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Tips for Creating a Functional Personal Knowledge Management System in Academia

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Tips for Creating a Functional Personal Knowledge Management System in Academia

Introduction

As academics, organizing information is key to our success. There are many books, blogs, and podcasts suggesting practices for academics and other content creators. However, finding a specific piece of previously collected information can be difficult when you do not remember the details of what you are looking for. It is even harder to find an information organization solution that will work in your context with such a variety of personal anecdotes available. Some common keywords include Zettelkasten, smart notes, second brain, and personal knowledge management.

Zettelkasten and smart notes are closely related terms, both stemming from a system created by Niklas Luhmann. The Zettelkasten method is a system for organizing and connecting notes created while reading literature. In this system, a researcher makes notes for each concept or piece of literature and adds tags and links to other notes and ideas. The tags help the researcher identify connections between papers and ideas that they may have forgotten over time. In the past, this was implemented on physical notecards organized in boxes. Now, several digital methods make notetaking, access, and tagging much simpler. It has been credited for enabling Luhmann's prolific publications [1].

Ahrens [2], proposes six steps for using Zettelkasten in the writing process: focus on the task, read for understanding, take smart notes, develop ideas, share your insight, and make it a habit. In the reading step, the writer should have an open mind and focus on getting the main ideas from the source. When making smart notes, the key is to summarize and understand the source. In the developing ideas stage, the author looks for connections between notes and ideas and categorizing notes. When working with slips of paper in physical boxes, Luhmann had a very sophisticated numbering and indexing system to keep track of notes. Modern digital Zettelkasten systems have eased indexing, however, the author must remain attentive to looking for conceptual connections between notes. Once the notes have been connected to larger ideas, then the author can begin to write these ideas and share the insight.

Personal knowledge management (PKM) may be the broadest term that has been used to describe these processes, however, I only encountered the term last fall. Second brain seems to be a more recent and popular synonym for PKM and is widely used by internet content creators. PKM goes beyond merely organizing research and literature to other aspects of larger projects. For example, some academics include information for courses and committee work in their PKM.

There are many models for PKM. Cheong and Tsui [3] reviewed several and proposed that a PKM system should have four components: personal information management, personal knowledge internalization, personal wisdom creation, and interpersonal knowledge transferring. Information management consists of collecting, evaluating, and organizing information. Knowledge internalization includes analysis, learning, and reflection. Wisdom creation is a higher order of thinking that adds problem-solving and creativity to the process. Finally,

knowledge transfer includes sharing and communicating what was learned in the other components.

There are many overlapping concepts between PKM models and how Luhmann implemented his Zettelkasten. Jarche [4] offers the simplest model which is seek, sense, and share. The steps in each system are key aspects of what faculty are expected to do for both teaching and research. In this paper, I share my personal journey of developing a PKM system with some tips and tricks I've learned along the way.

My Personal Knowledge Management System

My journey toward implementing a knowledge management system started with a desire to better organize the literature sources for my research projects. I had used reference managers for years, but each had limitations such as cost, portability, and searching. All the reference managers are great for what they were designed to do: collect information into a database to create citations. Beyond that they vary in their features for notetaking, highlighting articles, etc. After conducting research at three different institutions with licenses for three different reference managers, I wanted an easier-to-search option that was not platform dependent. I sought tips from other researchers and found the most frequent recommendations were annotated bibliographies and spreadsheets. These seemed a bit brute force and not user-friendly for large or multiple overlapping projects. I wanted a robust system to track literature sources for my research that was not locked into a specific file format or platform so that I could stick to a small budget. I found the Zettelkasten method and the numerous open-source tools that make it simple to implement on any platform.

Software Selection

There are many software programs available to support your PKM system. They all have a variety of features and work on some or all of the expected platforms (e.g., PC, Apple, Linux, mobile). Some of them are open source and free while others are commercial products with either one-time costs or subscription options. I reviewed several options when I started about three years ago and more are now available. There is now a public wiki that lists [5] and compares [6] notable software programs for PKM and Zettelkasten. The wiki grew out of many conversations on the Zettelkasten subreddit [7], which is where I have found many tips. Based on previous experiences my priorities for selecting a software package were:

1. Low or no cost
2. Available on multiple devices and platforms (PC and Android)
3. Non-proprietary format for notes, to assure portability and future access
4. Decent workflow for notes about papers and books for my research

After trying out Zettlr [8] for a while I switched to Obsidian [9] and have not looked back. They both are open-source projects with free versions, available on my preferred platforms, and use the MarkDown open standard to store notes. Three main differences led to my switch a couple of years ago: (1) Obsidian has a plugin to read JSON files from a reference manager to make the literature search workflow easier, (2) Obsidian has a larger developer community and new features were added faster, and (3) Obsidian has a helpful user community on Discord which

makes getting started easier. Since then, Zettlr has added many features as well, and may be worth a second look for those starting fresh. Other tools have been developed in the last two years as well.

