as mail, receipts, and documents from colleagues, which will need to be accounted for [13]. Tools needed to begin this process include a physical “inbox tray,” a “waiting to be scanned” bin, a scanner, and associated software to help organize what is scanned. The specifications of what

makes a good scanner and software are discussed in detail in the next section.

First, it is important to set up a quick and easy daily routine. As paper comes to you throughout the day, quick decisions should be made about its destination. If it is useless, it should be discarded immediately. If no action is necessary, then ask yourself, should it be scanned? This answer will vary somewhat from person to person, but a good general rule should be to scan things that will be needed again and cannot be accessed elsewhere. For example, a personal letter from the dean’s office may be scanned, whereas a university newsletter can be discarded because it is available on the website. Items to be scanned should then be placed into the “waiting to be scanned” bin. Actionable items should be dealt with as described above in the “Getting Things Done” section, and after the appropriate action is completed, the paper can be discarded or shredded or moved to the “waiting to be scanned” bin. At the end of the day (or after an even longer interval), it should take only a few minutes to scan everything in the bin and start afresh the next day [13,14]. Once this daily digital workflow process becomes a habit, old archived documents should be dealt with in the same way as time permits. There may be an initial time and monetary investment in going paperless, but these are outweighed by many benefits, including increased productivity, decreased cost, easy portability, better security (from physical theft and destruction from fire or flooding), and easy sharing [5].

SCANNERS AND SOFTWARE

Utility

The hub of any paperless workflow system is composed of the hardware (scanner) and the software to organize what is scanned. Choosing the right scanner will greatly enhance productivity by allowing quick and easy upload. Although there are a multitude of different scanner types which offer a wide array of functions, a fast, duplex (captures both sides of the document at the same time), sheet-fed scanner with an automatic document feeder will be the workhorse of any paperless operation. The ability to scan directly into cloud software applications such as Evernote (Evernote Corporation, Redwood City, California), Google Docs (Google Inc, Mountain View, California), and Dropbox (Dropbox, Inc, San Francisco, California) is an added feature that many new scanners are incorporating. A very popular scanner that meets these criteria is the Fujitsu ScanSnap iX500 (Fujitsu Ltd, Tokyo, Japan) [15]. Some of the most popular sheet-fed scanners are compared in Table 1.

Just as there are several scanners with similar specifications, there are numerous file management applications. The major software requirement when going paperless is optical character recognition, electronic conversion of scanned images of handwritten, type-written, or printed text into machine-encoded text. It is a way of digitizing texts so that they can be electronically

Table 1. Some of the most popular sheet-fed scanners

Scanner	Price	Wi-Fi Capability	Additional Features
Fujitsu ScanSnap iX500 (Fujitsu Ltd, Tokyo, Japan)	\$495	Yes	Comes with a free 1-year subscription to Evernote Premium; comes bundled with the popular reference manager Paperless (Mariner Software, Inc, Minneapolis, Minnesota); can use a wireless connection to scan directly to iOS or Android devices, bypassing the computer completely; 50-sheet maximum capacity
Brother ImageCenter ADS-2500 (Brother Industries, Ltd, Nagoya, Japan)	\$699.99	Yes	Direct scanning to various cloud applications; can scan directly to Android devices; 50-sheet maximum capacity
NeatConnect (Neat Company, Inc, Philadelphia, Pennsylvania)	\$499.95	Yes	Direct scanning to various cloud applications including their proprietary NeatCloud (subscription included); 15-sheet maximum capacity
Xerox Documate 3220 (Xerox Corporation, Norwalk, Connecticut)	\$299.99	No	50-sheet maximum capacity
Epson WorkForce Pro GT-S50 Document Scanner (Seiko Epson Corporation, Nagano, Japan)	\$299.99	No	75-sheet maximum capacity

searched [16]. The application and details of reference managers are discussed further in the next section [17-20].

Impression

Going paperless is a huge time, money, and stress saver, which involves using technology to generate less paper overall by collecting paper and imputing the content into a computer. A paperless workflow allows easy access to important documents from anywhere, better security, and easy sharing [5].

One limitation of going paperless is that the process can be slow in the initial learning phase. There is also a significant monetary investment upfront for a multiple-sheet-fed scanner (eg, the Fujitsu ScanSnap iX500 costs \$495) and a software suite with optical character recognition capability (eg, Papers 2 [Mekentosj BV, Dordrecht, The Netherlands], \$79). Another limitation of this system is that relegating a task to a folder that is not reliably reviewed can cause an important task to get ignored. This can be addressed by setting up reminders for important tasks and deadlines.