Since software options in this space change regularly, instead of adding more details here, I recommend creating your own list of desired features, as I did, and reviewing the options that are available starting with the wiki [5], [6].

There is one additional emerging category of software that is worth noting: AI-assisted literature searches, as literature searches are likely a key component of the seek or identify step of a PKM system. Therefore AI software that can assist with this step may be a helpful addition to the system, but likely does not contain all of the desired features of a PKM. These AI tools include ResearchRabbit [10], Elicit [11], Connected Papers [12], Inciteful [13], and Litmaps [14]. These are not listed on the wiki above because they are not complete PKM systems. They use advanced searches and AI to explore and visualize papers, however some are limited to papers that have a DOI. The primary function is to identify new papers related to your research and if desired generate digest emails and alerts when new papers are found, which is what can make it a key tool in the seek step of a PKM system. Each AI tool has different a pricing model from free to paid subscription options. I will likely explore adding one of these to my system soon.

Research

Applying a PKM system to research has clear applications for collecting and organizing literature for a research project. I applied a process similar to what is described in *How to Take Smart Notes* [2], adapted to use Zotero as my reference manager and collect my notes in Obsidian, see Figure 1. I opted to continue using Zotero as a reference manager in a limited context, primarily to collect reference information and to include citations in papers, but not for notes or any other processing of sources. This assures the data is easily exportable as a RIS or BibTeX file to import into another tool should I need to switch reference managers again, while keeping the stored data under the free-tier cloud size limit. I save all electronic sources in a folder in my Obsidian vault (folder), making it possible to put a preview or link to the file within an Obsidian note for easy access.

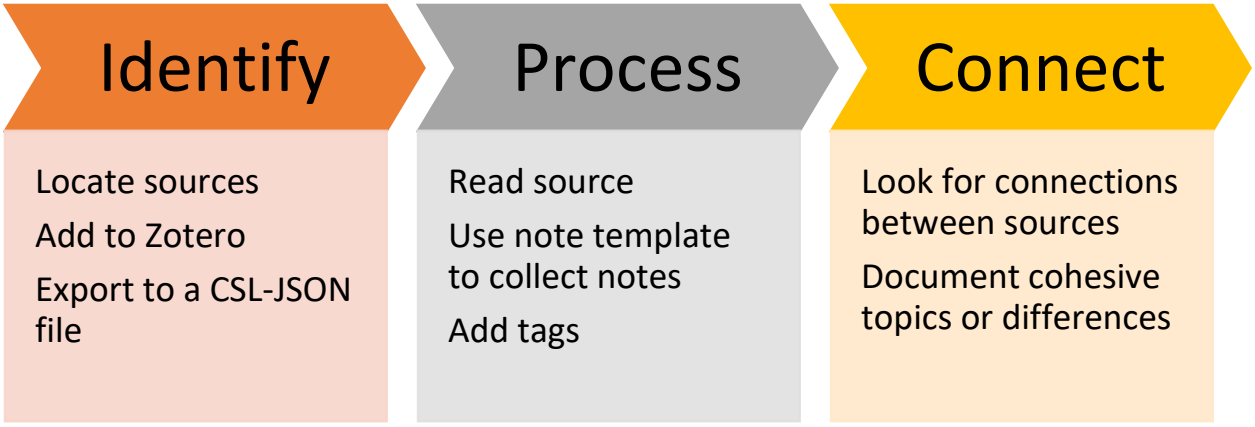

Figure 1 - My Literature System

After collecting several sources in Zotero, I export my entire library as a CSL-JSON file and save it in my vault for reading notes in Obsidian. To make my file names easier in Obsidian, I open the CSL-JSON file in a text editor and remove the web address from the ID field of the CSL-JSON file, leaving only the unique ID generated by Zotero. Obsidian has a plug-in that will use data in the CSL-JSON file to populate citations in notes or extensive fields in a template note, see Figure 2. When reading a source for the first time, I create a new reading note in Obsidian and it populates the header of the note with information about the source from Zotero, naming the file based on the unique ID generated by Zotero. Since I started using the Citations plugin, it has been updated to take a BibTeX file as an input as well as a CSL-JSON file. This means that it likely works with any citation manager that can export to BibTeX, not only Zotero. Once I have captured the main points of the source, I add tags to the file to make the information easier to find and connect to later. I find the graph view of notes in Obsidian helpful in identifying connections between tags and notes.