REFERENCE MANAGERS

Utility

Organizing innumerable journal articles available online for quick reference is a challenge. Currently up to 25% of radiologists opt for online-only journal subscriptions [21-23]. Reference management applications allow easy retrieval of material from online databases such as PubMed and Google Scholar, with the ability to save downloaded articles as PDF files, along with its associated metadata (title, authors, key words, abstract, etc). This feature allows material to be organized and used for bibliographic references and citations, saving significant time and energy when performing research and preparing manuscripts [24].

There are a large number of reference managers available to choose from. The majority of those currently available allow users to import already existing documents in various formats into a library by downloading directly either through search engines or through an institutional library. Users can organize references by subject, discipline, subspecialty, and so on. The software also allows users to annotate the documents in their libraries, with most reference managers also offering note-taking options. Some reference managers allow several users to share particular collections, resulting in ease of collaboration. All reference managers allow automatic citations in a manuscript, with the ability to quickly reformat the bibliography into various citation styles using just a few keystrokes. This is particularly helpful for those who perform interdisciplinary research or submit their manuscripts to various journals for publication. Several reference managers are also accompanied with mobile applications, automatic backup, and synchronization functions. Papers 2 is a file management software that allows you to search for, automatically retrieve, organize, annotate, and read PDF files on your PC or Mac [17]. Papers 2 handles scientific literature the same way iTunes deals with music, by using a similar iTunes feature (Smart Collections) as a means of organizing scientific research. Table 2 illustrates key features of the commonly used reference managers [25-27]. Several reference managers are available, many with overlapping functionality but slight variations in style. It is recommended to use the free trial period to determine your comfort with the user interface [28].

Impression

Reference managers make the task of organizing large extensive libraries of journal articles easy and save significant time with their easy retrieval abilities. The creation of

Table 2. Some of the most commonly used reference managers

Software	Platform	Cost	File Formats	Citation Styles	Additional Features
Papers 2	Mac, Windows	Free 30-day trial \$79 for a single-user license 40% discount for students Volume pricing also available	Export: Endnote, BibTeX Import: BibTeX	APA, Chicago/Turabian, Harvard, MLA	Handles scientific literature the same way iTunes deals with music by using a similar iTunes feature (Smart Collections) as a means of organizing research.
EndNote	Mac, Windows	Free 30-day trial upon request Students \$113.95, others \$249.95 Volume pricing also available	Export: Medline, Endnote, BibTeX Import: Endnote, Medline, MODS, PubMed	APA, Chicago/Turabian, Harvard, MLA	Built-in search engine of hundreds of online resources to collect references; select a reference and EndNote will find the full text. Web version allows mobile access; password protection and network functionality.
Bookends	Mac	Free up to 50 references Single license \$49.99 Bookends On Tap (Apple mobile application) \$7.99 Volume pricing also available	Export: Medline, Endnote, BibTeX Import: BibTeX, Endnote, Medline, MODS, PubMed	APA, Chicago/Turabian, Harvard, MLA	Unicode-savvy, so you can mix Roman (English, French, German, etc) and non-Roman (Japanese, Greek, Hebrew, etc) characters. Bookends/Mellel (an advanced multilingual word processor for Mac OS X) bundle available for \$69; synchronization library with Apple mobile devices (requires separate purchase of Bookends On Tap from the iTunes App Store).
Sente	Mac	Free up to 100 references and 250 MB of attachments Premium (unlimited library and 1 GB synchronization space) Students \$29.95, others \$49.95	Export: Endnote, BibTeX Import: BibTeX, Endnote, PubMed	APA, Chicago/Turabian, Harvard, MLA	Automatic cloud synchronization of your libraries to any number of Macs and iPads anywhere in the world; create full-access copies for your own computer and restricted copies for sharing with students or colleagues; password protection and network functionality.
Zotero	Mac, Windows, Linux	Free up to 300 MB Upgraded storage: 2 GB \$20/month, 6 GB \$60/month	Export: MODS, Endnote, BibTeX Import: BibTeX, Endnote, MODS, PubMed	APA, Chicago/Turabian, Harvard, MLA	Automatically senses content in your web browser, allowing you to add it into your personal library with a single click; password protection and network functionality.
Mendeley	Mac, Windows	Free account Free iTunes application	Export: Endnote, BibTeX Import: BibTeX, Endnote	APA, Chicago/Turabian, Harvard, MLA	Reference manager and academic social network; import and organize PDF files from your computer, EndNote, Papers, or Zotero; open your PDF files and capture your thoughts through sticky notes and highlight; synchronize library with Apple mobile devices (requires separate free download from the iTunes App Store); password protection and network functionality.