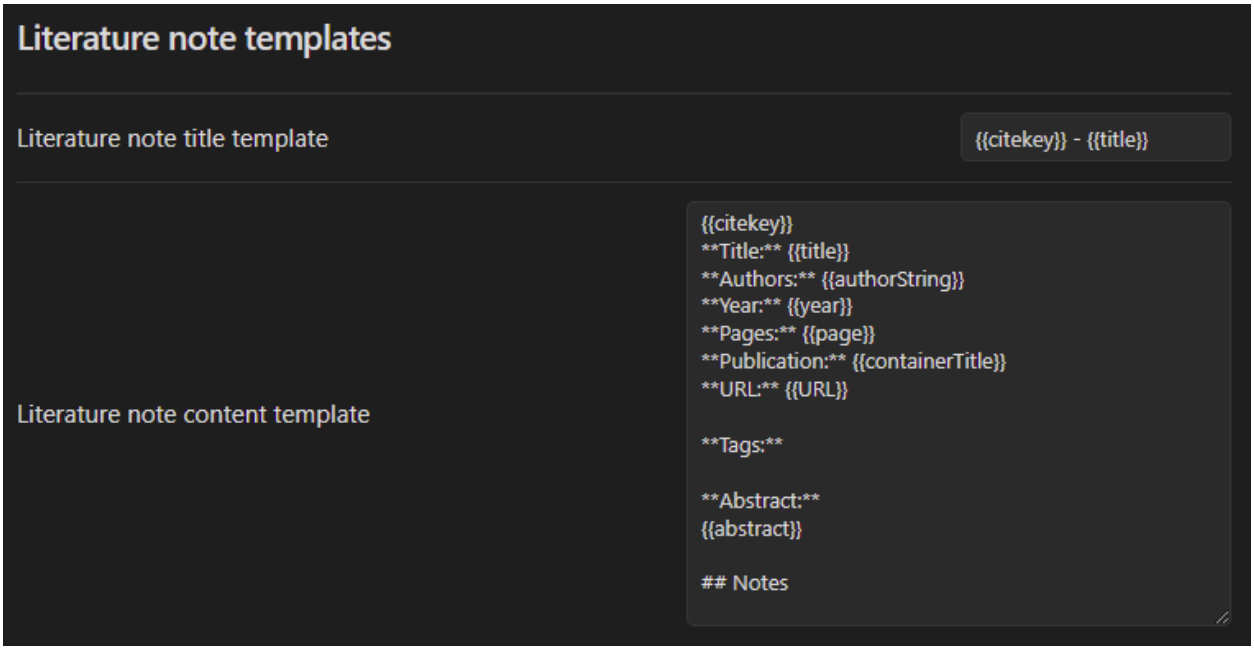

Figure 2 - Literature Note Template from Citations Plugin in Obsidian

Obsidian also has features for project management that help keep information for a project together. For example, there is a plugin to add Kanban boards [15]. I used this plugin to track the stages of an eText project last summer. In this Kanban board, I had columns for the outline, draft, quality check, build, and complete. Then I had a card for each chapter with checklists and due dates, making it easy to see at a glance if the project was progressing and on schedule. I have now set up Kanban boards to track other projects with multiple items that go through the same steps.

With an upgrade to add cloud storage from Obsidian or possibly using your cloud storage (e.g., Box, OneDrive, Google Drive, Dropbox) you may be able to collaborate with others in creating reading notes. I have not had the opportunity to try this, so I am not sure how well this would work.

Teaching

I use a similar process for collecting sources and inputs for the courses that I teach, except that I keep the notes in a separate folder. Since I do not always input these into Zotero, I do not use the same note template. Instead, I use a generic note template for all sources that are not intended for research inputs.