(continued)

Table 2. Continued

Software	Platform	Cost	File Formats	Citation Styles	Additional Features
BibDesk	Mac	Free (open source)	Export: MODS, Medline, BibTeX Import: BibTeX, Endnote, Medline, MODS, PubMed	APA	BibTeX front-end and repository; does not support copy/paste or drag and drop of references directly into Microsoft Word; password protection, but no network functionality.

Note: APA = American Psychological Association; MLA = Modern Language Association; MODS = metadata object description schema.

libraries available even on portable devices allows a quick review of references, facilitates collaboration, and can significantly improve productivity.

Potential limitations in using reference management software include an initial nominal cost in purchasing these software solutions. Optimizing and configuring this software might be cumbersome for some users. Collaboration with colleagues may be challenging if users have their libraries on different platforms.

NOTE-TAKING APPLICATIONS

Utility

To achieve productivity, a trustworthy, reliable system for recording thoughts, ideas, goals, and to-dos should be established [8]. Physically writing a note is certainly a quick option, but paper notes are often misplaced, and valuable time can be lost when searching for one specific piece of information. Electronic note taking saves time, as notes are easily searchable and available even on portable devices.

Evernote is a suite of software and services designed for note taking and archiving that has quickly developed a cult following of more than 60 million users since its release in 2008 [29,30]. Evernote allows users to capture and create notes in a variety of forms, including scanned documents, web pages, photographs, voice clips, and now even handwritten notes (Evernote with Moleskine). These notes are stored locally, but by using cloud technology, are automatically synchronized across all of the user's mobile devices for instant, ubiquitous access. Evernote has powerful built-in search capabilities as well. Even with thousands of notes, information can be retrieved within a few seconds, saving the user a tremendous amount of time [31]. Table 3 compares the most functionally rich note taking and archiving applications [32-34]. Finding an application that matches your personal needs and is the user-friendliest is key to ensure optimal use.

Impression

Having a reliable thought collection and organization system is imperative, and electronic note-taking applications offer additional advantages of being ubiquitous, diverse, and easily searchable. The price for such software ranges from free to \$70, plus a small initial time investment to learn the basics of whichever application is chosen. However, the cost of a paperless note-taking

system is far outweighed by the tremendous amount of time and hassle eventually saved.

Some academic radiologists may feel overwhelmed by the numerous capabilities of note-taking applications such as Evernote. A trial run is encouraged to figure out which features are most important for your personal use. A limitation of electronic note taking is time spent waiting for the application to start up when a user wants to make a quick note [31]. Also, critical information, such as patient information, passwords, and so on, should not be stored if data are stored on a cloud server.

TEXT EXPANDERS

Utility

Text expanders are software applications that automatically replace abbreviations (snippets) selected by the user with their designated longer phrases or paragraphs. They automate typing of repetitive information, allowing the user to concentrate on new material. Some applications offer clipboard support. The user can copy a phrase into the clipboard and assign the phrase an abbreviation, and it gets added to the existing expansions.

Text expanders offer several benefits. By typing snippets of a phrase or paragraph, the user saves time and energy in performing repetitive functions such as reminders, orientation or follow-up e-mails. Snippets can include formatted text, images, and so on, facilitating the creation of a document. Form filling can be easily achieved by creating snippets for name, address, e-mail address, phone number, fax number, and so on. Common spelling mistakes can be circumvented completely using snippets. Some software products offer applications for portable devices as well. Text-expander software collects statistics on how many characters are saved using the software, allowing quantitative measurement of the saved time. Commonly used text-expander applications are summarized in Table 4.

Impression

Text-expansion software circumvents repetitive typing, allowing the user to concentrate on creating new material. There is significant saving of time and energy that can dramatically increase productivity over time [35].

Initial configuration of the program can be a deterrent for the technologically challenged. However, most software products have excellent video tutorials to help new users. Commonly used words are not ideal snippets