In addition to sources, I keep a reflection journal for my courses in Obsidian. Each semester I collect stats on enrollment and other data that may be useful in a promotion or award document. I also keep notes on what went well or what I may want to consider changing in a future semester. For example, in the fall 2021 semester, I developed a running list of potential improvements for my new specifications grading system in my notes for that course. I also have a note for each laboratory in that course that includes learning objectives, required background, equipment, and assignment notes.

Other Applications

Since I now keep Obsidian open continually on multiple computers, I have started using it as a personal planner. My personal planner is based on a Bullet Journal [16] with some improvements based on *Getting Things Done* (GTD) [17]. Based on the Bullet Journal process, I start with a note with an overview of the year, add a more specific note for each month that I create a few days before the month starts, and finally during my weekly planning meetings create another note for each day. Obsidian has plugins that also support GTD processes and make a collective checklist based on date tags throughout a collection.

When I started looking at how other people used Zettelkasten, I did not perceive myself as a content curator like the bloggers, podcasters, and video creators that I was getting tips from. However, now that I have started the process, I realized there are two additional reasons I collect information: social sharing and mentoring.

I manage the social media presence for committees in two professional organizations, so I need a way to collect and share content on those platforms. This part of my system is still a work in progress. I need to refine my strategy for finding content regularly and getting it into an Obsidian note if I find something interesting while browsing on my phone.

In the mentoring category, I include workshops for graduate students or other faculty and one-on-one mentoring with new faculty or graduate students. In either case, it is helpful to be able to search in Obsidian to quickly find notes related to a particular topic of conversation and share the link or insight gained from that source. I've found that having these notes all in one place makes it easier to find than searching through bookmarks or the web each time the topic comes up.

Finally, I also take notes in Obsidian while in meetings or workshops. This is part of the Bullet Journal process described above. In a workshop, the techniques or information learned there is in the same place as the rest of my projects, making it easy to pull brainstorming notes or lessons learned for my active projects. One feature of Obsidian that makes this really easy is the ability to paste screenshots or images into a note and add accompanying text.

Other Tips

My first tip is to use tags liberally. Tags are the easiest way to find and connect notes. I have four primary categories of tags: keywords, sources, projects, and tasks. Keyword tags serve the same purpose as keywords in papers.

Source tags remind me where I found the content. These can be specific tags for a particular journals or website, or generalized tags for categories of sources like "podcast" or "blog." Sources as tags can be helpful if you are trying to find something that you remember hearing on a podcast but cannot remember other specifics. I also use source tags to credit my sources when sharing tips on social media.

Project tags narrow related notes while working on a particular project. By consistently using broad keywords or project-related tags you should be able to find any related note easily. One example I learned along the way was my first project in Obsidian where I was reading literature on different methods of alternative grading. At first, I was tagging each article with the specific method, however, it later became difficult to find all notes related to alternative grading or that project until I added additional project related tags.

Finally, task tags are notes to myself to create a reading list or reference for who I might need to share it with. I do not necessarily include all four tag types on each note, but I do think about each category as I am creating tags for a note.

Limitations

Some of the limitations of my PKM system include that it is constrained to PC platforms primarily due to Box being my institution's mandated cloud storage and backup solution for research data. Obsidian has a mobile app now, but I cannot access my vault because Box does not allow apps to access files directly through their mobile app. Therefore, if I want to edit or view a document on my phone, I can only open it through Box. It also limits my ability to take notes while at a conference or meeting where I do not have my computer out. In these cases, I take notes in a paper notebook or another app on my phone and transfer them to Obsidian when I am back at my computer.

Overall, setting up a PKM system takes time and is very specific to your application. Your implementation will likely evolve as mine has. However, now that I have started to see the benefits of an organized PKM system, I know the time investment was worth it.

Conclusions

I have successfully set up a system to collect and organize the sources of information I need to be a successful faculty member, using a blend of both PKM and Zettelkasten methods. The software solutions I use are free and/or open source and can be accessed from any of my Windows-based computers at home or in the office. Although Obsidian provides many features that are useful in visualizing and organizing information, all of my Obsidian notes are saved in an ordinary file system as plain-text MarkDown files, assuring they can be read with any text editor if necessary. PKM systems are necessarily individualized and therefore my system will not work for everyone. However, that adaptable nature supports my belief that it is

advantageous for academics to develop their own PKM implementations. I encourage anyone starting a PKM to look at a variety of examples for inspiration and jump into developing a system, understanding it will likely take some time to develop their own idealized solution.

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