Table 3. Some of the most commonly used note-taking applications

	Platform	Cost	Multimedia Notes	Handwritten Notes	Templates	Text-Formatting Features	Synchronization and Collaboration
Evernote	Windows, Mac, Android, iOS, BlackBerry, and WebOS; also web application	Free: 60 MB/month; premium: \$5/month	Allows files, audio, and video as attachments to notes; video notes are limited to premium users	Allows ink notes only with the Windows desktop application; notes cannot be mixed or edited using other platforms	Limited template options: blank paper, yellow ink note or checkbox-based to-do list	Clean and easy free-text input but less flexibility; notes not arranged in pages; allows rich-text formatting	Automatic synchronization every 15–60 min to 24 h, not real time; allows note sharing but collaborative editing allowed only for premium users
Microsoft OneNote	Part of Microsoft Office except Mac Office; also supports mobile apps for iPhone, iPad, and Android	Included with Office (\$119–\$349); also available as stand-alone (\$79); web application is free	Also allows files, audio and video notes; notes can be moved, resized, hyperlinked and indexed with spoken words for a later search	Allows robust inking system; notes can be placed anywhere, mixed with other text/notes, converted to text and resized	Allows a variety of templates: meeting notes, calendars, to-do lists, charts, forms, and reports	Text is contained in boxes that can be dragged and reorganized around the page without having to cut and paste; allows complex formatting	Allows real-time background synchronization of notes; simultaneous sharing and editing and whiteboard functionality; old versions of the notes can be retrieved
Google Keep	Can access via the web; however, limited to only Android 4 OS	Free	Allows text, voice, or photo note, or create a checklist; video not supported	None	None; does not organize related notes	Speech-to-text transcription for voice notes, home-screen widgets, and an archiving option	Real-time synchronization; limited sharing capabilities via email; does not integrate with Google Tasks
SpringPad	All except Linux; has iOS and Android apps	Free	Yes; allows capture and storage of audio and video notes	None	None; however, offers note content–based tips and suggestions	Can create, edit, and save a variety of notes as snippets that can be organized into notebooks	Allows private or public note settings; users may follow public notebooks for information sharing
Simplenote	Only Mac, iOS, Kindle, and Android platforms; can also be accessed via the web	Free; \$1.99 per month (pro account); pro account allows notes to synchronize to Dropbox	Not available; only text notes are supported	Not supported	None; only blank notes are allowed that can be tagged and grouped together	Sleek three-pane design with sidebar, notes pane, and note editor with search function; lacks other functionality	Excellent real-time sync feature; for collaboration, the note can be converted to a web page and link sent to the recipient for editing

Table 4. Some commonly used text-expansion software

Software	Platform	Cost	Additional Features
TextExpander	Mac	\$34.95	Generally regarded as the standard text expansion software; fill-in feature is a unique time-saving feature that allows the user to define multiple fields that will be fillable when the snippet gets expanded; the TextExpander library can be used by any other computer via Dropbox and MobileMe synchronization option; Apple mobile application also available
Typinator	Mac	\$33.45 (30% discount for students and faculty members)	Comes already bundled with automatic correction for English, French, and German, as well as File Maker 9 functions and 111 HTML snippets; Dropbox and MobileMe synchronization option
Typelt4Me	Mac	Free 30-day trial Students \$13.99, others \$19.99	Similar in functionality as TextExpander; password manager function; gives statistics about saved time in typing using the software
FastFox	Mac, Windows	Free 14-day trial; \$29.99	Because FastFox runs in the background, shortcuts can be used with any program, including word processors and e-mail; with intuitive auto-complete, FastFox learns the most commonly typed phrases and suggests them as the user is typing
Texter	Windows	Free	Runs in the background in the Windows system tray and thereby works in any application the user is typing in; last software update was in 2007
Phrase Express	Windows	Free for personal use	Performs mathematical calculations as the user is typing, thereby eliminating time wasted switching back and forth between a calculator; intuitive auto-complete; can synchronize snippets with TextExpander to provide a cross-platform text expander for Windows and Mac
Breevy	Windows	Free 30-day trial; \$34.95	Can synchronize snippets with TextExpander and Dropbox

because they get replaced with the designated phrase(s). With increased use, a user may not be able to remember all the snippets and their corresponding phrase or paragraphs. In such a scenario, the user must access the menu bar to select the required snippet [36].

CONCLUSIONS

Productivity is a skill that can be learned. The rewards of an efficient and relaxed life far outweigh the amount of time and effort it takes to create and maintain an organized workflow. We encourage readers to go paperless! The initial investments will more than make up for the time and stress saved over the long term.

TAKE-HOME POINTS

- Productivity is a skill that can be learned and honed through constant practice.
- GTD is a simple and flexible workflow management framework that can minimize stress and maximize productivity.
- E-mail can be a powerful productivity tool when used wisely; regularly processing your inbox using GTD principles can increase productivity.

- Going paperless is a potentially life-changing event that eliminates clutter and stress by saving both space and time and allowing instant, ubiquitous access to all of personal documents.
- Reference managers allow effortless organization of even large, extensive libraries of journal articles and save significant time with easy retrieval.
- Electronic note-taking applications offer a reliable system of recording thoughts, ideas, goals, and to-do items.
- Text-expansion software is a simple way to save significant time and energy by automating repetitive phrases and functions.

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